

Blue Economy Strategically issues and opportunity in Indian Ocean: A study based on Sri Lanka.

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Abstract: The Blue Economy is regarded as the decoupling of socio-economic activities and development from environmental degradation and optimizing the benefits which may be derived from marine resources. For many countries the marine, coastal and maritime sectors represent an important foundation for sustainable development. Sri Lanka, an island strategically positioned in the Indian Ocean amidst major commercial trade routes encompasses a sea area which is seven times larger than its land area. Having the geographical and territorial advantage, its potential in Blue economy is immense given accurate Implication and strategic planning. This research investigated on Sri Lanka's blue economy, strategic issues and the international economic relationship in the Indian Ocean. The research objectives were to study the blue economy strategy in the Indian Ocean and study the current blue economy background in Sri Lanka, the Current problems and the international economic relationship based on the blue economy. Research problems is what are the blue economy issues in the Indian Ocean and Sri Lanka? And what is the current blue economy strategically international economic relations? As the research methodology qualitative research methodologies were used. According to the research, Sri Lanka is very important in blue economy Strategy. Blue economy can be identified as a major Strategic issues in the Indian Ocean. At the present, to the mainly blue Economical issues in Indian Ocean and Non Traditional security threats, Human, arms and drug trafficking, Piracy, Illegal, Unreported and Unregulated (IUU) fishing and Threats for marine resources, Climate changes, Oil leakages from commercial ships, Over fishing and Threats to marine ecosystems due to tourism activities, Lack of sustainable ocean strategy.

Keywords: *Blue Economy, International Economic relations, Indian Ocean, Sri Lanka*

I. Introduction

The Blue Economy (BI) is increasingly relevant to the sustainable economic and political strategy to address trade issues and climate change, taking into account marine resources. While untapped marine resources can offer growth opportunities, particularly for developing countries, their sustainable use is a global responsibility and a time requirement. Current ocean resource management appears to be shared by developed and developing countries. Although the United Nations Convention on the law of the sea (UNCLOS) provides the legal framework for ocean resource Management, some of the key topics of business arrangements, such as fisheries subsidies, some under the mandate of the world trade Organization (WTO). Therefore, it is important for developing countries to prepare blue diplomacy strategies in order to function with the Developed nations in their social and economic development, while maintaining the ocean's health.

Oceans are increasingly important in facilitating international trade through linkages between sellers and purchasers. The behaviour patterns of such linking enablers in the oceans are receiving more attention from a regulatory and economic perspective as the relationship between ground and ocean evolves in its quality and importance. The blue economy is an economic term connected with the development and conservation of the marine environment. The scope of interpretation varies from one organisation to the next. Granting to the World Bank (2018), the blue economy is "the sustainable usage of ocean resources for economic development, improved livelihoods and employment while protecting the health of the ocean ecosystem. "The European Commission defines it (2018) as "All economic activities linked to oceans, seas and coastlines. It covers a wide range of both established and emerging sectors. "For the Commonwealth of Nations, it is "an emerging concept that fosters improved stewardship of our oceans or blue resources" (2018). Conservation International adds that "the blue economy also has economic benefits that may not be marketed, such as carbon sequestration, coastal protection, cultural values and biodiversity (2018)." The centre for the Blue Economy says (2018) "it is now a

widely used term around the world with three related but distinct meanings- the overall contribution of the oceans to economies, the need to address the environmental and ecological sustainability of the oceans, and the ocean economy as a growth opportunity for both developed and developing countries."

According to the Department Of Economic and Social Affairs in United Nations (UN DESA) (2019) representative recently defined the Blue Economy as an economy that "comprises a range of economic sectors and associated policies that together determine whether the role of ocean resources is sustainable. A significant challenge for the blue economy is to understand and better manage the many aspects of ocean sustainability, from sustainable fishing to ecosystem health and pollution prevention. Secondly, the blue economy challenges us to distinguish that the sustainable management of ocean resources will require collaboration across borders and sectors through a variety of partnerships, and on a scale that has not been previously achieved. This is a significant challenge, particularly for Small Island Developing States (SIDS) and Least Developed Countries (LDCs) that have significant limits. "The UN notes that the blue economy will contribute to the achievement of the UN Sustainable Development Goals, of which an objective, 14, is "Underwater Life".

World Wildlife Fund begins its report Principles for a Sustainable BLUE ECONOMY with two senses given to this term: "For some, blue economy means the role of the sea and its resources for sustainable economic growth. For others, it's just any economic activity in the maritime sector, whether it's sustainable or not."

As the WWF reveals in its design of the story, there is still no widely accepted definition of the term blue economy despite increasing high-level adoption of it as a concept and as a goal of policy-making and investment.

Ocean economy

The ocean economy is a term associated with the blue economy, and there are organizations that use the two terms interchangeably. However, they are different concepts. The ocean economy is limited to the utilization of ocean resources and is strictly intended to strengthen the economic system of the oceans. The blue economy does not limit itself to considering the ocean economy as a vector for economic growth. It highlights sustainable oceans for economic growth. Therefore, the blue economy encompasses the ecological aspects of the ocean and the economics.

Blue growth

A related term is "blue growth", which means "sustainably growing the marine sector". The term is adopted by the EU as an integrated maritime policy to achieve the objectives of the Europe 2020 strategy.

Blue economic strategically of Indian Ocean

The Indian Ocean has also become of significant interest to the great forces beyond the area and has become more and more a theatre in which global geopolitical rivalries are played away. This is because of the importance of its shipping routes of commerce and communication, as well as the rich natural resources of many of its coastlines. The Indian Ocean area is broad in scope.

The economy in the Indian Ocean is quite different. It is home to small island states, such as the Comoros and the Maldives, as well as some of the most populous economies, such as India and Indonesia. It also encompasses countries at all levels of development, from low-income countries like Mozambique and Tanzania to high-income economies like Australia and Singapore. According to the World Bank report (2017/2018), the combined GDP of the Indian Ocean economy amounted to 12% of global GDP in 2018. The East Asia and Pacific sub region represented 4.39% of global GDP in 2018, while South Asia represented 3.9% and the Middle East and Africa combined 2.2%. The region is expected to account for around 20% of world GDP by 2025, and per capita incomes are expected to double to US\$6,150 between 2017 and 2025. In addition, the share of the population in poverty should halve to 07% by 2025.

The geographical scope and diversity of the Indian Ocean economy means that it has a large base of natural resources. The Indian Ocean has 50.7 per cent of proven petroleum reserves and 44.5 per cent of proven natural gas reserves. In terms of fisheries resources, we have a lot of fish, shrimp, and livelihoods in the fishing industry. The Indian Ocean accounted for 28% of global fish capture in 2016, and according to the world ocean review 2013, there has been a continuous increase in fish capture in the western and Eastern Indian Ocean since the 1950s. While most of these products are consumed domestically, they also form the basis for export success in a number of countries. Based on a World Bank Report (2017/2018)

- For example, Indonesia and India accounted for approximately 4.5 per cent of the world's frozen fish exports in 2017.

- Sri Lanka: Exports of fish and fish products contributed to more than 02% of domestic export earnings in 2018.

Fisheries fleets in Russia, Japan, South Korea and Taiwan also operate in the Indian Ocean, mainly for shrimp and tuna. Demographics are also positive for the Indian Ocean economy. In 2018, the region was home to 36.7% of the world's population (2.7 billion inhabitants), most of them living in the South Asian sub-region (23%). In 2018 it was home to 24% of the world's working-age populations, those aged 15-64 (and based on UN department of economic and social affairs projections, this share will rise up to 38% by 2050). However, education and productivity levels vary widely across regions. And its ethnic and cultural diversity.

II. Research problems and Objectives

This research focused on the strategic challenges facing Sri Lanka's blue economy and international economic relations in the Indian Ocean. The research aims were to examine the blue economy strategy in the Indian Ocean and study the current blue economy background in Sri Lanka, the Current problems and the international economic relationship based on the down economy. And, Research problems is what are the blue economy issues in the Indian Ocean and Sri Lanka? And what are the current blue economy strategically international economic relations?

III. Research methodology

This research utilizes an objective and interpretative methodology, an empirical epistemology, and a descriptive and analytical approach. At its core, research is a qualitative investigation. Research issues are covered by primary and secondary sources. In addition, the data triangulation methodology was used to accumulate secondary data from multiple electronic and paper sources, including books, journals, the Web, reports, historical documents and treaties. Qualitative content analysis was utilized as a literature review and content analysis, an evaluation of the schoolbook of the text files, and a test of theoretical relevance to pull in a more complete and scientific understanding of the data.

It will test dominant theories in different settings by comparing categories of different contexts when we evaluate this subject area, it has employed some basic methodologies to achieve the objectives of the study. The study used qualitative secondary data from e-books, websites, books, journals and magazines, research articles and academic articles to gather general knowledge. The study used literature and concept analysis as the basis for analytical methods. The literature review defines a qualitative survey model where documents are returned by the researcher to present an important subject. In the literature review, it collects available documents and data related to the study in question and interprets them to identify the specific issue. Concept analysis is often based on a review of the literature associated with the study design. This may be more exemplified as an investigation process that explores concepts.

IV. Introduction to the theoretical frame on the blue economy.

The concept of 'blue' economy (or blue growth) has emerged over the past decade as a new and increasingly important direction for the global economy. The blue economy is an ocean-based economic model that utilizes sustainable technologies and infrastructure to grow while protecting our oceans. The Blue Economy is promoted as a model to improve the environmental performance of existing 'traditional' offshore activities such as oil and gas development, ports, shipping, fisheries, marine tourism and other marine industries as well as a tool through which to encourage emerging industries of aquaculture, carbon sequestration (or blue carbon) and renewable energy production, such as wind, wave and tidal energy. However, it is not clear to what extent environmental considerations and economic growth are incorporated in the decision-making process and how trade-offs are made. In essence, while it is recognised that social dimensions are a core part of ecologically sustainable development, these social dimensions are often overlooked within the literature associated with the Blue Economy. For the blue economy to be an effective and transformational new approach to ocean governance, it should be;

- social support or the ability to provide tangible and fair benefits to society, including social well-being, environmental protection and economic well-being;
- Socially supported, that is the concept of the Blue Economy, and its component sectors, industries and occupations will need to make and hold a 'social license to operate' and overcome any inherent resistance to change communities, workers and the business community.

The Blue Economy (BE) refers to oceans as “shared development spaces”. It is defined by the World Bank as “the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and healthy ocean ecosystems.” Often referred to as “marine economy”, “coastal economy”, or “ocean economy” In the literature, the concept is at a nascent phase and is still to be encapsulated in a comprehensive definition from an operational perspective. While the basic principles and objectives of these paradigms may be similar, there are differences in approaches and treatment with regard to resource management, growth targets, sustainability and social equality. For example, “ocean economy” refers to “decoupling of socioeconomic development and environmental degradation”. Therefore, “efficiency and optimisation of natural marine resources within ecological boundaries become paramount.” An “ocean economy”, meanwhile, could be understood through the knowledge of the following: (a) a sub-set of the economy; (b) dependent on the ocean for inputs to invigorate its production process; (c) based on the industry and also geographical locations; and (d) these industries/activities are located in coastal and non-coastal areas. For its part, the concept of “coastal economy,” is bigger than “ocean economy” and includes, concentration of activities on or around the coastal areas and the heart and soul of all activities relating to production, employment and wages in the coastal region. As a result, Colgan (2004) defined the coastal economy as “all economic action in the coastal area and thus accounts for the sum of employment, wages and production in the area. Part of the coastal economy is the ocean economy, but the coastal economy covers a wider spectrum of economic activities.” Whereas, a marine economy is “horizontally integrated cluster industries which include sectors meant for a common market for the end products, using common technology or labour force skills, or require similar natural resources. A subset of the coastal economy, the maritime economy consists of commercial seafood, marine transportation, coastal tourism and recreation, marine science and technology, marine construction and infrastructure. The Government of Australia, in its report titled, ‘Marine Nation 2025: Marine Science to Support Australia’s Blue Economy’ defines “blue economy” as “one in which our ocean ecosystems bring economic and social benefits that are efficient, equitable and sustainable.”

While specifying the concepts around and aims of BE, the Economist Intelligence Unit (2015) clarified that blue economy is synonymous to “greening of the ocean economy,” with futuristic development implications of visualising certain patterns of production and use of sea resources. From this position, the gloomy economy is a transformation from the old ‘brown’ development model of keeping the status quo, where the oceans are seen as a means of free resource extraction and waste dumping. This paradigm does not take into account the costs of negative externalities when accounting for resources, ignoring the costs of environmental damage and ecological imbalance through consumption. For its part, the European Commission (2012) defined the concept of blue economy as “all economic activities related to oceans, seas and coastlines”.

The growing competition among IOR countries for marine resources for their development underlines the need for greater regional cooperation to enable them to exploit them more sustainably. Adopting a full definition of BE is the first step toward understanding and taking common steps to explore the existing potential of BE in the IOR region. To date, the concept of the blue economy remains subject to multiple interpretations due to the coverage of activities, geographic locations and sectors. Based on the available literature, an indicative list of ‘blue economy’ sectors and activities can be found in Table 1. Although some studies classify different sectors of the blue economy as “traditional” and “emerging” sectors, few common positions exist in this regard.

Table 01: Taxonomy of Blue Economic Sectors and Activities.

Sector	Activity
Fishing	Catches, aquaculture and seafood processing.
Marine Biotechnology	Pharmaceutical products, chemicals, algae harvesting, algae products, bio-products by the sea.
Minerals	Oil & gas, deep water mining (rare earth metal exploration, hydrocarbons).
Marine Renewable Energy	Offshore wind energy production, wave energy production, tidal energy production.
Marine manufactures	Boat Manufacturing, Sail Manufacturing, Net Manufacturing, Ship & Ship Repair, Marine Instrumentation, Aquaculture Technology, Water Construction, Marine Industrial Engineering.
Shipping, Port & Maritime Logistic.	Shipbuilding and repairing, ship owners and operators,

	shipping agents and brokers, ship management, liner and port agents, port companies, ship suppliers, container transportation services, stevedores, roll-on roll-off operators, custom clearance, cargo forwarders, safety and grooming
Marine Tourism & Leisure	Sea fishing from boats, sea angling from the shore, sailing at sea, boating at sea, water skiing, jet skiing, surfing, sail boarding, sea kayaking, scuba diving, swimming in the sea, bird watching in coastal areas, whale/dolphin watching, visiting coastal natural reserves, trips to the beach, seaside and islands
Marine Construction	Shipbuilding and maritime engineering.
Marine Commerce	Marine Financial Services, Marine Legal Services, Marine Insurance, Marine Finance and Related Services, Charters, Media and Publication.
Marine ICT	Marine engineering consultancy, meteorological consultancy, environmental consultancy, hydro-survey consultancy, project management consultancy, ICT solutions, Geo-informatics services, yacht design, submarine telecom
Education and research	Education and training, R&D

Blue Economy Theoretical Cases

This article analyses the cases of blue economic theories in three aspects: national macroeconomic management, policy framework and management technology.

National macroeconomics strategies.

In 2012, the blue economy entered the practical and exploratory phase. Some countries and regions have proposed policy frameworks and action plans for developing a blue economy.

V. Finding and Discussion.

Blue Economy potentials in the Indian Ocean

The idea of the "blue economy" was first formulated by Gunter Pauli in 2010 and discussed at the UN Conference on Sustainable Development, Rio+20, in 2012. BE has since come out as an influential concept in the Indian Ocean region and is a powerful and contested discourse among the member countries of the leading regional governance organization, the Indian Ocean Rim Association's (IORA). Since its conceptualisation, a number of IORA States have strongly advocated more cooperation and better governance of IS. Bangladesh, for one, has been at the forefront of regional attempts to promote BE; in 2014 it became the 1st nation to host a major conference focused on proposing a Bay of Bengal partnership for Blue Economy. The conference was followed by a IORA conference, "Enhancing BE for Sustainable Development", in 2015. This resulted in greater attention to sustainable development in the Indian Ocean region and the emergence of the IORA Declaration on Strengthening Blue Economy Cooperation for Sustainable Development. BE has since grown in importance to India's strategic and development vision. Prime Minister Narendra Modi has stated it as a tool for India's development, emphasising on the protection of shared marine spaces for 'Security and Growth for All in the Region.' For his part, former president of the Republic of Seychelles, James Alix Michel, championed the concept from the perspective of Small Island developing states (SIDS) in his 2016 book, *rethinking the Oceans: Towards the Blue Economy*.

It is getting more and more evident that the concept of BE straddling principles of marine-led economic growth, protection of the marine environment, and enhanced maritime security in all national and regional manifestations would have profound implications for regional foreign policy in the coming decades. Therefore, the concept is particularly relevant to the Indian Ocean since the area is defined by "maritime regionalism" in pursuit of similar geopolitical objectives. With nearly half the world's population projected to be residing in the Indian Ocean Rim (IOR) countries by 2050, the region is making a geopolitical shift from its identity as the 'Ocean of the South' to the 'Ocean of the Centre', and further to the 'Ocean of the Future' as its core position in terms of global trade, industry, labour, environment and security is likely to shape the 21st-century world. Half of the world's trade has already crossed this area. In addition, the Rim possesses a variety of natural resources, both

marine and terrestrial, that are vital for the well-being of its inhabitants, trade and environmental stability. The scope for the maturation of such resources, including food, livelihoods, tourism, mineral resources, bio-prospecting, the mining of seabed resources and 'blue energy' is being understood, particularly in coastal and island developing states who are at the cutting edge of 'Blue Economy advocacy.'"

The goal of the Blue Economy is to promote intelligent, sustainable and inclusive growth and employment opportunities in the maritime economic activities of the Indian Ocean region. The Blue Economy is set to initiate appropriate programs for: the sustainable harnessing of ocean resources; research and development; developing relevant sectors of oceanography; stock assessment of marine resources; introducing marine aquaculture, deep sea/long line fishing and biotechnology; and human resource development; among others. This area of special interest was recognized at the 14th IORA Ministerial Conference in Perth, Australia, on 9 October 2014. The Blue Economy captured the attention of all IORA Member States due to its growing global interest and potential and for being recognised as the top priority for generating employment, food protection, poverty relief and ensuring sustainability in commercial enterprise and economic models in the Indian Ocean. Considering its wide reach of valuable resources, the Blue Economy is taking in increasing interest in IORA Member States that are all committed to the establishment of a common vision that would make this sector a driver for balanced economic development in the Indian Ocean Rim region. Since 2014, several capacity building programmes have been carried out covering a wide range of areas, including *inter alia*: fisheries and aquaculture; seafood products, safety and quality; seafood handling, post-harvest processing and storage of fisheries and aquaculture products; banking and artisanal fisheries; sustainable management and development of fisheries resources; fish trade; seaport and shipping; maritime connectivity; port management and operations; marine spatial planning; ocean forecasting/ observatory; blue carbon; and renewable energy. The first IORA Ministerial Meeting on the Blue Economy (EAC) was held in Mauritius on 2-3 September 2015, at which the Declaration on the Blue Economy was adopted. Reflecting global trends, the declaration aims to harness oceans and marine resources to drive economic growth, job creation and innovation, while maintaining sustainability and protecting the environment. Indonesia hosted the Second Ministerial Blue Economy Conference on "Financing the Blue Economy" on 8-10 May 2017 in Jakarta, Indonesia, whereby the Jakarta Declaration on the Blue Economy was adopted, aiming at optimising the use of existing financial instruments in the IORA region to enhance Blue Economy development in our Member States. The need for new innovative funding mechanisms and enhanced collaboration among the public and private sectors, as well as Dialogue partners, was also highlighted.

It is envisaged that Blue Economy development in IORA will further be strengthened and will be on the top of IORA's agenda in the coming years with the establishment of the Blue Economy Working Group (WGBE). The implementation of the WGBE derives from the IORA Action Plan 2017-2021 adopted at the Leaders' Summit on 5-7 March 2017 in Jakarta, Indonesia. The meeting also saw the adoption of the Jakarta Concord that reiterate IORA's commitment to promote Blue Economy development in the region as a key source of inclusive economic growth, job creation and training, based on the evidence-based sustainable management of maritime resources.

The IORA Secretariat has identified the following six priority pillars in the depressed economy were recommended by the Council of Ministers' meeting (COMM) and revised by the Secretariat in consultation with Member States:

- Fisheries and Aquaculture
- Renewable Ocean Energy
- Seaports and Shipping
- Offshore Hydrocarbons and Seabed Minerals
- Marine Biotechnology, Research and Development
- Tourism

Ocean Knowledge Clusters and SIDS & LDC Programmes are cross cutting priorities.

Fisheries & Aquaculture

Fisheries, which is a vital oceanic resource forms the middle of the Blue Economy, as unitary of the main resources of the Indian Ocean, which provide food to hundreds of millions of people and greatly contribute to the livelihoods of coastal residential areas. It plays a major role in food security, reducing poverty and has enormous potential for business opportunities as well. There has been a strong gain in fish production from 861,000 tons in 1950 to 11.5 million tons in 2010 and the world's total demand for fish and fisheries products is expected to rise from 50 million to 183 million tons in 2015, with aquaculture activities predicted to cover about 73% of this increase. Aquaculture, which offers huge potential for the provision of food and livelihoods, will under the Blue Economy incorporate the value of the natural capital in its growth, respecting ecological

parameters throughout the cycle of production, creating sustainable, decent work and offer high value goods for export.

To meet the growing demand for marine products, natural fish resources are over-exploited and threatened. Consequently, the pressing need to balance the needs of the population with the health of the environment has stimulated the promotion of sustainable fisheries and aquaculture. Well-managed fisheries can deliver billions to a greater extent in value and millions of tonnes more fish each year, while aquaculture has the potential for a continued substantial increase to supply the food needs of a growing universe.

Renewable Ocean Energy

The world population is expected to increase to an approximated 9 billion people in 2050, which is 1.5 times bigger than the current population, resulting in an increase in countries' demands on fossil fuels. Recently there has been a collapse in the price of crude oil, only the possibility of an eventual normalization (of return to higher prices) should not be dismissed and hence takes the continued attention of IORA Member States to consider alternative renewable sources of energy. Renewable energy sources such as solar and wind are already operating all over the world. However, there is a pressing need for additional incentives in the renewable energy sector to further reduce the burden of fossil fuels. Now is the time to explore the potential for ocean-based renewable energy. There is great potential for renewable blue energy from wind, waves, tides, heat and biomass. In line with the above exploits, it is also directed to bring together the offshore crude and gas community for the renewable ocean energy community to undertake a gap analysis in relation to Oil and Gas exploration. In this regard, the potential for development of the offshore oil and gas industry in the Indian Ocean area should also be considered.

Seaports & Shipping

The maritime and port transport sector is one of the main priority sectors of the blue economy, where there is increased interest from Member States. In spite of the continuous rise of maritime transport and shipping transactions in the region, uneven distribution of trade exists between the rim countries, where only a handful are benefiting economically from maritime exchanges and transit. Some Member States, unfortunately, are struggling to keep pace with the rapid development and complexity of maritime trade as they confront challenges in terms of congestion, new information technology and equipment, improvement of port infrastructure and professional inspection and repairs. In this regard, regional cooperation is important for unlocking the bottlenecks to port development and maritime economic expansion in the Indian Ocean so as to enhance blue growth through economic cooperation and trade relations between Member States.

Offshore Hydrocarbons & Seabed Minerals

With the reduction of inland mineral deposits and the increase in industrial demand, great attention is being paid to mineral exploration and seabed mining. The sea floor contains minerals that enable rapid economic development in the exclusive economic zones of coastal nations and beyond the limits of national jurisdiction. Seabed exploration in the Indian Ocean has already began, only the major constraints in the commercialization of these resources lie in the fact that Member States have restricted data on the resources their exclusive economic zone (EEZ) possesses, lack capacity for exploration, mining and processing of these minerals. Therefore, better information is needed to assess capacity at the regional level.

Marine Biotechnology Research & Development

Marine biotechnology (or blue biotechnology) is seen as an area of interest and high potential due to its contribution to building an eco-sustainable and highly effective society. A fundamental aspect is related to aquaculture, whereby new methodologies will assist in: selective breeding of species; increasing the sustainability of production; and enhancing animal welfare, including adjustments in nutrient supply, preventive therapeutic measures, and use of zero-waste recirculation systems. Aquatic products will also be improved to achieve optimal nutritional properties for human health. Another strategic domain of marine biotechnology is the development of renewable energy products and processes, such as the use of seaweed. In addition, the marine environment is a largely untapped source of novel compounds that could be potentially used as novel drugs, health, Nutraceuticals and personal care merchandise; Blue Biotechnology could be further involved in addressing key environmental events, such as in bio-sensing technologies to appropriate in situ marine monitoring, in bioremediation and in developing cost-effective and non-toxic antifouling technologies. Finally,

marine molecules could be extremely useful as industrial products or could be used in industrial processes such as novel enzymes, biopolymers and biomaterials.

Tourism

Marine tourism, with its related marine activities (including cruise tourism), is a growing industry that contributes significantly to the economies of countries and to job creation. However, these activities, if not managed sustainably, could make up a parasitic relationship with the environment, leading to destruction and degradation of marine habitats and environment, loss of biodiversity, marine pollution and over-exploitation of resources. This necessitates actions for environmental protection in order to prevent any irreversible impacts (for example sedimentation over coral organisms by sheer human physical impact, beach erosion, and mangrove clearance) that may get up for marine tourism industry. Protecting local marine resources is one of the most urgent needs with regard to the promotion of sustainable tourism. Sustainable coastal tourism can contribute to the conservation of small-scale fishing communities, support subsistence fishing, protect the environment and make a positive contribution to sustainable economic development. In expectation of addressing these things, there is a need to: create more and increase the size of marine protected areas (MPAs); build and promote sustainable marine tourism; create opportunities for financing MPAs; develop more marine parks, among others. Marine parks not only provide recreational and recreational spaces, they also support billions of dollars of vital global ecosystem services.

The Blue Economy a Framework for Sustainable Development

Blue Economy is a developing country initiative launched by SIDS, but relevant to all coastal states and countries with an interest in water beyond national jurisdiction. SIDS has always been highly dependent on the seas for their wellbeing, but the blue economy, while encompassing the concept of ocean economies, goes far beyond that. The blue economy conceptualizes oceans as 'development spaces' where spatial planning integrates conservation, sustainable use, extraction of oil and mineral resources, bio-exploration, sustainable energy production, and maritime transportation. The Blue Economy breaks the mould of the business as usual "brown" development model where the seas have been comprehended as a means of free resource extraction and waste dumping; with costs externalised from economic calculations. The blue economy will integrate ocean values and services with economic modelling and decision-making processes. The Blue Economy paradigm constitutes a sustainable development framework for developing countries addressing equity in access to, development and the sharing of benefits from marine resources; offering range for re-investment in human evolution and the alleviation of crippling national debt burdens.

The Blue Economy espouses the same desired outcome as the Rio +20 Green Economy initiative, namely: "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2013) and it endorses the same principles of low carbon, resource efficiency and social inclusion, but it is grounded in a developing world context and fashioned to reflect the circumstances and needs of countries whose future resource base is marine. The principle of equity, which ensures that developing nations:

- Maximising benefits from the development of their marine environment, for instance fishery agreements, bio prospecting, oil and mineral extraction.
- Promote national equity, including gender equality, with a focus on creating inclusive growth and decent jobs for all.
- Have their concerns and interests properly reflected in the evolution of the oceans beyond national jurisdiction; including the elaboration of international governance mechanisms and their concerns as States proximate to seabed development.

The mainstreaming of equity at international and national levels offers scope for growing nations to realize greater revenue from their resources and reinvest in their populace, environmental management, reduce national debt levels and contribute to the eradication of poverty and hunger.

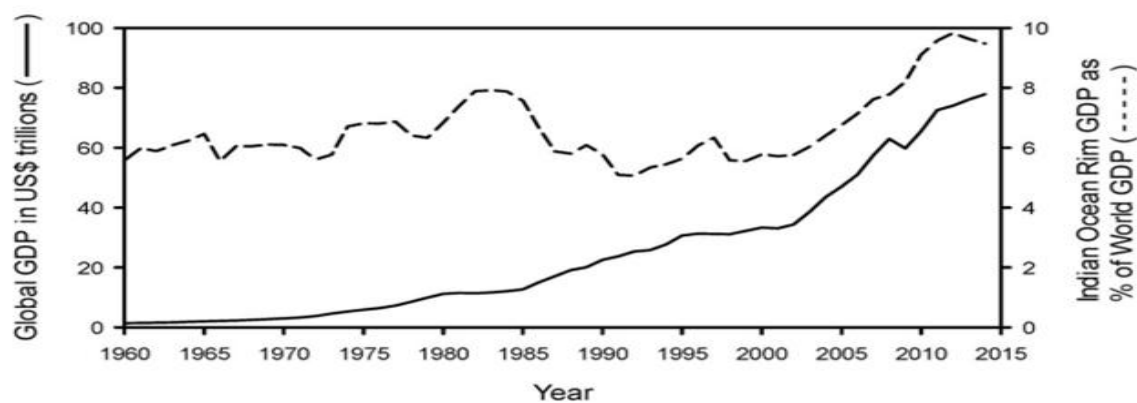
At the heart of the blue economy concept is the dissociation of socio-economic development from environmental degradation. To attain this, the Blue Economy approach is grounded upon the assessment and incorporation of the substantial value of the natural (blue) capital into all facets of economic activity (conceptualisation, planning, infrastructure growth, trade, travel, renewable resource development, energy production/use). The effectiveness and optimization of the use of resources are essential while respecting environmental and ecological parameters. This includes where sustainable the sourcing and employment of local raw materials and utilising where feasible "blue" low energy options to gain efficiencies and benefits as opposed to the line of work as usual "brown" scenario of high vitality, low utilisation, and industrialised development models.

The Blue Economy approach recognises and places renewed emphasis on the vital need for the international community to address effectively the sound management of resources and beneath international waters by the further development and nuance of international law and ocean governance mechanisms. Every nation must accept its share of the responsibility to protect the high seas, which handle 64 % of the surface of our oceans and constitute more than 90% of their mass.

GDP in South Asia

According to WB (keyword database) statistics 2015 (Fig.1) The countries of South Asia have a GDP per capita below the global average and a GDP slightly above that of Afghanistan. At any rate, the region is moving from low-income to middle-income. The state receives a large population of more wretched people and as a resolution despite a number of initiatives have been hired by the government, the progress on poverty reduction is defined in terms of GDP per capita. The Maldives and Sri Lanka have higher GDP in the region (Figure 1) because both countries have made policy changes to their development plans.

Figure No 1: Global GDP (US\$) since 1960 and the percent contribution of Indian Ocean nations.



Source: <https://www.orfonline.org/wp-content/uploads/2019/01/Global-GDP.jpg>

Blue Economy Potentials and opportunities in the Region

South Asian countries are blessed with the Bay of Bengal, the largest Bay in the world bounded by Bangladesh to the North, India to the west, North, West and East, Myanmar in the East, Sri Lanka to the southwest and Indonesia to the south-eastward. There is great potential in the blue economy. Coastal states have every right to explore and use resources within their marine boundaries. The blue economy has a global reputation, stretching from Pacific SIDS to the Southern Africa region. It also continues to grow in the region. In Bangladesh, the Ministry of Foreign Affairs held an international workshop on the blue economy from 1 to 2 September 2014. A bit of research and topics were submitted, including ocean resources and sustainable development proposals promising new fields of ocean energy and blue biotechnology, access to ocean resources, and so along. The outcomes of the workshop have been compiled for strategic planning. Island nations with better sea - land ratios have more opportunities to benefit from the sea as well as bigger responsibilities towards her. These rural areas like the Maldives and Sri Lanka also showing higher GDP volume and growth rate compared to other similar countries in the region with lower sea-land ratios do not essentially mean that Blue Economy is being implemented according to the planned framework.

Sri Lankan's blue economy.

Sri Lanka, a small island nation in the middle of the Indian Ocean, is a maritime territory 07 times bigger than its landmass. Being an island nation located in a central position in the Indian Ocean, adopting a blue economy strategy is not optional but mandatory for Sri Lanka. Sri Lanka is both a benefit and a challenge to Dute. The principal benefits of a blue economy are-

- A unique geographic situation.
- high accessibility to ocean resources from lengthy coastline around the country
- proximity to major sea lanes
- Diverse range of coastal and marine ecosystem.

- High potential for tourism and recreation industries.
- However, these opportunities also have challenges attached to them.
- the oceans around the country are highly contested by global power
 - Being a small player in global political arena Sri Lanka has to take caution path.

Opportunities:

- Fisheries, tourism and maritime transport, blue economy entails emerging industries including renewable energy, aquaculture, seabed extractive activities and marine biotechnology and Bio prospecting.

Ongoing plans of Sri Lanka

Coast conservation and coastal resource management department.

- Construction of research & information Centre at *niaweli*
- Off-shore sand mining & beach nourishment project at *marawila*
- Construction of coast protection scheme at *kappalady*
- Construction of two off shore – breakwater at *mudukatuw*

According to the Research, Challenges to development of blue economy governance in the Indian Ocean (blue economic strategically issues)

The Indian Ocean states are linked by historic ties, often united across the seas. There are a number of gaps in Indian Ocean governance mechanisms which hinder the implementation of blue growth in the region. Moreover, a complex regulatory landscape involving divergent sovereign laws, regional arrangements and international laws adds to additional challenges. While most Indian Ocean countries have developed their own fisheries regulations, they do not have adequate standards, guidelines and enforcement mechanisms due to lack of data and capacity. The IOC faces the common urgent challenges of increasing urbanization, industrialisation and migration, leading to the overexploitation of natural marine resources. Populations in these countries are expected to grow significantly by 2050; by that time, they will collectively support nearly half of the world's population. It will be fuelled by Africa's rapid geo-political and geo-economics boom. It's just going to exacerbate the difficulties. Countries like Seychelles, for example, are already in a period of rapid urbanisation, increasing rare earths and coastal resources. Therefore, it is imperative to close down the existing gaps in weak governance, lack of effective policies and enforcement measures, and larger security dilemmas such as illegal fishing, to cultivate sustainable development forms and blue growth in the region. In this context, it is crucial to ensure proper environmental management of the marine ecosystem, supported by effective laws and policies.

Food security, including seafood, is an existing global challenge threatened by climate change. The Indian Ocean region is rich in fisheries resources and is one of the largest fisheries sectors in the world. Over 800 million people in the region rely on seafood to meet their protein needs. As the farming sector in many of the Asian and African agrarian economies are likely to suffer from the impacts of climate change, it is anticipated that their reliance on seafood would increase. Meanwhile, fishing is already seriously affected by marine pollution and illegal fishing, destabilizing ecosystems and affecting the population of various marine species. Climate change has the potential to exacerbate adverse effects and further degrade marine species. The effects of climate change, such as erosion and flooding, may result in the loss of coastal habitats such as mangroves, which would impede species reproduction. Acidification and rising sea temperatures are destroying coral reefs, which are vital to diverse marine species. The impact of climate change would not just be catastrophic for the marine species only, but likewise for the communities that depend on them, while increasing their additional Socioeconomic and environmental pressures. For economies to meet important future food security concerns and avoid economic distress, managing fisheries and the marine environment remains a top priority. However, the ability to react to the increasing impact of climate change on the marine ecosystem would vary according to human and natural geography, mental ability and current as well as projected degradation.

While fisheries regulation and law at the national level have existed for centuries, there is a lack of coherent regional arrangement in the Indian Ocean that either goes over all the IORCs or ensures protection of various species. Furthermore, the lack of adequate governance, data and resources suggests that very few institutions, financial and technical resources are available to meet the challenges. There is no single organization that covers the full spectrum of OICR members. For

instance, the Southern Indian Ocean Fisheries Agreement (SIOFA) involves only eight countries and further opportunities for membership is restricted considering the organisation's limitation in covering only the high seas of the southern Indian Ocean. The Indian Ocean Tuna Commission (IOTC) and the Southern Indian Ocean Fisheries Commission (SIOFC) are in similar circumstances. While the IOTC is broader in scope, it is restricted to tuna-like species, leaving other unprotected species in different geographic regions. Therefore, a major shortcoming for these regional fisheries management organizations (RFMOs) is their Sectorial approach to ocean management, with limited attention to certain types of marine species. Moreover, an overarching focus of regional treaties towards the southern Indian Ocean ignores the regulatory concerns associated with non-highly migratory, shared and straddling fisheries resources in the high seas in the northerly portion of the Indian Ocean. Countries such as Bangladesh and Myanmar that do not accede to these treaties continue to fish in the affected areas. In the absence of a regional framework, research, monitoring and enforcement measures continue to be dispersed and lack a concrete, integrated knowledge of the Indian Ocean ecosystem that could foster effective governance mechanisms.

A major reason for the lack of progress in fisheries and environmental management in the region is the lack of research, barring a small consistency of biological and physical science data. It is imperative to comply up on research targeted at improving the technical knowledge of the seabed, sea column as well as the behaviours of those whose livelihoods are dependent on the health of the ocean. There is also a lack of research around the complex governance architecture needed to develop a regional SOR.

The problems are compounded by the lack of coordination of existing governance agreements for the oversight and delivery of sustainable development and blue growth programs in the Indian Ocean, such as fisheries management. While the regional systems such as IOTC and SIOFA are well-suited to combat IUU fishing, insufficient coordination at national, regional and international level is jeopardising effective multilateral and comprehensive governance instruments for the Indian Ocean. Tools and enforcement mechanisms could be applied to sustainable fisheries. These should include monitoring, control and surveillance (MCS) arrangements that cover surveillance, monitoring, inspections, observations, apprehension, reporting, trial and punishment, and satellite-based vessel monitoring systems (VMS) to monitor real time vessels fishing on the high seas. While the mechanisms for enforcement and technological results are available, the problem lies with inconsistent and sporadic application of these tools, lack of capacity for execution, a lack of clarity over which actor has enforcement rights, and the absence of a structured cooperation. The presence of large numbers of participants with different degrees of capabilities, normative outlooks and strategic attitudes makes it arduous for a country to assume position as a central actor in blue growth in the Indian Ocean. We've seen that with regard to seizure and commercial documents and joint inspection programs. Therefore, in order to achieve the blue economy objectives of reducing non-sustainable fishing and to fulfil goals for a broader sustainable development in the Indian Ocean, key is the more efficient use of existing monitoring and enforcement measures, along with the commitment of state and non-state actors to sustainable development and its oceanic dimensions.

The natural world worked up of the physical environment, its mineral components and biodiversity at all three levels (genetic, species, ecosystem) is intrinsically interconnected and most diverse and productive the natural system, the larger the level of interconnectivity. Therefore, identifying particular issues is intrinsically an anthropogenic construct and from its perspective can seem arbitrary.

A case in point is the precursory role that the preservation and sustainable utilization of biodiversity has in enabling the establishment of a Blue Economy, broader sustainable development and poverty eradication (see fig below). This is especially the case in developing countries where economies are more directly linked to the exploitation of the environment.

Towards a sustainable governance framework for India's blue economy.

Indian Ocean BE stakeholders are looking to do three things:

- Safe and sustained economic growth.
- Greater policy certainty.
- Greater social acceptance for the holding.

To ensure economic growth in the region and attain food security, manage fisheries and restrict environmental degradation, and to strengthen resilience to climate change risks, this newspaper establishes the following testimonials:

Potential and challenges

Challenges

- The destruction of maritime ecosystems, pollution or climate change, as well as poverty or maritime insecurity caused by terrorism or piracy.
 - Another item on the agenda is sexual inequality: women represent no more than 1% of the maritime industry and, in particular, hold only 4% of power positions in the sector, according to a report released today at the conference.
- Faced with these challenges, the document points out, the solutions could be:
- The granting of economic incentives to small fishermen to adopt sustainable practices, or the increase in protected maritime areas, to recover the habitats and productivity of the seas.
 - Also, as the blue economy is a relatively new concept, this conference will serve as a starting point to boost research and innovation in this area.

According to the report, the blue economy is a very important source of resources for coastal cities around the world, and African cities such as Mombasa (Kenya), Dares Salaam (Tanzania), Pretoria or Durban (South Africa) make a profit of 25,000 million dollars a year (about 22,000 million euros)

Potential

The blue economy delivers food, jobs, water and economic growth. It supports hundreds of millions of the world's poorest and most vulnerable people. It generates between three and six trillion U.S. dollars for the global economy. If it were a country, the ocean economy would be the seventh most important in the world.

But the seas are facing major challenges. Nearly a third of global fish stocks are over-exploited. Climate change affects both ocean and coastal ecosystems. Rapidly developing sensitive coastal areas are causing irreparable erosion. Pollution and marine litter from both country and marine sources threaten the health of our oceans, including its biodiversity which may have large implications on food supply and pose potential risks to human health through the food chain, albeit not yet well understood. To help guide these efforts, the UN, the World Bank and 15 other global stakeholders agreed on a trend to border the Blue Economy concept, to make a common spoken language communication that facilitates action. In *The Potential of the Blue Economy*, the report identified five types of activities: harvesting and trade of marine living resources; extraction and use of marine non-living resources; role of renewable, non-exhaustible natural forces (blue energy); commerce and trade in and around the oceans; And those activities that indirectly contribute to the economy, such as carbon sequestration, coastal protection, waste disposal and biodiversity.

It is necessary that, in order to proceed with sustainable oceanic activities, there must be effective regional cooperation because the objective is to avoid a tragedy of the commons. It is also important to identify and respond to challenges and issues. The current conflict between Sri Lanka and India over the international maritime border of Palk Bay and the Gulf of Mannar makes it impossible for the two countries to identify common objectives for the blue economy. The harmful practice of bottom trawling by Indian fishermen seriously harms the marine ecosystem (Goonetilleke and Colombage 2017). Sri Lankan waters have also become a transit centre for drugs and humans with the help of fishermen. Lack of regulation and immigration practices on the fishermen make the task easier for the vendors who carry out illegal business and transactions on the sea areas of Sri Lanka (Dissanayake, 2015). Fishing boats are also vulnerable to being exploited by the terrorist group as they were during the civil war.

The way onward is an economic development of the oceans that is both inclusive and environmentally sound it should be undertaken in a manner that does not deplete the natural resources that societies including local communities depend on in the long term. Balancing the economic, social and environmental aspects of sustainable development with the oceans is the driving force of the blue economy. We have to break out of the status quo and think differently. We need to leverage new technologies that can provide new solutions, such as mobile technology that provides better information on fish landings and the health of fish stocks. We need to embed long-term thinking into financial decisions through tools such as marine spatial planning and natural capital accounting. International finance should have products that allow them to contribute, such as: blue bonds, as is done in Seychelles. Efforts to strengthen fishing sectors in poor and vulnerable rural areas should be encouraged to ensure sustainable and sound fishing practices as well as greater local value creation, such as in the Solomon Islands. And ambitious investments in wastewater and water treatment, like the \$1 billion

Indonesian program for approximately 50 million people, should be supported and celebrated. The World Bank is deeply dedicated to defending the blue economy, with a blue portfolio of USD 2.6 billion in Investments through important knowledge work such as the Sunken Billions reports, as well as by supporting improved governance, fiscal and financial reforms at local, national and worldwide levels. Together with the United Nations and other partners, we are looking forward to working with member states and other stakeholders to respond to existing challenges and to design a way forward that allow for sustainable economic growth, making the most from the oceans building on the experience with green growth including in unique areas such as the Galápagos Islands.

Blue economic growth and issues in Sri Lanka and Indian Ocean

Table No 02: Fisheries Statistics report 2018 (Sri Lanka)

	Annual Fish Production 2014	2015	2016	2017				
1	Marine Sector			Mt.	459,300	452,890	456,990	449,440
	Coastal Waters			Mt.	278,850	269,020	274,160	259,720
	Offshore/Deep Seawaters			Mt.	180,450	183,870	182,830	189,720
2	Inland and Aquaculture Sector			Mt.	75,750	67,300	73,930	81,870
	Inland Capture Fisheries			Mt.	68,820	57,060	58,410	68,500
	Aquaculture Fisheries			Mt.	1,780	3,150	9,490	8,740
	Shrimp Farms			Mt.	5,150	7,090	6,030	4,630
3	Total Production			Mt.	535,050	520,190	530,920	531,310

Source: Fisheries Statistics_ (2018) <https://www.fisheriesdept.gov.lk/web/images/pdf>

Emerging Issues

Essentially, freedom of navigation is vital to the smooth conduct of maritime trade in the Indian Ocean, but threats such as competition among the major powers, non-traditional security risks and environmental degradation persist. Piracy and drug trafficking are increasingly prevalent in the region. The disruptive power export potential of the Persian Gulf and Iran to the rest of the world. Environmental degradation also threatens regional growth and the unsustainable use of marine resources often leads to rapid depletion of fish and other mineral stocks. The lack of a regional maritime safety architecture has caused major powers to compete for control of these resources and shipping lanes. The further escalation of such geopolitical tensions, as witnessed in the South China Sea, would threaten the openness of the region's sea routes, which in turn may disrupt trade and adversely affect energy dependent nations like Sri Lanka. And the relative decline of US power in the region has left a void that is increasingly being filled by China and India, both eager to secure their position as major power brokers in global affairs.

VI. Conclusion

Various bilateral and multilateral agreements currently link the coasts of the Indian Ocean. However, not only are these mechanisms limited, but they have not been successful in including all relevant stakeholders in the fray. The IORA, for example, with 21 member countries and a number of world economic and defence powers, is the most comprehensive arrangement that insures the entire region in a single assembly. Nevertheless, the current architecture lacks coherent governance instruments, and this could inhibit sustainable blue development in the Indian Ocean, even as they seek to address issues such as food security, ecosystem management and biodiversity conservation. The diversity of the commonwealths of the region in terms of geography, government, economy, and culture has so far stymied the development of regional institutions, cohesions and translation of blue development goals into reality. Achieving the blue economy goals would require extensive cooperation between the community of coastal states and a range of other stakeholders that include the private sector, non-governmental organisations, scientific and local communities. It would be useful to learn from lessons learned, compliance mechanisms and legislative models from other

regional bodies such as Pacific and Caribbean communities. Taking on best practices to the Indian Ocean context would fill the current disruption of a strong foundation of regionalism upon which new approaches to fisheries, climate change and food security could be won. The extent of business activities, including industrial activities on and around the sea are huge. South Asia is no exception. Aquaculture, fishing, mining, transport and tourism are some of the longstanding businesses on and around the sea. We recommend that all efforts, small or large, on and around the sea will be in line and in accordance with the concept of the blue economy. Three other very large economic activities are - shipbuilding, shipping and eliminating ships that can fit very well into the concept. Shipbuilding has the largest human input and no discharge, either gaseous or liquid. It's environmentally friendly and responsive in a blue economy. Compared with tonne-km or man-km, navigation is a champion of mechanized modes of transport in terms of pollution and cost. Scrapping of ships, a recycling process contributing directly in national development at the same time maintaining the natural source of a highly demanded base metal, may well be carried out according to the Blue Economy Concept. In a nutshell, the potentials are boundless - water contributes to the growth of life and supports sustainable life. The survey concludes that South Asia, particularly Bangladesh has potentials and scope for adopting out the Blue Economy but strong political commitments, plenty of research, societal awareness and attitude to optimize the dependency are required to achieve long-term sustainable prosperity. Let us now declare ourselves champions of the concept of the blue economy and let it be so.

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