FINANCING THE BLUE ECONOMY

A CARIBBEAN DEVELOPMENT OPPORTUNITY

CARIBBEAN DEVELOPMENT BANK

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A CARIBBEAN DEVELOPMENT OPPORTUNITY

The sea, once it casts its spell, holds one in its net of wonder forever.

– Jacques Yves Cousteau

To position ourselves to keep more economic benefits at home, SIDS and LDCs cannot wait for technology transfer handouts. We need to build on our own institutions, our own scientists, our own intellectual properties, and our own entrepreneurs. Failing to do so can be another generation of lost opportunities, and we have lost enough already.

– Dr. the Rt. Hon. Keith Mitchell, Prime Minister of Grenada

A COLLABORATIVE PARTNERSHIP WITH

UNDP

Empowered lives. Resilient nations.

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FOREWORD

At least one-fifth of the population of the Borrowing Member Countries (BMCs) of the Caribbean Development Bank (CDB) remains in poverty; and one out of every 10 persons is considered "food poor" or indigent. Tackling poverty is one of our Region's biggest challenges.

Caribbean countries have joined other members of the United Nations in adopting the 2030 Agenda for Sustainable Development and agreed to 17 Sustainable Development Goals to end poverty, protect the planet and ensure prosperity for all.

The obligations under this global initiative closely align with CDB's ongoing commitment, embedded in our Strategic Plan 2015-19, to help our BMCs to identify and exploit opportunities for achieving inclusive and sustainable growth and development. Being a catalyst for development resources and targeting the systematic reduction of poverty in our BMCs through social and economic development is the mission of CDB.

Within the context of the 2030 Sustainable Development Agenda and CDB's Strategic Plan, "Financing the Blue Economy: A Caribbean Development Opportunity" examines the potential of the blue economy to drive sustained and inclusive economic growth. The Paper, a joint initiative between CDB and the United Nations Development Programme, also explores factors that can constrain our Region's ability to take full advantage of the ocean's potential. New and high-value blue economy growth industries such as aquaculture, marine biotechnology, deep seabed mining, and ocean renewable energy remain under-developed in our Region.

Development of the blue economy should be accompanied by intelligent management and protection of coastal and marine resources. The economic benefits of the ocean cannot be realised without due consideration to sustainable development of these resources. An effective blue economy strategy, then, must seek to leverage our Region's largest resource base - the Caribbean Sea and bordering oceans - to achieve a balance between the three key pillars of sustainable development - economic development, social development and environmental protection.

Recognizing that access to finance may be a constraint to development of the blue economy, the study examines some innovative financing models and their applicability to the regional context; explores new approaches for mobilising private investment and development assistance; and proposes specific strategies and measures for creating an investment-friendly environment.

With this Paper, we hope to broaden and deepen the dialogue on the blue economy and its potential for advancing the Caribbean's development agenda.

Wm Warren Smith, Ph.D., CD
President
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ABBREVIATIONS

ANG	Anguilla
ANT	Antigua and Barbuda
BAH	Commonwealth of The Bahamas
BAR	Barbados
BMC	Borrowing Member Country
bn	billion
BVI	British Virgin Islands
BZE	Belize
CAGR	Compound Annual Growth Rate
CALC	Climate Action Line of Credit
CARICOM	Caribbean Community
CAY	Cayman Islands
CCCFP	Caribbean Community Common Fisheries Policy
CCRIF SPC	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company
CDB	Caribbean Development Bank
CLME	Caribbean and North Brazil Shelf Large Marine Ecosystems
COAST	Caribbean Oceans and Aquaculture Sustainability Facility
cpue	catch per unit of effort
CROP	Caribbean Regional Oceanscape Project
DAC	Organisation for Economic Co-operation and Development Assistance Committee
DFID	Department for International Development
DIB	Development Impact Bonds
DOM	Commonwealth of Dominica
DRM	Domestic Resource Mobilisation
ECCB	Eastern Caribbean Central Bank
ECCU	Eastern Caribbean Currency Union
ECLAC	Economic Commission for Latin America and the Caribbean
ECROP	Eastern Caribbean Regional Ocean Policy
EE	energy efficiency
EEZ	Exclusive Economic Zone
EIF	Environmental Impact Fee
EU-CIF	European Union-Caribbean Investment Facility
EUR	euro
FAO	Food and Agriculture Organization of the United Nations
FD	Agence Française de Développement
FDI	Foreign Direct Investment
GBP	pound sterling
GCF	Green Climate Fund
GDP	Gross Domestic Product
GE	geothermal energy
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRE	Grenada
GSDTF	Grenada Sustainable Development Trust Fund
GUY	Guyana
HAI	Haiti
HDI	Human Development Index
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDB	Inter-American Development Bank
IMF	International Monetary Fund
JAM	Jamaica
LAC	Latin America and the Caribbean
LME	Large Marine Ecosystems

ABBREVIATIONS

LSCI	Liner Shipping Connectivity Index
mn	million
MON	Montserrat
MPA	Marine Protected Area
MSME	micro, small and medium-sized enterprises
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OECS	Organisation of Eastern Caribbean States
OTE	Ocean Thermal Energy Corporation
OTEC	Ocean Thermal Energy Conversion
PAN	Protected Area Network
PANF	Protected Area Network Fund
PPE	Palau Pristine Paradise Environmental Fee
PPP	public-private partnership
R&D	research and development
RAOP	Regional Agency for Ocean Policy
RE	renewable energy
RFB	Regional Fisheries Bodies
RSP	Regional Seas Programme
SAP	Strategic Action Plan
SDGs	Sustainable Development Goals
SEEC	Sustainable Energy for the Eastern Caribbean
SEF	Sustainable Energy Facility
SeyCCAT	Seychelles Conservation and Climate Adaptation Trust
SIB	Social Impact Bond
SIDS	small island developing states
SKN	St. Kitts and Nevis
SLU	Saint Lucia
SPV	Special Purpose Vehicle
SUR	Suriname
SVG	St. Vincent and the Grenadines
SWAC	sea water air conditioning
TCI	Turks and Caicos Islands
tn	trillion
TNC	The Nature Conservatory
TT	Trinidad and Tobago
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNCLOS	United Nations Convention on the Law of the Sea
UNCSD	United Nations Conference on Sustainable Development
UNEP	United Nations Environment Programme
UNEP-GPA	UNEP Global Programme of Action
UNEP-WCMC	UNEP World Conservation Monitoring Centre
USD	United States dollar
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

The blue economy comprises economic activities that directly take place in the ocean and seas, or use outputs from the sea for consumption or as a source of income.

The ocean influences the livelihoods of about 40% of the world's population living at or near the coast, and its contribution to current and future economic growth is significant. Global ocean-based activities are estimated to have generated USD1.5 trillion (tn) and directly provided 31 million (mn) jobs in 2010, primarily in fisheries, maritime and coastal tourism, offshore oil and gas exploration, and port activities[1]. By 2030, it is estimated that based on current trajectories, the ocean's value added will rise by USD3 tn, with employment rising to over 40 mn. The total value of key ocean assets is estimated at approximately USD24 tn based on the ocean's earning capacity through "direct outputs (fishing, aquaculture), services (tourism, education) trade and transport (coastal and oceanic shipping) and adjacent benefits (carbon sequestration, biotechnology)"[2]. For the Caribbean Region, the ocean economy is not a new economic frontier, however traditional fishing and shipping-related industries have dominated ocean activities for centuries.

For small islands and coastal developing states such as the Caribbean, the ocean's role as an important generator of subsistence and income is magnified. The blue economy therefore calls for the intelligent management and conservation of coastal resources to drive economic growth, while protecting ocean and coastal ecosystems and long-term sustainable development. A development strategy grounded in the blue economy will enable the Caribbean to promote the growth of existing productive sectors, expand into emerging blue industries, improve food security, and potentially reduce dependence on imported fossil fuels[3]. Immediately, this addresses different aspects of at least seven of the 17 Sustainable Development Goals (SDGs), with the potential to drive progress in several others.

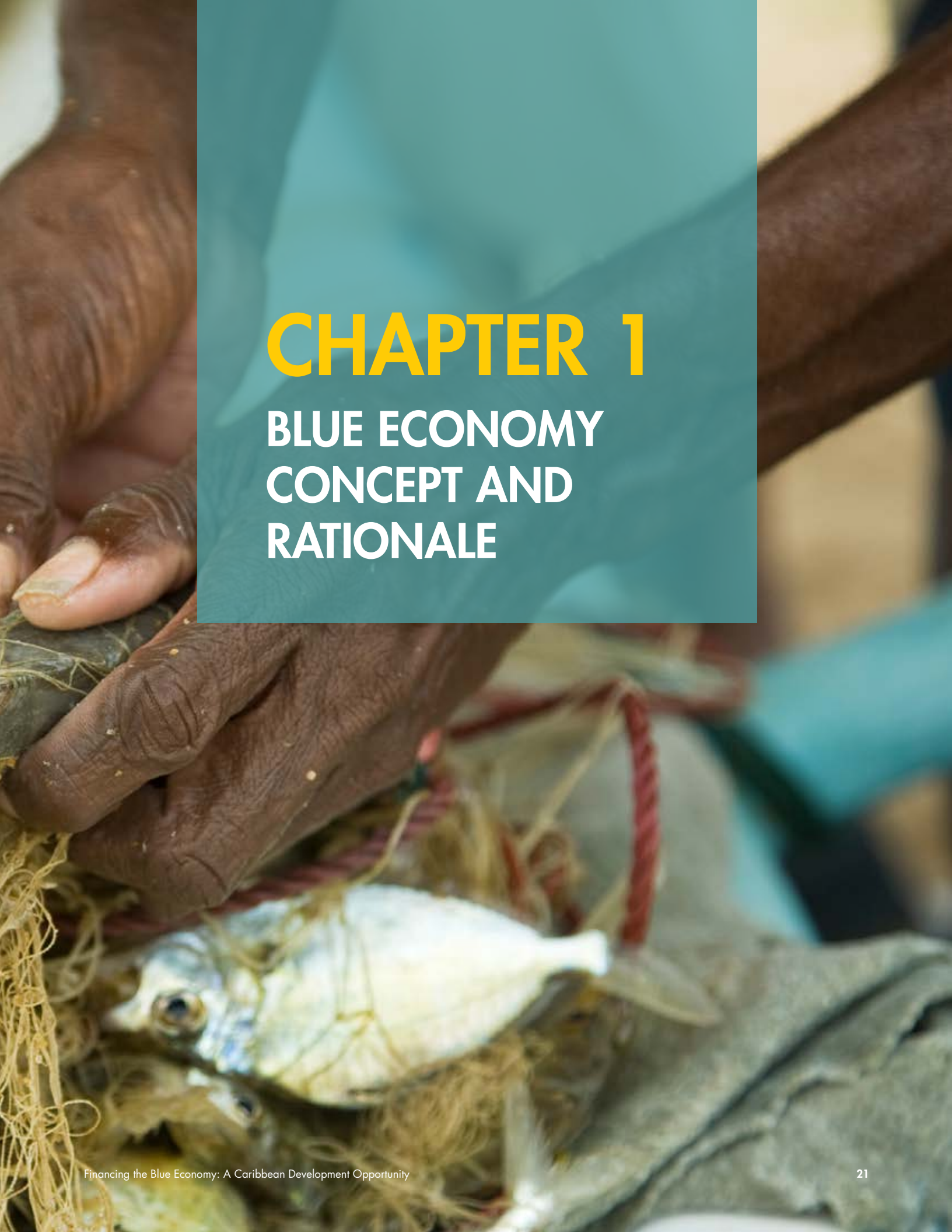
While a number of blue economy initiatives can be highlighted within the Caribbean, the scope and scale remains below the potential, mainly because the blue economy has not been formally recognised as an important economic driver. Leveraging a blue economy strategy will allow Caribbean countries to more effectively drive the triple bottom line of sustainable development: growing the economy, protecting the environment, and advancing social well-being. A blue economy strategy that forays into new growth sectors and expands existing ones in a sustainable manner will facilitate faster economic growth, and can usher in a new Caribbean economic development paradigm, that is more diversified and less vulnerable to external shocks. The effective adoption of the blue economy concept requires not only a focus on the specific activity associated with utilising the resource, but also, mainstreaming ocean sustainability into economic modelling and decision-making. To support the blue economy approach and investment, appropriate policies, legislation, incentives and infrastructure must be accommodative to facilitate the transition. That is, the policy mix, legislation and regulation, processes and other governance structures should align with the strategy, in order to maximise economic potential and value added.

This paper assesses the blue economy potential for the Caribbean, and focuses on innovative financing options that will enable policy makers to advance blue economy strategies at a national and regional level. Chapter 1 introduces the blue economy concept and discusses the need to leverage the ocean as a natural resource to accelerate the rate of regional economic growth, improve social inclusion, and protect coastal environments and marine life. This advocacy is balanced with the identification of possible inhibitors to a Caribbean blue economy strategy. This is followed by an assessment of possible blue economy industries in Chapter 2, which sets out the industry trends and possible areas for growth within the Region. It also identifies the sectors where targeted investments would have the greatest impact on economic growth, and provides a guide to feasible policy interventions at the national and regional levels. Chapter 3 identifies the financial challenges inhibiting Caribbean government-led investment in the blue economy and highlights innovative financial tools which could be tested in the Region. Case studies from the Region and across the globe further illustrate the challenges and successes of using novel financial tools and

1 *The Ocean Economy* in 2030. OECD Publishing, 2016.
2 Hoegh-Guldberg, Ove. Reviving the Ocean Economy: the Case for Action - 2015. WWF International, 2015.
3 Note: Given that the majority of the BMCs are net-energy importers, reduced fossil fuel dependence may be positive for the region overall, but can potentially threaten earnings of the oil-exporting economies.

sources to drive the blue economy in the Caribbean. Chapter 4 concludes with a discussion of policy and regulatory-based enablers for an effective blue-growth strategy, including collaborative regional strategies for economic sharing and ocean governance. Finally, the paper provides specific policy recommendations for Caribbean governments that are committed to growing the blue economy ecosystem.

This paper represents one of the Caribbean Development Bank's efforts to support member countries in reducing systemic poverty through innovative social and economic development interventions using existing natural resources. The blue economy presents an option for regional policymakers to embrace the Caribbean's comparative advantage, and to create an environment that better facilitates investments and private sector-led growth. Regional economic transformation grounded in the principles of the blue economy, needs advocacy and commitment at the highest levels, and empowered participation. Key institutional and policy requirements necessary to facilitate the transition identified in this paper include: (a) regional policy for economic sharing; (b) ocean governance; (c) supportive doing business environment and infrastructure; (d) advocacy and participatory development; and (e) a regional knowledge hub.



CHAPTER 1

BLUE ECONOMY CONCEPT AND RATIONALE

1.1 BLUE ECONOMY CONCEPT

The blue economy concept is part of a new wave of economic thought that emphasises the sustainable use of natural resources in the world's oceans, seas and coastal areas. The philosophies of natural resource economics and natural capitalism[4] are central to the blue economy. It is further grounded in the principles of the green economy which posits that growth and improvement in livelihoods can be achieved in a manner consistent with sustainable development.

Many of the activities that make up the blue economy such as fisheries and marine transport have been part of human economic activities for centuries. Following the 2010 work of Gunter Pauli "The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs", new perspectives were introduced, and the concept began to gain traction. Many small island developing states (SIDS) with extensive marine areas were already exploring ways to capitalise their dominant resource base: oceans and coastal areas[5].

Further impetus was achieved in 2012 with the submission of the blue economy concept paper at the Rio +20 United Nations Conference on Sustainable Development (UNCSD). In the lead-up to the conference, coastal countries questioned the relevance of the "Green Economy" to their context. They asserted that it was the ocean which represented their greatest resource endowment and which globally presented the largest untapped potential for countries to achieve sustainable development[6]. The blue economy concept was subsequently ratified by the international community's adoption of the Sustainable Development Goals (SDGs) in September 2015. Goal 14 (Life Below Water) specifically recognises the critical contribution the ocean can make to the development of the smallest and most vulnerable nations[7]. Goal 14 establishes targets to substantially reduce marine pollution, address ocean acidification, sustainably manage marine resources and increase scientific knowledge and transfer marine technology to developing countries, in particular small island developing states[8].

1.1.1 Definition

Several definitions of blue economy have emerged. However, the most referenced definitions emphasise sustainability and make an explicit connection between the utilisation of marine resources for economic advancement, and the maintenance and improvement of the ocean, coastal and marine resources and ecosystems.

4 The United States Institute of Food and Agriculture defines natural resource economics as the valuation of "natural resources to aid in the optimization of the production of goods and services from agricultural lands while protecting the environment". Natural capitalism challenges business practices to draw more productive value from natural resources while re-investing in natural capital. The blue economy concept expands on these philosophies and promotes the intelligent management of coastal and ocean resources to increase economic growth while protecting the ocean ecosystem.
5 Roberts, Julian, and Ahmed Ali. *The Blue Economy and Small States*. Blue Economy Series No. 1, Commonwealth Secretariat, 2016.
6 United Nations Division for Sustainable Development. 2014. Blue Economy Concept Paper.
7 Ibid
8 UN SDG 14. For the full list of targets and indicators under SDG 14, see: https://sustainabledevelopment.un.org/sdg14.

The Commonwealth Secretariat (2016) states that "the blue economy maximises the economic value of the marine environment in a sustainable manner that preserves and protects the sea's resources and ecosystems". The Economist Intelligence Unit (2015) notes that a "sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of the ocean ecosystems to support this activity and remain resilient and healthy"[9]. The World Bank (2016) defines it as "the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, while preserving the health of marine and coastal ecosystems." The United Nations Environment Programme (UNEP) describes a blue economy approach as one based on a vision of "improved wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities"[10].

While the Organisation for Economic Co-operation and Development (OECD) refers more broadly to an "ocean economy" that encompasses ocean-based industries, natural assets and ecosystem services, they acknowledge that the ocean's long-term growth and job creation potential will only be fully realised if more effective steps are taken to slow deterioration of ocean health and "improve integrated ocean management – including ecosystem preservation"[11].

Based on these definitions, the concept of the blue economy rests on these main themes:

1. Sustainable and inclusive growth and development[12];
2. Reducing the risk of over exploitation and risky methods of extraction/usage of the ocean's resources;
3. Enhancing the welfare of coastline communities in terms of economic opportunities and social protection; and
4. Ensuring resilience of countries to natural disasters and the impact of climate change.

1.1.2 Components

The blue economy comprises economic activities that directly take place in the ocean and seas, or use outputs from the sea for consumption or as a source of income (Figure 1). For the Caribbean Region, the ocean economy is not a new economic frontier, but traditional fishing and shipping-related industries have dominated ocean activities for centuries. Chapter 2 highlights growth drivers for the different blue economy industries and provides a deeper analysis of those sectors with the greatest regional potential.

9 Economist Intelligence Unit. *The Blue Economy: Growth, Opportunity, and a Sustainable Ocean Economy.* EIU 2015.

10 "Green Economy: Sustainable Development Knowledge Platform." United Nations Environmental Programme, United Nations Division for Sustainable Development.

11 *The Ocean Economy in 2030.* OECD Publishing, 2016.

12 The concept of "inclusive growth" promotes equitable opportunities for all, with benefits enjoyed by all. UNDP Deputy Director Thangavel Palanivel further highlights that this growth "takes place in the sectors in which the poor work (e.g., agriculture); occurs in places where the poor live (e.g., underdeveloped areas), using factors of production that the poor possess (e.g., unskilled labour); and reduces prices of items that the poor consume (e.g., food and fuel)." (Durán, Paloma. "What Does Inclusive Economic Growth Actually Mean in Practice?" UNDP: Our Perspectives, United Nations Development Programme, 31 July 2015).

FIGURE 1: ESTABLISHED AND EMERGING BLUE ECONOMY INDUSTRIES

ESTABLISHED INDUSTRIES

- Capture fisheries
- Shipping/Ports
- Shipbuilding
- Offshore oil/gas
- Marine construction
- Marine and coastal tourism
- Marine Transport
- Marine business services
- Marine R & D
- Dredging

EMERGING INDUSTRIES

- Marine aquaculture
- Offshore wind energy
- Ocean renewable energy
- Marine seabed mining
- Safety & surveillance
- Marine biotechnology
- High-tech marine services

1.2 CARIBBEAN ECONOMIC CONTEXT

The economies of Caribbean[13] countries range from service-based providers to larger commodity exporters. The service sectors comprise tourism and financial services as the primary economic activities for employment and foreign exchange earnings. A few countries are involved in the extractive sectors of non-renewable resources like bauxite, petroleum, and natural gas. On a global scale, these countries are small, relatively open, environmentally vulnerable, and are price-takers in their export markets.

Regional economic growth has traditionally been linked with conditions in and relationships with major trade partners—particularly consumers within the Region and in North America. This dependence partially explains the Region's slow recovery from the global financial crisis. Annual growth in CDB's Borrowing Member Countries (BMCs) economies averaged 0.8% from 2009 to 2017[14], far below comparable global rates. Post-crisis, the major sectors have faced unique challenges: growing competition from more budget-friendly tourist regions; low commodity and oil prices; and increased offshore finance scrutiny. "Falling labour productivity and rising unit costs"[15] have further constrained the Region's export competitiveness in several other sectors. Weak, outdated and damaged infrastructure[16] coupled with a challenging environment for doing business are among the obstacles to the Caribbean's economic diversification and foreign exchange earnings potential.

These challenges have been compounded by poor governance, weak institutions, low competitiveness, and unsustainable fiscal policies, which have together, contributed to the Region's weak economic performance. Average regional debt levels have risen as governments borrowed for budgetary support, disaster reconstruction and recovery from other negative external shocks. High public debt and increasing debt service payments have constrained the macroeconomic policy options of many governments. The impacts of climate change and natural disasters have further constrained strategies and policies to provide the high levels of sustainable growth required to build resilient economies.

Looking ahead, low but positive growth is anticipated for the Region, buoyed by improvements in the global economic climate. However, as the 2017 hurricane season indicated, a lack of economic diversity and stability has left the BMCs particularly vulnerable to external shocks. With climate change, environmental risks have heightened. There has been rising interest in rebuilding Caribbean economies to be more resilient to environmental threats, market volatility, and other shocks. The context is ripe for a new, regionally-built economic development paradigm.

13 In this paper, the Caribbean Region refers to the CDB's 19 Borrowing Member Countries (BMCs), unless otherwise stated.
14 2017 Caribbean Economic Review and 2018 Outlook. Caribbean Development Bank, 2018.
15 Quarless, Diane. *Economic Performance and Policies in the Caribbean. Economic Commission* for Latin America and the Caribbean, 2015
16 A 2014 CDB study *Public Private Partnerships in the Caribbean*: Building on Early Lessons estimated that BMCs needed to invest USD21 bn in improving transport, electricity, and water infrastructure over the period 2015 to 2025.

1.3 RATIONALE FOR A CARIBBEAN BLUE ECONOMY

More recently, the development community has paid more attention to the complex environment that covers almost three-quarters of the planet's surface: the oceans and seas. In addition to the growing body of work[17] advocating for the sustainable exploitation of ocean resources, world leaders signed on to an ambitious development agenda that, among other objectives, called for the better use of "oceans, seas and marine resources for sustainable development" (SDG 14). There is a shared recognition that the ocean influences the livelihoods of about 40% of the world's population living at or near the coast, and its contribution to current and future economic growth is significant. Three billion people around the world depend on the ocean to provide their primary source of protein[18].

In 2010, the OECD estimated that global ocean-based activities generated USD1.5 tn and directly provided 31 mn jobs, primarily in fisheries, maritime and coastal tourism, offshore oil and gas exploration, and port activities[19]. By 2030, they estimate that on current trajectories, the ocean's value added will rise by USD3 tn, with employment increasing to over 40 mn. Furthermore, in 2015, the World Wildlife Fund (WWF) placed the total value of key ocean assets at USD24 tn based on the ocean's earning capacity through "direct outputs (fishing, aquaculture), services (tourism, education), trade and transport (coastal and oceanic shipping) and adjacent benefits (carbon sequestration, biotechnology)"[20]. These estimates may still be understated, as it is challenging to fully capture the value added and employment provided by ocean-based artisanal, subsistence, and self-employed activities.

For small islands and coastal developing states, the ocean's role as a critical generator of subsistence and income is magnified. The blue economy calls for the intelligent management of coastal resources to drive economic growth while protecting ocean and coastal ecosystems. A development strategy grounded in the blue economy will enable SIDS to promote the growth of existing productive sectors, expand into emerging blue industries, improve food security, and potentially reduce dependence on imported fossil fuels[21]. Immediately, this addresses different aspects of at least seven of the 17 SDGs, with the potential to drive progress in several others.

17 In addition to CDB's and UNDP's current work in this area, recent and notable research by the OECD, World Bank, and WWF International have made strong cases for better leveraging of marine and coastal industries to drive inclusive and sustainable economic growth.
18 United Nations.
19 *The Ocean Economy in 2030*. OECD Publishing, 2016.
20 Hoegh-Guldberg, Ove. Reviving the Ocean Economy: the Case for Action - 2015. WWF International, 2015.
21 Note: Given that the majority of the BMCs are net-energy importers, reduced fossil fuel dependence may be positive for the region overall, but can potentially threaten earnings of the oil-exporting economies.

For example, a blue economy strategy will support Caribbean states' efforts to achieve the following SDG targets:

FIGURE 2: SDGs OFTEN ADDRESSED THROUGH BLUE ECONOMY STRATEGIES

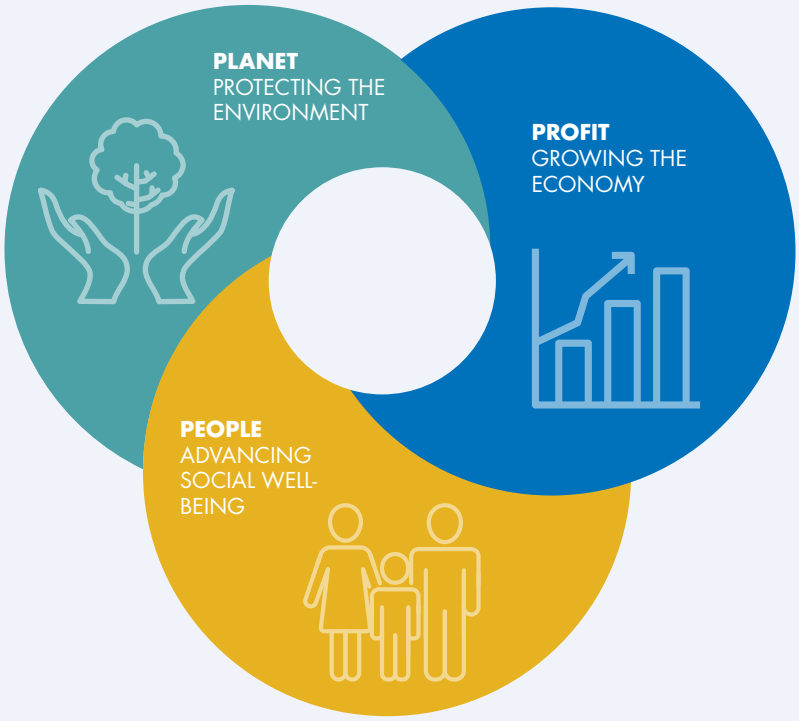
To support international efforts to sustainably manage and restore the world's ocean and coastal resources, and to track progress towards SDG 14 (Life Below Water), UNDP has developed the Ocean Action Hub, a platform to build knowledge, create new partnerships and foster actions around ocean and coastal ecosystem health and the blue economy[22]. At the sub-regional level, in 2013 the Organisation of Eastern Caribbean States (OECS) [23] approved an Eastern Caribbean Oceans Policy[24]—a framework to guide planning, developing, and governing the Region's marine waters and resources.

While a number of initiatives can be highlighted within the Caribbean, the scope and scale remains below full potential, mainly because the blue economy has not been formally recognised as an important economic driver. One regional initiative which speaks directly to blue economy development is the Caribbean Regional Oceanscape Project, a collaboration between the OECS Commission and the World Bank. The project is focused on preserving and strengthening the "resilience of coastal and marine resources, and implementation of regional policies to stimulate blue growth"[25]. Within the OECS, Grenada is at the forefront of this economic transformation, having articulated a Blue Growth Coastal Master Plan, which identifies opportunities for blue growth development in areas such as fisheries and aquaculture, aquaponics, blue biotechnology, research and innovation[26] [27]. In addition, Grenada is currently negotiating a Debt-for-Nature Swap.

Leveraging a blue economy strategy will allow BMCs to more effectively drive the triple bottom line of sustainable development: growing the economy, protecting the environment, and advancing social well-being (Figure 3).

22 UNDP: Ocean Action Hub.
23 The OECS is a ten-member group of islands in the Eastern Caribbean. Full members: Antigua and Barbuda, Commonwealth of Dominica, Grenada, Montserrat, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines; Associate members: Anguilla, the British Virgin Islands, and Martinique.
24 *Eastern Caribbean Regional Ocean Policy.* Organization of Eastern Caribbean States, 2014.
25 "OECS Signs US$6.3M to Support Blue Economy Transition in the Eastern Caribbean." OECS Media Centre, 20 Oct. 2017.
26 Patil, Pawan G.and Sylvia Michele Diez. 2016. Grenada - Blue Growth Coastal Master Plan (English). Washington, D.C.: World Bank Group.
27 Hurley, Gail. "From 'Spice Isle' to 'Blue Innovation' Hub: Grenada's Vision for the Future." *Our Perspectives,* United Nations Development Programme, 1 Mar. 2017.

FIGURE 3: TRIPLE BOTTOM LINE OF SUSTAINABLE DEVELOPMENT



1.3.1 Profit: Blue economy for driving Caribbean economic growth

The Exclusive Economic Zones (EEZs) of individual Caribbean states are substantially larger than their land area. For example, Grenada's EEZ is "75 times larger than its land area. Beyond its 345 square kilometres of land territory, Grenada has 26,000 square kilometres of blue ocean space"[28]. This presents significant opportunities for sustainably generating and extracting higher levels of economic activity and economic value capture from the vast seas and ocean surrounding the states.

The Caribbean's ocean economy is a substantial contributor to aggregate production—as much as 18% by World Bank estimates[29]. Global trends indicate that most of these ocean-based industries are poised for continued expansion, possibly at faster rates than overall global economic growth (see Appendix 2). The OECD anticipates that the ocean economy will be driven by growth in tourism, fisheries, ports, and renewables[30]—areas in which the Caribbean Region has notable potential and existing investments/interests. Despite this, many Caribbean countries are yet to fully capitalise on the ocean's capacity to deliver equitable and sustainable economic growth—particularly from new blue growth sectors (marine biotechnology, deep seabed mining, and ocean renewable energy).

28 Hurley, Gail. "From 'Spice Isle' to 'Blue Innovation' Hub: Grenada's Vision for the Future." *Our Perspectives*, United Nations Development Programme, 1 Mar. 2017.
29 The World Bank estimates that the Caribbean's ocean economy generated 18% of the region's total 2012 GDP (USD407 bn). This includes production and services in fishing, transport, trade, mining, waste disposal, energy, carbon sequestration, and drug development.
30 *The Ocean Economy in 2030*. OECD Publishing, 2016.

1.3.2 Planet: Blue economy for protecting Caribbean coastal environments

Economic benefits of the ocean cannot be realised without appreciating the need for sustainable development and recognising the importance of the Region's coastal and marine resources. The main constraint to the ocean's future economic potential will be related to environmental phenomena such as climate change and sea level rise, as well as direct human activity including marine and land pollution and resource over-exploitation. Therefore, a blue economy approach must also consider the protection of the ocean from further degradation and prioritise strategies that are regenerative and resilient.

This is increasingly relevant in the Caribbean, where the value of ocean assets is declining at a rapid rate. Over the past 30 years, reef-building corals have declined by at least 50%, based on WWF's 2015 estimates. Meanwhile, in 2017, the Commonwealth Marine Economies Programme estimated that approximately 70% of beaches bordering the Caribbean Sea are eroding at between 0.25 to 9 meters annually due to "destroyed reefs, sea level rise, and excessive coastal development"[31]. Relatedly, the 2017 Caribbean Marine Climate Change Report Card posits that "the seas, reefs and coasts on which all Caribbean people depend are under threat from coral bleaching, ocean acidification, rising sea temperature, and storms". Ocean pollution also poses a major threat to the future value of ocean assets. It is estimated that in 2010, 0.16–0.42 mn metric tons of plastic entered the Caribbean Sea[32] and 85% of wastewater was untreated[33]. This includes toxic pollution from marine debris, untreated sewage, and agricultural run-off which puts a heavy strain on the health of marine life and the general public. Large plastic particles can injure and kill fish and other marine life by way of ingestion, suffocation, infection, and entanglement[34].

The economic cost of doing nothing is also significant. Estimates reveal that the Region could lose up to 5% of its gross domestic product (GDP) over the next decade if governments fail to step up their resilience efforts and adapt to climate change[35]. These losses will be as a result of "more intense storms, floods, droughts, rising sea levels, higher temperatures, and ocean acidification"[36] harming marine and coastal ecosystems, consequently affecting Caribbean livelihoods. While a blue economy strategy may not directly reverse the trends associated with climate change, it can help to build a country's resilience to the negative impacts.

Environmental threats also place an additional burden on populations that depend on the sea as a food source. This impacts both seafood earnings and food security of fisher-families and those on the lower end of the socio-economic spectrum.

31 *Caribbean Marine Climate Change Report Card 2017.* Commonwealth Marine Economies Programme, 2017.
32 Jambeck, J. R. et al "Plastic Waste Inputs from Land into the Ocean." *Science* 347 (6223). 2015.
33 Regional Sectoral Overview of Wastewater Management in the Wider Caribbean Region. United Nations Environment Programme-Caribbean Environment Programme, 2010.
34 "The Problem of Marine Plastic Pollution." Clean Water Action, 20 Dec. 2017.
35 *Caribbean Marine Climate Change Report Card 2017.* Commonwealth Marine Economies Programme, 2017.
36 Ibid.

1.3.3 People: Blue economy for achieving Caribbean social inclusion

Despite the Region's success in improving several development outcomes over the last three decades, at least one-fifth of the population remains in poverty and 1 out of every 10 persons is considered "food poor" or indigent[37] [38] (Appendix 1). Recent macroeconomic challenges have intensified social problems, evidenced by persistently high levels of poverty and inequality, poor healthcare, high unemployment, and the rise in crime and insecurity. These problems point to the overarching challenge of social exclusion—a multidimensional phenomenon where certain populations aren't able to equally participate in and benefit from society. Group-based inequalities [i.e., race, gender, disability, location, and age] "continue to slow the pace of poverty reduction in the Caribbean and undermine the development process and shared prosperity"[39].

This exclusion extends to several economically lucrative ocean-based industries in the Region, where there are high financial and competence-based barriers to entry, and where discrimination further limits access to credit, training, and other resources for certain groups. For example, only 2% of the world's official maritime workforce is female[40], in part due to social conventions around women's roles and also due to their limited access to credit and formal/informal maritime education[41]. However in Caribbean fisheries, women conduct the majority of supportive roles and post-harvest work[42]. Despite female dominance in processing and marketing activities, their roles may not be adequately measured, valued, and/or compensated.

FIGURE 4: EXAMPLES OF ROLES WOMEN PLAY IN THE FISHERIES VALUE CHAIN

Source: Gender in Fisheries Team (GIFT), UWI-CERMES

37 Smith, Warren. "President's Remarks." Caribbean Leadership and Transformation Forum: Delivering Results, 18 Sept. 2017, Barbados
38 See Appendix for the latest country-specific statistics.
39 The Changing Nature of Poverty and Inequality in the Caribbean: New Issues, New Solutions. Caribbean Development Bank, 2016.
40 Tifuh, Azirh Nicholine. "Women Merchant Mariners: Empowering West African Women." *World Maritime University,* 2014.
41 *Africa's Blue Economy: A Policy Handbook*. United Nations Economic Commission for Africa, 2016, pp. 33–39.
42 Nembhard, Nadine. "Caribbean Fisheries: Perspectives on Gender." Gender in Fisheries Team, University of the West Indies - Centre for Resource Management and Environmental Studies.

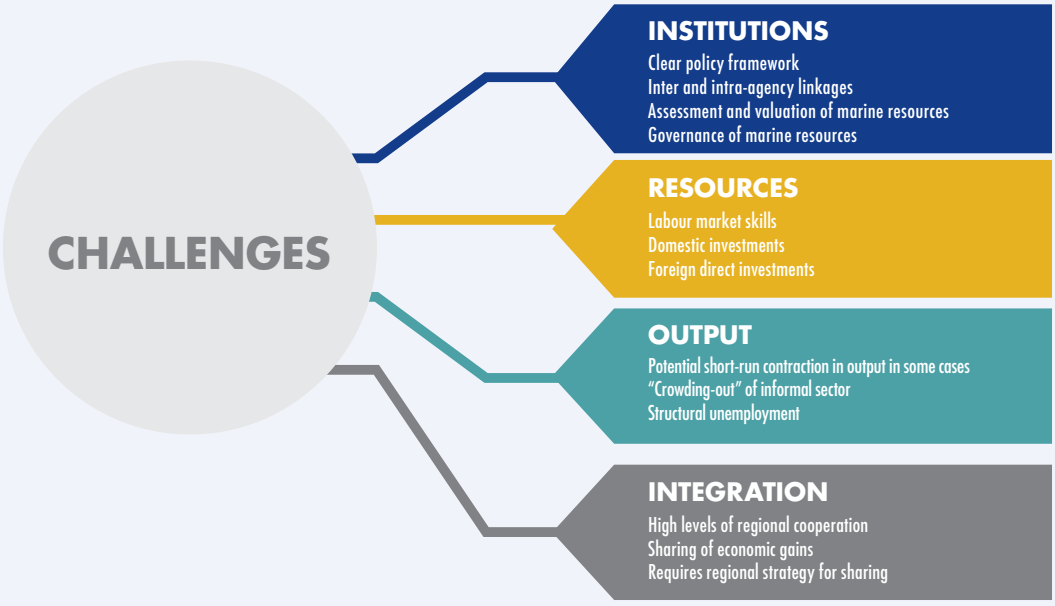
The blue economy concept is grounded in principles of social inclusion, where the perspectives and needs of all societal groups are integrated into the overall strategy. In particular, an effective blue economy strategy should seek to support women, youth, local communities, and other groups traditionally marginalised or underrepresented in policymaking and economic activity. In this regard, the example of Grenada is worth noting: their national Blue Growth plan expressly calls on coastal communities to help with the sustainable management and preservation of blue assets. Blue economy strategies can also prioritise training that better equips local youth to take advantage of highly skilled blue economy job opportunities.

In addition to driving socioeconomic inclusion, a blue economy strategy can also seek to preserve the Caribbean's rich cultural traditions, heritage, and knowledge about the oceans and seas. The displacement of coastal indigenous communities for hotel development or other high-value economic activities is not uncommon in the Region. Empowering these communities to take part in strategy planning and approvals may enable more socially equitable growth.

1.4 CHALLENGES WITH A BLUE ECONOMY STRATEGY

A blue economy strategy requires a holistic approach, balanced between output maximisation and ensuring environmental sustainability and inclusive growth. The challenges facing the blue economy strategy fall within four broad areas: 1) institutions, 2) resources, 3) output and 4) integration.

FIGURE 5: CHALLENGES WITH IMPLEMENTING A BLUE ECONOMY STRATEGY IN THE CARIBBEAN



1.4.1 Institutions

The blue economy concept is not new to the Caribbean as sectors such as energy, fishing, transport, tourism and desalination have been in existence for a long time. The challenge is capturing these sectors and the related developmental and operational activities into a single space of policy and decision-making. In this regard, a clear policy framework and well-designed implementation strategy is critical. These need to be intra and inter-agency as the blue economy requires a collective approach at the national and regional levels to ensure its success. Grenada's Blue Growth Coastal Master Plan is one example which introduces an Integrated Coastal Zone Management Policy that provides "a vision for the future use, development and protection of the nation's coastal zone" and guides "relationships among resource users, community facilities and activities, and physical development and infrastructure"[43].

The importance of evidence-based decision-making cannot be understated as a necessary shift to ensure the success of the blue economy strategy. Research, identification of sectors for development and measurement of results are as essential as the monitoring of policy impacts and evaluation of operational efficiencies of the respective sectors. The research and development culture, including data collection throughout the Region, will require significant strengthening in terms of quantity and quality of statistics. Further, frequent assessment and evaluation of marine resources is needed to inform the levels of degradation and depletion in specific industries.

1.4.2 Resources

Within the current context of low growth and high debt, significant investments in the blue economy are constrained by a lack of fiscal space and readily available financing. Hence, new forms of financing or leveraging the private sector will be necessary to facilitate the operationalisation of a blue economy strategy. Investments in and development of the blue economy will require resilient approaches that integrate climate change adaptation and mitigation in order to reduce the vulnerabilities associated with natural disasters. All forms of development must be approached within the core principle of sustainability on land and sea.

Physical capital development will also need to be accompanied by investments in human capital that will enable skills and competencies that are responsive to the needs of the blue economy, new technologies and innovation. The blue economy strategy also warrants suitable labour market assessments and investments in the areas where the country has significant gaps and there is potential to transition into high-value productive sectors.

43 Patil, Pawan G.and Sylvia Michele Diez. 2016. Grenada - Blue Growth Coastal Master Plan (English). Washington, D.C.: World Bank Group.

1.4.3 Output

A blue economy strategy may negatively impact current practices and output as the context of sustainable use may warrant production reductions, stoppages, or phasing out in the short-run. Such an approach will require extensive collaboration with key stakeholders—particularly those that may be negatively impacted. A well-designed strategy will include steps to avoid sudden-stops and allow time for transitioning from one method to another, perhaps through a phased approach. In some cases, governments may have to invest in exploring different sustainable methods of extraction or production that are not cost prohibitive.

The blue economy concept also posits inclusiveness as one of its core ideals, but there are often challenges associated with efforts to formalise certain informal industries (e.g., small-scale fisheries) and spread the benefits of growth across different socioeconomic groups. Additionally, the introduction of larger private sector firms into some predominantly informal sectors such as fishing and marine tourism (private boat operators) may lead to a 'crowding-out' of vulnerable populations who engage in these activities. As such, the strategy needs to identify disadvantaged groups and seek to promote a more inclusive approach to development.

1.4.4 Regional Integration

An integrated and cohesive policy accepted and promoted regionally, which supports the development of a blue economy strategy is necessary to ensure success. One of the most sensitive and critical aspects to the BE, the EEZs, must be leveraged as a common natural resource and negotiated from a common platform in order for the Region to benefit from investments by external parties. Countries within the Region require commitment that their economic interests will be represented within the negotiating process; through a strong participatory approach the needs of member countries may be sufficiently facilitated.

1.5 CONCLUSION

A blue economy strategy that forays into new growth industries and expands existing ones in a sustainable manner will facilitate faster economic growth, and can usher in a new Caribbean economic development paradigm that is more diversified and less vulnerable to external shocks. The effective adoption of the Blue Economy concept requires not only a focus on the specific activity associated with utilising the resource, but also on mainstreaming ocean sustainability into economic

modelling and decision-making. To support the blue economy approach and investment, appropriate policies, legislation, incentives and infrastructure must be accommodative to facilitate the transition. That is, the policy mix, legislation and regulation, processes and other governance structures should align with the strategy in order to maximise higher economic potential and value added.

It is important to note that sustainability does not necessarily translate into economic contraction. A well-timed strategy can do two key things: (1) it can provide opportunities for new industries, increase employment and expand GDP in the transition period; and (2) it will extend the life of ocean and coastal resources. A successful blue economy strategy will place the Region on a path for development that does not place economic priorities in competition with environmental needs. As countries build resilience to climate change, greater focus can be spent on investing in growth rather than on rebuilding after destruction.

Figure 6 presents a SWOT (strengths, weaknesses, opportunities, threats) analysis of a Caribbean blue economy strategy.

FIGURE 6: KEY TAKEAWAYS OF CHAPTER 1

Source: CDB

CHAPTER 2

TARGETED INDUSTRIES FOR CARIBBEAN BLUE GROWTH

2.1 OVERVIEW

This chapter aims to identify blue industries which offer potential benefits of increased output and opportunities for inclusive and sustainable development in the Region. The blue economy identifies new products, in some cases, but also provides more efficient and targeted strategies to enhance current economic activities and practices. The proposed strategy depends on the current economic reality and potential for growth. Opportunities for expansion of industries which are not economically efficient and require concerted efforts at conservation or reallocation of resources are also examined. The total economic value of proposed interventions can be analysed according to direct and indirect gains and a measure of social benefits or costs. Given current data limitations, it is difficult to quantify the benefits of each proposed industry, however the paper uses anecdotal data to identify the potential direction of the industries and feasible strategies for growth. This initial desk examination identifies areas for future and more in-depth analysis to fully quantify potential gains.

The blue economy is comprised of several industries, notably: marine transport; fisheries; ocean and coastal tourism; waste management; renewable and non-renewable energy; ocean mining; and blue biotechnology research and development (R&D) with multiple sectoral components and activities. Each activity is associated with several industries, as outlined below.

TABLE 1: BLUE ECONOMY ACTIVITIES, INDUSTRIES, AND GROWTH DRIVERS

Type of Activity	Activity Subcategories	Related Industry	Drivers of Growth
Harvesting and trade of marine living resources	Seafood harvesting	Fisheries (primary and secondary), trade of seafood products (edible and non-edible), marine-based aquaculture	Demand for food and nutrition, demand for cosmetic, pet, and pharmaceutical products
	Usage of marine living resources for pharmaceuticals and chemicals	Marine biotechnology and bioprospecting	R&D and usage for healthcare, cosmetic, enzyme, nutraceutical, and other industries
Extraction and use of marine non-living resources (non-renewable)	Extraction of minerals	(Seabed) mining	Demand for minerals
	Extraction of energy sources	Oil and gas	Demand for energy sources
	Freshwater generation	Desalination	Demand for freshwater

Type of Activity	Activity Subcategories	Related Industry	Drivers of Growth
Use of renewable non-exhaustible natural forces (wind, wave, and tidal energy)	Generation of (off-shore) renewable energy	Renewables	Demand for alternative energy sources
Commerce and trade in and around the oceans	Transport and trade	Shipping and shipbuilding	Growth in seaborne trade; transport demand; international regulations; maritime transport industries (shipbuilding, scrapping, registration, seafaring, port operations, etc.)
		Marine transport	
		Ports and related services	
	Coastal development	National planning ministries and departments, private sector	Coastal urbanisation, national regulations
	Tourism and recreation	National tourism authorities, private sector, other relevant sectors	Global growth of tourism
Indirect contribution to economic actives and environments	Carbon sequestration	Blue carbon	Climate mitigation
	Coastal protection	Habitat protection, restoration	Resilient growth
	Waste disposal for land-based industry	Assimilation of nutrients, solid waste	Wastewater management
	Existence of biodiversity	Protection of species, habitats	Conservation

Source: Adapted from World Bank (2017)

2.2 FISHERIES AND AQUACULTURE

2.2.1 Fisheries industry trends

Regionally, current estimates of annual fish consumption range between 10 and 35 kg per capita[44]. This figure reflects both local consumption and the higher-value demand due to tourism-related activities. The demand for fish from tourism-related activities generates a stronger multiplier due to the value-added from the sea to restaurants, similar to the farm to table concept in agriculture.

44 "The Sustainable Intensification of Caribbean Fisheries and Aquaculture." *Food and Agriculture Organization of the United Nations,* 2014.

Exports of fish and seafood from Caribbean Community (CARICOM) countries were approximately USD290 mn annually during the period 2013 and 2014. "The fisheries sector also provides employment for approximately 116,000 persons and contributes between 0.32% and 2.3% of value added to GDP of CARICOM countries"[45]. At least 64,000 people are directly employed in small-scale fisheries and aquaculture. If other industries such as boat construction, net repair and fish processing are added, the number of people employed in the CARICOM Region in the broad-based fisheries sector is estimated around 180,000 (Food and Agriculture Organisation of the United Nations [FAO] 2014). While this estimate of value added is relatively low, it does not account for the particularities of the fishing industry in the Caribbean. Most of the industry is informal, on a relatively small scale, and subsistence-based with limited commercial and industrial-based fishing.

The largest fish-producing countries in the Caribbean are Guyana (31%), Suriname (21%), The Bahamas (11%), and Trinidad and Tobago (7%). Marine fishes account for about 53% of all produced species in the CARICOM Region, while shrimp accounts for 20%, conch 10%, lobster 8%, and tuna and bonito 6%. Fisheries production can vary depending on weather, fishing intensity and fuel prices (FAO, 2014).

The regional dynamic for fisheries is one of net consumption and not production. Due to the service-based (tourism) dependence of most Caribbean islands, additional external demand pressures outweigh the productive capacity of the Region. Accordingly, over the period 1997 to 2016, the majority of Caribbean economies had a negative export position (Table 2). While fish species and seasonality may account for the differentials, this trend identifies a mismatch between production and demand. In spite of this, the Region was a net exporter due to the significant exports of The Bahamas, Belize and Guyana, as well as Grenada and Suriname over the period 1997 to 2007.

TABLE 2: NET FISHERIES EXPORT POSITION OF REGIONAL ECONOMIES

Country	Year Last Available	Net Exports (USD)
ANG	2004	(1,051,823)
ANT	2016	(4,433,656)
BAH	2015	46,492,937
BAR	2016	(14,997,744)
BZE	2016	21,055,081
DOM	2012	(1,131,570)
GRE	2008	(87,057)
GUY	2016	98,728,941
JAM	2016	(45,927,781)

45 Figueroa, Omar. "Statement Delivered by Honorable Minister Dr. Omar Figueroa, Minister of Agriculture, Belize." UN High level Session of the Side Event "Food from the Ocean." 6 June 2017, New York, United Nations Headquarters.

Country	Year Last Available	Net Exports (USD)
SKN	2014	(2,198,238)
SLU	2015	(5,532,894)
SVG	2015	(990,896)
SUR	2012	(1,328,815)
TT	2015	(21,597,259)
TCI	2012	(1,507,579)

Source: Author calculations, data from UN Comtrade

Evidence suggests that approximately 60% of commercially exploited fish species or stocks within the Region have been overfished or over-to-fully fished[46]. It is estimated that coastal fisheries have declined sharply in recent years, which has adverse impacts on economic sustainability, particularly for coastal communities which rely on fisheries for livelihood and food. The Strategic Action Programme for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+SAP) report of 2013 identified a 30% reduction in fishery catch over the last two decades. Further, a CARICOM diagnostic study (2012) on fishing communities pointed to high levels of poverty and vulnerability, suggesting that profits from the industry may not be sufficient to engender growth and development, at least in the current incarnation.

On average, fisheries in the OECS contributes less than 1% to value added, with the exception of Anguilla and Grenada where they accounted for 3.1% and 1.6%, respectively (Table 3). Since 1984, all economies registered a decline in the contribution of fisheries to value added. Combined, these trends represent a relative diminution of the sector, although, in absolute terms, the sector size did increase, growing at an average of 2.7% over the 1985–2016 period.

TABLE 3: FISHERIES CONTRIBUTION TO GDP (%)

	1984	1988	1992	1996	2000	2004	2008	2012	2016
ANG	4.48	3.64	3.99	2.87	2.09	2.37	2.03	2.81	3.11
ANT	1.16	1.03	1.14	0.93	0.89	1.09	0.93	1.07	0.98
DOM	0.78	0.76	0.51	0.60	0.60	0.37	0.44	0.36	0.69
GRE	2.03	1.55	1.69	1.67	1.28	1.43	1.44	1.49	1.64
MON	0.31	0.33	0.46	0.30	0.28	0.25	0.22	0.25	0.18
SKN	0.76	0.72	0.62	0.59	0.43	0.69	0.51	0.52	0.30
SLU	0.72	0.51	0.58	0.65	0.95	0.67	0.69	0.70	0.63
SVG	0.47	0.50	0.53	0.61	0.58	0.47	0.37	0.37	0.37

46 World Bank, 2016.

The Region can benefit from significant gains on the value-chain by focusing on final products from the fishing industry—restaurants and hotels, as well as marine parks. A blue economy strategy will therefore benefit from an evaluation of the opportunities in fisheries and the possibilities that exist in focusing greater efforts on the final stages of the value-chain. Regional trade and growth could be strengthened by matching the outputs from the net exporting countries to the demand from tourism-dependent economies. Interventions in the fisheries industries can be tailored towards sustainability and conservation, in the short to medium-term. Properly managed, such initiatives can be linked to the tourism industry through marine parks, visitor attractions, and other land-based and community events associated with fisheries[47].

The industry also presents a range of opportunities for technical and economic diversification in various fisheries-related activities such as the "land-based production of ornamental fish for export; growing fish, seaweed and other marine organisms in the sea; recreational fishing linked to tourism; food processing and manufacturing; and conservation of the marine environment"[48]. However, these opportunities can potentially be eroded by climate change impacts.

2.2.2 Climate change and ecosystem degradation impacts and mitigation

The Caribbean Region's fisheries industry is among the most vulnerable to climate change in the world (FAO 2017). Climate change has increased the frequency and intensity of tropical cyclones, resulting in warmer seas, increased acidification of the ocean, and rising sea levels, among other impacts. This has led to higher financial and time costs associated with fishing and a reduction in the sustainability of commercial fishing, resulting in lower fish catch, less income, and reduced employment opportunities. The industry is also highly susceptible to illegal fishing and pollution, which threatens the coastal and marine. These pollutants range from oil hydrocarbons, sediments, nutrients, pesticides, litter and marine debris, and toxic wastes to sewage.

47 Examples of such popular events include Oistins Fish Fry, Barbados; Port Royal Fish Fry, Jamaica; Gouyave Fish Fry, Grenada; etc.
48 Jessop, David. "Greater Emphasis Needed on Caribbean Fisheries." *Caribbean Intelligence*.

TABLE 4: IMPACT OF CLIMATE CHANGE ON FISHER COMMUNITIES

Effects of Climate Change	Impacts for Fisher Folk
Coral reef bleaching: Kills corals and negatively affects fish production	Decreasing catches and lower catch per unit of effort (CPUE). Fish available for local consumption decreases
	Land sites and coastal communities are more prone to flooding and coastal erosion
Increased intensity of storms along with sea level rises damage coral reefs and mangroves, landing sites and piers	Loss and damage of gears and fishing vessels.
	Unsafe fishing conditions and potential increases in accidents at sea
	Land sites and coastal communities are more prone to flooding and coastal erosion
Large amount of Sargassum washing ashore disrupting fishing operations.	Decrease in catches for fishers since this reduces the number of days fished and makes fishing more difficult
	Sargassum attracts juvenile dolphin fish which are caught thereby resulting in fewer mature dolphins in following years
Large pelagic fish such as tuna, dolphin, marlins and sailfish moving to cooler waters	Fishers have to fish further away which increases their costs, decreases total catch and reduces fishery-related income
	Fishers may need to target other species instead
Ocean acidification is expected to result in fewer conchs, urchins, and sea cucumbers, and will also affect behaviour of fishes	Decreases in catches of these species and CPUE

Source: FAO 2017

Development of the industry also requires investments in data collection, research, knowledge and instruments that assist with planning such as undergoing vulnerability and risk assessments, particularly as it relates to climate change risks. There is also a need to improve harbours and landing sites as well as the development and implementation of appropriate measures to increase safety and reduce risk of storm damage, accidents and losses in fisheries assets. Smart climate adaptation interventions can contribute to a reduction or mitigation of various climate change impacts and exploration of additional opportunities to grow the sector and increase food security. Most solutions involve investments in building knowledge and capacity, investments in infrastructure and sustainable technology, and mainstreaming climate change.

2.2.3 Opportunity in aquaculture

Aquaculture,[49] has the potential to expand the fisheries industry and help reduce fish imports, provide employment and food security and make the industry more climate change resilient. Aquaculture development has been relatively slow and current production only accounts for about 5% of total fish production in the Region. Most of this is freshwater based, since investments have been directed towards on-shore production using non-native species (dominated by tilapia) with the larger and more water-abundant territories (Belize, Guyana, and Jamaica) being the main producers. Limited technical expertise and high infrastructure and input (feed) costs have been cited as major constraints to larger investments in freshwater aquaculture.

Marine aquaculture, while being less vulnerable to the constraints of freshwater aquaculture, has received relatively low investments in the Region due to limited R&D. Resource-poor coastal communities can explore marine shellfish aquaculture (molluscs, clams, oysters and crustaceans) which require low investment, operating costs, and technical expertise. The production systems can be simple and the ocean environment naturally supplies the food that shellfish require, thus eliminating the need for costly external feed. Low barriers to entry, coupled with the high demand for shellfish products, point to shellfish aquaculture as a "viable approach for diversifying livelihoods"[50] for the Region's poor and rural communities. The FAO (2014) estimated that greater investment in CARICOM's aquaculture development could increase total fish production by as much as 30% in a decade. Aquaculture development also has the potential to increase the production of other commodities such as seaweed.

Such initiatives however, would require the development of an enabling aquaculture policy and legal frameworks, as well as programmes that build knowledge and capacity. Notwithstanding large start-up costs, aquaponics, which integrates vegetable or plant production with fish production, offers potentially large production and environmental benefits to the Caribbean. It would allow the Region to develop more sustainable and intensive food production systems that are extremely water efficient.

49 "The National Oceanic and Atmospheric Administration (U.S. Department of Commerce) broadly defines aquaculture as the "cultivation of aquatic organisms in controlled aquatic environments for any commercial, recreational or public purpose".
50 Hall, Stephen. "More Fish – Surely We Just Need to Farm the Sea?" *WorldFish Blog*, 20 Mar. 2012.

2.3 COASTAL AND MARINE TOURISM

2.3.1 Tourism industry trends

Tourism is a major growth engine and foreign exchange earner in many Caribbean countries. Despite only accounting for on average, 2% of the global tourism market share[51], the Caribbean tourism attracts approximately 22.7 mn visitors annually for "sun, sand, and sea" experiences. Typically, tourism refers to coastal activities such as swimming, surfing, and sunbathing; maritime activities such as boating, yachting, cruising, and nautical sports; and supporting services and infrastructure (Ecorys 2013). However, many Caribbean countries have invested in diversifying their tourism product to offer ecotourism (Belize and Dominica), education tourism (Grenada and St. Kitts and Nevis), and other tourism sub-products. Diversification, along with a growing cruise ship industry, has helped the industry during economic downturns.

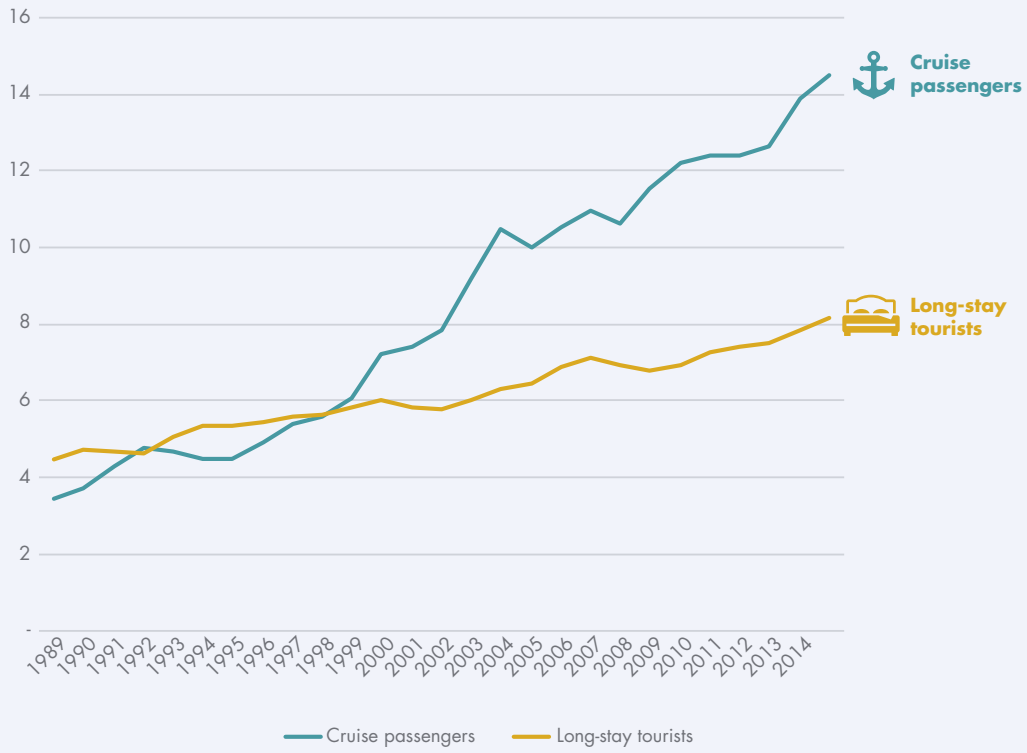
The direct impacts derived from tourism services flow from spending on accommodation, food, transport, entertainment and attractions. In 2014, tourists spent over USD13 bn in the BMCs—equivalent to 11.2% of aggregate regional GDP of the Region. The ratio of tourism expenditure to GDP varied widely by country: from 2% of GDP in Trinidad and Tobago to 91% in the Turks and Caicos Islands. The industry is also one of the largest employers in the Region, supporting a third or more of the labour force in the more tourism-dependent countries[52]. It is estimated that for every USD100 that a tourist spends locally, USD35–USD54 is added to the same year's GDP (CDB 2017). On average, a 10% increase in tourist spending increases GDP per capita by 0.58%–0.89%. In the longer term, this impact is magnified because of the dynamic effects of increased spending and demand.

2.3.2 Key drivers

The most significant development in marine-based tourism activity in the Region is the growth of the cruise industry. Cruise-based tourism has emerged as one of the most important maritime and coastal tourism activities in many Caribbean islands over recent years. The Caribbean's cruise industry accounts for 50% of the global cruise market share of vessel calls and passengers. In 2017, 29.3 mn cruise passengers ported in the BMCs, a 75% increase over 2006. By comparison, the Region's annual long-stay tourist arrival growth has been the lowest globally at 2.5%. Asia, Central and South America, and Africa are increasingly being established as more affordable alternatives to the Caribbean for longer trips.

51 UNWTO Tourism Highlights, 2016 Edition.
52 Tourism dependent countries include: BVI (where tourism is 84% of GDP), Anguilla (59%), Antigua and Barbuda (54%), and Dominica (32%).

FIGURE 7: BMC TOURIST ARRIVALS (MILLIONS), BY VISITOR TYPE



Source: Caribbean Tourism Organization, CDB (2015 Tourism Study)

Cruise and cruise ship porting represent one of the biggest challenges for Caribbean governments. Significant investments in port infrastructure are required to accommodate larger ships and increase revenues from cruise ships and tourists. The current value added from cruise tourism is relatively small, due in part to limited visitor spending. Cruise passengers typically stay for one day in each destination, and on average spend 94% less in the country than stay-over (or long-stay) visitors[53]. This evolving profile of a typical Caribbean visitor has impacted expenditure anticipated from each tourist. From 1989 to 2014, average regional expenditure per-person per-visit declined over 30% from USD870 to USD608.[54] The economic returns from the cruise industry are further compromised by the inability of governments to appropriately price cruise passenger head taxes and other fees in the destination countries. Inter-island competition has reduced the Region's collective bargaining power, thus compromising the revenue potential of the cruise industry. To compete with neighbouring ports and incentivise cruise ships for continued patronage, regional port authorities often charge concessionary 'docking' or 'landing' fees to large cruise companies[55],

53 CDB 2017. *Tourism Industry Reform: Strategies for Enhanced Economic Impact.*
54 Cruise Lines International Association (CLIA) statistics indicate that the average expenditure of each passenger visiting the Greater Caribbean ranges between USD222 and USD300 in each destination, during a 7-8 day trip.
55 Aguirre, Sandra Z, and Juan G Brida. The Impacts of the Cruise Industry on Tourism Destinations. 2008.

or offer tax refunds to major cruise lines for landing over a certain number of passengers[56]. This overall decline in revenue per visitor has constrained the growth in tourism revenues, as well as the overall economic impact of the industry.

To effectively leverage the cruise industry for a blue economy strategy, Regional governments and policy makers should assess the fees and charges applied to cruise companies. This may entail exploring options for acting as a consortium in implementing minimum docking fees and environmental levies, by which revenues raised are ring-fenced for further investments in the blue economy. This will help to meet financing needs for port infrastructure development and to create a fund for environmental conservation or climate change adaptation.

Marine and coastal tourism services have expanded to include a range of activities including sport fishing and deep sea fishing. The Caribbean is said to be one of the world's most popular fishing locations, particularly deep sea fishing. Other activities such as scuba diving and snorkelling have also increased. A novel addition is the underwater gallery of sculptures in Grenada's Molinere Beauséjour Marine Protected Area (MPA) which serves the dual purpose of environmental and biodiversity conservation while providing economic benefits, in line with the blue economy model. Yachting has also emerged as one of the most popular features of the tourism product. The number of facilities and events developed to cater to yachting communities including marinas and other facilities have contributed to an increase in sailing regattas and other competitions within the Region. In addition, the British Virgin Islands has developed a niche market in beds at sea using yachting berths which supplements the land based accommodation stock. As such, yachting berths are estimated to provide on average 53% of total visitor expenditure of the Territory.

2.3.2 Opportunity in linking MPAs to tourism

A healthy natural environment is a significant asset for the tourism industry, such that if mass tourism is not properly managed, activities can generate considerable pressures on local environment and coastal ecosystems (UNDP, 2014). MPAs present significant opportunities for preserving the environment that underpins much of the Caribbean coastal and marine attractions. In 2010, there were an estimated 6,800 MPAs globally (Toropova, 2010). To date, the number of MPAs has more than doubled to 15,271, but over 520 are still unimplemented[57]. Globally, only about 3% of the world's oceans are actively protected and managed, and about 1.5% of them are no-take marine reserves (The Marine Conservation Institute, 2017). In terms of coverage, United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) (2017) estimates that about 6% or some 23 mn square kilometres (km^2) of the ocean is now considered marine protected. Notably, 14 mn km^2 of this protected space was added since 2010, driven by expansions in existing areas and the creation of very large new sites. The ten largest sites account for over 50% of the area that is covered by MPAs.

56 In the past, The Bahamas has refunded half of cruise passenger head tax earned from cruise lines landing at least 500,000 passengers in a given year; while Jamaica has also given a 50% rebate to Carnival and Royal Caribbean cruise lines for large passenger numbers (Ajagunna and Pinnock, 2014)
57 Atlas of Marine Protection, Marine Conservation Institute

The Nature Vest Conservatory (2017) identified the Caribbean as one of the world's most biologically diverse marine regions, with over 13,000 plant species, 12,000 fish and other marine species and 10% of the world's coral reefs[58]. Given the steady decline in the health of the Caribbean Sea, coral reefs and beaches, coupled with the effects of overfishing, pollution and climate change, conservation efforts have heightened in an effort to slow the effects of unsustainable development particularly along coasts. Implementation of marine reserves or no-take areas as well as sustainable fisheries practices have emerged all across the Caribbean; all relevant initiatives for the creation of a robust blue economy. However, while the primary objective of these parks is ecosystems and biodiversity preservation, in many instances they have become major tourist attractions in the destination countries, supporting key activities such as reef fishing, and scuba diving. These activities establish the links between tourism and relatively sustainable environmental practices that form part of a sustainable tourism product and underpin the development of the blue economy strategy.

Development of coastal and marine tourism has the potential to meet sustainable economic conditions through conservation initiatives. As such, more MPAs should be encouraged to preserve the clean, clear waters that coastal tourism depends on; and to protect coral reefs and mangroves, therefore ensuring that the natural habitats for marine life are preserved. Coral reefs are powerful attractions for tourism, and are important natural breakwaters, which minimise wave impacts from tropical storms and hurricanes.

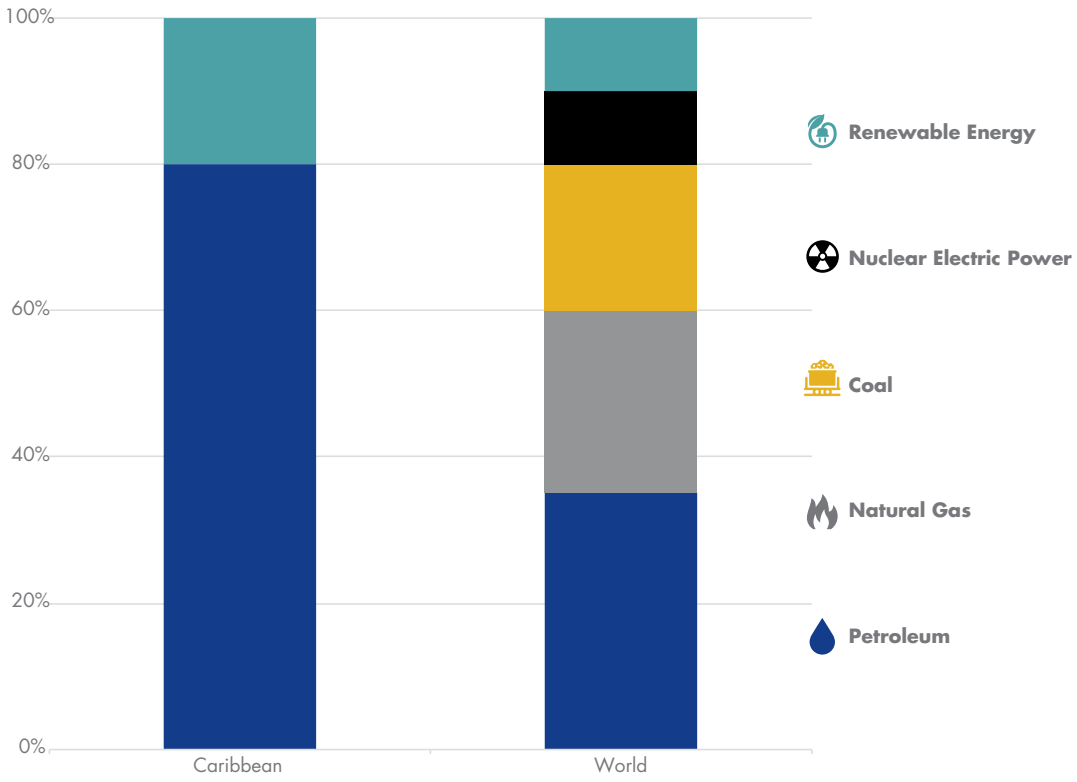
58 The Nature Conservancy. 2017. *Caribbean: Protecting the Heart of the Atlantic.*

2.4 RENEWABLE MARINE ENERGY

2.4.1 Energy industry trends

The United Nations has estimated that about 15% of global energy is generated from renewable sources with potential for a doubling in the percentage of renewable energy use by 2030. In 2011, the world's investment in clean energy was estimated at USD260 bn, with more than 70% of the growth in renewable energy generation since 2000 coming from non-OECD countries. By contrast, the Caribbean is dependendent on fossil fuels for the majority of its energy needs, with investments in renewables particularly low (Figure 8). As a result of the high input of fossil fuels, energy costs in the Region are volatile and often represent a significant expenditure for households, businesses and government. Electricity tariffs throughout the Region are sigificantly higher when compared to the US rates, and even intra-regional rates are far dispersed[59] (Figure 9).

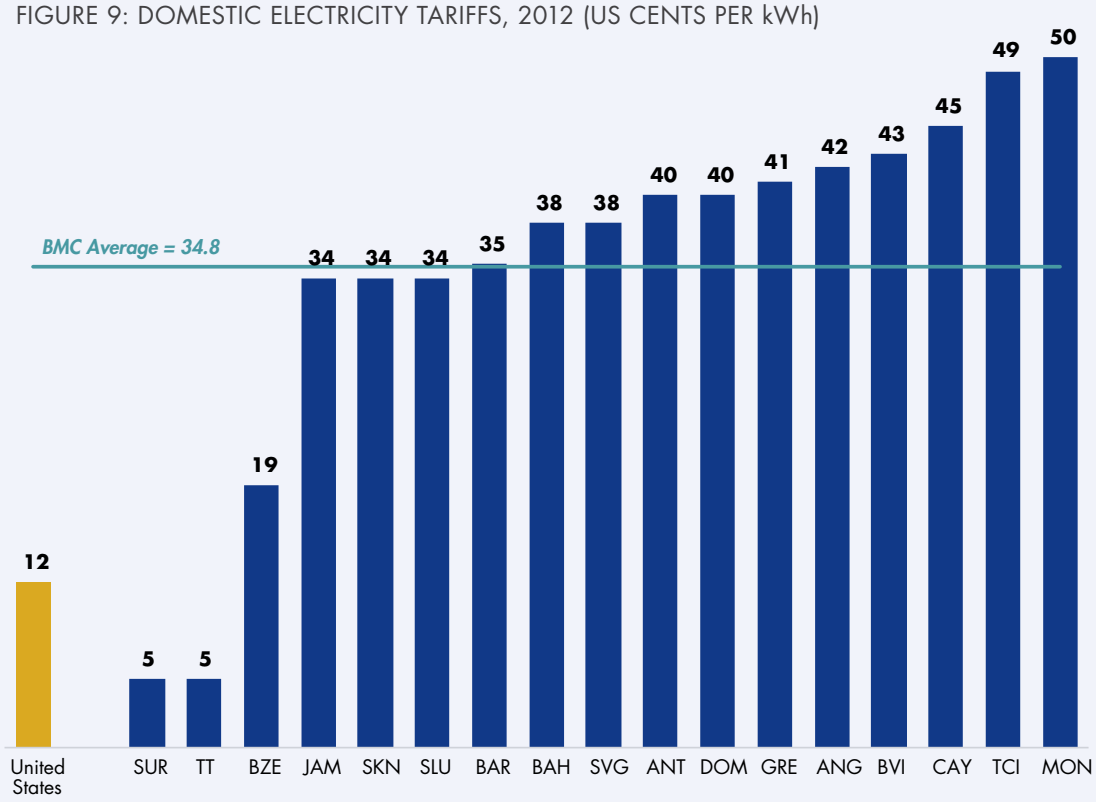
FIGURE 8: PRIMARY ENERGY CONSUMPTION BY SOURCE (% OF TOTAL)



Note: (1) Excludes T&T and Haiti; (2) Renewable energy includes hydro power, geothermal, solar/PV, wind, and biomass; (3) For the Caribbean, renewables include hydropower and biomass | Source: EIA; IDB; and IMF staff calculations (2016)

59 International Monetary Fund. 2016. Working Paper: *Caribbean Energy – Macro related Challenges.*

FIGURE 9: DOMESTIC ELECTRICITY TARIFFS, 2012 (US CENTS PER kWh)



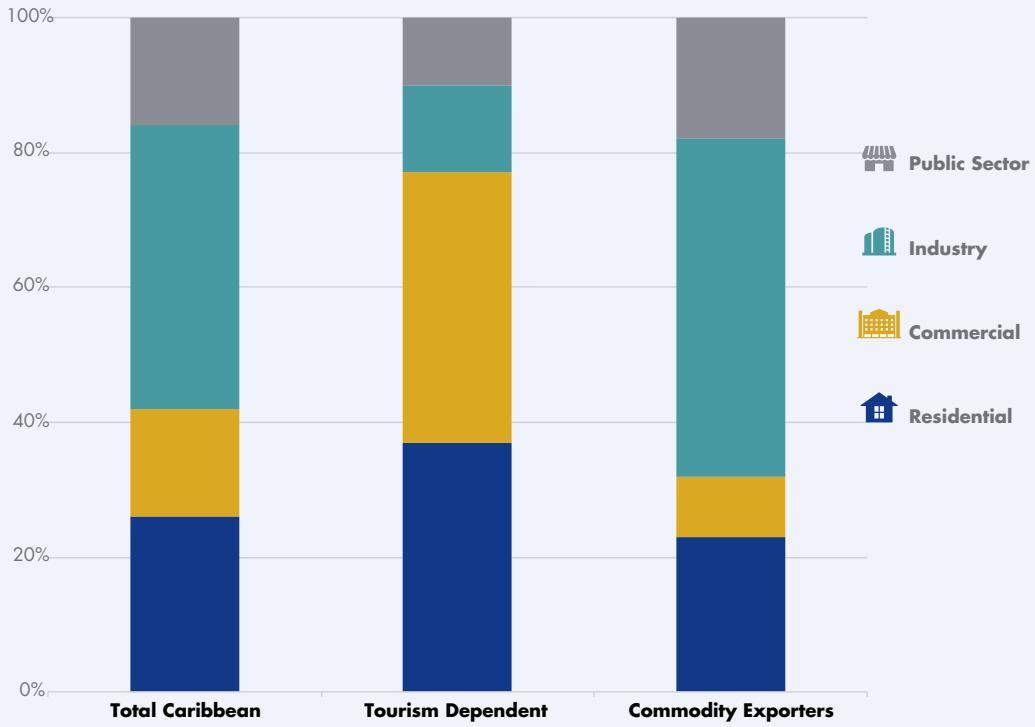
Source: IMF 2016

Many Caribbean countries have set themselves some very ambitious targets which requires diversifying their energy mix by 2030. For example, in 2016, Barbados set a target of achieving 65% of its power from renewable sources by 2030. Similar targets have been set by St. Vincent and the Grenadines (60-100% by 2030) and the Cayman Islands (70% by 2037). Though ambitious, many Caribbean nations are well on the way to achieving their goals. In 2017, the Inter-American Development Bank (IDB) noted that Latin American and the Caribbean (LAC) had one of the highest rates of renewable energy consumption of any region in the world. The LAC Region's renewable energy potential is large enough to cover its projected 2050 electricity needs 22 times over.

As at 2007, the per capita energy consumption of Caribbean states was half that of the United States (World Bank 2017). A review of energy consumption per capita shows that the incorporation of renewable energy in the regional energy mix could help improve the cost competitiveness of goods produced and services offered. The main users of energy in the Region are service-based economies, primarily tourism; a reduction of energy costs can help these economies reduce the cost of operations. The bulk of demand across both services and commodity based economies lies

in the commercial and industrial sectors. As such, savings through renewable energy generation will have the largest impact in the productive sectors of the Caribbean economy. The IMF (2016) highlighted the positive growth impetus of increased energy consumption. Therefore, reducing the cost of energy through increased renewable sources can stimulate domestic economies and facilitate further industrial and commercial activities.

FIGURE 10: ENERGY CONSUMPTION IN THE CARIBBEAN



Source: IMF 2016

The Caribbean Sea has large untapped sources of renewable energy, with huge solar, wind, geothermal and marine energy potential. This recognition led to the development of a Community Energy Policy by CARICOM in 2013, signalling an interest in the transformation of the energy sector of the member states of the Community. Members have sought to provide secure and sustainable supplies of energy in a manner that will minimise energy waste and provide greater access to modern, clean and reliable energy supplies at affordable and stable prices.

2.4.2 Opportunity in renewable energy

Much of the Region's renewable energy generation is tied to hydro resources, supported with elements of solar and wind energy generation. In addition, a few countries have begun explorative activities into the geothermal space. However, little has been done directly in the area of marine renewable energy, despite the possibility that the oceans can meet the Region's energy needs. The options for productively developing marine resources for energy generation are mainly in the areas of offshore wind, ocean and wave action energy.

Some progress has been made in developing ocean thermal energy conversion (OTEC); seawater air conditioning (SWAC), and desalinated water systems. Desalinated water systems are the most advanced as many countries in the Region rely on desalinated water in the absence of freshwater systems. In the wider Caribbean, Ocean Thermal Energy Corporation (OTE) entered into direct power purchase agreement negotiations with the U.S. Virgin Islands Water and Power Authority to build an OTEC plant on the island of St. Croix. This pilot project is expected to test the viability of OTEC technology to provide affordable renewable energy.

Notwithstanding, high marine energy exploration, investment, and financing costs constrain the ability of Governments who are also restricted by limited fiscal space to make the necessary investments. Advancing marine energy requires external finance and expertise. The United Nations Development Programme (UNDP) has developed a framework to assist governments with the right policy, incentive and financing mix to cost-effectively promote investments in renewable energy. UNDP's Derisking Renewable Energy Investment Initiative systematically identifies the barriers and associated risks which can deter private sector renewable energy (RE) investment, and assists policymakers in developing packages of targeted public interventions to address these risks. The framework provides a platform which for countries to create a risk-return profile that catalyses private sector investment at scale, while funding reliable and affordable renewable energy solutions, particularly marine renewable energy in developing countries[60].

Caribbean countries have also been tapping into global capital sources to fund RE initiatives. Member countries of the OECS obtained funding from the Green Climate Fund (GCF) to pursue a sustainable energy facility for the Eastern Caribbean[61]. This project demonstrates a coordinated approach to address energy demands across small states which benefits from greater economies of scale. The funding proposal identified potential annual savings of USD50 mn[62] to these economies as the power generated from geothermal sources reduces the demands for oil by close to 750,000 barrels of oil. Likewise, potential investments in marine renewables may lead to similar savings. Savings pass through to households in the form of lower electricity prices, estimated by as much as 50% of the kilowatt cost[63] using geothermal energy. Further, IMF estimates (2016) indicate that

60 *Derisking Renewable Energy Investment*. United Nations Development Programme, 2013.
61 The OECS countries included are Dominica, Grenada, St. Kitts and Nevis, Saint Lucia and St. Vincent and the Grenadines.
62 This estimate is based on a fuel price of USD70 per barrel.
63 Ibid.

real oil price movements impact as much as 7% of real GDP[64]. Reduced dependence on fossil fuels through greater investment in renewables offers significant potential gains for regional economies.

The time may be right and the environment conducive for investments in renewable energy[65]. For example, Barbados was ranked 27th out of some 71 countries on their past, present, and future ability to attract investment for clean energy companies and projects. The use of alternative energy is largely dependent on the backstop price; non-renewable fossil-based energy is generally cheaper to develop on a per unit basis; and with oil prices being at relatively low per barrel rates, the incentives to develop alternative renewable energy potentials, and especially those that are marine based, are less attractive. Up-front capital investment costs are also high, and external expertise and finance are typically needed to make projects a reality. Notwithstanding, in promoting a blue economy the development of clean renewable marine energy could be a critical element, not only for its potential for creating jobs and fueling the economy, but also for its long-term benefit of environmental conservation.

2.5 MARINE TRANSPORT

As a mostly sea-locked group of states, there are significant benefits to having viable maritime connectivity throughout the Region. Maritime options to transportation may provide the Region with improved returns to investment regarding inter and intra-regional travels. However, over the years, sea transportation has suffered a plethora of challenges and has been used mainly for cruise tourism and trade purposes. Countries with existing maritime passenger transportation are used mostly for domestic purposes. Developments in marine transportation should facilitate greater inclusion of the private sector, thereby sharing the investment cost and risks and leveraging technical and human capacity.

2.5.1 Passenger transport

Ferry travel serves as a low-cost option for domestic travel in the Region, with tremendous potential for growth beyond domestic travel. Domestic ferry transport accounted for almost two-thirds of all ferry traffic in 2014[66] (Briceno-Garmendia, et al. 2015), which is partly explained by the lack of intra and extra-regional options. An effective intra-island ferry network throughout the Region may ease many constraints facing regional air transportation. Air transport in the Region poses a significant financial burden, and passengers are inconvenienced by irregular connections between countries. Improving marine passenger transport can also assist the Region in becoming more attractive as a tourism destination, given that tourists may be inclined to do Caribbean tours similar to the "backpackers" of Europe.

64 *McIntyre, Arnold, et al. 2016. Caribbean Energy: Macro-related Challenges.* International Monetary Fund.
65 Multilateral Investment Fund. 2017 *ClimateScope Index.*
66 Briceno-Garmendia, Cecilia et al. 2015. *Connectivity for Caribbean Countries: An Initial Assessment.* Policy Research Working Paper;No. 7169. World Bank Group, Washington, DC.

Intra-regional travel is typified by a large volume of routes with low volumes (Briceno-Garmendia, 2015). Ferry transport provides a cheaper alternative and more timely connections than the airlift routes, and can help arrest the declining levels of intra-regional tourism experienced over recent years (Briceno-Garmendia, 2015). Existing routes, particularly among the OECS countries, show that ferry transport can provide reductions in passengers' costs by more than 30% (Table 5). Additionally, ferries can offer greater connectivity between countries and provide more than two connections per day, thereby increasing the convenience and accessibility of intra-regional tourism.

TABLE 5: FERRY FARE BY TYPE OF FERRY - OECS

	Average ferry fare (USD/mile) - OECS	Percentage of Average LIAT cost/mile
Average slow ferry fares	0.67	35.8
Average fast ferry fares	1.31	69.9
All ferries	1.06	56.6

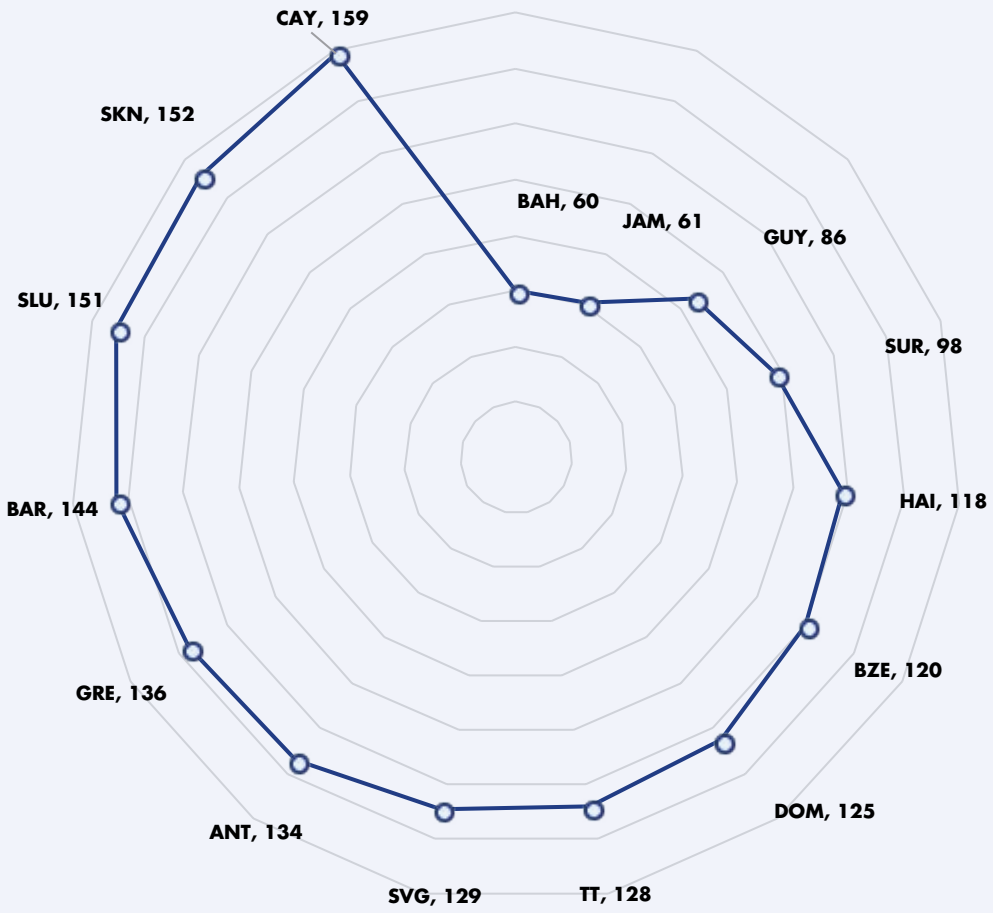
Source: Driving Tourism in the Eastern Caribbean, World Bank 2015

2.5.2 Freight (merchandise) transport

The Caribbean accounts for approximately 1% of global port throughput[67] despite its geographical advantage regarding the Panama Canal and United States (World Bank, 2015). The issue of freight transportation is tied to the logistics of the respective country and the ability to derive gains from the existing network. Currently, the Region's connectivity to the global networks is rather low despite its closeness to major trans-shipment ports. Measured by the United Nations Conference on Trade and Development's (UNCTAD) Liner Shipping Connectivity Index (LSCI), the Caribbean Region ranked in the lower half of global interconnectivity in 2017 (Figure 12). Despite the passage of 130 routes and 37 carriers of international freight transport through the Region in 2011, the cost of freight transportation in the Region is almost double the rates for routes which are three and four times longer.

67 The United States Bureau of Transportation Statistics states "port throughput measures the amount of cargo or number of vessels that are handled by the respective port".

FIGURE 11: LINER CONNECTIVITY SHIPPING INDEX (2017)

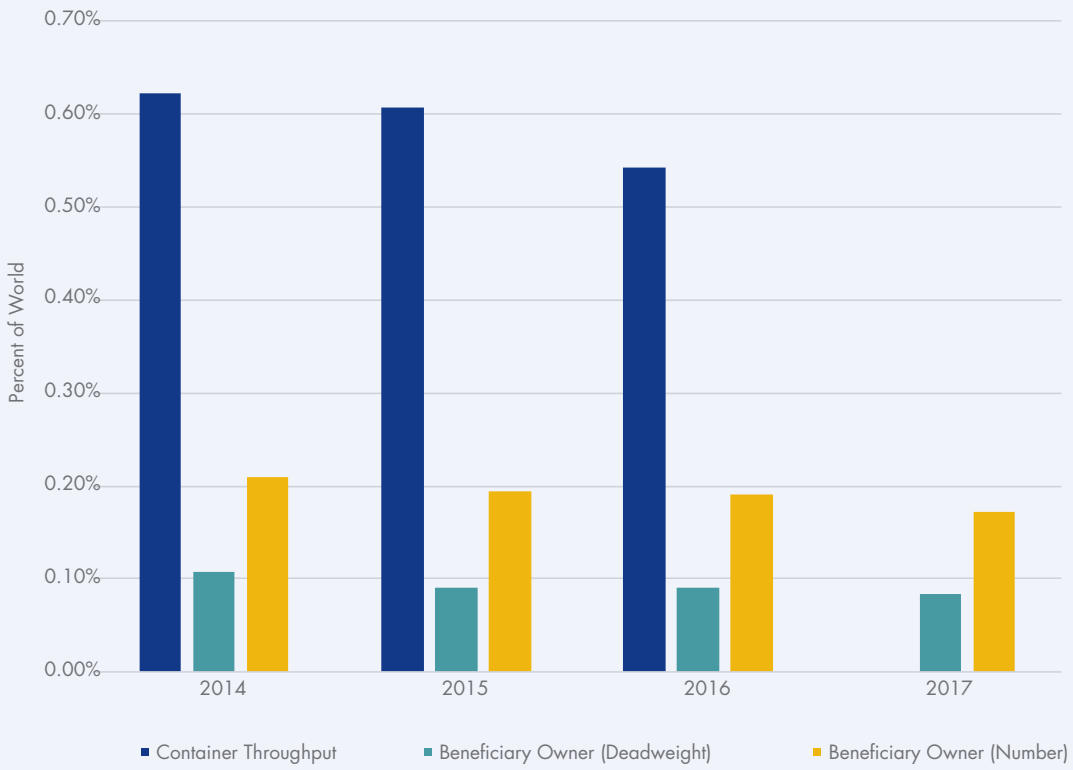


Source: United Nations Conference on Trade and Development

Selected indicators of maritime shipping in the Region show a sector without much growth impetus. The number of merchandise containers handled by regional seaports (i.e., container throughput) declined between 2014 and 2016. In 2017, the Caribbean's share of the total world fleet (measured in deadweight tonnes) fell to its lowest levels since the turn of the millennium. The main measures all declined over the period, except for the 'other' category. The Bahamas accounted for the majority of the Regional fleet, the only Caribbean country with more than 1% of the total world fleet. In 2017, the Caribbean accounted for 5.7% of the total world fleet of ships, 4.3% of which is due to The Bahamas. The Region's major gain in maritime freight transport is not as a service provider but rather as a trans-shipment hub. As such, efforts to develop this sector may be better supported through focus on logistics and an enabling environment for doing business.

Regional gateway container demand is expected to increase with projected compound annual growth rates (CAGR) of over 5% between 2010 and 2025 in Suriname and Guyana alone (CDB, 2016). Expansion of the Panama Canal also provides significant opportunities for the Region. Potential benefits include: 1) trans-shipment services, where Regional ports provide the avenue for cargo transfer onto smaller ships, and 2) backhaul, where BMCs can provide warehousing for products to be loaded onto ships when returning to their country of origin. The latter avenue presents growth enhancing opportunities to the shipping industry with positive spill over effects across various other industries. In anticipation of these potential benefits, Antigua and Barbuda, The Bahamas, and Jamaica have embarked on significant port expansion projects. While still embryonic, should Regional economies provide greater incentives and an improved doing business environment, significant untapped potential exists to provide this intermediary service.

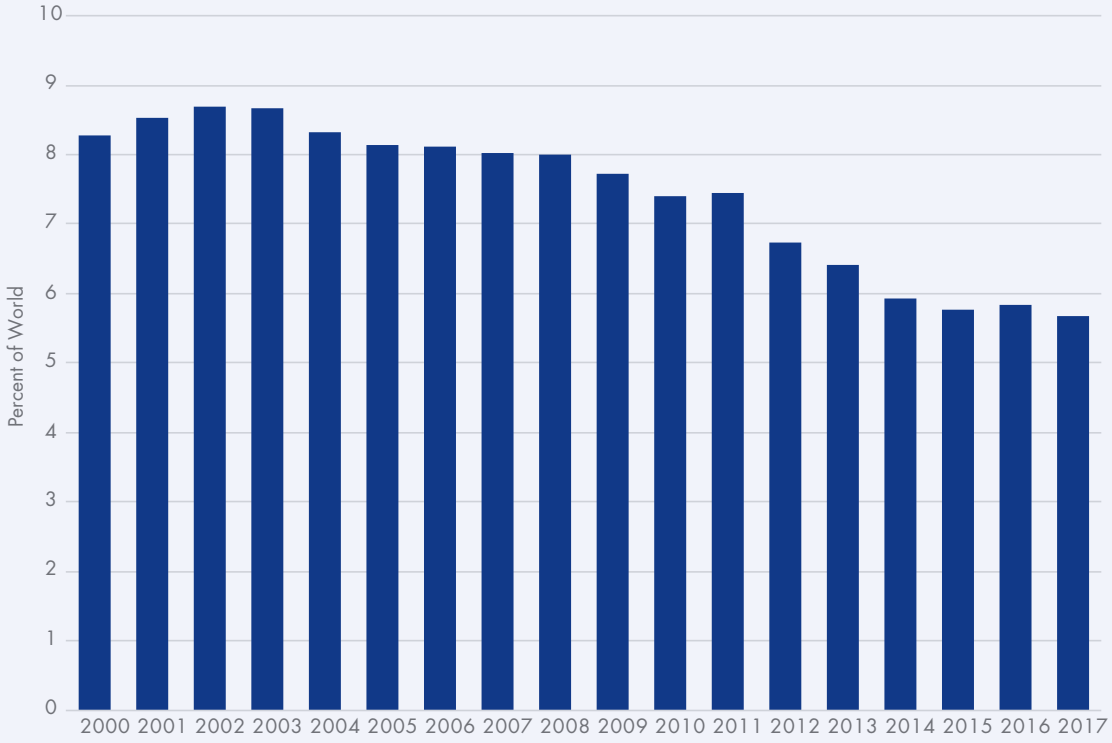
FIGURE 12A: SELECTED INDICATORS OF CARIBBEAN MARITIME SHIPPING[68] (% OF WORLD) – CONTAINER THROUGHPUT



*Data unavailable for 2017 container throughput

Source: UNCTAD

FIGURE 12B: SELECTED INDICATORS OF CARIBBEAN MARITIME SHIPPING[68] (% OF WORLD) – TOTAL FLEET



Source: UNCTAD

TABLE 6: GATEWAY CONTAINER DEMAND FORECAST

	2010	2015	2016	2017	2018	2019	2020	2025	CAGR
ANT	14.9	15.0	15.5	15.9	16.5	17.1	17.7	20.7	3.24%
BAH		136.8	144.4	151.2	155.4	159.7	163.7	198.4	3.79%
BAR	74.6	60.9	64.2	65.4	66.6	68.1	70.2	81.1	2.91%
BZE	31.9	45.4	47.9	50.4	52.6	54.8	56.9	67.7	4.09%
DOM	12.2	13.4	13.7	14.0	14.4	14.8	15.2	17.2	2.51%
GRE	15.0	16.5	16.7	17.0	17.3	17.6	18.0	19.6	1.74%
GUY	59.9	68.8	74.1	78.7	83.5	87.4	91.5	112.4	5.04%
SKN	7.2	9.8	10.0	10.2	10.5	10.8	11.0	12.5	2.44%
SLU	30.6	64.0	32.4	33.0	33.7	34.6	35.4	40.4	2.33%
SVG	17.0	17.6	18.1	18.6	19.1	19.7	20.3	23.5	2.94%
SUR	91.6	104.9	105.7	115.3	124.1	131.4	137.1	179.8	5.54%
TT	172.3	167.7	171.4	175.3	179.5	184.0	188.8	212.8	2.41%

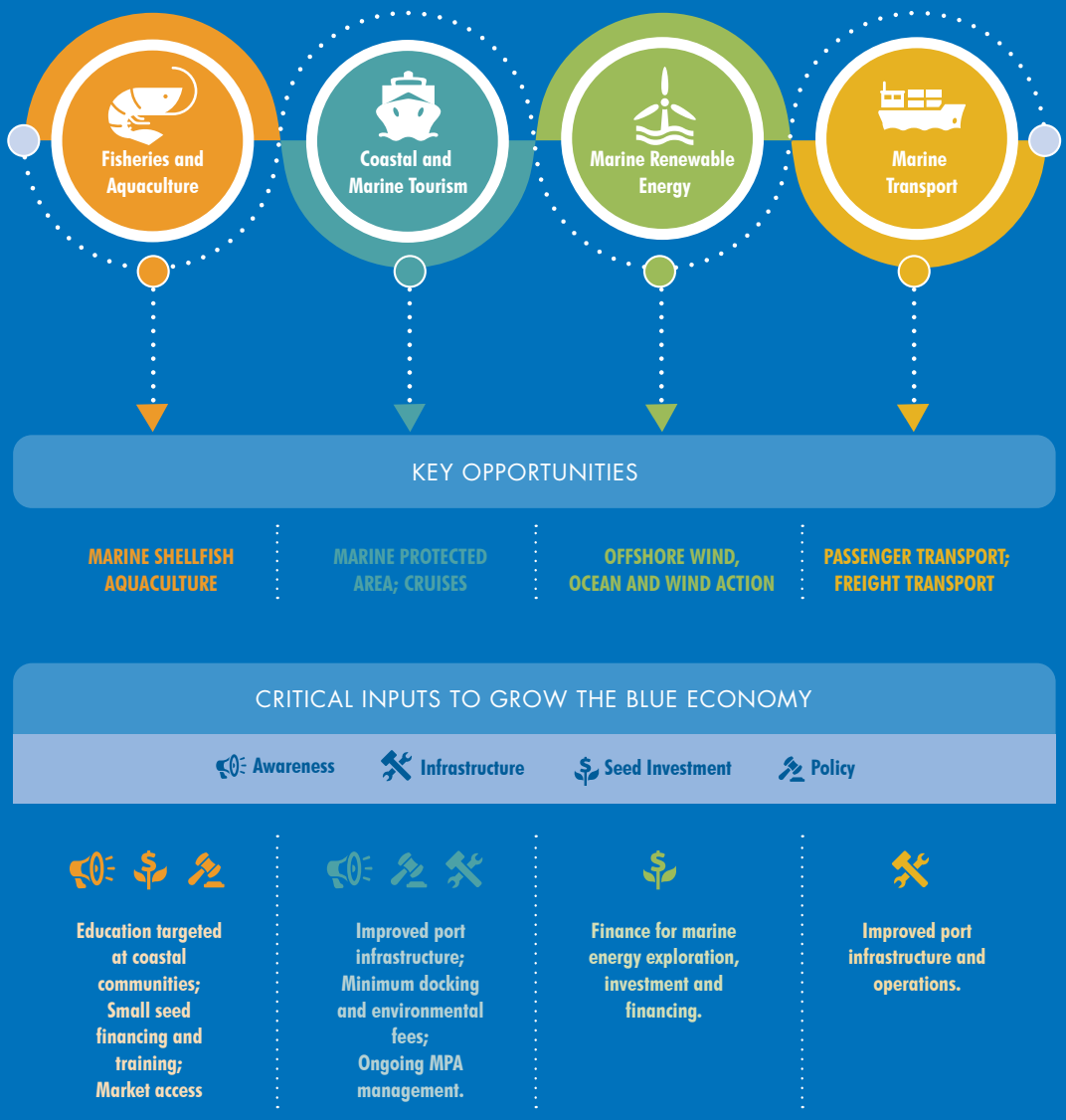
Source: CDB 2016

2.6 CONCLUSION

The Caribbean economy is complex with some similarities but substantive differences in relation to the rest of the world. A blue economy strategy therefore, cannot be applied uniformly across industries and countries. This paper lays the ground work to test the potential of specific industries to individual countries. This is an opportunity to collaborate with regional peers to achieve greater efficiency and output. While some industries may not be beneficial to one country, the value-chain approach suggests that reallocation of resources to areas where there is a comparative advantage may lead to greater benefits.

Blue economy opportunities need funding, awareness and technical capacity building, and a more supportive policy environment (Figure 13). These are compounded by issues surrounding the ease of labour mobility—between industries and among countries, technological impairment and budget constraints. Where traditional industries may be negatively impacted, the appropriate assessments must be conducted to either ease the informal and formal players into new industries, or afford them the opportunity to move to countries where their specific skill sets would add value.

FIGURE 13: KEY TAKEAWAYS OF CHAPTER 2



CHAPTER 3

FINANCING THE BLUE ECONOMY

Domestic resources and traditional sources of funds, such as Official Development Assistance (ODA) are likely to be insufficient to fund investments in the blue economy within the Region. High fiscal deficits in many Caribbean countries coupled with considerable debt overhang and declining ODA constrain the ability of Governments and policy makers to invest in new economic sectors.

This chapter analyses the challenges facing many BMCs, which inhibit their ability to invest in new economic models. The potential of leveraging alternative sources of finance such as international climate and environment funds as well as new and innovative finance models, including blended finance, impact investment and blue bonds are examined. Private sources of finance in support of blue economy investments are also proposed within the context of the Region. This chapter uses a case study approach by drawing on existing examples from around the world to demonstrate that financing the blue economy is feasible with research, innovation, technology and collaboration.

3.1 CURRENT CHALLENGES TO FINANCING THE CARIBBEAN BLUE ECONOMY

Blue economy investments are constrained by a number of challenges, particularly related to financial resources within the Region. These include limited scope for debt finance and restricted fiscal space, and declining aid flows.

3.1.1 Limited scope for debt finance and restricted fiscal space

Increasing debt levels have placed a drag on economic growth and development in the Caribbean, while constraining the allocation of resources for productive and new investments. Public debt within the Region has been on an upward trajectory over the past two decades, in excess of USD57 bn at the end of 2017 for the BMCs. The increase in debt within most CARICOM states can be attributed to infrastructure reconstruction costs after natural disasters; reduction in aid; little or no access to concessional financing; dependence on commercial finance; erosion of European Union trade preferences since the early 1990s; and the impact on tourism of the global economic crisis, which began in 2008 (IMF, 2016; IMF, 2018).

The median total public sector debt as a percentage of GDP was approximately 64.6% at the end of December 2017 for CDB BMCs compared to an average of 48.3% of GDP for emerging and developing countries as a whole. The majority of countries have debt-to-GDP ratios in excess of the generally accepted prudential benchmark for fiscal sustainability of 60%. These high debt levels are led by Barbados and Jamaica, with reported debt-to-GDP ratios of 157.1% and 111.9% respectively in 2017 (Figure 14). Although some Caribbean governments have been able to restructure national debt, these restructuring operations typically entail heavy social and economic costs.

FIGURE 14: DEBT-TO-GDP RATIOS (%) IN CDB BMCs

	2016	2017
BAR	161.5	157.1
JAM	119.4	111.9
BZE	92.3	93.9
ANT	81.9	78.3
SVG	82.1	77.2
DOM	72.7	69.4
BAH	68.0	72.7
SLU	69.5	68.5
GRE	76.3	66.3
SKN	64.8	64.6

	2016	2017
SUR	68.8	63.2
TT	58.8	60.1
ANG	60.6	56.8
GUY	45.7	45.2
HAI	33.7	32.6
BVI	18.8	18.7
CAY	16.3	14.7
TCI	7.6	7.4
MON	5.1	6.1

Source 2: Regional Central Banks, CDB

The costs associated with increasing incidences of natural disasters have contributed to further deterioration of the fiscal situation in many Caribbean small states. On average, the annual cost of disasters for small states is estimated to be nearly 2% of GDP (Acevedo Mejía 2016). Further, it is estimated that 9% of disasters in small states record damage and losses of more than 30% of GDP (Acevedo Mejía 2016). This is evident in the most recent disasters in the Region during 2017.

In 2017, Hurricanes Irma and Maria caused severe damage to several Caribbean states, including Antigua and Barbuda (15% of GDP); the British Virgin Islands (350% of GDP); Dominica (224% of GDP); and the Turks and Caicos Islands (51% of GDP). For small island states, disasters such as these are not localised events but impact the entire nation. In addition to the loss of lives, homes and livelihoods, there are also implications for key industries such as tourism and fisheries. Major disasters may also prompt large population movements, including outward migration.

For Caribbean small states, damage and losses are expected to further exacerbate with increasing climate change impacts. For example, a one-metre sea-level rise by 2080 is projected to result in losses and damage of about 8% of projected GDP (Simpson, Scott and Harrison 2010). A sea-level rise of one metre will also have a profound impact on the coastal tourism industry, as resorts are at risk of losing their properties due to beach erosion. Using a geo-reference of 906 major coastal properties in 19 CARICOM countries, it was estimated that 29% of resorts and 26 of the Region's 73 airports would be partially or fully inundated, with five countries losing in excess of 50% of their coastal properties under this scenario (Scott, Simpson and Sim 2012).

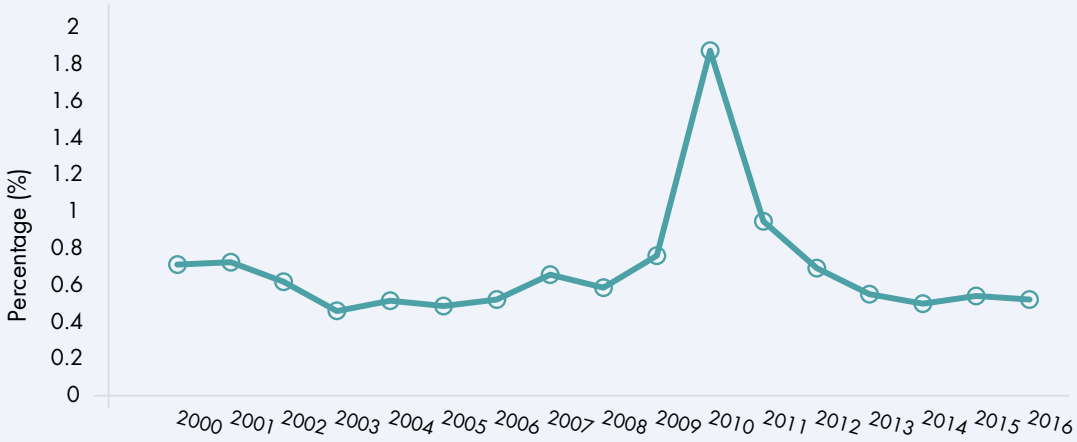
These trends suggest that Caribbean governments may have to allocate larger shares of domestic budgets to initiatives that aim to build resilience to environmental shocks in the future. At the same time, this must be balanced with a need to ensure that sufficient resources are set aside for relief and reconstruction, in the event of a disaster. Yet in a context in which fiscal resources are constrained and the private sector perceives a heightened risk due to natural disasters and climate change, there may be a considerable opportunity cost associated with building fiscal buffers.

3.1.2 Declining aid flows

Development finance, and specifically ODA to the Caribbean has been characterised by a declining trend over the last 20 years, falling from 0.72% of global ODA in 2000 to 0.52% in 2016 (Figure 15). ODA to the Region peaked in 2010 with a global share of 1.8%, primarily due to a number of extreme weather events and debt cancellations in Haiti. ODA provided to Haiti has been traditionally equal to, or has outweighed, the ODA provided to the other CDB BMCs due to the number of developmental challenges that the country faces. For instance, in 2010, ODA to Haiti equated to USD2.24 bn, more than 12 times that provided to the other CDB BMCs combined (USD176.02 mn) as a result of five natural disasters. The most destructive of these events was a 7.0 magnitude earthquake that resulted in the deaths of 222,570 persons, with estimated damage of USD8 bn.

In addition to the significant reduction in the amount of ODA allocated to the Region, the objectives have shifted over time; from an earlier focus on poverty reduction, health and education (as embodied in the Millennium Development Goals) towards targeted climate change adaptation and mitigation. While this shift may represent an opportunity to leverage more official concessional finance in support of blue economy interventions, in practice, Caribbean SIDS' ability to access new climate and environmental finance has been challenging (Box 1).

FIGURE 15: SHARE OF GLOBAL OFFICIAL DEVELOPMENT AID TO CDB BMCS 2000-2016



Source: OECD Statistics

The ability of the Region to access concessional development finance has been hindered by weak technical capacity for project identification, the development of high-quality proposals, and complex application processes, as well as chronic implementation deficits. Therefore, the Region will require technical and capacity-building support from the international community in order to fully develop and benefit from competitive blue economy industries. Some of these capacity building needs include, training in project pipeline preparation, developing high-quality project proposals, research and application of alternative financing models and an enhanced capacity to implement, monitor and evaluate projects which will be critical to delivering on blue economy objectives.

Developing a coherent and credible blue economy strategy may also potentially enable the Region to leverage more financing for blue economy development. Capacity building and collaboration in these areas may also enable enhanced targeting of traditional infrastructure investments, and climate funding to better integrate and support the blue economy.

BOX 1

Eligibility for ODA and concessional finance: A key challenge for small island states

A key challenge for some Caribbean SIDS relates to their eligibility for aid and concessional loans from some bilateral and multilateral development partners. Many development partners use income per capita as the principal determinant when deciding on eligibility and resource allocations. With many Caribbean countries at middle-income, upper-middle, and high income status (coupled with high rankings on the UN's Human Development Index (HDI), many countries are considered either ineligible for aid or low priority. For example, Barbados and Trinidad and Tobago are ineligible for ODA (UNDP 2015). More recently, St. Kitts and Nevis graduated from ODA eligibility. Antigua and Barbuda was also set to graduate at the end of 2017, until Barbuda was devastated by Hurricane Maria. Consequently, Caribbean SIDs receive on average between 0.13% and 5% of their Gross National Income in ODA.

With respect to multilateral development banks, a few Caribbean countries have access to the World Bank's concessional International Development Association (IDA) window under its 'small island exception', but this does not extend to all Caribbean countries. In the case of IDB, the OECS sub-Region is not eligible for any resources as they do not hold membership status. Only Guyana has access to concessional financing that is provided through blended finance, while Haiti benefits exclusively from grants.

For CDB, from a policy perspective, no BMC is ineligible for access to concessional resources as there are specific regional set-aside resources that target particular regional development challenges. However, countries in the high GDP per capita income bracket (Group 1) do not receive a specific country allocation and can only benefit from projects with regional scope, or in the case of emergency assistance. Haiti is the only country in Group 3 and is eligible for mainly grant resources, while Group 2 countries—Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, St. Vincent and the Grenadines and Suriname—are able to access both concessional and non-concessional resources.

Access to—and eligibility for—aid and concessional finance for middle and high-income small states has been recognised as an important issue by the international community. In the UN's Addis Ababa Action Agenda on Financing for Development (2015), countries pledged to explore alternatives to current approaches based on income per capita. UNDP and the World Bank in partnership with other international organisations, including the OECD are also undertaking analytical work in this area. Similarly, in response to the challenge, CDB has considered incorporating a vulnerability measure in its methodology for the allocation of its most concessional resource—the Special Development Fund.

3.2 FINANCIAL INNOVATION FOR THE BLUE ECONOMY

Advancing the blue economy will require investments in infrastructure, conservation, research and development, institutional and human capacity development, as well as information-sharing and knowledge-building.

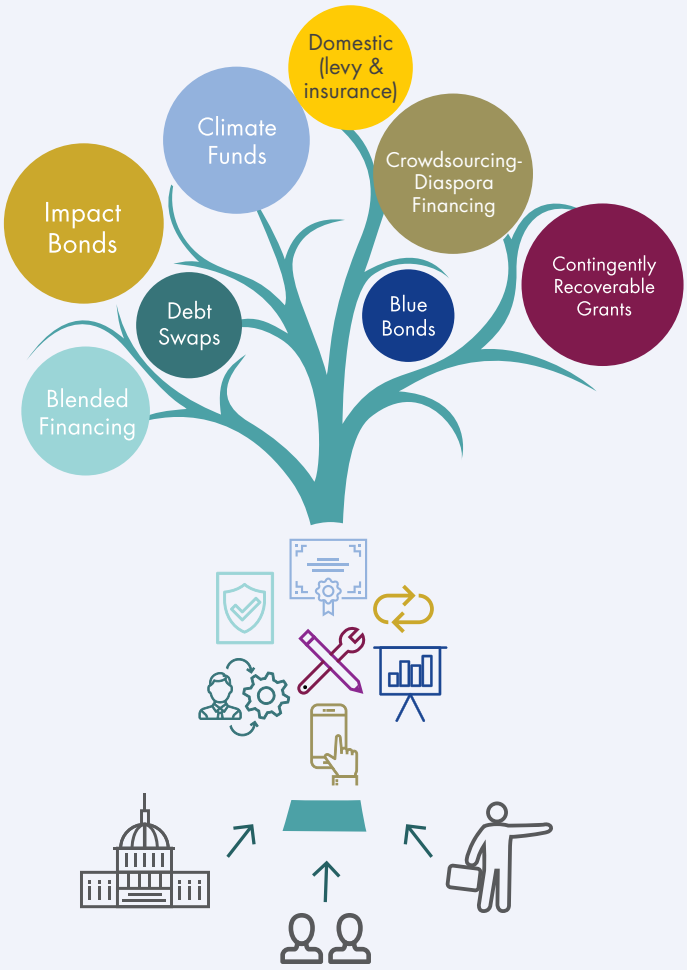
Considering the level of investment that will be needed to achieve these objectives, vis-à-vis current Caribbean fiscal constraints and debt dynamics, the Region must find new and innovative ways to finance investments in the blue economy. A paradigm shift is needed in the use of available financing as well as optimal use of available resources from all sources. The opportunities to leverage domestic resources by blending official concessional finance with other international resources for the blue economy, are promising. Opportunities also exist for increasing available public resources as well as private sector finance and investment for blue economy initiatives. Increasing the resource envelope to finance blue economy initiatives also requires new approaches to draw upon the existing pools of development finance. It may also require the development and piloting of new instruments.

The financing for development landscape has become more diversified, complex and sophisticated over the last 15 years. New sources of finance have emerged or become more important, such as South-South Cooperation, international climate funds and impact investors. In parallel, a much richer and more sophisticated range of financial instruments and tools is being deployed in support of development: from blended finance arrangements to green bonds, social and development impact bonds, debt-for-nature swaps, and state contingent debt instruments. Heightened awareness of social and environmental risks and exposure to possible reputational risks has encouraged many investors to value sound natural resource management, and implies an expanding pool of investors interested in activities where development is aligned with sustainability. A blue economy approach presents an opportunity to potentially leverage additional resources for investments in ocean and coastal health and ecosystems, and utilise a wide variety of new and innovative financing models, for which both the public and private sector can partner to pool finances and share skills, expertise and approaches.

There is limited awareness (on the part of both the investor and investee) as to the possibilities of a blue economy approach. The 'pipeline' of investment-ready activities remains limited. Commercial investors remain cautious, in part due to information asymmetries and risk perception, and the majority of investments targeted at ocean health to date, have relied heavily on bilateral and multilateral development banks to assume the associated upfront risk. Many blue economy interventions will also carry higher upfront costs and returns that will not immediately accrue to investors. This underscores the need to ensure that the Region retains access to concessional public finance from the international community and multilateral development banks.

This section explores several innovative finance models, and examines their applicability to the blue economy (Figure 16). This section also showcases the applicability of some of these financing models using examples and case studies.

FIGURE 16: MOBILISING RESOURCES TO DEVELOP THE BLUE ECONOMY



3.2.1 Blended finance and the blue economy

Blended finance is broadly understood as the strategic combination of public and/or private development finance flows (e.g. concessional finance and philanthropic resources) with other public or private capital to enhance resources for investment in key areas such as infrastructure (Box 2). Blended finance can therefore involve public-public financial partnerships as well as public-private partnerships. The rationale behind blended finance is broadly threefold:

(i) to increase capital leverage (aid and philanthropic funds are used to attract/mobilise additional public or private capital);
(ii) to enhance impact (the skillset, knowledge and resources of public and private investors combined can increase the scope, range, and effectiveness of the project); and
(iii) to deliver risk-adjusted returns (manage risks so that returns are in line with market expectations) (World Economic Forum, 2015).

Interest in blended finance has mushroomed in recent years, and it is one of the most dynamic fields in the financing for development arena. A host of actors are involved in blended finance--from bilateral development agencies to multilateral development finance institutions and philanthropic foundations (Appendix 3). Many are also keen to expand their activities in this arena as blended finance presents an opportunity to scale up both public and private financing for development in an overall context, where public aid resources for development are constrained (UNDP and Agence Française de Développement (AFD) 2016). Against this backdrop, there may be opportunities to explore how blended finance arrangements can support blue economy interventions.

Much blended finance has been used to support investments in infrastructure development and other interventions where there is an expected economic return. Green investments supported with blended finance include: renewable energy; environmentally friendly transportation; and energy efficient (or eco-friendly) buildings. In a blue economy context, areas for exploration include: sustainable fisheries management and fish processing; sustainable marine aquaculture; ocean renewable energy; and responsible marine and seabed mining, amongst others.

The concessional finance element in blended finance packages can be used in a variety of ways. This includes: technical assistance (for project preparation services, and to provide advice/training to public or private investees to lower transaction costs); underwriting risk (to fully or partially protect the investor against various forms of risk); market incentives (to provide guaranteed future payments to investors in exchange for upfront investment in new markets, or to stimulate innovation around new products or services); top-up returns; insurance against catastrophic events; and provision of incentives for successful performance (UNDP and AFD 2016). This helps to reduce financing costs and make investments viable and/or profitable for the private sector.

Despite the potential of blended finance to significantly scale up resources for sustainable development, there are challenges and constraints. Finalising a blended finance package can be time consuming as there are typically multiple financing instruments and institutions or entities involved. Other constraints include limited knowledge and awareness of such instruments and limited technical capacities to structure, manage and execute these types of arrangements in ways that serve the public interest and take into consideration the social and environmental impacts of projects (UNDP and AFD 2016). These are present both on the supplier side (i.e. within development finance institutions) as well as on the recipient side (i.e. within developing countries). Caution must be exercised in recommending non-concessional finance for some countries in the Region where debt sustainability may already be a major concern.

Looking ahead, it is recommended that Caribbean countries pool talent and expertise to create a technical team specifically dedicated to supporting project development and implementation utilising blended finance structures. This team would build blended finance capacities, develop a project pipeline and coordinate execution capacity.

BOX 2

Blended finance in the Caribbean: The Sustainable Energy for the Eastern Caribbean Programme

The Sustainable Energy for the Eastern Caribbean (SEEC) Programme is a multi-partner trust facility that provides assistance to the public sector for investments in renewable energy and energy efficiency, as well as technical assistance for institutional strengthening, capacity building and project support. The SEEC is co-financed by CDB, the European Union-Caribbean Investment Facility (EU-CIF) and the United Kingdom Department for International Development (DFID). It provides innovative financing that is designed to advance sustainable energy solutions in the Eastern Caribbean with an objective of reducing dependency on imported fossil fuels. As such, all projects that are implemented under the Programme aim to displace fossil fuels in electricity generation, and support economically viable investments in renewable energy and energy efficiency.

SEEC comprises a blend of CDB loans of USD12 mn, donor contributions of approximately USD8.5 mn (investment grants by allocation to be blended with CDB loans and technical assistance grants), pilot lines of credit of USD500,000 to selected intermediaries to support micro, small and medium enterprises, as well as a pilot guarantee facility of USD2 mn. As at September 2017, these resources had yielded the construction of a 400kW of solar PV plant, the retrofitting of 20 government buildings toward energy efficiency, the replacement of 21,585 inefficient street lamps with efficient light-emitting diode (LED) systems, and the initiation of over 50 energy audits.

The six beneficiary countries of the Eastern Caribbean are Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines.

3.2.2 Blue bonds

Blue bonds are modelled on successful green bonds, which have been issued by multilateral financial institutions, sovereign states and municipalities to fund investments in sustainable energy, clean transportation, and other areas. Blue bonds, however, are applied to ocean-based activities. They offer private investors an opportunity to diversify their investment portfolios into products that generate a financial return as well as deliver environmental benefits. In this context, sometimes a small interest discount can be obtained where there is a commitment to use the proceeds for specific socially or environmentally responsible investments, though usually these bonds are issued at market rates. The first blue bond was issued by the Seychelles, where the blue economy concept was used to leverage finance from the international capital market at a discount (Box 3).

Blue bonds have the potential to raise large amounts of capital, which can assist Caribbean governments in financing initiatives such as marine conservation and sustainable fisheries. Similar initiatives to that of the Seychelles are under active consideration in the Caribbean. Nevertheless, there are a number of key issues for deliberation:

(i) the importance of technical assistance (and in the case of the Seychelles a partial credit guarantee) provided by multilateral financial institutions to enable the bond issuance at an affordable rate;
(ii) the need to ensure that the bond complies with industry good practice principles, such as transparency in the projects/interventions to be financed with bond proceeds;
(iii) careful consideration of some countries' already very large debt overhang and how this financing modality is aligned with the countries' debt sustainability and debt management strategies; and
(iv) development of a concrete project pipeline suitable for effective deployment of the resources raised via a blue bond issuance.

Caribbean Development Bank

BOX 3

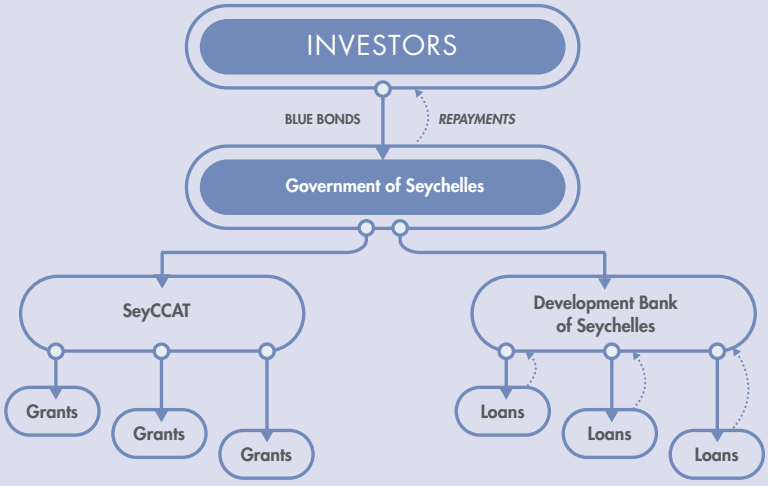
Blue bonds: A potential source of finance for the blue economy in the Caribbean

Seychelles issued the world's first sovereign blue bond as a means to attract private capital firms to invest in sustainable fisheries management. The bond emanates from a debt buy-back (see debt-for-nature swaps below) of USD22 mn with Paris Club creditors in February 2016.

The bond was issued at a nominal amount of USD15 mn with a 10-year maturity period, and supported by a USD20 mn finance package from the World Bank and the Global Environment Facility (GEF), which consists of a USD5 mn loan from the International Bank for Reconstruction and Development (IBRD) and a USD5 mn grant from the GEF to improve the conservation of its marine resources and expand seafood value chains. In addition, a guarantee of EUR5 mn from the IBRD has been provided and a credit of USD5 mn from the GEF's Non-Grant Instrument Pilot. This will help reduce risk to investors and subsequently lower the interest rate to between 2% and 3%.

Proceeds of the blue bond will be used as grants for fisheries management planning activities and as loans to encourage local public and private investment in activities consistent with sustainable fishing, such as post-harvest value-adding opportunities, jobs and the protection of ocean resources. The blue bond proceeds will be disbursed on a competitive basis through the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) and the Development Bank of Seychelles (Figure 17).

FIGURE 17: FLOW OF FUNDS OF THE BLUE BOND



Source: The Nature Conservancy 2018

3.2.3 Debt swaps

Debt-for-nature swaps leverage funds for use in local conservation efforts and are based on the model of debt-for-equity swaps (in which discounted debt is exchanged for investments in the assets of an indebted country). In the case of debt-for-nature swaps, the proceeds of the swap are invested in conservation activities in the indebted country. Under a typical debt-for-nature swap, a conservation organisation buys part of a country's debt from an official or commercial lender on the secondary market at a sizable discount. The non-governmental organisation then swaps all or part of the face value of the debt with the debtor country for 'conservation payments-in-kind'.

Debt–for-nature swaps present a potential avenue through which debt can be reduced and complementary funds raised for important conservation activities–however, some of the drawbacks have been identified as the relatively small amounts of actual debt relief; and potential high transaction costs, particularly financial and legal fees, where there may be a need to issue new instruments to re-finance the loan (buy-back). Typically, this instrument has been used following a debt-restructuring process. The combination of public and private funds also creates a new model for co-investment debt swaps in SIDs.

A debt-for-nature and resilience financing facility for small states was recently proposed by the World Bank. The facility proposes to retire high-cost commercial or bilateral debt, such that the savings from the debt reduction creates additional fiscal space, which can be used to finance current or capital expenditure. The qualifying criteria include:

(i) willingness to implement policy and institutional reforms for environmental management and climate resilience;
(ii) identification of debt that could be bought back, preferably at a discount and/or replaced by cheaper and longer-maturity debt; and
(iii) identification of a donor/or donors who can provide additional funds for the debt buyback operation (in exchange for policy reforms).

Similarly, the Commonwealth Secretariat developed a proposal for a debt-for-climate swap facility for small vulnerable economies (many of which are SIDS). This facility could potentially mobilise up to USD4.5 bn in additional financing for climate change adaptation across all small island states. In addition, UNDP proposed "multi-creditor" debt swaps as a tool to reduce heavy transaction costs and maximise development impact. Additionally, the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) is exploring the potential for climate finance pledges to be used to write down the high debt of Caribbean countries in exchange for investments in climate adaptation and mitigation by those countries.

BOX 4

The potential for debt-for-nature and resilience swaps in the Caribbean

The Government of Seychelles, with the support of The Nature Conservancy (TNC) was able to redirect a portion of its current debt payments to fund nature-based solutions to climate change and marine conservation, using a debt-for-nature instrument (Box 3). In so doing, this debt conversion instrument has proven to be a potential high-impact model for SIDS that face high levels of sovereign debt and limited fiscal space to address developmental challenges. The instrument could also be of interest to countries that are facing foreign currency constraints, since a portion of the existing international debt is effectively converted to local currency. The structure and flexibility of the model also assists with the institutionalisation of a purpose-driven institution that provides a permanent funding stream for interventions long after the initial deal has closed.

Convergence (2017) in its highlight of the Seychelles case study emphasised four high-level steps to structure such deals. These are:

1. Identify and work with the debtor country to purchase sovereign debt; secure commitments from debtor to improve policy and increase investment in the specific developmental area;
2. Identify and reach agreement with creditors willing to sell debt owed by the debtor country at a discount;
3. Fundraise for repayable loan and non-repayable grant capital for debt buyback;
4. Establish a local trust fund or non-profit entity to lend the debtor country funds to purchase sovereign debt (discounted), receive debt payments and fund programming of interventions for the specific developmental challenge in the future.

Building on the successes of the Seychelles, TNC has set out on a mission to finance USD1 bn of new debt conversions, or blue bonds, around the world. Given their high debt burdens, lack of fiscal space and relatively large EEZs, a few Caribbean nations have expressed an interest in exploring such an instrument to assist in paving the way to finance the attainment of some developmental goals. Early movers included The Bahamas, Grenada and Saint Lucia followed by Jamaica and Dominica.

To date, Grenada has advanced the most in its pursuit of using this instrument to restructure some of its sovereign debt in exchange for debt that will have a longer tenor and a more favourable interest rate. The new debt will be subject to conservation covenants and the cash flows from the restructured debt will be used to finance conservation commitments and to capitalise endowments that will serve as a long-term funding source for continued conservation work.

Grenada, with the support of TNC, has already begun to identify and work with some of its creditors to negotiate and secure better terms for the retirement of some of its sovereign debt. It has also begun to fundraise for both repayable and non-repayable capital resources, and in the process has found allies in the NatureVest and the German Development Bank. The Government has also established a local trust fund/non-profit entity – The Grenada Sustainable Development Trust Fund (GSDTF) that will be the conduit for the deal and will fund the programming of conservation efforts in keeping with the terms of the agreements.

At present, much of Grenada's EEZ is not under active management. Assuming 30% of the EEZ is committed, as was done in the case of the Seychelles, Grenada could potentially set aside about 7,847 square kilometers of its EEZ for conservation with approximately half of this becoming no-take zones. Additionally, as a part of the process, Grenada will also complete a comprehensive disaster risk reduction strategy for the marine coastal system and a full marine spatial plan. The final nominal value of the instrument is yet to be determined, however it will depend heavily on the negotiations between Grenada and its creditors, as well as the amount of capital that can be raised to repurchase the debt. Combined with its recent strong economic performances, the success of such an instrument would assist in achieving a debt-to-GDP target of 55% by 2030, as laid out in Grenada's fiscal responsibility legislation.

3.2.4 Development impact bonds

Social Impact Bonds (SIBS) and Development Impact Bonds (DIBs) are forms of payment-for-results schemes based on a public-private partnership arrangement between governments (or donors in the case of DIBs), and the private and non-profit sectors to deliver projects with a particular social or environmental objective. They are not bonds in the traditional sense (which offer a fixed rate of return and repayment of principal on maturity); instead, impact bonds are redeemed by the investor only if specified social or environmental outcomes are achieved.

Impact bonds typically involve three key actors:

(i) investors who provide up-front capital for the project;
(ii) service providers who implement the project; and
(ii) outcome funders (also known as payors) who return the capital to the original investor(s) plus a small return in the event of success (outcome funders can be donors, philanthropists or national authorities).

SIBs and DIBs have been used to fund interventions such as tackling youth unemployment; tackling recidivism; and increasing biodiversity. These instruments are typically better suited to smaller well-targeted and bespoke interventions, and can have high transaction costs relative to their small size.

This financing tool is still relatively new to most developing economies, including the Caribbean. With respect to the blue economy, this financing model may have several applications, which warrant further exploration. These include ocean and coastal biodiversity conservation or restoration (e.g. coral or mangrove restoration), and youth unemployment programmes with a focus on blue economy jobs and training.

Significant lead time is required to prepare clearly defined and quantifiable performance metrics (that are used to trigger payments to the initial funder); lead time is also required to put in place the mix of partners needed (i.e. private sector provider of the upfront capital; project implementation partner(s); independent performance evaluator; outcome funder(s)—which could be an official donor or the national government, or both). Notably, many investors use intermediaries to structure and oversee the contracts on their behalf given their complexity. Nevertheless, this financing model may offer opportunities to fund smaller niche interventions which could otherwise be left unfunded.

3.2.5 Crowdsourcing – diaspora financing

The Caribbean has a sizeable diaspora, and remittances are an important source of household income and foreign exchange. The diaspora is also a potential source of complementary investment in sustainable development, and by extension, in the blue economy. A number of countries, especially in sub-Saharan Africa, have benefited from initiatives that aim to connect the diaspora to equity and bond deals for development projects in their countries of origin through, for example, crowdfunding investment platforms. Projects supported by the diaspora range from housing, infrastructure, agribusiness, manufacturing, technology and healthcare.

To incentivise the diaspora to invest, private intermediaries often provide quality assurance services (vetted investment projects) and investment guarantees, which are in turn made possible through partnerships with official donors, such as bilateral development agencies or multilateral development banks.

IDB has explored the extent to which diaspora bonds are indeed a viable financing source for the Caribbean. Using a set of favourability factors, the potential of diaspora bonds for different countries within the Caribbean was analysed. The favourability factors included:

(i) the size of the stock of emigrants;
(i) whether migrants have above average median incomes;
(iii) sovereign credit ratings above the speculative grade;
(iv) lower perceptions of public corruption; and
(v) above-average ratings in global competitiveness and government effectiveness.

Based on these criteria, it was concluded that The Bahamas and Trinidad and Tobago had the highest potential to make use of this financing modality; while Barbados, Jamaica and Suriname had a fair chance. For other Caribbean countries, it was concluded that it would be more difficult.

The recent devastation wreaked by Hurricanes Irma and Maria presents an opportunity to connect with the diaspora in the spirit of solidarity. Public sector donor agencies may also be interested in partnering in initiatives that aim to catalyse new investment. Governments in the Caribbean could explore connecting the diaspora with blue economy investment opportunities, through crowdfunding investment platforms. Such an initiative could leverage improved information and transparency, legal and regulatory frameworks and tax incentives to support specific projects. Governments may also explore match-financing for specific projects while development partners could work with private intermediaries to provide independent project vetting and investment guarantees to reduce investor risk. Some areas that hold potential for this modality of financing include ocean renewable energy and sustainable aquaculture. While the diaspora may be able to make important financial contributions to projects, in many cases governments and/or donors would also need to provide additional project financing specifically in research, project identification and design and monitoring and evaluation.

3.2.6 Contingently recoverable grants

Contingently recoverable grant resources reduce the risks and upfront costs associated with the exploratory phase of capital intensive projects particularly commercial extractive-type resources. The resources are usually provided to special purpose vehicle (SPV) entities to fund, for example, resource exploration and pre-drilling phases. If the resources are proven, the contingently recoverable grant converts to loan resources and can be complemented with the issuer of the initial grant resources exercising an option to undertake future debt financing, if the project is to advance beyond successful exploration. This instrument has been used to incentivise geothermal projects in the OECS and offers some useful concepts to other emerging sectors, including the blue economy. This instrument provides a vehicle to reduce the risks and costs associated with the exploration of unproven resources and a means to bring private sector players to the table.

BOX 5

Utilising contingently recoverable grants to incentivise geothermal exploration in the OECS

The Sustainable Energy Facility (SEF) for the Eastern Caribbean was launched in October 2015 as a USD42 mn package, made up of a loan, grant and contingently recoverable grant resources, from IDB provided to CDB as execution agency. CDB also committed USD30 mn of its resources to support the Facility, which is mostly directed towards geothermal energy development in the OECS.

SEF was designed to contribute to the diversification of the energy matrix in the Eastern Caribbean in an effort to reduce the cost of power generation and electricity tariffs by promoting the implementation of energy efficiency and renewable energy technologies to reduce the Region's dependency on liquid fossil fuels. As such, SEF has the potential to move the Eastern Caribbean countries closer to energy security, a more diversified energy matrix, and increased competitiveness.

Components 1 and 2 of SEF provide resources to governments for energy efficiency and adjustments in the regulatory framework. These activities include, but are not limited to, the retrofit of government buildings and increasing the efficiency of power generation and distribution as well as strengthening institutional capacity to implement the programme. Component 3 of the SEF provides concessional resources to governments and SPVs established under public/private partnerships (PPPs) for baseload RE, such as geothermal energy (GE) as well as for intermittent RE, such as wind and hydro.

CDB through its GeoSMART initiative provides resources to finance:

a. pre-investment activities, for which grants are best suited to unlock investments, including surface studies (geology, geophysics and geochemistry), environmental and social impact assessments; and drilling of early exploration wells (slim holes);
b. exploration activities, for which risk mitigation instruments are suited, such as contingently recovery grants, concessional loans and/or guarantees; and
c. field and power plant development activities.

In 2016, IDB also secured an additional USD80 mn for the programme from the Green Climate Fund (GCF) which is intermediated via CDB. These resources augment those under the CDB GeoSMART initiative, and also include a contingent recoverable grant that assists in reducing the risks associated with investments in the geothermal sector in the Caribbean and aims to leverage private sector capital and expertise to complete such projects.

3.3 MOBILISING DOMESTIC RESOURCES

Opportunities for domestic resource mobilisation (DRM) are critical to supporting investments in the blue economy. Notwithstanding, DRM is expected to be largely insufficient for the level and scale of investment needed in the blue economy. The key to effectively utilising DRM and international sources of finance, including development assistance, is through innovative and strategic interventions.

3.3.1 Scope for a blue levy

In the Caribbean, potential exists to scale up DRM for blue financing, particularly for marine conservation, which remains widely untapped. Belize, for example, imposes a tourism entry fee, which is used to fund conservation projects. In most other Caribbean states, an Environmental Protection Levy and/or Tourist Enhancement Tax/Levy is imposed on visitors to the destination. In addition to land-based, green conservation projects, these resources may be utilised for blue economy initiatives related to the ecosystem such as wastewater management and coral reef preservation. Other potential sources include grants, donations and revenues from the fishing industry, energy, mining and biodiversity, (Spergel and Moye 2004). Similarly, a blue economy levy can be explored as a mandatory or voluntary charge on specific industries and activities related to ocean activity. This, however, would require preparation of a well-researched and credible blue economy strategy, backed by policies and procedures for transparent use of the funds mobilised.

Caribbean SIDS presently allocate less than 4% of fiscal expenditures to capital investment, which is below trend and at variance with expanded investment requirements for economic transformation, climate change adaptation and mitigation, and expansion of economic and social infrastructure, among others (UNDP 2015). DRM could potentially contribute to increasing investments related partly to blue economy initiatives.

BOX 6

Palau's environmental impact (or green) fee (EIF)

Palau joined the Micronesia Challenge (MC) in 2006. The MC was a deliberate effort of the Marshall Islands, Palau, Guam and the Commonwealth of the Northern Marianas Islands to promote and support conservation effort across Micronesia. Through the Micronesia Challenge initiative, Palau established a Micronesia Challenge Endowment Fund to provide additional financial support for Palau's conservation sites.

Palau levies an environmental impact fee or green fee on visitor arrivals and donations (private and public). The green fee was part of the USD35 departure tax for non-Palauan passport holders to pay when leaving the territory. Of this amount, USD15 was the green fee that was paid into a national account managed by the Protected Area Network Fund (PANF). Palau created an independent non-profit organisation to serve as a financial trustee of the monies obtained to support the Protected Areas Network (PAN) to manage the funds from donations and arrival fees. This non-profit organisation is called the PAN Fund. The PAN Fund contributes to the Endowment Fund through an annual allocation of monies raised by the green fee. These resources are managed by the Fund, and used to finance conservation projects in both terrestrial and marine environments in Palau.

More recently, the Environmental Impact Fee was repealed in 2017, and replaced by a Palau visitor fee, called the Palau Pristine Paradise Environmental Fee (PPEF), which took effect in 2018. The PPEF of USD100 is included in the price of every international airline ticket into the Republic of Palau. From the USD100 collected, USD12.50 shall be allocated to the Fisheries Protection Fund, and USD30 earmarked as the green fee for the same purpose previously identified under the Green Fee.

3.3.2 Incentivising insurance for the blue economy

The insurance sector plays an important role in economic and financial development. By design, the sector pools and/or transfers risks in an effort to reduce the impact of losses and adverse events. For the Caribbean, many of the blue economy interventions that may be contemplated are relatively new and untested and may be deemed to carry heightened investor risk. A means to transfer some of the risks associated with developing new and innovative economic activities would be to consider the use of insurance. Insurance instruments may be of interest for the Region, given the greater frequency and intensity of natural hazards and the impacts of climate change.

The availability of an insurance tool to cover risk in the blue economy would directly reduce the perceived risks of new activities, and act as a conduit to facilitate new investment and finance. Insurance could also contribute to improved efficiency of other industries by enhancing the value of collateral by reducing losses. Other potential benefits include encouraging innovation and longer-term planning horizons as risk-adverse investors may be more willing to pursue an unproven activity when not subject to major exogenous insurable risks.

Marine insurance is one of the most common types of indemnity insurances which has been well developed in the Region. Marine insurance usually seeks to cover losses and damage to offshore assets such as ships, cargo and in some cases onshore assets such as terminals. There are also other types of insurance instruments that may prove useful to the development of the blue economy. In particular, the development of parametric insurance instruments may be one of many insurance tools that could augment the attractiveness of investing in the blue economy. While this offers an option similar to the Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC), it would require research and design for which donor agencies and partners could provide technical assistance. Similar to the capitalisation of CCRIF SPC, this form of instrument would also need to be supported by the international community for the development of a blue economy insurance product. The Caribbean Oceans and Aquaculture Sustainability Facility (COAST) is one such example that is currently being developed.

BOX 7

COAST: An innovative insurance tool for the blue economy

COAST is a parametric insurance instrument that is being designed jointly by CCRIF, the United States Department of State, the World Bank, TNC and the FAO to foster country-led climate-smart food security and to develop and implement disaster risk management plans.

COAST seeks to reduce the risk that climate change poses to food security and nutrition in the fisheries sector, and to mitigate climate change impacts on sustainable food production, where possible. The instrument is designed to incentivise the uptake of climate-smart food security best practices within the fisheries sector to simultaneously improve food security as well as coastal resilience in the face of a changing climate. COAST partners foresee a number of outcomes of developing this product in the Caribbean Region. These include:

- Increasing the insurance penetration and the number of fishers indirectly covered by climate-risk insurance;
- Providing incentives for countries to implement the Caribbean Community Common Fisheries Policy (CCCFP) through country-led, climate-smart food security strategies and independent third party verification;
- Encouraging countries to develop coordinated disaster management plans for the fisheries sector, inter alia marine capture fisheries, aquaculture, and bio-tourism and conservation to ensure that the benefits of parametric insurance coverage extend from the national level down to the level of small and medium enterprises, fisher folk collectives, and individual fishers; and
- Crowding-in finance for development to improve coastal resilience and support good governance and conservation for fisheries.

To date, there have been a number of key developments in the advancement of COAST. In January 2015, the United States Department of State committed USD5 mn to establish COAST. Additionally, CCRIF SPC has established a new segregated portfolio—COAST SP—and has undertaken three feasibility type studies in Jamaica and Saint Lucia. It is expected that the first policies will be undertaken during the policy year 2017/2018. This instrument presents an opportunity for the Caribbean to broaden the scale and where possible improve on the model contemplated. The key to further investments however, are centered on the ability to finance the research and development aspects as well as capitalisation. Hence the importance of collaboration between agencies and departments, particularly the international community.

3.4 ENGINEERING BLUE ECONOMY INTERVENTIONS TO LEVERAGE INTERNATIONAL CLIMATE FINANCE

Climate finance is based on the agreed responsibility of developed countries to assist low-emitting climate vulnerable countries to respond to climate change (CDB 2014). For SIDS, the blue economy has an important role to play in climate change adaptation and mitigation as approximately 70% of the Caribbean population lives on the coast (Meier 2013). Most of the Caribbean's main cities, with their millions of inhabitants and their essential infrastructure, are less than a mile from the coast (Meier 2013). As such, the shallow coastal areas such as mangroves, reefs and sea grass beds will continue to play an important role as natural protection against environmental hazards as these events become more frequent and more intense.

To facilitate this shift towards the blue and green economy objectives, the Region will need to fully tap into existing funds for climate mitigation and adaptation, while developing innovative financing mechanisms that leverage these pools of resources. Global investment to address climate change averaged approximately USD382 bn over the last five years, peaking at USD437 bn in 2015 (Climate Policy Initiative 2017). This peak was due primarily to increased investments from countries such as China, Japan and the United States of America, with about two-thirds of investment funds coming from the private sector and one-third being sourced from the public sector. Over the same period, globally, development finance institutions accounted for the majority of public flows (89%) for climate change adaptation and mitigation. In the Caribbean, development financial institutions may also contribute for a large percentage of the public flows toward climate change mitigation and adaption as well as the development of the blue economy.

Despite the absence of special international climate funds explicitly designed to support blue economy investments, there is scope to tailor climate change mitigation and adaptation projects in such a way that the same activities also support the development of the blue economy (Box 5). CDB manages eight funds[68] and is accredited for an additional two funds[69] which can be used to finance climate change mitigation and adaptation (Appendix 3). In some instances, once there is alignment, these funds could also be leveraged to support blue economy initiatives as their overarching objectives coincide with the development and implementation of certain blue economy projects and activities.

68 SEEC (Sustainable Energy for the Eastern Caribbean), Climate Action Line Of Credit (CALC), EIB Technical Assistance in Support of CALC, Canadian Support for the Energy Sector in the Caribbean Fund, GIZ (Renewable Energy and Energy Efficiency Technical Assistance), Agence Française de Développement (AFD), DFID: Caribbean Infrastructure Partnership Fund (UK CIF), and IDB: Sustainable Energy Facility (SEF) & GeoSMART Initiative.

69 The Green Climate Fund (GCF) and The Adaptation Fund (AF)

3.5 ACCELERATING BLUE GROWTH: THE ROLE OF THE PRIVATE SECTOR

Investment capital, both public and private, is essential to unravelling a sustainable approach to the development of the blue economy. It is recognised that, "Government can set the rules for the sustainable development of our ocean territory and ensure they are implemented, but development cannot take place without the strong participation of the private sector."[70] The private sector is known to be the driver of productivity and participation, which drives economic growth (The Australia Government 2014). Hence, leveraging private capital can widen and deepen the pool of funding for governments to address development needs, while driving economic growth and creating jobs.

For developing nations, the private sector has been credited with generating the majority of jobs (90%), funding the majority of investments (>60%), being the dominant producer of exports, contributing the largest share of government revenues (>80%), and providing a growing share of essential services, inventions and innovations (The Australia Government 2014). However, in the Caribbean context, governments tend to be the most active economic players, although in some countries the contribution of the private sector is quite meaningful to overall real growth. Given the current economic conditions in the Caribbean, the need and scope for increased private sector activity has been elevated, particularly in the development of new industries and sectors.

There are many benefits to engaging the private sector in efforts towards sustainable economic development. For example, actively engaging the private sector in the development and provision of key infrastructure to facilitate the blue economy could provide greater access to funding as well as assist with increasing the value-for-money proposition of a project through the provision of global best practices, experience, innovation and capital. This value-for-money benefit should be reflected in the quality of the infrastructure, leading to greater long-term efficiencies as the private sector would be incentivised to provide the highest quality standards given their direct stake in investments.

For the Caribbean, private sector partnerships and engagements in key productive projects also represent an opportunity for governments to create much needed fiscal space and to avoid further accumulation of debt. An efficient Caribbean private sector could mobilise the needed resources to accelerate the blue economy growth agenda particularly in key productive areas, given the potential economic profits and rents. Leveraging the private sector enables governments to focus on more strategic objectives, including the provision of social goods and a doing business policy environment that facilitates investment and growth.

70 Vincent Meriton - Vice-President, Government of the Seychelles. 'Financing Sustainable and Climate-Resilient Ocean Economies in Africa' conference held at Savoy Seychelles, Resort and Spa. Feb 22-23, 2018.

The private sector can contribute in a number of ways to the inclusive sustainable development of the blue economy by:

(i) advocating for a better business environment and lobbying for greater participation in the development process;
(ii) participating in well-structured, win-win public-private partnerships;
(iii) leveraging their networks and international institutions to provide syndicated loans;
(iv) supplying technical support to supplement in areas where governments may be deficient; and
(v) providing opportunities for the enhancement of the public sector through capacity building.

The efforts of the private sector can be offset by a poor doing business environment and policy that is not conducive to private sector investment and engagement. The main challenges to the Caribbean private sector are access to and the cost of finance as well as an inadequately skilled workforce (Dohnert et al. 2016). These, along with many other constraints, are directly linked to government policy decisions and actions, or the lack thereof. Government has a major role in supporting a dynamic ecosystem for the private sector, the absence of which will continue to limit prospects for private sector-led growth. To attract the quantum of capital that will be needed to develop and capitalise the existing and potential blue economy industries, Caribbean governments will be required to assist in the provision of an environment that is characterised by sufficiently accessible finance; stable and proactive policies; reliable and quality infrastructure; a healthy and relevantly educated workforce; adequate regulation; and appropriate taxation. Notably, these characteristics may prove to be necessary but might not be sufficient, as issues related to geographic and natural hazard vulnerability as well as market size still persist.

3.6 CONCLUSION

For the Region, opportunities to harness the blue economy for long-term sustainable development are evident. In addition to the economic benefits, the longer-term gains with respect to environmental sustainability, conservation and climate resilience are also related to, and dependent on, the use of the ocean. The challenge for the Region, however, lies in the ability to finance the blue economy and includes:

(a) the ability of the Region to leverage available resources more efficiently;
(b) aligning resources more strategically with blue economy priorities; and
(c) the capacity to access resources, develop and implement viable projects which complement the blue economy efficiently.

Investing in blue economy-related activities and sectors requires developing innovative and robust financing models. It may also require a reconsideration of the rules on concessional finance to make a more strategic link between climate change, environmental sustainability and green and blue economy innovations. Strategies that can assist the Caribbean Region in developing innovative finance instruments and accessing the global pool of finance on climate change include:

a. Building capacity in innovative financing for the blue economy as well as specific blue economy-related skills and human resources. A regional programme supported by international and regional development partners can contribute to the establishment of a regional blue economy knowledge hub for knowledge sharing, creativity and innovation.

b. Analysing and researching the challenges and opportunities associated with exploring the blue economy. This will contribute to evidence-based policy making by which institutional, regulatory and legislative changes could be guided. This type of research can be supported by a regional hub recommended in (a) above. The research output can be used for national and regional dialogues by which experiences and best practices could be shared. This will also support knowledge sharing and raising awareness.

c. Identifying and aligning national development priorities and blue economy activities that could be supported. Development of national blue economy strategies, aligned with medium- to long-term development plans will also contribute to more effective budgeting and implementation.

d. Exploring financial inclusion and inclusive growth to support the blue economy. Blue economy sectors, such as fishing, that are important for rural communities will not provide benefit unless issues related to access to credit, risk and insurance and financing through new financial instruments are sufficiently addressed.

e. Adopting a regional approach to the blue economy that will attract foreign direct investments. This may require the development of a blue economy pipeline.

FIGURE 18: KEY TAKEAWAYS OF CHAPTER 3

CHAPTER 4

THE PATH AHEAD: ENABLING THE BLUE ECONOMY

In addition to financing, advancing the blue economy requires an enabling environment, which can attract and facilitate investments. This chapter examines some of the key enablers needed to develop a growth strategy for the blue economy.

At the regional level, the Region can benefit from improved economies of scale and deeper collaboration in ocean governance and management, particularly in maritime-related industries. The OECS has taken the lead by embarking on a Caribbean Regional Oceanscape project (CROP)—a sub-regional initiative for developing a coherent and integrated blue economy strategy. A broader regional strategy for a harmonised maritime policy and the related blue economy sector can benefit from a collective and participatory approach for research, knowledge sharing, policy development, monitoring and evaluation and enforcement.

The enablers for an effective blue economy growth strategy are:

i. Regional policy for economic sharing;
ii. Regional agency for ocean governance and management;
iii. Efficient regulatory framework for doing business and supportive infrastructure;
iv. Advocacy and participatory development; and
v. Regional knowledge hub for efficient information sharing.

4.1 REGIONAL POLICY FOR ECONOMIC SHARING

An effective regional policy for economic sharing is a critical success factor for blue economy growth. While EEZs are helpful in demarking the geographical reach of each nation's exclusive access to and ownership of ocean resources, around the world they are used by some countries to destabilise the law of the sea[71] (e.g., through excessive maritime claims)[72]. Furthermore, within the Caribbean, competitive strategies between regional economies limits the potential benefits for the wider Caribbean as it reduces the rents accruing from the ocean's resources to each sovereign. In particular, the fishing and transportation sectors can share EEZs with little or no loss in revenues to each market participant. However, since this sharing of economic zones could lead to lower rents received by some countries, then the inevitable competition lowers the aggregate economic returns to the Region.

A regional economic policy—similar to that of the Pacific Islands Forum Fishing Agency—may facilitate negotiation with investors under identical terms and conditions with prices determined at the regional level and under conditions of near perfect competition (Appendix 4). Such a model requires two rounds of negotiations in a systematic manner, firstly between regional economies and then between investors and the Caribbean countries—represented by a regional agency. Under this arrangement, the Region benefits from harmonised ocean governance and revenue-sharing (Box 8). In this way, gains from ocean-related activities are shared among the countries using a pre-determined revenue sharing formula. Market entrants and participants such as cruise and shipping lines are therefore restricted in their ability to pitch countries against each other in a race to the bottom. This approach ensures that economic rents from ocean based activities are more predictable.

4.2 REGIONAL AGENCY FOR OCEAN GOVERNANCE AND MANAGEMENT

4.2.1 Ocean governance

Ocean governance refers to the mechanisms, laws, processes, and institutions through which the ocean and its resources are managed in order to maintain or enhance its productivity and diversity. A framework for ocean governance should be multifaceted, comprising mechanisms, laws, processes, and institutions at the international, regional, national and local levels. At the international level, instruments such as the United Nations Convention on the Law of the Sea and the Convention on Biological Diversity Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, provide the overarching framework for maritime

71 The U.S. Department of Commerce defines the *law of the sea* as "a body of customs, treaties, and international agreements by which governments maintain order, productivity, and peaceful relations on the sea". Most prominent is the UN's Law of the Sea Convention developed during the 1982 Law of the Sea conference held in Montego Bay, Jamaica.

72 Kraska, James. 2011. Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics, Oxford Scholarship Online.

activities and ongoing work to improve ocean governance at the regional and sub-regional levels. These conventions appear well organised and may even be over-developed relative to regional and national institutions, suggesting that it is at the regional and sub-regional levels where the governance frameworks fall short (Chakallal et al. 2007).

At the national level, deficiencies in the governance framework are further compounded by the assignment of various aspects of the blue economy to different ministerial portfolios such as trade, tourism, fisheries, transport, and sustainable development. There are over 30 different regional and sub-regional entities that are involved in ocean governance, along with various agreements—some of which are non-binding—as well as several programmes, projects and national laws (World Bank 2016).

Ocean governance requires detailed coastal and marine planning along with monitoring and evaluation which could benefit from a regional approach due to limited capacity at the national level. Three of the most commonly used mechanisms for regional ocean governance across the globe are the Regional Seas Programmes (RSPs), Regional Fisheries Bodies (RFBs) and Large Marine Ecosystems (LMEs) (UNEP 2017)[73]. Most RSPs are supported by UNEP with a mandate to address issues ranging from pollution to protection of marine biodiversity. RFBs address fishing and associated activities and to a lesser extent, aquaculture and research. LME mechanisms tend to focus on the assessment and management of LME goods and services.

Governance frameworks for large marine ecosystems should consider two important elements: the policy cycle, and jurisdictional levels (Fanning et al. 2007). Giving responsibility for ocean governance to a regional agency will ensure a harmonised approach that is not overly burdensome on individual countries.

4.2.2 Ocean management

The success of a blue economy strategy also depends on a concerted and pragmatic approach to developing industries. Essentially, the strategy needs to be centralised around key institutions with focus on creating the apt environment to achieve the gains of this initiative. Centralisation of key institutions is necessary for creating the apt environment for building on previous work in the area; coordinating current activities at the sub-regional level; and overseeing the involvement of multi-national players. There is a need for an implementation agency to act as a conduit for communal negotiations and also to facilitate the process in country and throughout the Region. A Regional Agency for Ocean Policy (RAOP) can guide the process within participating countries, while tackling the broader ocean governance responsibilities detailed previously.

73 United Nations Environment Programme (2016), "Making Regional Seas Programmes, Regional Fishery Bodies and Large Marine Ecosystem Mechanisms Work Better Together" Reports and Studies No.197.

To ensure the sustainability of this effort, the issues of a common ocean policy and regulatory framework are critical to give context to the regional implementation. Caribbean countries need to recognise each other as complementary economies and not direct competitors. Housed within a context of regional growth, the blue strategy can provide the necessary impetus for such discussions to begin. In this regard, the Caribbean must ensure the RAOP is empowered and sufficiently resourced to maintain and build relationships throughout the Region. The RAOP can also be the central agency to work with countries in strengthening the institutions and human and technological capital to fully benefit from the blue economy.

4.3 DOING BUSINESS ENVIRONMENT AND SUPPORTIVE INFRASTRUCTURE

Significant constraints to doing business and poor infrastructure quality are expected to affect access to Foreign Domestic Investment (FDI), particularly for new and emerging non-traditional sectors. A conducive doing-business environment, regulatory, skills development and capacity, and quality infrastructure could help to accelerate investments in the blue economy.

It is estimated that improving the Caribbean's infrastructure to international standards would cost the Region approximately USD21.4 bn over 11 years[74] (CDB 2014). However, a financing gap is anticipated as governments are expected to finance only about half of the level of investment needs. Unmet investments in port infrastructure, for example, may contribute to the inefficiencies in port operations in many countries[75], which has consequences for growth and development. Hence, the Region continues to face the challenge of balancing investments in traditional or new growth sectors, which is further compounded by the impact of continuous external shocks. Coastal investments, for example, are further constrained by the Region's increased vulnerability to natural hazards, higher risks, and increasing insurance premiums for such investments. As such, reinvesting in port infrastructure is critical not only to improving the ease of doing business but also to reducing potential losses from any weather- or climate-related event.

Both foreign and domestic investment have also been constrained by the relatively high costs of doing business in the Region. Investors are often deterred by the lack of economies of scale, limited number of productive industries, high energy costs, infrastructural deficiencies, and generally inadequate policy, regulatory, and institutional environments (CDB 2018). The regional business climate does not fare well when ranked against other parts of the world. On average, BMCs were ranked at 123 out of the 190 nations included in the 2018 World Bank Ease of Doing Business rankings. Currently, Jamaica is the highest placed BMC at 70th. In the 181st position, Haiti is the lowest ranked BMC as it is particularly difficult for entrepreneurs to start a business, register property, access credit, and enforce contracts. These challenges hamper the establishment of formal businesses and the creation of jobs in the blue economy.

74 *Public-Private Partnerships in the Caribbean: Building on Early Lessons.* Caribbean Development Bank, 2014.
75 *Transforming the Caribbean Port Services Industry: Towards the Efficiency Frontier.* Caribbean Development Bank, 2016.

Innovation and technology are also critical for blue economy investments. Increased efficiency and greater penetration of new technology into traditional productive activities can expand output. The FAO has already reported positive outcomes from the use of new technology in the fishing sectors with similar sentiments echoed in other industries such as tourism, transportation and energy. While this may increase investment costs in the initial stages of the project, the costs savings and efficiency gains are expected to significantly outweigh the initial outlays. Therefore, it is imperative that the Region—through the central agency—identify and invest in new technologies which can redound to the benefit of all.

BOX 8

The Eastern Caribbean Regional Ocean Policy

The OECS Caribbean Regional Ocean Policy is a global best practice in regional co-operation for transition to a sustainable ocean economy (a blue economy).

Through the Caribbean Regional Oceanscape Project (CROP), the OECS and the World Bank design, implement and monitor the success of various marine and coastal strategies. A critical objective of the project is the use of marine and coastal assets of the sub-region to alleviate the plight of the poor and vulnerable communities. With a land-to-sea ratio of greater than 1:80 (World Bank 2017), the maritime assets of the Region provide significant opportunities if utilised in an optimal and efficient manner. There were several complementary initiatives in support of the regional blue economy: the Caribbean Large Marine Ecosystem Project (2009), the Caribbean Challenge Initiative (2013), and the Eastern Caribbean Regional Ocean Policy (ECROP) (2013). ECROP engenders a common approach to ocean governance within the sub-region. This is necessary to enhance coordination among the country states and helps further strengthen integration in key areas of communal activity.

In creating the case for a blue economy growth strategy, the OECS identified certain components which are replicable at the wider regional level and can serve as strong recommendations for an effective strategy. These components are:

1. Strengthening ocean governance;
2. Strengthening knowledge and capacity; and
3. Project management, monitoring and assessment.

Component 1: Strengthening ocean governance
Through the use of a marine spatial plan and national ocean strategies, and with close alignment to the sub-regional focus, the aim of this component is to facilitate stronger and more effective investment in the marine and coastal sectors. This component also speaks to a wider and more equitable distribution of benefits to all participating groups. The OECS identified areas such as marine tourism, fisheries, transport and gas/oil as industries that can potentially benefit from stronger ocean governance.

Component 2: Strengthening knowledge and capacity
Specifically, this component relates to improving and widening the knowledge and capacity of human resources to meet the growing needs of the blue economy. In addition to the human resource needs, integral institutions require strengthening to be able to respond to the projected increase in demand — in terms of quality, quantity and timeliness. A cross-sectional approach is necessary to ensure a holistic overview of key public goods such as education, health, statistics and national security.

Component 3: Project management, monitoring and assessment
In this component, the aim is to encourage long-lasting collaboration with key stakeholders. Critical here is to achieve 'buy-in' from relevant parties to the process and gain wide acceptance. Also, the strategy promotes continuous monitoring and evaluation of the activities and processes to ensure that it remains relevant and up-to-date. Additionally, communicating clearly through effective media and channels is necessary so that the momentum of the project is not lost and that persons/institutions/governments continue to feel that they are part of the process.

The ECROP is a valuable and timely sub-regional project from which many lessons can be learnt and lays a solid platform on which to build a wider regional strategy. Going forward, any regional strategy requires a focused approach with integration and cooperation as core competencies in the process.

4.4 ADVOCACY AND PARTICIPATORY DEVELOPMENT

Similar to any new and innovative policy or project, education is necessary to encourage participation and engagement of the wider population. A participatory approach contributes to changing perception and culture across government, private sector and households. This also requires a close working relationship with the business community who are also potential investors in a blue economy strategy. A community wide participatory approach also contributes positively to issues related to conservation, enforcement and regulation.

Blue economy investments present potential displacement and livelihood impacts particularly on coastal populations and highly vulnerable groups who have traditionally benefited from ocean based activities, such as fishing. A blue economy strategy will require research and detailed assessments of potential impacts on small vulnerable groups as well as strategies and policies which can contribute to easier transitions and sustainable livelihoods. Adopting a participatory approach will help policy makers identify and address any negative fallout from blue economy activities, such as conservation and marine protected areas. Strategy development and implementation can also benefit from the inputs from civil society groups, trade unions, and other social partners.

4.5 REGIONAL KNOWLEDGE HUB

Advancing the blue economy as a strategic economic growth pillar in the Region requires continuous research and development, targeted feasibility studies, competitive analysis and the development and testing of new instruments and models. Based on the financial and capacity constraints which exist in the Region, the most feasible option would be a regional knowledge hub. A Ricardian model of comparative advantage[76] can allow for countries focusing on the areas where there are specific advantages; thereby improving the quality and quantity of the regional output with significant economic gains to the individual countries; in this case, the Pareto optimal position[77]. This will strengthen evidence by which policy, institutional, regulatory and legislative changes could be guided. The research output from the regional hub could be used for national and regional dialogues by which experiences and best practices could be shared. This will also support knowledge sharing and raising awareness. Box 9 highlights the benefits of a regional knowledge hub to building capacity for the regional adoption of a blue economy strategy. Such a regional approach can help achieve economies of scale in the provision of education and training specific to a blue economy strategy. A regional hub can also contribute to greater sharing of experiences and increased mobility allowing skills and knowledge transfer between countries. This diffusion of capacity can help strengthen the human capital resource base within the Region.

76 The Ricardian model states that a country should only produce a goods /service that if it can produce at a lower opportunity cost than other countries (i.e., if the country has a comparative advantage).

77 Pareto optimality defines an economic state where resources are allocated most efficiently, and there is no other allocation where someone can be made better off (i.e., having more) without another person being made worse off.

BOX 9

Caribbean knowledge hub on the blue economy

Knowledge sharing, innovation, learning from best practices and working collectively will be vital support to countries developing a blue economy approach.

Some small island states have begun moving in this direction.

The Seychelles, an archipelago of 115 islands in the Indian Ocean, is one country championing the blue economy model. Its approach centres around pioneering several innovative financing mechanisms to fund sustainable ocean development and conservation, combined with developing the Seychelles as a centre of knowledge and expertise on the blue economy.

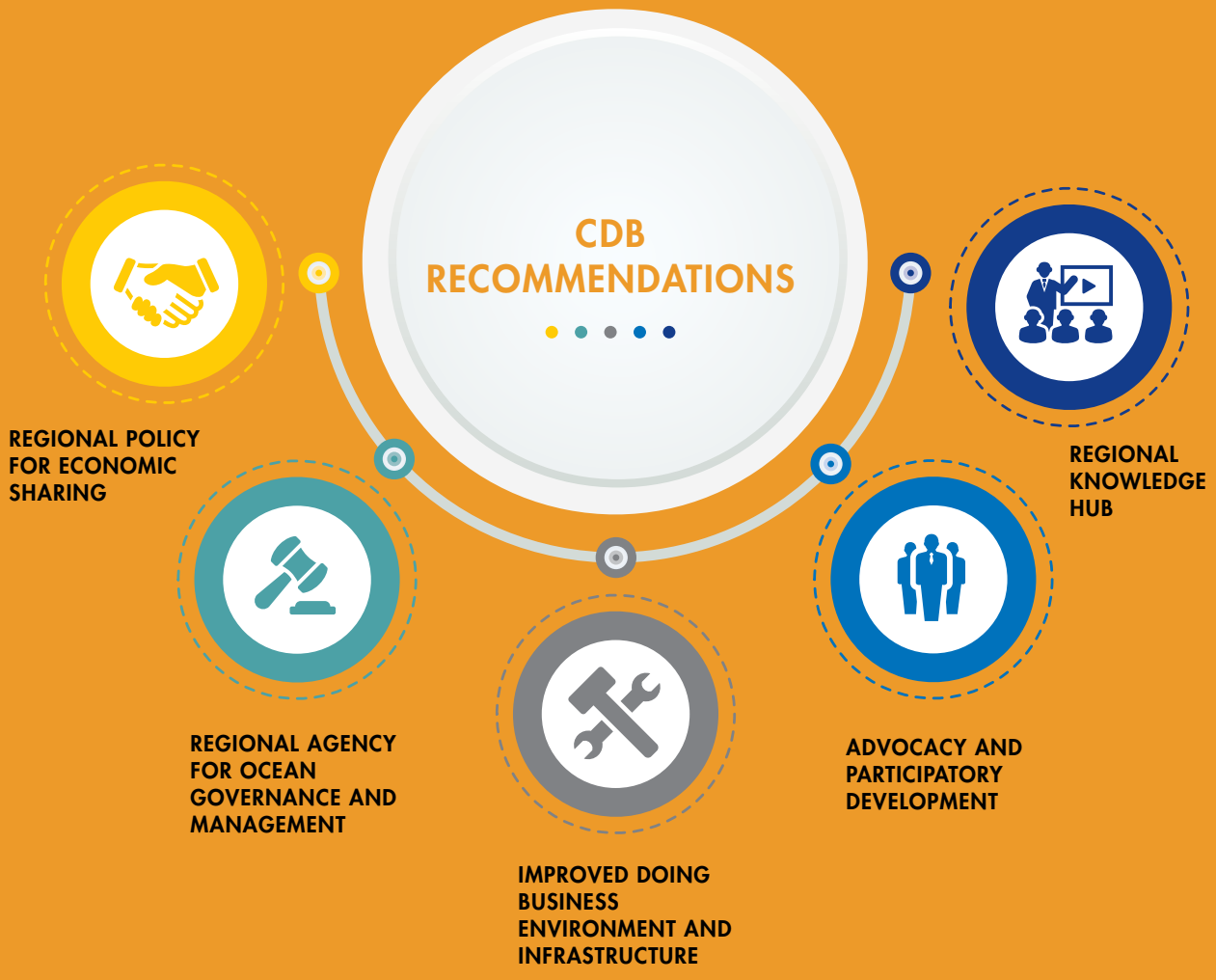
On financing the blue economy, the Seychelles has combined the use of several innovative finance models to fund sustainable ocean development and conservation. It issued its first blue bond in 2017 to raise USD15 mn in capital to finance the transition to sustainable management of small-scale artisanal fisheries, including measures aimed at rebuilding fish stocks, harvest control measures, post-harvest and value adding activities, and scientific and sector support services. The blue bond issuance is complemented by a debt-for-nature swap, implemented in partnership with the Nature Conservancy and impact investors which will see blended capital proceeds from the debt conversion channelled to a new trust fund, SeyCCAT that was created to manage investments in marine conservation and climate adaptation.

In addition, Seychelles is leading on knowledge sharing. It established a Blue Economy Knowledge Centre in 2015, which brings together best practices and knowledge from various blue economy programmes across the islands, including research, eco-tourism, coastal and marine conservation and restoration, and climate change adaptation.

In the Caribbean, Grenada is one of the first countries to develop a vision for "Blue Growth" and to articulate a national "Masterplan" for blue economic development. Grenada's "Blue Innovation Institute" is one of the key components of the country's masterplan. The Institute aims to be a centre for excellence and think tank on the blue economy and also seeks to develop innovative new "blue" financing instruments, such as, debt-for-nature swaps, blue bonds, blue impact investment schemes and blue insurance. Grenada has also been pivotal in the creation of the "Blue Network"—a consortium of countries and international organisations, such as Grenada, Indonesia, Netherlands, and FAO—interested in supporting innovations and investments in the ocean economy, especially by the private sector.

One recommendation is for the Caribbean to explore the creation of a shared platform or knowledge hub on the blue economy. Such a hub would serve as a platform to pool expertise, assess lessons learned from existing initiatives, scale-up successes, build skills on the blue economy at the regional level, and develop common approaches. The hub could also serve as a catalyst to engage, not only high-level political leadership in the Caribbean, but also leaders in the private sector, impact investors, donor agencies and financial institutions to promote investment, innovation and forging of public-private partnerships for sustainable development of ocean and coastal economies.

FIGURE 19: KEY TAKEAWAYS OF CHAPTER 4



The blue economy requires a purposeful attempt at regionally integrated development and an action plan which is aligned to each country's national development priorities and blue economy activities. At the country level, development of national blue economy plans aligned with medium to long-term development and budgeting will contribute to greater effectiveness. These plans should be linked to a regional strategy to ensure consistency but also to allow for greater regional collaboration and economic sharing. Strategies exploring financial inclusion and inclusive growth to support the blue economy can benefit from regional linkages, creating a circular effect which ensures that the benefits of the blue economy filter to the national and regional development outcomes.

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APPENDICES

APPENDIX 1: REGIONAL COMPARISON OF POVERTY, VULNERABILITY AND INEQUALITY

Country	Year	Population Poor (%)	Population Vulnerable (%)	Population Indigent (%)	Poverty Gap Index	Gini Coefficient (0=equality)
Anguilla	2009	5.8	17.7	0	1.1	39
Antigua and Barbuda	2007	18.3	10	3.7	6.63	48
Bahamas	2001	9.3	-	5	2.8	57
Barbados	2010	19	10.4	9.1	6	47
Belize	2009	41.3	13.8	15.8	11.4	36
BVI	2002	22	-	<1	4.3	23
Cayman Islands	2006/7	2	1.8	0	0.44	40
Dominica	2009	28.8	11.5	3	8.9	44
Grenada	2008	37.7	14.6	2.4	10.13	37
Guyana	2006	36.1	-	18.6	16.2	35
Haiti	2012	58.5	11.5	23.8	-	61
Jamaica	2012	20	-	-	4.5	38
St. Kitts	2008/9	23.7	-	1.4	6.4	38
Nevis	2008/9	15.9	-	0	2.7	38
Saint Lucia	2005	28.8	40.3	2	9	42
St. Vincent/ Grenadines	2007/8	30.2	48.2	2.9	7.5	40
Suriname	2012	47.2	-	-	-	-
Trinidad and Tobago	2005	15.5	9	1.2	4.6	39
Turks and Caicos Is.	2012	21.6	11.4	0	4	36
World	2013	22.3†				
LAC (excl. high income)	2013	10.8†				

Source: Regional Government Reports, CDB, WB; †WB Poverty Gap at $5.50/day

APPENDIX 2: TRENDS IN MARINE AND COASTAL INDUSTRIES

Marine Industry	Global Trends	Caribbean Trend
Fisheries	Globally, aquaculture is one of the fastest growing food sectors, with an annual growth rate of 8.8% (FAO, 2014). In the three decades to 2013, capture fisheries production increased from 69 mn to 93 mn tons, while aquaculture production increased from 5 mn to 63 mn tons (World Bank, 2013). Forecast: The World Bank (2013) estimates that by 2030, aquaculture will supply over 60% of fish production for direct human consumption.	Fisheries production slightly decreased from 2010-2014 and aquaculture growth lagged in other regions. Over 40% of fish consumed in the Eastern Caribbean is imported. Regional aquaculture growth has been relatively slow. Forecast: With good governance and an enabling investment climate, aquaculture has the potential to increase CARICOM fish production by 30% from 2014-2024 (FAO, 2014). Demand is also expected to increase, driven by tourism and the push for healthier diets.
Offshore Oil and Gas	The offshore sector has been testing different approaches to lowering production costs (e.g., remote operating models, more predictive, data-driven analytical tools). Investment is uncertain as oil prices have stabilised at lower levels. Forecast: Further technological progress for production of offshore oil and gas may help to drive production growth and investment. (Off-shore Technology, 2018)	In 2012, the U.S. Geological Survey estimated that the Caribbean region held up to 126 billion barrels of oil and 679 trillion cubic feet of undiscovered natural gases in 31 geological provinces. After ExxonMobil's major oil discovery near Guyana in 2015, offshore fossil fuel exploration has been rejuvenated in the Region. This follows declines in Trinidad and Tobago's petroleum production. Forecast: In addition to Trinidad and Tobago and Guyana, other Caribbean nations have been wooing investors. Deep water drilling in Jamaica and The Bahamas, as well as more technologically advanced exploration (e.g., satellite imagery by Ursa Space Systems) may pave the way for greater production in the Region.
Renewable Energy	A fifth of today's electricity is produced by renewable energy (WEF, 2018), which includes wave and tidal energy. As clean energy production costs declined, investments to the overall RE/EE industry have increased substantially in the last few years. Commercial success of ocean energy companies has been thwarted by finance challenges that stem from the high risk, high upfront costs, and challenging licencing environment of the sub-sector. (REN21, 2017) Forecast: Potential for increased activity in sector if collaboration continues between governments and industry to de-risk and fund ocean energy research and testing.	The majority of the Caribbean depends on imported oil to meet local energy demand. Throughout the Region, a number of renewable energy options have been identified, including those that are ocean-based. Forecast: Marine renewable energy may be an increasingly viable option for the Region, given increasing government backing. Many islands have set ambitious goals for transitioning to renewable energy. By 2020, Aruba aims to have 100% of electricity from renewable energy; St. Vincent and the Grenadines – 60%; Saint Lucia – 35%; and Grenada – 20%.

Marine Industry	Global Trends	Caribbean Trend
Shipping, and Port Infrastructure and Services	Currently some 90% of global trade is carried on via the ocean. The past decade has seen increased consolidation and rationalisation in the ports, shipping and stevedoring industry. (Deloitte) Forecast: By 2050 global maritime freight transport is projected to quadruple from 2010. Port infrastructure and services revenue is projected to increase by 4.7% from 2015 to 2020. (OECD, 2016) The trend of increasing size of ships is expected to continue in the next 15 years, which will require investments in more depth, wider docks, stronger quays and larger cranes. (Deloitte, 2015)	Within the region, maritime connectivity is limited to the main transhipment hubs: Kingston, Freeport, San Juan, Port-of-Spain, and the Dominican Republic. Higher transport costs are incurred by smaller islands that cannot receive direct calls (Samuel, 2016). Cruise ships are the fastest growing segment of the Caribbean tourist market. However, the placement of ports in urban areas (particularly in the smaller islands) adds to heavy congestion, with little physical space for expansion. Forecast: The expansion of the Panama Canal and construction of the Nicaragua Canal suggest a significant future role for the Caribbean region in international maritime shipping. Jamaica has taken the lead in capitalising on this opportunity, for example by establishing a Logistics Hub Initiative to lead the development of key infrastructure assets, among other growth strategies. To expand the capacity of Caribbean ports, transport infrastructure investment needs have been estimated at 6.2% of GDP in the Region annually between 2012 and 2020.
Tourism and Travel	Tourism and travel contributes over 10% of global GDP. Forecast: The sector is expected to grow at a rate of 3.8% per year from 2015 to 2025—much of which will be coastal and marine. (OECD, 2016)	Cruise ship visitor growth has driven tourism growth in the BMCs. From 1989 to 2014, cruise arrivals more than tripled from 4.4 mn to 14.5 mn – currently almost double the number of long-stay tourists (CDB, 2017). In 2016, Travel and Tourism directly contributed 4.7% of total Caribbean GDP. When indirect contributions are considered, the industry fuelled over 14% of the Region's 2016 GDP (WTTC, 2017) Forecast: By 2025, the annual real growth in tourism's total contribution to GDP is projected at 3.3% for the Caribbean Region. It is anticipated that the sector's direct contribution to total GDP will rise to 5.7% by 2027. (WTTC, 2017)

Sources: Toward A Blue Economy: A Promise for Sustainable Growth in the Caribbean, World Bank, 2016; The Ocean Economy in 2030. OECD Publishing, 2016; The Sustainable Intensification of Caribbean Fisheries and Aquaculture, Food and Agriculture Organization of the United Nations (FAO), 2014; Fish to 2030: Prospects for Fisheries and Aquaculture. World Bank, 2013; Tanti, Tulsi. The Key Trends That Will Shape Renewable Energy in 2018 and Beyond. World Economic Forum, 12 Jan. 2018; Renewables 2017 Global Status Report. REN21, 2017, pp. 61–63.; Heidi Vella. An Ocean of Opportunity or Rough Waters Ahead? The Outlook for Oil & Gas in 2018. Offshore Technology, 19 Jan. 2018; Global Trends to 2030: Impact on Ports Industry. Deloitte, 2015; Samuel, S. Brian. "Caribbean Port Efficiency: Challenges and Opportunities." CDB 46th Annual General Meeting, 19 May 2016, Montego Bay, Jamaica; Tourism Industry Reform: Strategies for Enhanced Economic Impact. Caribbean Development Bank, 2017; Travel and Tourism: Economic Impact 2017 - Caribbean. World Travel and Tourism Council, 2017.

APPENDIX 3: CLIMATE CHANGE FUNDS THAT COULD FACILITATE THE DEVELOPMENT OF THE BLUE ECONOMY

Fund Name	Amount of Funds	Possible Applications of the Funds	Country Coverage	Validity Period	Potential Blue Economy Application
SEEC (Sustainable Energy for the Eastern Caribbean)	EUR 6.75 mn + USD30 mn (minimum)	Institutional strengthening and capacity building of local and regional actors; Technical Assistance for supporting RE and EE Projects; Investment and financial mechanisms for RE & EE pilot projects.	Antigua, Dominica, Grenada, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines.	June 2010-March 2020	Coastal and Nearshore Marine Renewable Energy Projects
Climate Action Line Of Credit (CALC)	USD65 mn + USD100 mn	Adaptation to climate risks, Renewable Energy (RE), Energy Efficiency (EE), forestry and land-use, low carbon technology research development and innovation, and transport projects that reduce greenhouse gas emissions.	CDB's BMCs and creditworthy public and private sector counterparts	Feb 2012-Dec 2019	General; Coastal and Nearshore Marine Renewable Energy Projects; Marine Transport
EIB Technical Assistance in Support of CALC	EUR 2.5 mn	Project preparation and feasibility studies for sub-projects potentially eligible for the CALC and scale-up of CALC investments to national strategy processes where such a process is likely to identify and prioritise similar types of investments.	CDB's BMCs and creditworthy public and private sector counterparts	Feb 2012-Dec 2019	General; Coastal and Nearshore Marine Renewable Energy Projects; Marine Transport
Canadian Support for the Energy Sector in the Caribbean Fund	USD5 mn	Development of legislative and regulatory frameworks and associated institutional capacity in the Caribbean; Support to increase deployment of EE and RE technologies in the Caribbean; Workshops/training/professional attachments.	All CDB Borrowing Member Countries.	March 2016-March 2019	General; Coastal and Nearshore Marine Renewable Energy Projects;
GIZ (Renewable Energy and Energy Efficiency Technical Assistance)	EUR 3 M	Donor-funded technical assistance or support: Caribbean Sustainable Energy Roadmap and Strategy implementation, capacity building, model projects and the financial sector including CDB; short-term expert pool for consultancy support.	All Caribbean Community (CARICOM) Member States and the Dominican Republic		Coastal and Nearshore Marine Renewable Energy Projects
Agence Française de Développement (AFD)	USD $33 M Line of Credit + EUROS €3 M Technical Assistance Grants	Contribute to the economic development of the Caribbean Region and improve resilience of national economies; Facilitates the development of sustainable infrastructure projects with significant environmental or climate impacts.	CDB Borrowing Member Countries (with exceptions)		Coastal Development and Coastal Protection

Fund Name	Amount of Funds	Possible Applications of the Funds	Country Coverage	Validity Period	Potential Blue Economy Application
DFID: Caribbean Infrastructure Partnership Fund (UK CIF)	GBP300 mn	Critical economic infrastructure in the Caribbean to set the foundations for growth and prosperity, reducing poverty and increasing resilience to climate change.	Antigua and Barbuda, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Lucia, St. Vincent and the Grenadines.	Jan 2016-March 2020	General; Transport and Trade; Coastal Development and Protection; Tourism;
IDB: Sustainable Energy Facility (SEF) & GeoSMART Initiative.	USD22,063,698 + GBP5 mn	A grant convertible to a loan to finance expenses associated with geothermal exploration activities. There are two funds: CTF-Clean Technology Fund and the GEF - Global Environment Fund.	CTF: Governments of, public utilities of and special purpose vehicles legally established in, Dominica, Grenada, St. Kitts and Nevis, Saint Lucia and St. Vincent and the Grenadines. GEF: Governments of Antigua and Barbuda, Grenada and St. Vincent and the Grenadines.		Coastal and Nearshore Marine Geothermal Energy Projects
Green Climate Fund (GCF)	Max USD50 mn	As an accredited entity to the GCF, CDB can support the design and submission of applications for resources from the fund on behalf of its BMCs. CDB is also tasked with a fiduciary responsibility for any such project or programme. The Fund's investments can be in the form of grants, loans, equity or guarantees.	All CDB Borrowing Member Countries.		General; GCF invests in adaptation and mitigation activities in developing countries
Adaptation Fund (AF)	Max USD10 mn	As an accredited entity to the GCF, CDB can support the design and submission of applications for resources from the fund on behalf of its BMCs. CDB is also tasked with a fiduciary responsibility for any such project or programme.	All CDB Borrowing Member Countries.		General; AF invests in climate change adaptation activities in developing countries

APPENDIX 4: PERFECT COMPETITION UNDER A BLUE ECONOMY GROWTH STRATEGY

Theory:

Perfect competition is a theoretical model used to construct an industry supply curve under conditions where the firm is a price-taker. The model of perfect competition operates under the following assumptions:

1. *Firms do not face any barriers to entry and/or exit;*
2. *Factors of production are homogeneous whereby prices are uniform across the industry and there are no restrictions to/differences in access;*
3. *Information symmetry exists among firms with each being privy to analogous data on prices and industry output; and*
4. *All firms aim to maximise profit in the long-run.*

In addition, the Seychelles is leading on knowledge sharing. It established a Blue Economy centre in 2015, which brings together best practices and knowledge from various blue economy programmes across the islands, including research, eco-tourism, coastal and marine conservation and restoration, and climate change adaptation.

The Blue-growth Strategy:

The prescribed blue-growth strategy helps develop the conditions of perfect condition within the respective industries. The Regional Agency for Ocean Policy (RAOP) acts as the intermediary between the market firms and the owners of the factors of production. Any new firms or firms wishing to do so are able to, on their own accord, with the RAOP playing the role of facilitator. The RAOP also provides new entrants into the market with the same support and information as current market players. Further, following agreement of national governments, firms in the market face identical costs and access the same pool of resources. Resources include raw materials, labour and access to capital. This lack of market differentiation and common cost of access creates the necessary conditions for perfect competition.

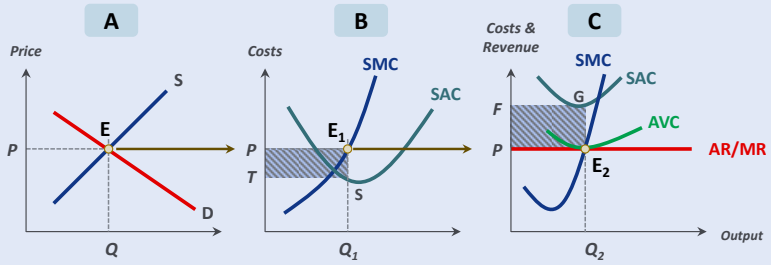
In the case of such a scenario, in the short-run, the blue strategy can attract significant new investments into the Region. Firms operating in the Region will face a set price, and given the regionally agreed supply of maritime territory and labour, the efficient firms are encouraged by the realisation of supernormal profits. Inefficient firms will be rendered uncompetitive and cannot compete by lowering prices or providing lower quality supplies. As such, their losses leads to their exit from the industry. In the long-run, the efficient firms continue to exist and will be joined by additional firms attracted to the prospect of supernormal profits. The resulting competitive forces increases the costs of the factors of production, in this case land and labour. As a result, the long-run prices of these will be driven upwards to the benefit of the Region. In the long-run, firms will make normal profits which encourages current market players to remain in the industry and incentivises new entrants.

Perfect Competition - Short-run Market Structure

In the case of short-run equilibrium, the industry achieves equilibrium at price P and output Q but with varied firm performance (Figure 20- graph A). While the industry is in equilibrium, the reality of each firm is different. In this way, a regional ocean policy protects the interests of countries (industry) by safeguarding their profitability and rewards the efficiency of firms. This is further encouragement to devise a perfectly competitive market space among firms but not between countries.

In the short-run, the firm faces a horizontal demand curve because the price is set by the market; this results in the price and marginal revenue being equal. However, each firm faces a different cost curve depicted by the respective short-run marginal cost (SMC) and short-run average cost (SAC) curves. Given that the firms are price takers, their profitability depends on their ability to produce efficiently. At the market price P, firms achieve equilibrium at the point where price = SMC (for efficient firms this is point E1 (graph B) and at point E2 for inefficient firms (graph C)). The relationship between E and the SAC defines the profitability of the firm and industry; the distance between where E cuts the SAC (S1 and S2) and E1 and E2, respectively, depicts the level of supernormal profits or losses. As such, the shaded areas in graphs B and C depicts profits and losses, respectively.

PERFECT COMPETITION – SHORT-RUN INDUSTRY



Perfect Competition - Long-run Market Structure

In the long-run, all costs become variable and the firm is able to change its scale of operations; additionally, firms in the long-run are likely to review operations and decide whether it's optimal for them to remain in the industry or not. In the long-run, the industry benefits from higher prices of the factors of production due to the realisation of supernormal profits by firms. The RAOP can demand higher rents for use of the Region's ocean space and labour can demand higher wages. However, within the industry, those inefficient firms will be unable to compete at the higher prices and will choose to exit the market; this is countered by the attraction of supernormal short-run profits encouraging new market players. In essence, this long-run equilibrium ensures a sustainable industry driven by efficiency to the benefit of all countries.

Graph D shows the effect of an upward movement in prices under conditions of perfect competition. In this scenario, the movement of prices from P1 to P2 shifts the equilibrium point to E1. This price increase can result from increased rents for the main factors of production due to the profitability of the industry. The leftward shift of the supply curve (S to S1) results from inefficient firms leaving the market. These firms are forced to leave the market because their long-run average cost (LAC) exceeds the market price shown by the shift in the LAC to LAC1. Efficient firms are able to produce at the point where their LAC equals the market price result in normal profits (graph E).

PERFECT COMPETITION – LONG-RUN INDUSTRY