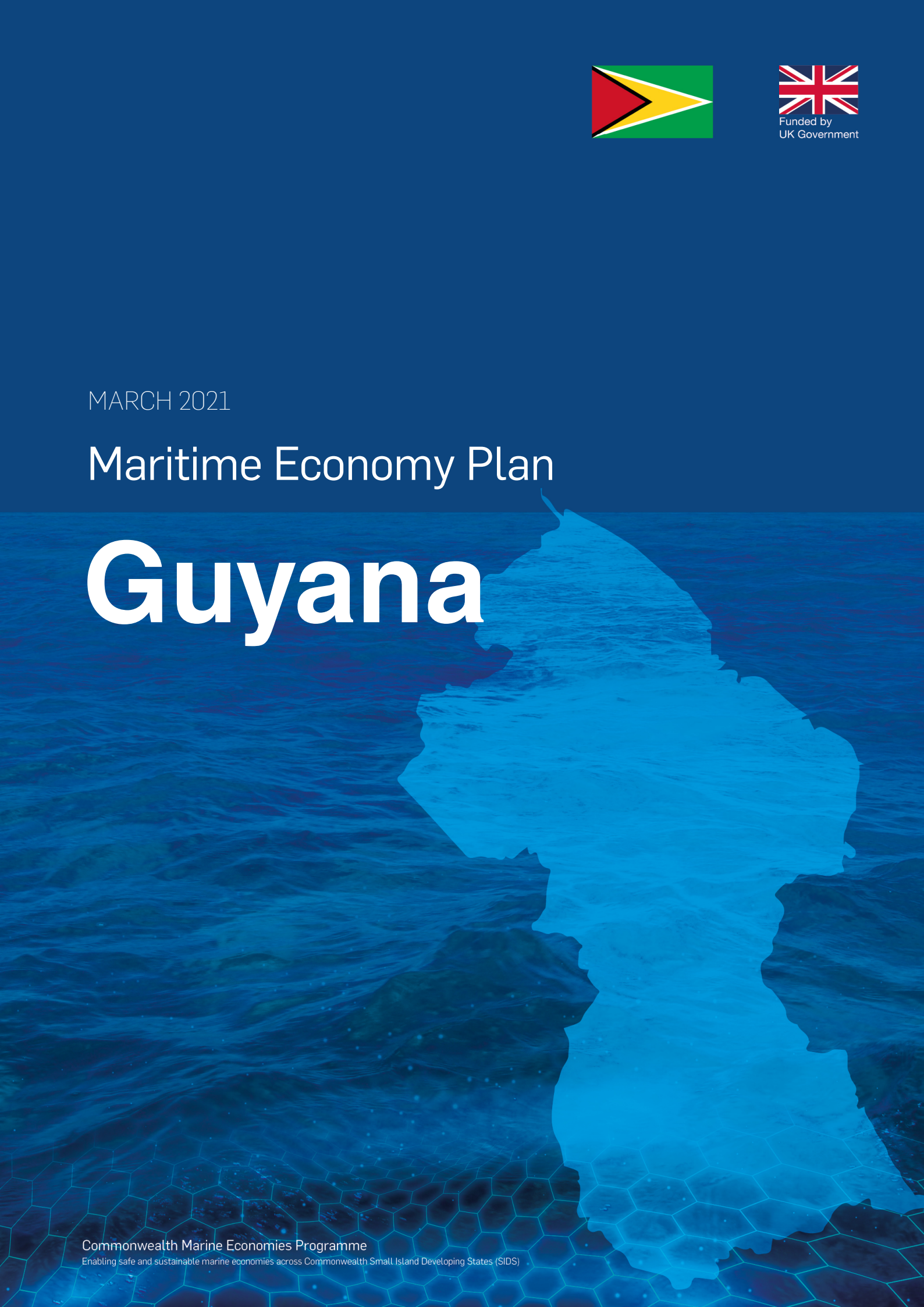
MARCH 2021

Maritime Economy Plan

Guyana



Commonwealth Marine Economies Programme

Enabling safe and sustainable marine economies across Commonwealth Small Island Developing States (SIDS)

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Ministerial Statement on behalf of the Government of Guyana

More than a decade ago, when nations were debating actions to avert the inevitable devastating impacts of climate change with little progress, Guyana championed an innovative solution to climate change and national development. This birthed a partnership with the Government of Norway that allowed Guyana to leverage its forests to garner much needed financial resources for national development.

Guyana, now a new oil producing state, intends to build on its legacy of low carbon development because as a small developing state with most of its population, economic activities, and government business along its coast, it is already bearing the cost of delayed action. We are witnessing sea-levels rising five (5) times the global average, increasing incidents of storm surges and higher than usual high tides, and more extreme rainfall events, all of which are contributing to flooding.

Low-lying States, like Guyana, remain at the mercy of the ocean. However, we recognise the potential of harnessing our ocean resources to contribute even more to both climate change action and national development. Therefore, as a nation we are embracing the further development of our marine resources along a blue economy pathway which embodies all the principles outlined in our economic development model - low carbon, resource efficiency and social inclusion. We view the ocean as being just as important as our forests. They are both carbon sinks, both significant to the sustainable development of our national economy.

As a country, we are now beginning to use our marine space for energy production. Concomitantly, we are pursuing other sustainable economic avenues to harness the potential of the ocean, and our internal waters to produce renewable energy, such as tidal energy and hydropower. Additionally, we may seek to pursue emerging sectors in this space, such as biopharmaceuticals.

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The Government of Guyana is fully committed to managing this space in a sustainable and responsible manner for the benefit of the people of Guyana, and humanity, generally. Guyana has a well-established fisheries sector that is supporting lives and livelihoods, contributing to our economy, and is an important element of the country's food security. This sector is ripe with the potential for growth and diversification to ensure its sustainability.

Our tourism sector is also expected to expand and, therefore, the experiences we provide, and the services we offer, must grow and embrace world class standards. Our ports have served us for many decades. However, increasing development opportunities now emphasise the need for improved port infrastructure to meet the demands associated with the nation's exponential rise in economic activities.

The importance of coastal shipping and the efficient use of our waterways is yet to receive adequate emphasis. Recognising that shipping is the most economical mode of transportation, we aim to create and implement a National Maritime Strategy that is aligned with the Low Carbon Development Strategy (LCDS), and Guyana's overall developmental objectives.

Our expectation of this Maritime Economy Plan is that it serves as a strategic overview of Guyana's marine economic potential. It is to be viewed as a basis for further dialogue and to support Guyana along the difficult, but necessary path towards the achieving of a true blue economy. The plan will also stimulate at the national level, the development of the infrastructure requisite for a port authority, port modernisation, port connectivity and coastal zone development and management.

This plan is part of our multi-faceted approach to creating sustainable livelihoods and prosperity for all our people even as we battle the impact of climate change, global economic recessions, and a pandemic.

We will, with this plan, achieve specific, and significant milestones.

Hon. Dr. Bharrat Jagdeo
Vice President, Co-Operative Republic of Guyana

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Ministerial Statements

Ministerial Statement on behalf of the UK Government

The ocean is where life began and is essential for all life on Earth. It regulates climate and weather patterns, provides our food, medicine, energy and other valuable resources, facilitates marine transport and trade and is full of wonders we have hardly begun to understand. Mangroves, seagrass beds and coral reefs also offer natural protection from the effects of climate change.

We know that effective ocean protection will be game-changing in turning things around for climate, for nature, and for people. For many nations, especially Small Island Developing States (SIDS), or 'Large Ocean States', that is even more important, since the ocean is at the very heart of their sustainable economic development and the future of their people. We are delighted that the UK has been working in partnership with the Government of Guyana to develop Guyana's bespoke national Maritime Economy Plan under the Commonwealth Marine Economies (CME) Programme.

This plan presents a holistic view of the opportunities presented by the ocean for developing a sustainable 'blue economy' in Guyana. It covers the role of marine tourism for Guyana's prosperity; the need for responsible coastal development to protect lives and homes in the face of extreme weather events; the importance of including the protection of valuable ecosystems in national planning decisions; and the provision of diverse training and job opportunities within the blue economy to ensure that future generations continue to reap the ocean's benefits.

The CME Programme has also been supporting Guyana, in collaboration with the UK Hydrographic Office, the Centre for Environment, Fisheries & Aquaculture Science, and the National Oceanography Centre, to deliver capacity building and to facilitate scientific data collection. This research has provided much needed information about the health and status of the marine environment and enabled the production of new maritime charts (crucial for safe and accurate navigation).

I'm delighted that, with UK support, Guyana now has documented risks and threats associated with climate change to the fisheries sector, and options for adaptation. For example, the supply of hydrographic equipment and training has embedded the capacity for national mapping, and allowed continued assessment of the changes in the seabed over time: Guyana's Maritime Administration has already surveyed the entrance channel to the Demerara and Essequibo Rivers,

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just one potential application for this capability. And with the help of our scientific experts, the Guyana Association of Trawler Owners and Seafood Processors helped three of Guyana's largest seafood export companies to attain Marine Stewardship Council certification.

This national Maritime Economy Plan, alongside Guyana's work to update its Low Carbon Development Strategy, its new membership of the Global Ocean Alliance, and the establishment of a National Ocean Policy to strengthen capacity for ocean governance, will all facilitate the transition to a maritime economy. By working in partnership through the CME Programme, and through projects supported by our British High Commission in Georgetown, the UK and Guyana are supporting commitments made at the Commonwealth Heads of Government Meeting (CHOGM) in 2018. That includes the Commonwealth Blue Charter, which helps Commonwealth countries work together on a fair, inclusive and sustainable approach to ocean protection and economic development.

Ambitious and coordinated actions, like those outlined in this Plan, are critical for the future health of the ocean. As President of the 26th United Nations Climate Change Conference, the UK will make the case for ocean protection at every opportunity. I am so pleased to be partnering with a number of Large Ocean States on the frontline of climate change to inspire climate action. There is simply no path to net zero emissions, or the sustainable development goals, or the recovery of nature, without effective ocean protection and sustainable management of the marine environment.

The UK Government remains committed to maintaining its track record as a reliable and committed development partner with Guyana in navigating this rapidly developing maritime sphere. We share one global ocean – so we need a whole earth effort to sustain it.

Lord (Zac) Goldsmith of Richmond Park
Minister for Pacific and the Environment

Abbreviations and Acronyms

ABS – Access and Benefit Sharing (of genetic resources)
BoS – Bureau of Statistics (of Guyana)
CAP – Conservancy Adaptation Project
CARICOM – Caribbean Community
CCCCC – Caribbean Community Climate Change Centre
CBD – Convention on Biological Diversity
CDB – Caribbean Development Bank
CDC – Civil Defence Commission
CDEMA – Caribbean Disaster Emergency Management Agency
Cefas – Centre for Environment, Fisheries and Aquaculture Science (of the United Kingdom)
CHPA – Central Housing and Planning Authority
CIMH – Caribbean Institute for Meteorology and Hydrology
CME – Commonwealth Marine Economies
CRSAP – Climate Resilience Strategy and Action Plan (for Guyana)
CRFM – Caribbean Regional Fisheries Mechanism
C-SERMS – Caribbean Sustainable Energy Roadmap and Strategy
DECC – Department of Environment & Climate Change
DoE – Department of Environment (now DECC)
DRRM – Disaster and Risk Reduction Management
EASME – European Agency for Small and Medium-size Enterprises
ECROP – Eastern Caribbean Regional Ocean Policy
EDF – European Development Fund
EEZ – Exclusive Economic Zone
EIA – Environmental Impact Assessment
ENSO – El Niño Southern Oscillation
EPA – Environmental Protection Agency
EU – European Union
FAD – Fish Aggregating Device
FAO – Food and Agriculture Organisation
FCDO – Foreign, Commonwealth & Development Office
FDI – Foreign Direct Investment

GATOSP – Association of Trawler Owners and Seafood Processors

GDP – Gross Domestic Product

GEA – Energy Agency

GESTER – Governance, Environment, Social, Technology, Economy, Resilience & Risk (analysis)

GFC – Forestry Commission

GHFS – Guianas, Green Heritage Fund Suriname

GIZ – Gesellschaft für Internationale Zusammenarbeit (German development agency)

GLSC – Land and Survey Commission

GNSC – National Shipping Corporation Ltd.

GTA – Tourism Authority

GY$ – Guyanese Dollar (national currency)

ICZM – Integrated Coastal Zone Management

IDB – Inter-American Development Bank

ITCZ – Inter-Tropical Convergence Zone

JICA – Japan International Cooperation Agency

LCDS – Low Carbon Development Strategy

MARAD – Maritime Administration Department

MEP – Maritime Economy Plan

MPA – Marine Protected Area

MSC – Marine Stewardship Council

MPW – Ministry of Public Works

MoU – Memorandum of Understanding

MSP – Marine Spatial Planning

MW – Megawatt

NAREI – National Agricultural Research and Extension Institute

NCD – Nature Conservation Division

NDC – Nationally Determined Contributions

NDIA – National Drainage Irrigation Authority

NEMO – Nucleus for European Modelling of the Ocean

NEOC – National Emergency Operations Centre

NICs – Nationally Implementing Committees

NGO – Non-Governmental Organisation

NOC – National Oceanography Centre (of the United Kingdom)

NOP – National Ocean Policy
O&G – Oil and Gas
OECS – Organisation of Eastern Caribbean States
OP – Office of the President
ORE – Offshore Renewable Energy
OTEC – Ocean Thermal Energy Conversion
PAC – Protected Areas Commission
PSC – Private Sector Commission
PV – Photovoltaic
SCCF – Special Climate Change Fund
SDG – Sustainable Development Goal
SAG – Shipping Association of Guyana
SAMOA pathway - SIDS Accelerated Modalities of Action
SFM – Sustainable Forest Management
SIDS – Small Island Developing State
SLR – Sea Level Rise
SME – Small and Medium-sized Enterprise
SOBE – Sustainable Ocean Based Economy
SRDB – Sea and River Defence Board
THAG – Tourism & Hospitality Association
UKHO – United Kingdom Hydrographic Office
UNCLOS – United Nations Convention on the Law of the Sea
UNEP – United Nations Environment Programme
UNFCCC – United Nations Framework Convention on Climate Change
USD / US$ – United States Dollars
VERT – Voluntary Emergency Response Team
WSG – Work Services Group
WTTC – World Travel & Tourism Council
WWF – World Wide Fund (for Nature)

The Commonwealth Marine Economies Programme

The Commonwealth Marine Economies (CME) Programme was launched in 2016 and aims to support 17 Caribbean and Pacific Small Island Developing States (SIDS) in conserving their marine environments and making the most of their maritime resources to catalyse sustainable economic development. It is designed to promote growth, innovation, jobs and investment whilst safeguarding healthy seas and ecosystems, and it helps to address climate change, the UN Sustainable Development Goals and the Paris Climate Change Accord.

The CME Programme broadly comprises three components:

> **Government Engagement and Dialogue:** The UK Government is committed to working in partnership with the governments of individual SIDS.

> **Scientific Research and Capacity Building:** To sustainably manage and use marine resources, it is vital to understand them. As a demand-led initiative, since 2016 the Programme has been collecting data, undertaking scientific research and delivering capacity building activities against a clear action plan developed from country requests.

> **Preparation of national Maritime Economy Plans:** Where requested by SIDS Governments, and in partnership with them, the Programme will assess the existing national economies and identify the opportunities and obstacles to development. Bespoke national Maritime Economy Plans (MEPs) will be developed to enable individual countries to address economic growth and alleviate poverty.

The UK's Foreign, Commonwealth & Development Office (FCDO) is leading this Programme, which since 2016 has showcased UK world-leading expertise in marine science through delivery partners at the United Kingdom Hydrographic Office (UKHO), the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and the National Oceanography Centre (NOC). The programme has also engaged a team of technical experts who are working in partnership with SIDS governments to develop national Maritime Economy Plans. Examples of the work carried out in partnership with Guyana are provided in Section 1.5.

At the Commonwealth Heads of Government meeting in April 2018, 53 countries agreed the landmark **Commonwealth Blue Charter**, a bold commitment that sets out how member states will lead international efforts to sustainably develop and protect our ocean. The CME Programme supports the aims of the Commonwealth Blue Charter and is an integral part of the UK's effort to protect the health of the world's ocean and promote the growth of blue economies.

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Executive Summary

This Maritime Economy Plan is a partnership initiative between the Governments of the UK and Guyana. It provides an overview of the existing maritime economy of Guyana and sets out priorities and actions that aim to help Guyana demonstrate a clear vision and direction that takes account of national issues, international commitments and the challenges of a Small Developing State. Actions support economic growth, livelihoods and jobs and reduce losses from natural hazards, extreme weather events and climate change. The overall objective is to help grow the national economy in a way that reflects the aims of the Commonwealth Charter, including good governance, sustainable development, and gender equality while recognising the needs of small and vulnerable States.

The principles of **low carbon, resource efficiency** and **social inclusion** have been used to shape the development of this Plan. This is compatible with the concept of the 'blue economy', which first emerged at the 2012 Rio+20 United Nations Conference on Sustainable Development and recognises the need to maximise the vast economic potential of the ocean while also preserving it for current and future generations. Progress towards a blue economy can help achieve a range of UN Sustainable Development Goals (SDGs), including SDG 14 (Life Below Water), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 7 (Affordable and Clean Energy), and SDG 11 (Sustainable Cities and Communities).

The maritime economy includes established sectors such as fisheries, tourism and shipping as well as emerging activities such as offshore renewable energy, aquaculture and marine biotechnology. It also includes the policies and management of these sectors and of the coastal and marine environment on which these sectors rely. This Plan describes the maritime economy in terms of Bedrock / Traditional sectors and "Emerging" sectors, although other reports may describe it using different categories (there is no internationally agreed way to describe maritime economy sectors).

Bedrock/traditional sectors	Emerging sectors
Energy – O&G	Energy – renewables, storage, hydrogen, OTEC[1]
Shipping, ports	Biopharma
Fisheries and aquaculture	New fisheries and aquaculture incl. macroalgae
Tourism – cruise, yachting, beach / all-inclusive resorts	Tourism – eco tourism
Minerals / aggregates	Deep sea minerals / minerals

This Maritime Economy Plan has been produced as a result of several months of desk work, structured questionnaires, a consultative mission to Guyana and discussions with a range of Government, NGO, and other stakeholders. It is, therefore, very much a strategic overview of Guyana's maritime economic potential. Each maritime economy sector was subject to a bespoke **multi-criteria analysis** using the information collected from all the sources to consider **governance, environment, social factors, technology, economy** and **resilience and risk**.

The draft Maritime Economy Plan was subject to review, feedback and update during 2020 / 2021, in consultation with the Government of Guyana. Due to the COVID-19 pandemic, engagement with stakeholders was carried out remotely through a series of online meetings, phone calls and emails. The Guyana Maritime Administration Department (MARAD) has acted as the focal point for engagement on the Maritime Economy Plan.

Key findings for Guyana's maritime economy are:

> The development of the **oil and gas** industry will fundamentally change the national economy. The physical and support service infrastructure required by the offshore oil and gas operations may lead to opportunities across other sectors, e.g. port facilities, new roads and infrastructure, tourism, up-skilling and local employment. There are risks of environmental damage and the government is monitoring these risks as they develop with policies to address them.

> The **tourism sector** has potential for growth as part of the country's opening-up process driven by the development of the oil and gas industry. From new hotels with high-level standards, to river tours, to small and medium size enterprises that are locally owned, the sector should take advantage of the expected economic growth but ensure it does so in a sustainable way from the start.

> Natural hazards and sea level rise are a perennial risk affecting livelihoods in coastal areas where the majority of people live. Besides the use of traditional sea defences, drainage systems and the use of dredged materials, there is a need to understand and effectively use **ecosystem services** for managing costal erosion and flooding.

> The **COVID-19 pandemic** has had a significant impact on the economy of Guyana and the Caribbean as a whole. While the national economy expanded in the first half of 2020, emergency measures (including restrictions to oil and gas crews) have led to an overall decline in GDP, with economic activity in the tourism sector coming to a halt, and retail business, restaurants and the construction sector contracting between 40-50%[2].

Actions, primary actors (who should be responsible for the actions) and desired outcomes are presented for each maritime economy sector. These are high **level actions** that are of strategic importance for the sector and the country as a whole. Each sector is given a prioritisation category – Urgent, New / Needs Attention or Well Established.

22 sectoral actions are identified. The Coastal Development sector requires **urgent** attention. Updating of surveys and conditions assessments of sea walls and drainage systems, together with restoration and protection of mangrove areas to enhance coastal protection functions[3], and which take climate change into account, would reduce risks to communities, crops, livestock and property. A strategic review of infrastructure and capacity needs for the projected growth in demand, including Environmental Impact Assessments, waste, utilities and land use needs would benefit the **tourism** sector and the economy as a whole. Development control should be more strongly linked to EIA processes, with awareness raising and training for EIA and enforcement, supported by capacity building in coastal defence.

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The national economy will benefit from Guyana's sovereign wealth fund, known as the Natural Resources Fund. This fund will invest oil resources in long term infrastructure that will diversify the economy and create a sustainable economic path for the country.

Shipping and ports is a well-established sector which is projected to grow rapidly, and continuation of hydrographic surveying and capacity building, complemented with dredging work, removal of wrecks, and upgrade of navigation aids would allow the sector to expand and develop safely. There is great potential for inland waterways to contribute to sustainable marine economic development through the development and implementation of an integrated transport policy. Investment in marinas to attract more small cruise ships and yachts would stimulate the tourism sector.

The **fisheries** sector would benefit from improving capacity and training to monitor Marine Stewardship Certification, illegal fishing, and to develop potential co-location or suitable arrangements for the use of the maritime space with the growing oil and gas sector.

The actions, issues and outcomes identified in this Maritime Economy Plan are **high level, strategic issues that require further discussion and development** before they can be implemented. Appropriate sources of funding need to be identified to support this process. The Maritime Economy Plan has been able to identify organisations potentially able to provide suitable funding, however, it was beyond the scope of this initial high level approach to develop the actions and identify specific funds at this stage. The Guyana Natural Resources Fund may be utilised to finance certain activities of this MEP.

The next step along the pathway towards a blue economy is for Guyana to work across government to identify those actions that are highest priority and which Guyana is most able to develop and implement in order to create **detailed implementation plans** and identify **funding sources** capable of achieving success with regional and national development agencies and funds. Such packages should create synergies with Guyana's Integrated Coastal Zone Management (ICZM) Plan and the Low Carbon Development Strategy (LCDS), link to regional activities and goals in the Caribbean (e.g. Eastern Caribbean Regional Ocean Policy, SAMOA[4] Pathway) and meet the aims and objectives of donor countries and organisations, and funding programme's priorities. This is a significant task and should be addressed in a partnership approach across government and with regional organisations.

Maritime Economy Plan
Guyana

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1. Introduction

Commonwealth Marine Economies Programme
Enabling safe and sustainable marine economies across Commonwealth Small Island Developing States (SIDS)

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1. Introduction

1.1. What is the Maritime Economy?

A maritime economy can include diverse components, from established ocean industries such as fisheries, tourism and maritime transport, to emerging activities such as offshore renewable energy, aquaculture, deep sea mining, and marine biotechnology. The mix will depend on national circumstances but will provide social and economic benefits for current and future generations, restoring and protecting the diversity, productivity, resilience and natural capital of marine ecosystems.

In the context of developing Maritime Economy Plans, the terms marine or maritime economy and **blue economy** are considered synonymous, such that the focus on the maritime economy, and plans to support its development and growth, encompass the sustainability and equity concepts of the blue economy.

Blue economy has been defined as, "economic activities that (i) take place in the marine environment or that (ii) use sea resources as an input, as well as economic activities that (iii) are involved in the production of goods or the provision of services that will directly contribute to activities that take place in the marine environment"[5].

At its simplest, the blue economy includes all economic activities (existing and potential) that depend on the existence of the ocean, either directly or indirectly.

In many coastal States, such as Guyana, interactions between economic, ecological and social interests on land and at sea, therefore, become symbiotic and difficult to disentangle, such that a development on one side of the land/sea interface affects the other.

1.1.1. Sectors in the Maritime Economy

The maritime economy can be divided and subdivided in many ways, with high-level generic divisions such as 'Harvesting of resources', 'Trade and commerce', and 'Ecosystem services' giving way to more detailed categories based on specific and established ocean industries such as 'fishing', 'shipping' or 'tourism'. These can be subdivided further – 'fishing' can be divided by vessel size, catch method or target species and can include onshore activities such as selling and processing or supporting activities such as net making and repair or chandlery and vessel maintenance.

A key step in the development of sustainable Maritime Economy Plans is to analyse existing maritime sectors, known as 'bedrock' or traditional sectors, and to help their transition to more sustainable practices, where needed. Consideration is given to the potential for developing new sustainable maritime activities to replace those that are in decline or diversify the economy. Natural capital/ecosystem services are also take into account as these underpin so many economic sectors and activities.

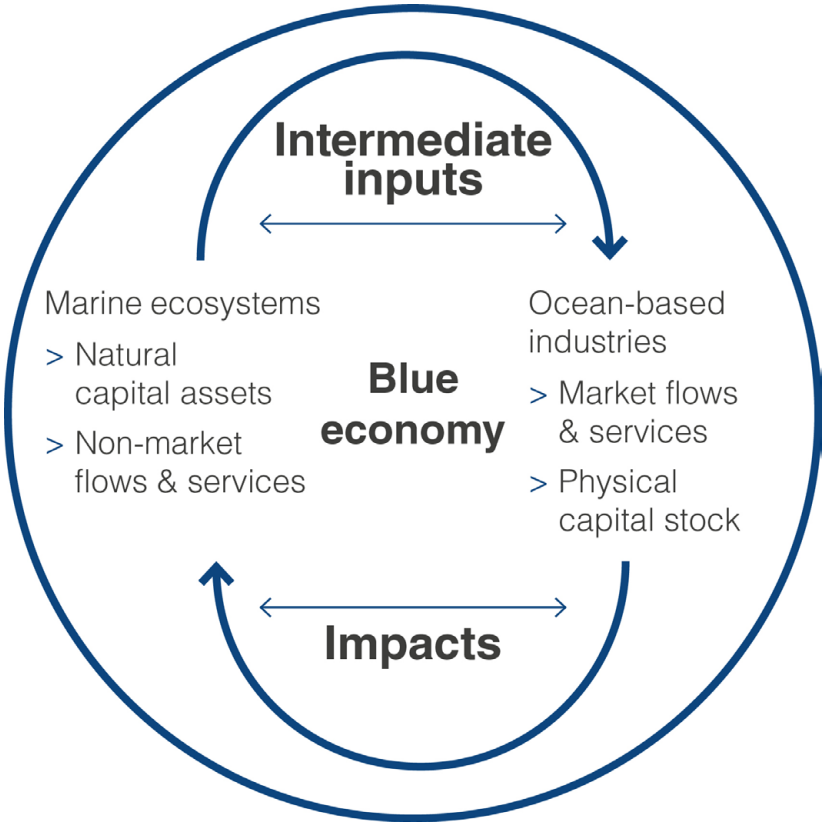

Figure 1 – A conceptual diagram of the sectors and interactions within the blue economy[6]

Marine ecosystem services

Natural resources and the economic benefit derived from them, whether specifically measured and included in economic valuations or not, are often termed **'ecosystem services'** and are also considered as part of the blue economy.

These traditionally non-monetised resources, such as the coastal defence benefit derived from reefs, are increasingly being explicitly considered in management decisions and, are integral to the value and support of the blue economy, as they underpin and support many of the traditional sectors such as fishing and tourism.

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1.2. What is a Maritime Economy Plan?

There are many types of plans used and applied in the management of the marine area. Most countries have some form of planning in their marine area already, even if they are not specifically called a 'Marine Plan' e.g. designation of shipping/navigation lanes or the identification of protected areas for conservation or fishing. Planning helps to communicate and achieve objectives. Planning, as a process, is important for a range of reasons:

> Increases efficiency by avoiding activities that do not work towards the stated objectives of the plan and by helping to organise resources.

> Facilitates coordination between organisations – everyone knows what the objectives are and helps to define roles and responsibilities.

> Helps to maintain management control over activities.

> Helps facilitate consistent decision making.

1.3. How to use this Plan

> This Plan only considers sustainable (blue) practices and is concerned with **finance** and **economics** of the Guyana Marine Area. It focuses on opportunities and risks to sustainable economic development and areas where there are greater opportunities / risks.

> It may be used to support decisions about **strategic Government / financial support** bodies or mechanisms for sectors to develop e.g. should there be financial instruments for a new fishery, for fleet renewable, for renewal energy supply chain development. Ideally, a Maritime (or Blue) Economy Plan should sit underneath and assist the implementation of a National Ocean Policy.

> It is **not** the intention that this Plan will be used to inform **individual management decisions** by regulators about which individual activities should / should not be permitted in a particular place / time - this is the role of a Marine Spatial Plan.

> It does **not set priorities for all activities / uses** - there are activities that take place in the marine area which do not have a 'traditional' economic benefit that are not included (e.g. cultural use, landscape/ seascape, non-use values, recreation, health benefits). Such activities and uses will, however, be enshrined within a National Ocean Policy (NOP) (which may sit **above** this plan[7]) or be presented within a Marine Spatial Plan, which might sit **alongside** this document. The NOP will potentially provide the platform needed to formally define the country's marine space and supporting maritime related legislation, whilst aligning with the commitments of the Government of Guyana's political manifesto 2020 - 2025. The international principles set within the EU Marine Spatial Planning Directive could potentially be applied to the Guyanese (or CARICOM) situation to support this action.

> It does not contain management measures, but may identify **how management can be financed** e.g. user access fees for recreational diving areas, blue bonds, etc.

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1.4. Benefits of a Maritime Economy Plan for Guyana

Maritime Economy Plans enable an analysis of existing maritime sectors to be undertaken in order to help the transition to more sustainable practices, where needed, and to consider the potential for developing new, sustainable marine activities. The work identifies the bedrock/ traditional sectors of the maritime economy, the emerging sectors and the natural capital / ecosystem services utilised.

Having a Maritime Economy Plan helps to demonstrate that there is a clear vision and direction for the development of a sustainable maritime economy that takes account of national issues, international commitments, such as working towards the achievement of the **UN's Sustainable Development Goals (SDGs)**, with particular reference to SDG14 – Life Below Water, and the challenges associated with a number of themes shared by Guyana and other Small Island / Coastal States, such as:

- High dependency on imports for energy – the main source of energy is from hydrocarbons that have to be imported from elsewhere.
- High dependency on imports for food supply.
- Reliance on one or a few economic sectors (e.g. fishing, tourism, etc).
- Large ocean resource, with potential for new / emerging sector growth (e.g. biotechnology, renewable energy, minerals, etc).
- Capacity constraints to effectively manage / exploit sustainably a large ocean area / resource - relatively small population, government, resource (e.g. navy, research / exploration capability).
- Vulnerable to economic and environmental shocks (e.g. earthquakes, tsunami, hurricanes), including those driven by climate change (e.g. sea level rise, ocean acidification) with low resilience / ability to recover.
- Regional co-operation and organisations are well established (these may be sector specific e.g. fisheries, or more wide ranging).
- Remote locations – increases costs for both imports and exports of goods and services.
- High levels of poverty / social inequality – need to make growth inclusive to benefit all.
- High country debt and high relative proportion of government budget on servicing debt.

The overall objective is to grow the national economy, such that the country becomes economically resilient and less reliant on financial aid. It is also intended to reflect the aims of the Commonwealth Charter, including good governance, sustainable development, gender equality and recognising the needs of small and vulnerable States.

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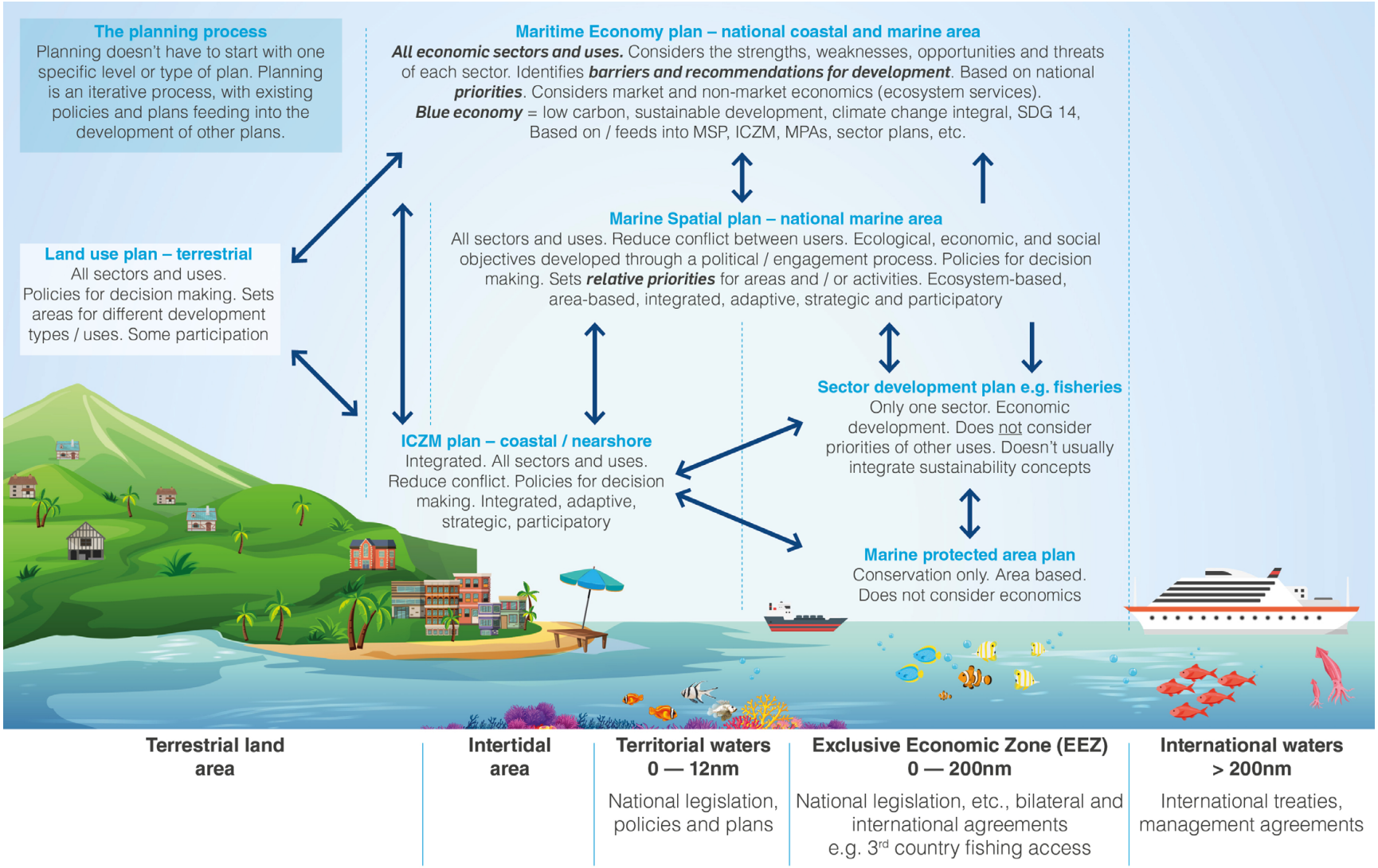

Figure 2 – Types of marine plan and how they relate to each other

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1.5. The Commonwealth Marine Economies Programme in Guyana

A number of activities have been carried out in Guyana under the CME Programme, following national engagement on country priorities in 2016. These include:

- Seabed habitat mapping and training to improve knowledge of the marine environment and support biodiversity measures to sustainably manage the coastal environment.
- Supply of new navigation charts and training in the use of new maps and bathymetric data to inform the development of future plans for sustainable blue economic growth and improve access for commercial shipping.
- Production of a Maritime Safety Information Development Plan to assist port authorities with compliance of international shipping regulations.
- Provision of data on coastal sensitivity to oil spills and risk of introduction of non-native species for the national and regional disaster management teams.
- Coastal assets and community vulnerability risk assessment against climate change.
- Training on measuring sea level, surface winds and waves to help predict natural hazards.
- Assistance to achieve Marine Stewardship Council certification for seabob fisheries (shrimp) through local capacity building for fisheries management, data collection for stock assessment and habitat mapping. Delivery of the accreditation has meant job and economic security, and training has allowed for greater independence in carrying out key activities to maintain the accreditation.
- Regional Caribbean initiatives:
  - Ocean modelling and monitoring using the Caribbean regional NEMO (Nucleus for European Modelling of the Ocean) model to validate water level, currents, temperature and salinity data to support climate change resilience and decision-making.
  - Development of the Caribbean Regional Climate Change Report Card to clearly define the risks and threats associated with climate change in vulnerable areas. This report card was used as a formal submission by the region into the UNFCCC process.
  - Hydrographic governance training and action planning to help identify and prioritise hydrographic data gaps and capacity requirements, based on economic risks, opportunities, safety at sea (e.g. shipwrecks), environment and crisis management.
  - Development of a risk register, list of case studies and guidance to improve the planning, design, and installation of subsea cables to reduce risk from hazards. This will improve understanding of the impact of hazardous events to communications cables and their causes, and will, therefore, improve telecommunications resilience.
  - Production of a Fisheries Report Card for the Caribbean on increasing the resilience of the sector to climate change.
  - Development of a report and workshop to raise awareness of renewable energy opportunities in the Caribbean.

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2. Guyana's Maritime Economy

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2. Guyana's Maritime Economy

2.1. Background

The Co-operative Republic of Guyana (hereafter, Guyana) is located on the northern coast of South America and is the only English–speaking country on the South American continent. However, despite its continental location, the country has strong historical and social links to the Caribbean. Guyana covers an area of 214,970 km^2 (83,000 square miles), with a coastline of 430km, and a population of 746,955 (Guyana Bureau of Statistics 2012). Approximately 90% of the population and infrastructure is concentrated in the coastal zone, although this accounts for only about 7% of the total land area (EPA, 2000)[8].

Approximately 30% of the population lives in urban areas, most of which are located in the coastal area. Guyana's emigration rate has been around 10,000 individuals per year, making it one the Caribbean countries most affected by emigration. Unemployment for youth is around 26% in Guyana[9], with few opportunities for young people or skilled professionals resulting in a 'brain drain'. The discovery of significant offshore oil and gas reserves is likely to dramatically reverse this trend, as large numbers of skilled workers will be required to support the development of the industry, with a further workforce needed to build the necessary supporting infrastructure.

Guyana spends approximately 24% of its GDP on imported fuel – gasoline, diesel and heavy fuel (2012 figures) (Guyana Energy Agency, 2014)[10]. The discovery of oil and natural gas below the seabed in Guyana's marine area in 2017 means that oil and gas will, at least in financial terms, overtake all other historic economic sectors. The development of this industry over the coming years is likely to significantly change the whole economy of the country, altering both the value and destination / origin of all imports and exports in a way that is difficult to predict. Estimates put the value of the reserves at over $200 billion at today's prices. Guyana's GDP jumped from US $824m in 2005 to US $3.6bn in 2017 (World Bank)[11], even before production had started in earnest. GDP is predicted to increase approximately four-fold to $13 billion by 2025 (Lunde Seefeldt, 2019)[12]. Guyana is investing the proceeds of oil and gas in its Natural Resources Fund, a kind of sovereign wealth fund, as a means to invest in long term infrastructure to enable the country to diversity its economy and have a future of clean energy.

The COVID-19 pandemic has had a significant impact on the economy of Guyana, and the Caribbean as a whole. While the national economy expanded in the first half of 2020, emergency measures (including health restrictions to returning oil and gas crews) led to a slowdown of the economy, with economic activity in the tourism sector coming to a halt, and retail business, restaurants and the construction sector contracting between 40-50%[13]. Nevertheless, the country still saw overall economic growth in 2020 and 2021, partly due to the outputs of extractive industries.

In addition to oil exports, the rising prices in gold (over 50% of exports) and rice contributed strongly to export earnings. While the pandemic depressed domestic economic activity, imports declined. Sugar production, as well as some gold and bauxite operations, were impacted by social distancing measures and the suspension of work caused by the departure of technical expatriate staff and entry restrictions on their return. The fisheries and shipping sectors have, for the most part, continued to operate with export markets of fish products remaining largely unaffected[14].

To tackle the pandemic, the Government launched several fiscal and monetary measures, and as COVID-19 gradually recedes, it is expected that the development of more oil fields will drive a surge in imports of capital and goods and lead to increased oil production, which will help narrow the current gap in the national account deficit[15].

Source: https://www.worldometers.info/maps/guyana-map/

Figure 3 – Map of Guyana

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Table 1 – Gross Domestic Product (GDP) by Industry (GY$ millions)

	GDP at Current Factor Cost				GDP at Constant 2006 prices		
	2006	2007	2008	2009	2016	2017	2018
Agriculture, Forestry & Fishing	**46,515**	**46,747**	**47,406**	**49,162**	**67,140**	**67,408**	**68,390**
Mining & Quarrying	14,031	19,209	21,649	22,701	61,208	55,798	57,402
Manufacturing	**13,324**	**12,943**	**12,675**	**13,285**	**25,933**	**27,019**	**27.292**
Industry & Construction	9,790	11,579	13,191	13,925	40,147	44,704	49,622
Wholesale and retail trade					46,337	50,375	54,459
Transport & Communication	17,438	21,867	25,112	26,946			
Financial activities	6,159	7,447	8,675	9,292	19,722	19,321	20,234
Real Estate					**4,594**	**4,825**	**5,187**
Education					**17,545**	**17,896**	**18,333**
Government	**27,132**	**29,072**	**36,611**	**39,178**	**27,877**	**28,240**	**28,607**
TOTAL GDP AT CONSTANT BASIC PRICES					**398,230**	**406,698**	**423,528**

*Sectorial data gaps affecting the total value

Note: 2005 GDP has been revised at Budget 2007

Sources: Series 2005-2009: Bureau of Statistics, https://statisticsguyana.gov.gy/nataccts.html#regdp; Series 2016-2018:

The Private Sector Commission of Guyana Ltd., 2018 Annual Report (hard copy publication).

2.2. Existing Economic Sectors

2.2.1. Context

Guyana has rich reserves of bauxite, gold and timber, but it struggles to overcome poverty and attract investment to bolster its small economy. Subsistence **agriculture** and **mining** are Guyana's most important economic activities. The country's top exports are gold, rice, aluminium ore, and raw sugar, with raw gold accounting for almost 60% of exports by value. Agricultural, fishing and forestry products account for a further 25% and bauxite 8% (figures for first quarter of 2019, Guyana BoS, 2019)[16].

Fisheries is an important economic activity along the coast, providing a livelihood for over 15,000 people, including fishers and their families, boat builders, trap and net makers, packers, distributors, retailers and processors[17]. The value of fish and fish products for local needs has also been recognised by the Government.

The **offshore oil and gas** sector is set to expand rapidly. The Government intends to build a $500 million petroleum processing and service centre on Crab Island (Krauss, 2017[18]).

Guyana has continued to reduce its current account deficit; economic growth remains positive and inflation is relatively stable at around 2%. In 2016, the IMF reported that Guyana continued to maintain its macroeconomic stability (European Commission, 2016)[19].

2.2.2. Maritime economy

This section describes Guyana's maritime economy, using the sectors set out in Table 2.

Table 2 – Maritime Economy sectors

Bedrock/traditional sectors	**Emerging sectors**
Energy – O&G	Energy – renewables, storage, hydrogen, OTEC
Shipping, ports	Biopharma
Fisheries and aquaculture	New fisheries and aquaculture incl. macroalgae
Tourism – small-scale cruise, yachting, beach/ all-inclusive resorts	Tourism – eco tourism
Minerals/aggregates	Deep sea minerals/minerals

The following tables provide details of current economic activities via a sectoral overview and summary of economic contribution, along with a short description of emerging opportunities.

Aerial view of the Demerara river flowing into the Atlantic ocean, Georgetown

2.2.2.1. Bedrock sectors

ENERGY Sector overview	Historically, Guyana has depended on imported petroleum-based fuels to power its economy, which exacerbates economic vulnerability by exposing the country to global market volatility. The largest consumer of power is the transport sector followed by the electricity sector, then agriculture, fishing and mining, residences and the industrial and manufacturing sectors. An increasing proportion of the population has access to electricity (from 68% in 1990 to 84% in 2016), but over 100,000 people are still without electricity. This is well below the regional average, both for Caribbean and middle-income states (DoE, 2019). Electricity supply and reliability is particularly low in the hinterland, leading people to use their own diesel generators. Several national and international initiatives have encouraged the use of renewable energy, but this has a limited capacity and is mainly aimed at households and small businesses. Reliability of electricity and the cost of production continues to be a challenge. The government is seeking to increase grid efficiency and remove import duties and tax barriers for renewable energy equipment, as well as expanding electricity supply. In 2014, ~17% of power generation came from renewable sources, particularly photovoltaic (PV) solar panels for household heat and electricity, biofuel from bagasse and onshore wind. There is significant potential for hydro- and biofuel power generation. Guyana has 4,600 MW - 7,600 MW of technically viable power potential in its rivers and tributaries. In this context the Government is looking at completing the Amalia Falls Hydropower Project, but is also committed to invest in solar and wind systems for off-grid areas, improve and upgrade the national grid transmission and distribution capacity; and develop micro grids for large hinterland villages.[20]
Economic contribution	Between 2012 and 2016, Guyana imported roughly US$ 300-600m per year in fossil fuels, accounting for 15-33% of imports (Ministry of the President, 2017). From 2017 to 2018 the import of 'fuel and lubricants' increased by 20.6% (PSC, 2018). Around 1,300 people are currently employed in the energy generation sector and the main regulatory body, the Guyana Energy Agency. The economic contribution of the energy sector will change dramatically, based on the discovery of offshore oil and gas.
Emerging opportunities	Discovery of significant offshore oil reserves by Exxon Mobil in 2015 has forced the country to rethink its energy policies, and establish a Natural Resources Fund. The discovery of oil and gas and the development of this industry over the coming years is likely to significantly change the whole economy of the country, altering both the value and destination / origin of all imports and exports in a way that is difficult to predict. The former US Ambassador to Guyana estimated that the GDP of Guyana would increase by 300% - 1,000% by 2025, making it potentially the richest country in the southern hemisphere (Maybin, 2019)[21]. Notwithstanding the oil and gas discoveries, some early feasibility work is being undertaken on nearshore offshore wind farms though not wave power.

Cross-cutting issues	According to the World Bank, Guyana is one of the poorest countries in South America, with 43.4% of the population living on less than US$ 5.50 per person a day in 2011 (Purchasing Power Parity)[22]. It is expected that GDP will surge when commercial production of oil and gas begins. The discovery brings concerns over environmental issues, including pollution risks, and the experience of other countries where exploitation of oil reserves has increased corruption. The government is fully aware of potential risks to traditional economic sectors, such as agriculture, and has strict fiscal measures in place to mitigate this potential 'Dutch disease'.

SHIPPING & PORTS Sector overview	Guyana has historically had an economy based on the export of commodities such as sugar, gold, bauxite, rice and wood. Some of these need to be transported from the interior of the country. The large rivers allow shipping to reach a significant distance inland from the coast and there are several large shipping facilities that are vital for connecting markets and allowing the transportation of goods where road infrastructure is limited. Georgetown is the main port of entry and exit of Guyana with smaller ports in New Amsterdam, Linden, and Corriverton. Ship maintenance and repair services are only available in a shipyard in Georgetown, with other ports only able to conduct minor repairs. There is also a floating dry-dock and a small slipway in the Demerara River, and another small floating dry-dock is at Parika, Essequibo River. Georgetown has port facilities along the East Bank of the Demerara River with container, bulk and fuel terminal capabilities. Its piers and terminals, owned by private companies or public corporations, can accommodate large vessels but growth is limited. Persistent siltation in the river caused by the large volumes of sediment coming from the densely vegetated hinterland limits the draught and ships cannot make use of their full loading capacity (Caribbean Maritime, 2013, confirmed by Shipping Association of Guyana, July 2019). Linden is located on the Demerara River approximately 100km inland from Georgetown. It serves extractive industries, which use the port to ship cargo to Georgetown for processing and storage, or directly abroad. New Amsterdam is located on the mouth of the Berbice River, on its east bank. It has 5 - 10 berths for small vessels and two oil terminal mooring points, linked to storage tanks. Corriverton is on the River Corentyne, in the east of the country on the border with Suriname. It has two jetties, one of which is used by the ferry that crosses the river to South Drain in Suriname, and a few small bulk cargo wharves. The Guyana National Shipping Corporation Limited is a government owned company that operates out of Georgetown and offers shipping services for domestic and international destinations, such as cargo handling and storage services, insurance, customs agents, and terminal operations. The Shipping Association of Guyana (SAG) is a private organisation representing approximately 31 members of ship owners, shipping agents, terminal owners, and the shipping industry of Guyana in general. Demerara Shipping Company Limited is a large local shipping operator in Guyana with its own wharf in Georgetown.

Economic contribution	Road connections with neighbouring countries are poor and most trade in goods is by ship. The GDP of Guyana in 2016 was US$ 3.5bn. Top exports by value were gold (US$ 865m), rice (US$ 166m), aluminium ore (US$ 121m), raw sugar (US$ 70m) and excavation machinery (US$ 67.6m). The main imports to Guyana in 2016 were refined petroleum (US$ 278m), excavation machinery (US$ 118m), cars (US$ 39.7m), larges construction vehicles (US$ 34.3m), and cement (US$ 27.1m) (Observatory of Economic Complexity). There is no statistical data available on employment from shipping and ports.
Emerging opportunities	Guyana's ports and shipping sector competes with Paramaribo in Suriname for transatlantic shipping services. The oil industry expansion is expected to lead to a 20% increase in cargo and storage, for which current port facilities are not prepared or equipped. There is a lack of both physical space and infrastructure for development to support required development (SAG, pers. comm., July 2019). Developments for new ports are underway along Guyana's coastline.
Cross-cutting issues	The development of the offshore oil and gas sector will produce opportunities for the ports and shipping sector, including the expansion of existing facilities, development of new ones and new job creation. However, there is a lack of a skilled workforce, so training and capacity-building is needed if the local population is to see the benefits, including multiplier effects in the economy. In addition, there is a growing demand for a growth in the riverine transport network. which links directly to the demands for a new deep-water port to help foster export and trade. Hand-in-hand with this is the need to consider potential new environmental risks of larger oil spillages associated with the oil and gas industry and increases in shipping.

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FISHERIES

Sector overview

The fishing sector is split into a large-scale offshore shrimp fishery, a separate large-scale commercial seabob[23] (Xiphopenaeus kroyeri) fishery exporting 90% of catch to the US, long-liners targeting red snapper on the deep slope and a small-scale artisanal sector supplying the local market[24].

Total catch reported in 2018 was about 41,200 tonnes, a decrease after the peak of 53,000 tonnes[25] reached in 2012, which was the result of good catches of shrimps. However, this was similar to the 41,000 tonnes and 42,600 tonnes captured in 2016 and 2017 respectively. Significant declines in catch per unit effort (CPUE) have been reported (i.e. longer trips and longer nets for the same catch), suggesting that the main stocks are being depleted (pers. comm. DoE, 2019, GATOS, January 2021). Some of the demersal species, particularly prawns and shark are showing clear signs of being exploited at an unsustainable rate. Conversely, the deep slope demersal and pelagic species are underexploited. Although some species are widely fished within 80km of the coastline, a number of species further offshore are yet to be fished commercially, including deep-water snapper, prawns, swordfish and tuna. The industry is not currently set up to exploit these species[26], in part due to the lack of data on fish stocks and the skills and equipment needed to exploit these areas, though interest for deep-sea resources in Guyana is being expressed by Chinese and Japanese fleets.

The Fisheries Department would benefit from additional capability to support stock management and monitoring of MSC certificated fisheries. Licensing and enforcement could be improved. Non-commercial fishermen are known to fish in protected areas. Piracy and illegal sales of fuel and fish are also a problem in border areas, with the Coast Guard not having sufficient resources to cover the large marine area that they have to patrol (GATOSP, pers. comm., July 2019, January 2021). Issues of concern have been raised over the 8-fathom bathymetric line, whereby a discrepancy appears to exist between fisherfolk and the Coast Guard over the correct set of coordinates from which regulations relate. Fishing limitations were extended offshore recently to be 8 fathoms (as rays were more commonly found in circa 7m depths).

In addition to the Fisheries Department, there are other advisory mechanisms in place to support the sector, including: the Fisheries Advisory Committee, an Anti-Piracy Task Force (similar to the task force within the Coast Guard and the Civil Defence Commission), the Coastal and Marine Management Committee (led by the EPA), and the Port State Measures Agreement Focus Group (PSMA), which focuses on revenue related issues.

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Economic contribution	The fishing fleet is relatively small but is of critical importance to the economy and social wellbeing of the country. Around 1,470 vessels were operating commercially in 2017[27]. It supports significant direct and indirect employment via capture and processing activities, along with boat-building and maintenance operations[28]. In 2020, coastal fisheries were estimated to provide 1,200 jobs directly and 6,000 jobs indirectly (Guyana Association of Trawler Owners; pers. comm., January 2021) and contributed 1.8% to national GDP, with the shrimp fishery being the most valuable element (Project Global)[29]. The Department of Fisheries estimates that over 15,000 people are directly employed in the fisheries sector, at a split of 10,000 working in harvesting, and 5,000 working in processing fish products[30]. Total exports of fish and fisheries products were valued at US$ 73.8m, with imports worth US$ 3.2m (FAO, 2016). Around 90% of the seabob catch is exported to the USA, with other key export markets being the EU and China (GATOSP, pers. comm., July 2019).
Emerging opportunities	Strategic initiatives, such as the Caribbean Regional Fisheries Mechanism (CRFM), promote more sustainable management of fish stocks and other marine resources for the economic and social benefits of the region's current and future populations. Guyana's membership of such organisations enables access to best-available scientific information, which can underpin domestic approaches to fisheries management measures. Mariculture represents a potential emerging opportunity but there is a need to undertake a feasibility study for options of nearshore and offshore mariculture to progress this. The red snapper longline fishery may have potential for future MSC accreditation. Overseas interest in Guyana's deep sea fisheries represents an opportunity to grow the sector, but this would potentially see much of the benefit not accruing to nationals, as product would most likely be directly exported. There are also risks around the management of such a fishery.
Cross cutting issues	It is possible that the developing oil industry may offer lucrative opportunities for those currently employed in fishing, especially for supply and support vessels that will be required in due course, which may lead to a decline in the size of this sector. There is also a perception among some in the EPA and GATOSP that offshore oil and gas operations, carry a risk to the marine environment, such as potential oil spills. The Government is producing coastal sensitivity maps and contingency response plans to minimise such risks (GATOSP, EPA pers. comm., July 2019, January 2021), and an assessment of potential impacts to marine life should accompany the growth of the sector.

MARINE MINERAL EXPLOITATION & DEEP-SEA MINING Sector overview	Land-based mining is a long-standing activity in Guyana; it is well developed but dominated by foreign companies. There are no known substantial deposits of minerals on the seabed of Guyana. Geological characteristics of the seafloor formation at the Demerara plateau of neighbouring Suriname suggest the potential presence of mineral deposits but there is no evidence this extends into Guyanese waters. Instead, the activities on the seabed in Guyana have concentrated on the exploration for oil and gas with substantial findings of offshore oil deposits made in 2015 (see Energy sector table). Guyana has several rivers flowing into the sea that are loaded with sediments from the hinterland and require dredging to enable the use of the rivers for navigation and export of materials (e.g. bauxite, timber, sugar cane). The ample supply of sediments makes extraction of sea-based sand aggregates negligible as an economic activity. While aggregates are mined and used locally, some aggregates needed for construction, such as crushed rock, are sometimes imported from Saint Kitts and Nevis (Nevis Island Administration website)[31].
Economic contribution	The economic contribution of sea mining is minimal. Minerals from the seabed are not being explored nor exploited, but there may be some minor dredging for aggregates being carried out. However, this appears to be marginal and takes place without making any significant contribution to the national economy. There are no employment figures for sea mining in Guyana.
Emerging opportunities	There are limited opportunities for the development of aggregates or marine mineral exploitation. This sector is not established, nor is there sufficient development potential. It is not considered further in the development of priorities or actions for the maritime economy.
Cross-cutting issues	Flooding events in recent years have highlighted the challenges of draining inland storm waters to the rivers and sea during high tides (tide locking), something that will be exacerbated by rising sea levels. Understanding the interaction of navigational dredging with flood risk and coastal erosion management and climate change is an important consideration.

TOURISM Sector overview	The tourism sector is projected to grow in Guyana, largely due to the oil business but also with regard to the diaspora that makes up 60% of arrivals into the country. This projected growth in tourism represents a key opportunity for Guyana. The sector is currently mainly focused on inland areas[32] as it is based around interior rainforest hikes, savannah, mountain ranges and river trips, rather than activities on the coast. Coastal tourism is limited due to a lack of infrastructure; existing opportunities are mostly centred around Shell Beach for turtle watching and at Beach No. 63 for more traditional sun and beach holidays. Both beaches have management plans in place (Guyana Tourism Authority, pers. comm., July 2019). River sport fishing (i.e. catch and release) has seen a growth in demand along the river network (GTA, pers. comm., December 2020). The modernisation of Cheddi Jagan International Airport, the widening of the road between the airport and capital, the creation of the Guyana Tourism Authority (GTA) and the construction of two large hotels (the Princess and the Marriott) have helped the sector in recent years. The number of tourists has steadily increased from 105,000 in 2000 to 151,000 in 2010 (Wenner & Tonny, 2015)[33]. There is still a lack of infrastructure, formal hospitality and of global awareness of the country's attractions, particularly for beach / marine tourism[34]. There is a need for further investment in infrastructure, facilities and services to support markets such as yachting and boat services along the rivers. Institutional capacity building, training and an expanded workforce is also required. The Tourism and Hospitality Association of Guyana (THAG) is an umbrella body for tourism-related entities that include accommodation (hotels and interior resorts), restaurants, tour operators, tour guides, domestic and international air carriers, bars and nightclubs, transportation providers, travel agencies, tourism consultants, jewellers, gift and craft shops.
Economic contribution	The direct contribution to GDP in 2017 was 4.5%, with Guyana recording the highest increased growth in the tourism sector within the Caribbean region during the first half of 2018 with a growth of 18.3% (GTA, pers. comm., January 2021). GTA estimates that tourism is worth US$123m (GTA, pers. comm., January 2021). WTTC data for 2018 calculates that the industry supports 23,000 jobs (WTTC, 2019)[35]. Tourism is a growing contributor to the economy and has potential to grow further but it is heavily community-based, where villages have pooled their resources and come together to invest in the sector as one of their main sources of income. The Ministry of Public Works (MPW) has initiatives in place to produce a Master Plan to help develop the Georgetown frontage, including the possibility of cruise terminals. The Ministry recognises the potential for the development of the cruise and yacht industry. Guyana's cruise/yacht industry is in its infancy, and provides almost negligible impact to the economy or the environment. Despite the constraints posed by its relatively shallow navigation channel, Guyana is able to accommodate smaller cruise vessels. In addition, its position south of the Caribbean hurricane belt enables it to offer safe harbour facilities for small yachts during the traditional Caribbean hurricane season.

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Emerging opportunities	Future tourism development may focus on nature-based and adventure travel or cultural heritage aspects such as the beginning of the Caribbean rum route to tell the story of rum, from ship to shop. Cruise tourism may offer prospects for river and small-ship cruising and yachting, although infrastructure will be required. Multi-destination tourism, working with Barbados, Suriname and other neighbours may also provide opportunities. Importantly, as most tourism is inland and along the river network, there is a need to assess tourism potential along the Demerara River as part of a programme to improve river transport. River sport fishing (i.e. catch and release) is being expanded along the river network as well as nature observation tours (e.g. birds) and these activities will require more and better riverine service infrastructure. Interest is also growing in sports fishing as a niche tourism area for development (Region 1 and 9). Tarpon fish is one species that offers a commercial and recreational role. Region 6 offers the experience of catfish fishing on a recreational basis with tour operators from neighbouring Suriname. The Living Guyana Tourism Strategic Action Plan 2018 – 2025 (Version 3.3, April 6, 2020) was developed and managed by the Guyana Tourism Authority and the Department of Tourism (DOT). It recognises the potential of community tourism and includes an action to evaluate existing projects with the aim of scaling up these activities. The plan provides the roadmap necessary to strengthen the tourism sector and maximise benefits to all stakeholders in the Guyana tourism sector. It is designed to guide sustainable tourism development to 2025 and is informed by the Low Carbon Development Strategy (LCDS), as well as input from government departments, the private sector, civil society and community leaders. It aims to: > raise the profile and impact of each organisation, > present an enabling environment for tourism development, > build tourism capacity, > increase market demand, > develop new products based on market demand, and > improve the positive socio-economic and conservation outcomes from all tourism activities.

Cross-cutting issues	The oil industry expansion is predicted to put pressure on the hospitality and tourism industry in Guyana. The demand for hospitality and recreational services is likely to increase and has potential to include high-value services to cater for foreign contractors and executives of the oil and gas industry. The GTA recognises the growth opportunity, but that this must be in a controlled manner to prevent negative environmental impacts. Existing regulations can be administratively burdensome for new entrants, discouraging development, which GTA is working to address (GTA, pers. comm., July 2019). Sustainability within the sector and the importance of ecosystem services to the nature-based tourism offering is recognised in the Living Guyana Tourism Strategic Action Plan (Ministry of Business & South American Undiscovered Guyana, 2018). The Georgetown Chamber of Commerce & Industry in partnership with the GTA, and the Tourism & Hospitality Association Guyana (THAG) has secured funding from the Micro, Small and Medium-sized Enterprise Development Programme of the Caribbean Development Bank (CDB) to improve the quality of hospitality and service delivery. CDB funds (GY$11 billion) are being set aside for the construction of a new Tourism Institute to increase tourism capacity and hospitality related training. This initiative will develop capacity in environmental management (eco-friendly tourism) and institutional capacity building (e.g. enforcement officers to visit villages that are not aware of regulations and caveats applying to hunting in indigenous communities). Groups such as the new “Seawalls Beyond” are being set up to reduce litter and rubbish along the Georgetown seawall in Region 4 to help promote a sustainable night-time economy.

2.2.2.2. Emerging sectors

OFFSHORE RENEWABLE ENERGY (ORE) Sector overview	There is some potential for wind power in coastal regions, but detailed wind assessments have not been carried out to determine optimal locations for turbines. In 2007, an MoU was signed between the Guyanese Government and DELTA Caribbean N.V. to construct a 13.5 MW windfarm at Hope Beach, East Coast Demerara, but this project has not proceeded to construction yet. Total Energy Solutions Inc., which has formed Hope Energy Inc., is interested in developing a 26-megawatt wind farm at the same location (DoE, 2019). ORE opportunities may be possible. Ocean Thermal Energy Converter (OTEC) technology is at the demonstration stage and requires a 20oC temperature differential between surface sea water and cooling water in waters of 1,000m depth or more; locations in equatorial waters with nearby deep seas are of interest for commercial viability, which may include Guyana. The Government has stated its intent to invest the benefits from the offshore O&G industry development into renewable energy. This will support its intention of having an energy mix made of 50% from natural gas, and 50% from renewable energy.[36] Given the preference for the use of established renewable energy technologies – e.g. solar power, biofuel and onshore wind generation – and the recent oil findings, the development of marine renewable energy appears limited.[37] However, given the continuous growth in offshore wind technologies, this should be considered as a potential renewable energy source in the future.
Economic contribution	There are no publicly available, published statistical data on employment in the renewable energy sector and the economic contribution of renewable energy is difficult to quantify. It is assumed that the development of renewable energy projects will require labour and contribute to the economy – particularly during construction- in places where the import of fossil fuels does not. However, the development of the offshore oil and gas prospects is likely to have a greater economic impact. Guyana would still require international support to implement renewable energy projects, if pursued.
Cross-cutting issues	Guyana's Natural Resources Fund will potentially invest in renewables and electricity infrastructure which could possibly include offshore renewable energy.

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MARICULTURE Sector overview	Guyana's coastline has a large tidal range and is naturally high in suspended sediment, which does not make for ideal conditions for mariculture. However, a form of fisheries enhancement similar to aquaculture has been practiced for many years on the Corentyne Coast, mostly using low input cultivation methods in brackish water and freshwater ponds. Most existing aquaculture focuses on freshwaters species. Marine species such as salmon shrimp (*Mesopenaeus tropicalis*), common snook (*Centropomus undecimalis*), tarpon (*Megalops atlanticus*) and mullet (*Mugil spp.*) are grown in brackish water. Recent declines in marine capture fisheries has resulted in a renewed interest in aquaculture (FAO website)[38] and it is attracting interest from private investors and the Government alike. The increased demand for aquaculture products, such as tilapia, in the United States and the EU (which certified Guyana as an aquaculture supplier in 2004), has strengthened the case to increase aquaculture production, which could be facilitated by the conversion of rice fields into aquaculture facilities[39]. The Government has supported the growth of the industry and is developing a regulatory framework which would set export standards and best practice for the aquaculture industry, particularly for producers of tilapia. Overall, mariculture is not considered of immediate large-scale importance in Guyana (Guyana Land and Survey Commission, stakeholder workshop, July 2019), but it is still a sector which could be explored for future growth. Experimental trial of marine cages in Region 6 to rear mullet and Quierriman are being funded by the Government to provide relief to wild-caught fisheries[40].

Economic contribution	In 2003, an estimated 100 people were involved, mainly part time, in brackish water aquaculture production which is supplemented by other agricultural activities such as rice, cash crop, chicken and cattle farming[41]. The Trafalgar Union Agriculture Cooperative has about 200, mostly female, members and, after receiving assistance from the FCDO, it has developed (freshwater) tilapia farming in excavated ponds in Region 5 (Ramotar & Fitzsimmons, 2011)[42]. In 2019 there were 3 small, 12 medium and 10 large scale brackish water farms operating in Guyana. Aquaculture production in 2017 was 231 tonnes of Black shrimp (Penaeus spp.), and 80 tonnes of Red tilapia (Oreochromis spp.),[43], decreasing slightly to 193 tonnes of Black shrimp in 2019[44]. However, the industry has lately seen additional support to increase production, with shrimp aquaculture in inland brackish waters receiving substantial financial support from the Government. During 2021 there were 23 aquaculture farms (71 ponds or 533 acres) rehabilitated; and in 2022, the plan is to rehabilitate further 66 farms (109 ponds or 1,300 acres). This intervention seeks to increase annual production from an average 250 tonnes to over 500 tonnes to promote employment, secure livelihoods, provide food security and increase exports[45]. As part of the Government's support to the industry, it developed in collaboration, with the Guyana School of Agriculture, a certificate course in Fisheries Studies, which includes aquaculture studies. The course aims to build capacity and create jobs in the sector, including small scale aquaculture development. Currently, a strategic plan for inland fisheries and aquaculture development and management is being elaborated.[46]
Cross-cutting issues	Converting existing rice fields into aquaculture facilities may cause environmental impacts associated with the excavation of ponds, management of water resources and resulting waste products from in-water fish farming on an increased scale. The current flood and weather related risks that challenge the development of coastal mariculture are coastal erosion, high sediment loads, inland flooding leading to large river flows post storms and coastal storm surges. These issues are likely to increase in frequency and magnitude with climate change.

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BIOPHARMA Sector Overview	The marine environment represents a unique source for finding raw materials for pharmaceutical and cosmetic purposes. Rich biological and genetic diversity has potential for biotechnological applications related to drug discovery, environmental remediation, seafood supply and safety, and developing new resources and industrial processes. The key to future biotechnology is the systematic search for biopharmaceuticals in marine organisms from the sea, along the coast, the seabed or beneath the seabed. The technological journey involved in the search for biopharmaceuticals, from finding an organism with biotechnological potential to having a product that is marketable, can be a complex, time-consuming and expensive procedure. There is no guarantee of success. It is important that the search for biopharmaceuticals does not take valuable resources without compensating the communities from which the samples have come, or whose knowledge led to a valuable discovery. The economic value of the search for biopharmaceuticals can benefit the pharmaceutical industries, the host country and the indigenous community who gain benefit from ownership of the biological resource and can expect adequate compensation for resource use, particularly after the Convention on Biological Diversity (CBD) in 1992 (Sandhu)[47]. The CBD, of which 196 countries are signatories (including Guyana)[48], requires the 'fair and equitable sharing of benefits arising out of the utilisation of genetic resources (Sandhu). Protection for such activities, via 'Benefit Sharing' are enshrined in The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity. Guyana has acceded to the Nagoya Protocol. In 2020 the Government announced that it will establish an International Centre of Excellence for Biological Diversity with the objective of promoting cutting-edge research and developing and exporting educational services (PPP/C Manifesto 2020). This sector is not established, nor is there a clear development potential to be supported by Government. While there are examples of the use of terrestrial genetic resources by indigenous communities that have been developed into products, currently, the use of marine genetic resources is limited and is not considered further in the development of priorities or actions for the maritime economy.
Economic contribution	There are no publicly available, published statistical data on the economic contribution of the biopharma sector or of employment connected to it.

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3. Cross Cutting Issues

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Enabling safe and sustainable marine economies across Commonwealth Small Island Developing States (SIDS)

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3. Cross Cutting Issues

A number of issues cut across the different economic sectors previously highlighted and deserve consideration in their own right. Individually, they are significant enough, but their inter-connections increase their individual effects. As a result, these interactions need to be actively considered as part of the recommendations contained within a Maritime Economy Plan.

3.1. Regional Organisations in the Caribbean

Countries in the Wider Caribbean Region have a strong tradition of working together to achieve shared goals and this is a particular feature in relation to ocean governance and management. The **Caribbean Community (CARICOM)** is an economic bloc of 14 member countries (including Guyana) that allows for the implementation of common approaches and collaboration including the use and exploitation of marine resources. CARICOM has several associated agencies that deal with issues of relevance to maritime economy sectors or concerns, including the Caribbean Regional Fisheries Mechanism (CRFM), Caribbean Community Climate Change Centre (CCCCC), Caribbean Tourism Organization (CTO), the Caribbean Institute for Meteorology and Hydrology (CIMH), Caribbean Meteorological Organization (CMO), Caribbean Regional Organization for Standards and Quality (CROSQ) and the Caribbean Public Health Agency (CARPHA).

The **Organisation of Eastern Caribbean States (OECS)** was established by several CARICOM states. Whilst not specific to Guyana, these countries share a common approach to policy areas such as trade, health, education and the environment, including matters relating to the sea and its resources. The OECS is also an economic union of member states with a single currency (Eastern Caribbean Dollar). It also provides the basis for the delivery of the Principles of Environmental Sustainability under the St. George's Declaration, making it a significant driver to achieve SDGs in the Eastern Caribbean.

In 2013, the OECS approved and adopted the **Eastern Caribbean Regional Ocean Policy (ECROP)** to promote a common approach to ocean governance in all member states and mandated that each member develop a national ocean policy to support the regional policy. The ECROP has a number of priorities and goals, of which many find synergy with the SDGs. Whilst not specific to the Guyanese context, the principles set out will prove of relevance in any future National Ocean Policy (NOP) for Guyana[49].

3.2. Current State of Marine Planning and Management in Guyana

Guyana published an Integrated Coastal Zone Management (ICZM) Action Plan in 2010, drafted by the Environmental Protection Agency (EPA). The EPA operates under the Office of the President and is responsible for overseeing the effective management, conservation, protection and improvement of the environment. The EPA has established Coastal and Marine Management Committee (CMMC) with a focus on addressing issues within Guyana's coastal and marine environment. However, no formal effort has been made recently to produce a new climate resilient ICZM Framework for Guyana, which could be a mechanism to ensure improved sectoral integration.

There is a Marine Spatial Planning (MSP) project in place between Guyana and Suriname. The four-year EU funded project Promoting Integrated and Participatory Ocean Governance in Guyana and Suriname: The Eastern Gate to the Caribbean, is being implemented through a partnership between WWF Guianas, Green Heritage Fund Suriname (GHFS), Guyana's Protected Area Commission (PAC) and the Nature Conservation Division (NCD). The project aims to improve the governance and protection of the coastal and marine environment through marine spatial management and improving the capacity and knowledge of key stakeholders in these areas.

The project will use a participatory approach to fill critical information gaps in marine and coastal data to help support and facilitate more informed decision making on marine management and protection. The project takes account of indigenous peoples' and gender issues to ensure equity of input from these groups to ensure their needs are met and will be taken account of in decision making (WWF, pers. comm., July 2019).

Although the project focuses on marine protected areas (MPAs), it is expected that it will act as a catalyst for a more comprehensive MSP process in the future, as it will have a range of outputs that can be used to inform marine spatial planning / plan creation, such as:

- Legislative review and gap analysis – to consider what national legislation exists and what is required to enable effective marine spatial management;
- Stakeholder analysis – identifying stakeholders and their roles;
- Capacity needs assessment – what technical and stakeholder capacity exists and what is required to help planners, decision makers and managers to create and implement marine spatial planning;
- Equivalence gap analysis for indigenous peoples – analysis to ensure the needs of indigenous and harder to reach groups are included in marine spatial planning;
- Engagement platform – framework for regular and effective participation to enable stakeholders to interact;
- Marine GIS atlas – integrating all local knowledge, satellite data (published and unpublished) to a GIS platform to inform decision making and management actions;
- Environmental sensitivity index maps – summary of coastal and marine resources at risk, should an oil spill take place;
- Oil and gas national management guidelines – promoting a better understanding of potential risks of oil and gas exploration and production;

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- Ocean data repository – for all oceanographic and marine data;
- Marine spatial zoning plan – a framework for management, zoning and governance for the marine and coastal area;
- Participatory 3D modelling – community-based process that integrates local spatial knowledge with topographic data to produce 3D models.

Table 3 – Ministries, Departments and Bodies with a role in marine planning and management

Ministry / Department / Organisation	Role in marine planning / management
Department of Environment and Climate Change (Office of the President)	Provides policy and strategic direction in aspects of coastal and marine planning regarding the environment and climate change, including UNFCCC negotiations and processes. It supports development in the areas of biodiversity, renewable energy, water management and the blue economy, in line with the LCDS.
Geology and Mines Commission (Ministry of Natural Resources)	Regulates some mineral extractive activities exploration for oil and gas.
Guyana Forestry Commission (Ministry of Natural Resources)	Responsible for monitoring state forests including mangroves.
Petroleum Management Programme (Ministry of Natural Resources)	Manages hydrocarbon resources (including recent offshore oil findings). Responsible for the review and upgrade of the current Oil & Gas regulatory framework and operational and management system.
Guyana Energy Agency (Office of the Prime Minister)	Manages aspects and advises on matters relating to energy, including oil, gas and renewables.
Civil Defence Commission	Responsible for disaster risk management (including coastal risk) and developing oil spill response plans.
Guyana Tourism Authority	Manages and promotes tourism including river and coastal activities.
Ministry of Tourism, Industry and Commerce	Provides policy and strategic direction for the tourism sector, including greater diversification and competitiveness in coastal tourism activities.
Fisheries Department (Ministry of Agriculture)	Administers and manages offshore, coastal / inshore fisheries and aquaculture.
Guyana National Shipping Corporation	State-owned company rendering port and maritime transportation services.
Environment Protection Agency	Responsible for the ICZM Action Plan (2010), heading the Coastal and Marine Management Committee, promoting awareness of ICZM, regulating industrial activities, including environmental management linked to the Oil & Gas sector.
Guyana Land and Survey Commission	Administers public record of land ownership.
Central Housing and Planning Authority (Ministry of Housing and Water)	Manages and advises on housing and urban planning including coastal development.
Guyana Defence Force Coast Guard	Responsible for surveillance and monitoring fishing vessels and maritime area enforcement.

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Ministry / Department / Organisation	Role in marine planning / management
Ministry of Finance	Key stakeholder in allocating funds to implement the updated LCDS and MEP.
Ministry of Foreign Affairs	Coordinates foreign policy including international boundaries and international maritime conventions and agreements.
Ministry of Public Works	Administer and manages major public infrastructure works such as sea and river defences.
Maritime Administration Department (MARAD) (Ministry of Public Works)	Manages ports, harbours, and ship registration and licensing, including certification for maritime jobs, surveys, inspections, port state control, and monitoring of shipping within national waters. MARAD is also the principal source of hydrographic surveying information.
Demerara Harbour Bridge Company (Ministry of Public Works)	Manages the Demerara Harbour Bridge.
Canawaima Ferry Services Inc. (Ministry of Public Works)	Manages ferry services to and back from Surinam.
Transport and Harbours Department (Ministry of Public Works)	Manages scheduled ferry services in Guyana.
Hydro-meteorological Office (Ministry of Agriculture)	Advises on meteorological information including sea conditions.
National Agricultural Research and Extension Institute Mangrove Department	Responsible for managing and monitoring mangrove areas, restoration and replanting.
Ministry of Local Government and Regional Development	Responsible for guiding the sustainable economic development of each region's local government. It also promotes participation among local governments, the central government and civil society.
Ministry of Education	Has formative role in training and in raising awareness about marine and maritime issues.
Sea and River Defence Board	Responsible for coastal and riverine flood defences, construction and maintenance.

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3.3. Weather events and Climate Change

Guyana has a tropical climate that is typically warm and moist. Mean air temperature is 25-27.5˚ throughout the year in most regions except the upland regions in the west of the country, where mean temperatures are a cooler 20-23˚C. There are two distinct rainfall seasons (April to July and November to January) and two dry seasons (February to April and July to November). The major weather system is the Inter-tropical Convergence Zone (ITCZ), and the major climate system is the El Niño Southern Oscillation (ENSO). A unimodal annual wet cycle (mid-April to August) is witnessed over the southernmost part of Guyana. The Rupununi Savannahs experience one wet season (May to September) and one dry season (October to April); this area has an annual precipitation ranging from 1300 to 1400 mm, which is lower than the tropical wet climate zone, and annual rainfall is less well distributed throughout the year; the wet season is shorter and the dry season longer with a more severe risk to drought.[50]

Guyana's tropical marine environment / coastal plain represents 6% of the country's area and this is where 90% of the administrative, industrial, agricultural and residential activities of the country are concentrated, including approximately 85% of the population[51]. Domestic agriculture is particularly vulnerable to sea level rise, given that the majority of the country's most productive soils are located along its narrow coastal strip.

The main natural hazard is flooding, mostly linked to heavy rainfall but also sometimes linked to sea swells and storms. Large rainfall events increase the water volume of rivers and the combination of fluvial (river) flooding, terrestrial run off and tides can lead to 'tide locking' and exacerbate flooding. The low-lying coastline, which in some areas is 2m below sea level, has experienced many floods in recent years that are heavily influenced by La Niña events[52]. As well as inundation of coastal areas, overtopping of existing sea defences leads to saline intrusion into water sources (both surface and ground water). The El Niño and La Niña events affect water supply on a yearly basis and can affect the recharge rate of both ground and surface water supplies. Conversely, Guyana is also affected by drought on an annual basis, which is heavily influenced by the ENSO.

Future climate projections indicate a continued rise in temperature and increase in intensity and frequency of extreme events[53]. This could result in increased storm surges during the Caribbean hurricane season, greater rainfall, flooding and erosion and saline intrusion to important agricultural production areas.

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3.3.1. Opportunities and plans for climate action

In 2001 Guyana published a **National Climate Change Adaptation Policy and Implementation Plan** as its response to a wider framework for planning for climate change in the Caribbean. This sets out the legal, policy and management mechanisms proposed to mitigate the adverse effects of climate change. It focuses on the low-lying coastal plain even though climate change will negatively impact the entire country.

The Government also published a **National Climate Change Action Plan** (2001), which called for climate change measures be considered from a socio-economic development perspective. It identified actions to deal with the impacts of climate change such as coastal zone monitoring and management, assessment of the impacts of sea level rise and warming on coastal activities (e.g. on agricultural land, coastal aquifers, coastal flooding, fish stocks, nursery and aquaculture sites, migratory fish species, drainage and irrigation), assessment of sediment losses on the coast including ways to halt land erosion.

Guyana's has been an active party in the UN Framework Convention on Climate Change and is currently drafting a new set of **Nationally Determined Contributions (NDC)**. A National Adaptation Strategy for the Agricultural Sector was produced to build resilience and adaptive capacity along with promoting awareness adaptation techniques. Keeping forest degradation to ensure a high level of forest cover (87%) to maintain the country's global position as an important carbon sink. This forms the major part of the existing LCDS (2013).

Of particular significance is the update to the **Low Carbon Development Strategy (LCDS)**. This was issued originally in 2010, updated in 2013 and is currently being updated (2022). It seeks to transform Guyana's economy from one of a high energy intensity 'business as usual' path towards one focused on low carbon growth and reduced exploitation of forests with concomitant benefits for climate change mitigation. Linking the pillars being set for the LCDS with those in the MEP can also reference similar Policy Outcomes set for the Eastern Caribbean Regional Ocean Policy (ECROP), which may be relevant to Guyana. Consultation on the updated LCDS is scheduled for April 2022. The updated LCDS intends to reflect a new impetus towards better mainstreaming of environmental issues, including forestry, biodiversity protection, water management issues (including coastal flooding risk), energy, and the blue economy.

The **Climate Resilience Strategy and Action Plan (CRSAP) for Guyana (2015)** summarises the key strategic actions that need to be taken to increase Guyana's resilience to a variable and changing climate. It builds on the earlier policy work and identified key climate risks and priority resilience building actions.

Mitigation:

> Renewable energy – including large solar farms, large hydro systems (Amaila Falls), small hydro systems in Moco Moco, Kato and Tumatumari and 26 MW wind farm.

> Sustainable forest management (SFM) – Voluntary Partnership Agreement and promotion of reduced-impact logging with emission reduction potential estimated at 0.43 MtCO2 per year;

> Monitor, Report and Verification System (MRVS) for forest resources and carbon stock under the climate and forest partnership with Norway;

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> Conservation – conservation of an additional 2 million hectares through Guyana's National Protected Area System and other area-based conservation measures in line with the commitments under the UN Convention on Biological Diversity (UNCBD).

Adaptation:

> Comprehensive land use planning and sustainable land management – strengthening support for indigenous communities.

> Biomass energy – the use of bio-digesters to reduce waste, produce biogas and provide affordable, healthy and efficient household cooking fuels.

> Coastal Zone Management – mangrove restoration programme and use of dredged material along the coast, using ecosystem services to provide protection against erosion and flooding.

> Watershed and River Basin Management - integrated water management infrastructure including the construction, rehabilitation and maintenance of canals, sea defences, water supply and sanitation; protection of conservancies, reservoirs and their watersheds and the watersheds upstream of new hydro-power sites.

> Agriculture – development and introduction of crop varieties that are flood resistant, drought tolerant and disease resistant; introduction of new agricultural techniques such as hydroponics, etc.

> Disaster preparedness – upgrading infrastructure and other assets to protect against flooding; development and implementation of Early Warning Systems.

> Climate services – enhanced weather forecasting including microclimate studies and localised forecasting.

> Climate Risk Management - implementation of the Climate Resilience Strategy and Action Plan for Guyana (CRSAP); development of environmental and climate change awareness programmes; development of innovative financial risk management and insurance measures along with hinterland adaptation measures.

3.4. Ecosystem Services

Coastal and marine ecosystems provide a variety of ecological functions that directly and indirectly translate to economic services and value to humans. However, the value of ecosystem services is often difficult to quantify as it is not easily captured in 'traditional' economic balance sheets. The importance of natural assets can be disregarded if they are under-valued, and they may become overused or depleted. In turn, this may have real and significant, if unintended, knock-on effects to economic sectors. Strategies to implement Payments for Marine Ecosystem Services, (mangroves and peatlands, etc.) in line with the terrestrial model, is an important focus of the (updated) LCDS and something Guyana can explore, as this has not been given much consideration for the marine area to date. Specific reference is placed on current initiatives to support the Barima Mora Passage Mangrove Forested Area, which has research tourism potential with the indigenous Warraus Community of Imbetero[54]. The Government of Guyana seeks to continue its fulfilment of the agreement made with the Government of Norway for Ecosystem Service Payments linked to forestry conservation.

The Protected Areas Commission (under the Office of the President) is seeking to establish a network of Marine Protected Areas (MPAs) in Guyana to comply with international commitments.

3.4.1. Economic contribution

There is no published data compiling the value of ecosystem services for Guyana at present. However, the government, NGOs and private sector have begun to recognise the importance of coastal and marine ecosystems to the economy as well as the importance of ecosystem services in natural coastal defences, including mangroves and their protection and restoration. Coastal mangroves have been severely depleted due to damage by human use, rise in sea level, increased wave force, and impacts from pollution from timber operations as well as industrial and agricultural run-off. In 1992 the total area of mangrove forests in Guyana was estimated at 80,432 hectares but by 2017 the total coverage had decreased to 22,632 hectares (DoE, 2019). Long term sustainability is hampered by the natural movement of mud banks along the coastline. A pilot programme on mangrove restoration was funded under the Global Climate Change Alliance and the Government is currently seeking to strengthen and expand the National System of Protected Areas, which could potentially include mangrove areas.

There are 10 different organisations involved with mangrove management in Guyana, however, the Sea and River Defence Board (within the MPW) is the organisation legally responsible for their management and protection. In practice, much of the management and monitoring of the mangrove areas is carried out by the Mangrove Restoration and Management Department in the National Agricultural Research and Extension Institute (NAREI) of the Ministry of Agriculture, which also undertakes restoration, replanting, and research in co-operation with Universities and community development activities. This responsibility, in part, overlaps with that of the Guyana Forestry Commission (GFC), which controls and monitors state forests including mangroves, however, it is now agreed, in principle, that the GFC will oversee mangrove monitoring and management.

Limited data is available on the value of mangroves to coastal protection to Guyana but the value of international support for engineered solutions for coastal protection and drainage

management is over US$50m. Conservation International estimates that replacing aging seawalls with a combination of mangroves and sea defences could potentially save US$1.5-3.6 billion in repair and maintenance costs.[55] Improved protection from restored mangrove ecosystems could reduce the need to spend on engineering solutions. It is also estimated that Guyana's mangroves sequester approximately 17 tonnes of carbon annually (DoE, 2019b and Moonsammy 2020).

3.5. Coastal Risk Management

The low-lying coastal plain of Guyana is 459km in length and between 26km and 77km wide with many parts below sea level. It consists of man-made and natural sea defences such as mud banks, mangroves and sand flats, all of which serve to protect the coast from inundation and flooding. Agriculture is the dominant economic activity in the coastal zone, which has favourable soil and climate for crops such as sugarcane and rice (EPA, 2000) but is at risk from erosion and saline intrusion.

Flood risk management is an ongoing challenge and Guyana, over many decades, has invested heavily in a system of conservancies to manage flood waters and rainfall run-off and also for irrigation water to farm lands on the coastal plain, the most significant being the rice farms. Flooding events in recent years have highlighted the challenges of draining inland storm waters to the rivers and sea during high tides (tide locking). This will be exacerbated by rising sea levels in the future. Maintaining sustainable sea and river defences is a top priority for the Government, as reflected in the Sea and River Defence Sector Policy. Risk-informed investments will strengthen defences as well as contribute to sustainable and equitable economic growth.

The Civil Defence Commission (CDC) has overall responsibility for disaster risk management, including coastal risk and is a full member of the Caribbean Disaster Emergency Management Agency (CDEMA). Responsibilities for coastal defences, drainage and irrigation systems lie with other Government Departments. Guyana has developed a National Integrated Disaster Risk Management Plan and Implementation Strategy (2013 - 2023) and has recently carried out consultation to feed into drafting of the Disaster Risk Management Bill (CDC pers. comm, July 2019). This will streamline roles and responsibilities that are currently distributed among various institutions. It will also allow Guyana to meet its international commitments as a member of CDEMA (e.g. establishing a National Disaster Coordinator, etc.)[56].

Since 2019, the Ministry of Public Works (MPW) has been implementing coastal defence actions in line with ICZM principles, as part of an effort to include scientific information in the planning process and develop strategic interventions to rationalise resources[57]. This has been supported by the EU EDF programme[58] and the funding has included support to update the Disaster Risk Management Bill, a Sea Defence Bill, multi-annual maintenance and investment plans, improved and upgraded outfalls to increase drainage capacity and support to establish protected areas of mangrove.

3.5.1. Resources and training

In order to enhance national capacity to respond to disasters, the CDC has set up a Voluntary Emergency Response Team (VERT) which receives training and support from the University of Guyana. The team of volunteers (which includes engineers, doctors, technicians and other professionals) will help with responses to disasters primarily at community level[59]. The CDC has also carried out vial training sessions in Disaster Risk Management and action with the coastal communities.

Oil spill contingency planning has become more important at a national level since the discovery of oil. Significant technical, human and equipment resources are required for surveillance, containment / remediation action and monitoring resources in the event of an incident occurring. Sufficient resources are not currently in place and will need to be developed to support the sustainable development of the oil and gas sector.

3.6. Gender Equality

The UN SDG 5 aims to achieve gender equality and empower all women and girls. There are nine targets, with at least one indicator each, that aim to achieve the overarching goal. Maritime industries are traditionally male-dominated areas, particularly in bedrock sectors of fishing, ports / shipping, marine aggregates. Commercial and offshore fisheries remain a male-dominated sector worldwide. Women's roles and activities in these bedrock sectors tend to be in supporting onshore roles, such as fish processing, food preparation and service sector roles.

Women's involvement in subsistence nearshore / coastal fishing is often unpaid and, therefore, undervalued in economic data. A move towards valuing ecosystem services and the economic contribution that ecosystems make in supporting the economy will help to highlight the value of the roles of women to the economy. The stewardship and management of ecosystem services and the creation of new small scale business opportunities can also provide additional opportunities for women and more rural or remote island communities, such as through small scale aquaculture.

Tourism is one maritime economy sector that offers a wider range of opportunities for women to take an active part of the economy. The opportunity to diversify and expand the tourism offering creates the opportunity for women and rural / remote communities to engage in the economy.

The UN has highlighted the gender equality issues around the COVID-19 pandemic, noting that the majority of caregivers, at home, in communities and in health care, are women. Although those most affected by COVID-19 are reportedly men, the elderly, and people with chronic diseases and weak immune systems, women and girls are disproportionately impacted by both the disease and the public health measures to contain it. Women are at increased risk of infection due to their caregiving role; and of loss of livelihood, due to their jobs tending to be in service sectors that have been closed; or in part time or informal work.

The development of this Maritime Economy Plan has included consideration of how gender equality currently affects the maritime economy sectors as part of the multi-criteria analysis carried out (see section 4.1).

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4. Analysis and Plan Development

Commonwealth Marine Economies Programme
Enabling safe and sustainable marine economies across Commonwealth Small Island Developing States (SIDS)

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4. Analysis and Plan Development

This Plan has been produced as a result of several months of desk work combined with a consultative mission to Guyana, during which intensive discussions were scheduled with wide a range of Government, NGO, Private Sector Stakeholders and others. It is, therefore, very much a strategic overview of Guyana's maritime economic potential. Often such swift approaches and taking a 'helicopter view' can be a highly beneficial mechanism for succinctly cutting through detail and prioritising needs.

This document is presented as a basis for further dialogue and to support Guyana along the difficult but necessary pathway towards the realisation of a blue economy.

The draft Plan was subject to wide-ranging scrutiny and consultation and following associated revisions, it is anticipated that it will ultimately assist Guyana in the implementation of its ICZM approach to coastal management and the development of any marine spatial plans that are developed in the future.

4.1. Methods

The following methods were developed and applied to assist consultation and discussions with stakeholders and analysis of information:

- To help gather information during country visits and seek the views and opinions of stakeholders to inform the development of the maritime economy plan, a series of **structured questions** was developed. Questions were grouped by sector (e.g. fisheries) or theme / issue that is common to many Small Island / Coastal States or that has the potential to affect the maritime economy (e.g. disaster risk, infrastructure and engineering).
- Where appropriate, stakeholders were aided in the process of prioritising maritime sector issues with the help of a **Card Sorting exercise (see Figure 4)**. 'Card sorting' prioritisation of maritime economy sectors and discussions of priorities were held with stakeholders, either individually, in groups, or in workshops. Discussions focused on four 'key drivers' for the country's maritime economy, their relative importance and any potential tensions between the key drivers, to understand the over-arching issues of importance affecting all maritime economy sectors. Figure 4 presents the key drivers.
- Information collected through the structured interview questions; a desktop study of published and grey literature and reports and data provided by the departments and ministries contacted was subject to a **bespoke multicriteria analysis** developed to help inform the maritime economy plan process. The multi-criteria analysis was termed a **GESTER analysis** (see Table 4).
- Traditional and emerging maritime economy sectors were subject to the GESTER analysis of the current situation or status of the sector, considering both positive and negative aspects of the sector. The exercise served **to expose the process to basic environmental and social screening**.

The criteria against which each sector was considered are shown in Table 4. Card sorting (see Figure 4) provided a series of lenses for examining different sectors. The Maritime Economy Plan was then drafted following this analysis.

Table 4 – Multicriteria (GESTER) analysis

Criteria	What is considered/included?
Governance	Regulation, management, monitoring, enforcement, resources (human and technology)
Environment	Impacts/risks to the environment from the sector, dependency on environmental quality/risks from other sector impacts to the environment
Social	Consider gender, rural and urban, educational factors, health and safety, community issues, skills and training of workers today, access to training/education for future workforce, availability of workforce locally, loss of workforce overseas, influx of workers from overseas
Technology	Consider impacts of new technology on the sector, technology requirements for the sector, if low tech can achieve similar outcomes
Economy	The effects on the economy, or economic effects on this sector – local and global factors, resilience to economic change
Resilience & Risk	To/from natural hazards (earthquake, tsunami, extreme weather) and climate change (increase in extreme weather, sea level rise, ocean acidification, sea temperature rise), preparedness and response to events, integration across policy/government

Kaieteur waterfall, one of the tallest falls in the world at Potaro river, Guyana.

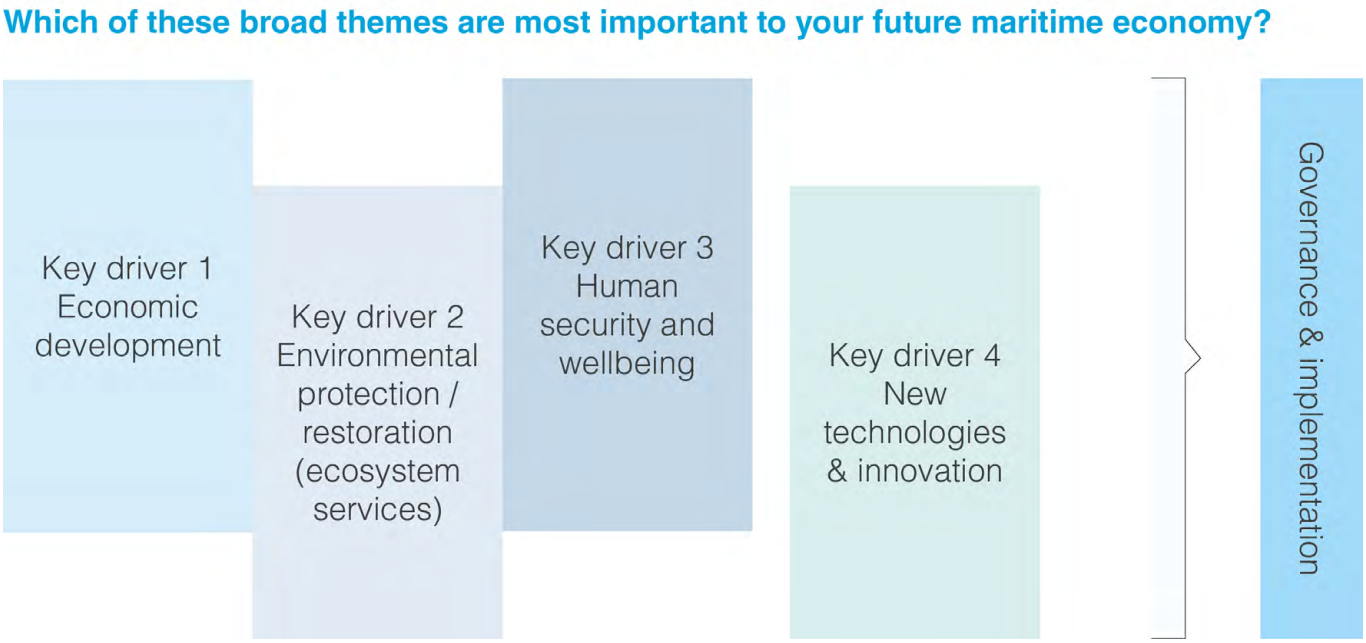

Figure 4 – Card sorting key drivers

Building a vibrant and productive maritime / blue economy may be assisted by concerted focus upon key maritime economic sectors. These sectors may then be aligned with a series of over-arching Principles that once adhered to will assist a country to follow a clear and inclusive pathway to sustainable maritime economic growth (see Figure 5).

The United Nations has adopted ocean development as part of its **Sustainable Development Goals (SDGs)**. SDG 14 aims to ***"Conserve and sustainably use the oceans, seas, and marine resources for sustainable development."*** The blue economy interlinks with the majority of the SDGs, including SDG5, SDG11, SDG8, SDG7 and others. Aquatic and marine resources play a crucial role in supporting maritime economic sectors. Progress towards a blue economy can help achieve a range of SDGs. Figure 6 illustrates some of the linkages between blue economy development and the 17 SDGs[60].

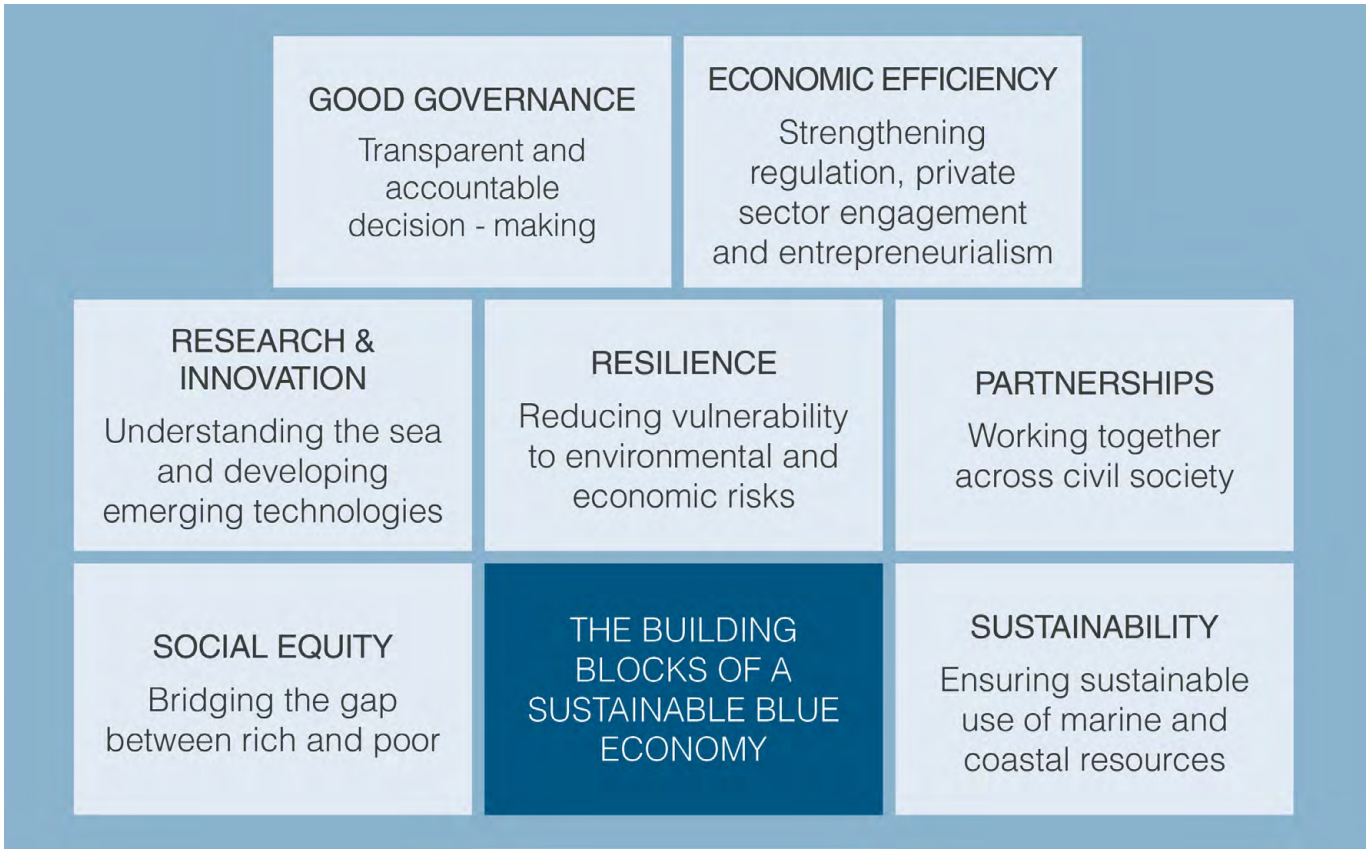

Figure 5 – Principles of a sustainable Blue economy[61]

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Sustainable development Goals:

SDG 1 – No poverty
SDG 2 – No hunger
SDG 3 – Good health and wellbeing
SDG 4 – Quality education
SDG 5 – Gender equality
SDG 6 – Clean water and sanitation
SDG 7 – Affordable and clean energy
SDG 8 – Decent work and economic growth
SDG 9 – Industry innovation and infrastructure
SDG 10 – Reduced inequalities
SDG 11 – Sustainable cities and communities
SDG 13 – Climate action
SDG 14 – Life below water
SDG 15 – Life on land
SDG 16 – Peace, justice and strong institutions
SDG 17 – Partnerships for the goals

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Potential positives of proper development of the Blue Economy:

SDG 1 – Improved livelihoods and employment. Investment in enterprises.

SDG 2 – Enhanced sustainable food production. Improved food distribution

SDG 3 – Improved water quality. Increased funding to health services. Improved occupational safety of seafarers

SDG 4 – Enhanced knowledge infrastructure. Increased funding for the education sector. Skill development

SDG 5 – Increased equal rights to economic resources. Increased participation in decision making

SDG 6 – Increased funding for access to dean water and sanitation Investments in nature-based water provision services

SDG 7 – Enhanced access to renewable energy Improved knowledge base to build and maintain infrastructure

SDG 8 – Job creation. Economic diversification

SDG 9 – Increased and improved infrastructure. Technological progress

SDG 10 – Enhanced benefit distribution. Enhanced participatory engagement of all stakeholders

SDG 11 – Improved cycling, harvesting, and use of water. Cities have access to dean renewable energy

SDG 13 – Removal of inefficient fossil-fuel subsidies. Promotion of more equitable trade of goods and services

SDG 14 – Enhanced health of aquatic and marine ecosystems Increased stock abundance supporting sustainable fisheries

SDG 15 – Increased water security. Enhanced sustainable transboundary water sharing

SDG 16 – Improved governance. Promotion of continental peace and security

SDG 17 – Improved partnerships between public, private, and civil society actors. Strengthened continental cooperation

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Potential negatives of improper development of the Blue Economy:

SDG 1 – Space conflict. Marginalization

SDG 2 – Increased food waste. Harmful commoditization of food

SDG 3 – Pollution. Weak revenue capture at national level

SDG 4 – Outsourcing of skilled labor. Unwillingness to invest in local training and education Brain drain

SDG 5 – Increased gender disparity in wages. Proliferation of income gap

SDG 6 – Water pollution. Destruction of nature-based water provision services

SDG 7 – Continued incentivisation of carbon-based energy. Population displacement. Environmental impacts

SDG 8 – Wealth concentration. Over-reliance on quantitative growth

SDG 9 – Environmental impacts. High dependency on technology

SDG 10 – Business as usual. Concentration of influence

SDG 11 – Increased pressure on freshwater. Resources Pollution

SDG 13 – Unsustainable production practices Increased waste flows. Transition to low carbon economies. Resilience to uncertain climate future

SDG 14 – Overexploitation of aquatic and marine resources. Environmental degradation

SDG 15 – Nutrient pollution. Biodiversity loss

SDG 16 – Resource conflicts. Failure to implement and enforce laws and regulations. Dutch disease and resource curse

SDG 17 – Insufficient partnerships. Bureaucratic complexity

Maritime Economy Plan
Guyana

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5. Key messages, Priorities and Actions

Commonwealth Marine Economies Programme
Enabling safe and sustainable marine economies across Commonwealth Small Island Developing States (SIDS)

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5. Key messages, Priorities and Actions

This section of the plan sets out the key messages and priorities for the maritime economy of Guyana. It highlights the overarching messages and key drivers for the country and for each of the maritime economy sectors, taking account of the current economic activities, opportunities and risks and consultation with stakeholders.

5.1. Key messages and drivers for Guyana's Maritime Economy

The overarching key messages for Guyana's maritime economy are:

- **The future development of offshore oil and gas resources will fundamentally change the national economy**. The physical and support service infrastructure required to take advantage of the offshore oil and gas resources may lead to opportunities across other industry sectors, e.g. tourism, port facilities and up-skilling in local employment, reducing the recognised 'brain drain' of young people and skilled professionals. There is also the potential for environmental damage from pollution incidents and the acknowledgment that the discovery of large petroleum reserves in other countries has not always improved governance issues. The current Environmental Impact Assessment (EIA) process is reasonably strong, however, with the onset of new projects such as the development of onshore support facilities for the O&G industry, an improved screening process is needed that covers more activities and better embraces marine issues.
- It is important that the massive oil revenue is used to benefit the country as a whole. Opportunities exist to learn from others' experiences The Natural Resources Fund presents an important opportunity for management of oil revenue through investment in productive assets such as infrastructure.
- **Tourism** is a sector with potential to benefit from the opening-up of Guyana through the development of the oil and gas sector. New hotel infrastructure, operating at globally-acceptable standards, will be required and this may provide the catalyst for further development of roads and other infrastructure, both along the coast and on the in-land river networks. This sector offers opportunities for small and medium sized enterprises (SMEs) that are locally owned, communities and women that may be under-represented in the burgeoning oil and gas sector (including mangrove forested areas in which indigenous peoples are situated, such as the Warrau communities within and around the Barima Mora Passage Mangrove Area, Region 1).
- Risks posed by **natural hazards and climate change** are a significant consideration for human security and wellbeing. Strategic level planning for coastal flood and erosion management, protection of ecosystem services to provide natural coastal defences and the mainstreaming of Disaster Risk and Recovery Management (DRRM) consideration in planning and development control is needed to decrease the risk to life and livelihoods in coastal areas, where the majority of the population lives. Action is required to better understand the role and value of ecosystem services, particularly the role they play in managing coastal flooding and erosion.

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5.2. Priorities

Guyana's national level priorities are articulated in the Low Carbon Development Strategy 2010 and 2013, which is currently being revised and updated. The central objective is development that provides a better quality of life for all Guyanese derived from the country's natural wealth – its diversity of people and abundant natural resources.

The LCDS aims to protect and maintain the forests in Guyana in an effort to reduce global carbon emissions and at the same time attract payments from developed countries for the climate change services that the forest provides to the world (i.e. mainly net greenhouse gas sequestration). Additionally, the protection of forests will also support global biodiversity and other ecosystem services (e.g. carbon storage, climate and water regulation, etc.). The income attracted by limiting emissions from deforestation and degradation is intended to support sustainable economic growth by investing in several priority areas, such as (1) low carbon infrastructure that produces 'clean energy' (by investing in the Government equity in the Amaila Falls Hydro Electric Company); (2) support Amerindian land rights; (3) support Amerindian development; (4) expand fibre optic digital infrastructure and access to laptops per family; (5) support low carbon economic opportunities for micro and small enterprises; (6) establish an International Centre for Biodiversity Research and Low Carbon Development and enhance the national curriculum with content around low carbon and sustainable development; (7) develop climate resilience and adaptation; and (8) develop a monitoring, reporting and verification system to support the LCDS.

This MEP is aligned with the approach of the LCDS because it centres on the blue economy, which encapsulates the same principles of low carbon, resource efficiency and social inclusion but is focussed on the marine area.

The MEP will add value to the issues already covered by the LCDS, as it is recognised that the LCDS does not embrace certain maritime sectors and this represents a key knowledge gap that the MEP can help to address. Discussions have taken place in Guyana regarding creating a 'Blue State Development Strategy' or 'Sustainable Ocean Based Economy Development (SOBE) Strategy') for which this MEP could form the basis[62].

The actions proposed will require increased cooperation and collaboration across all ministries and statutory agencies, as well as non-governmental stakeholders and Amerindian (indigenous) groups. Many will require continuous improvement and enhancement in the capacities and skills of governmental organisations (on maritime economy related issues) as well as civil servants who work with them.

Across all of the sectors, it is recommended that Technical Committees are used to help set up a team for Guyana that will take responsibility for ocean and marine governance related matters nationally. This could be an update to the existing Coastal and Marine Management Committee, headed up by the Environmental Protection Agency (EPA). An alternative may be to link to existing CARICOM focused National Implementing Committees (NICs), which develop many of the SDGs (including SDG14). These national level decisions will be for Guyana to determine and steer, integrating a national consultation process to ensure all stakeholders are engaged in the process.

Finally, an institutional arrangement / governance / capacity baseline study may be needed to identify details for the implementation of the actions being put forward in this MEP. This assessment would benefit from covering public, private, and non-governmental sectors, so that clarity is reached on the "gaps" in capacity and how they could be filled to move towards a successful maritime economy. A new Ocean Affairs Authority (OAA) or similar may need to be formulated under new legislation, which provides continuity across different government administrations.

5.3. Action Plans

Actions, primary actors and desired outcomes are presented for each maritime economy sector in the following pages. Recommendations and actions have been drafted to be relevant and applicable to both women and men, and to all of Guyana's communities. Key messages and recommendations that could provide opportunities for women are highlighted.

Each sector is given a prioritisation for action based on the categorisation below.

■	This work is urgent. It is critical to both GDP and /or Guyana's ability to adapt to climate change.
●	This work is new / needs attention. Sustainably developing it further now would help to build a future sustainable maritime economy 'game changer'' for Guyana.
▲	This work is well established and already very important to Guyana's sustainable maritime economy. Attention to implementation plan suggestions will further strengthen the sector.

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5.3.1. Coastal Development

Status – Bedrock (Established)

SUGGESTED PRIORITY
This work is urgent. It is critical to both GDP and the ability to adapt to climate change

Key investments to Guyana's drainage and irrigation infrastructure are being made, but the system is struggling to deal with recent conditions. Over the past few decades, unseasonal rainfall coupled with the increased frequency of high spring tide events and storm surges has led to breaches and over-topping of many of the conservancies. This has resulted in flooding in areas such as East Coast and West Coast Demerara and to a lesser extent, the Essequibo Coast, causing damage to crops, loss of livestock and property.

Key messages:

> Despite significant investments to rehabilitate sections of the sea defence system, there are still dilapidated and critical sections. Several strategic investments were made under the Conservancy Adaptation Project (CAP) and the National Drainage and Irrigation Authority (NDIA) continues to expand drainage capacity. The 2014 survey of defence structures showed that 1% were in critical condition, 9% poor condition and 35% fair condition. The weakest points lie in Regions 2, 4 and 6. Updated surveys and condition assessments are needed to help prioritise works. Repairs and upgrades need to be designed to take account of climate change and sea level rise (SLR) projections.

Aerial view to Georgetown and Atlantic Ocean.

- There is a need to protect and / or restore mangrove areas to complement and enhance the coastal defences. A better understanding of the role and value of mangroves to coastal defence and biodiversity is needed to support strategic planning and decision making. This is needed as there is a lack of data on biodiversity in general and on marine fisheries specifically, which makes it very difficult to manage the marine resources sustainably. The Government is currently establishing exactly what data is available and what is needed. Input from the Central Housing and Planning Authority (CHPA) in relation to land use and zoning matter is key in this respect.
- The MEP provides a sector focused approach; however, there would also be benefit from an additional sectoral plan to reduce pollution and promote better waste management. This is important as waste from industrial and agricultural practices are impacting the wider marine environment. Actions linked to waste and marine / water quality protection, through regulation or management practices for example, need to be considered.
- All relevant organisations need to be involved in the planning of restoration and protection programmes – e.g. EPA, Work Services Group (WSG), NAREI, University of Guyana.
- Consider and apply all relevant enforcement regulations in all future public and private coastal developments (including mangrove restoration management developments), taking account of climate resilience and coastal management plans and policies and EIA. This may involve a review of the current enforcement regulations and their suitability regarding future coastal developments, as well as awareness raising and capacity building to strengthen understanding of sustainable coastal development policies across government.
- Consider a precautionary and risk-based approach, including the use of environmental impact assessment (EIA) to ensure that activities and developments in the coastal zone are climate resilient and sustainable.
- Consider the need for continued understanding and monitoring of coastal dynamics to support improved planning and decision making in the design of coastal defences.
- Coordinated implementation of the National Climate Change Policy and Action Plan (2020-2030).
- Blending donor-funded interest will be important, as shown by the Government currently building on the EU's support for mangrove management and sea and river defence management.
- Building institutional capacity to support understanding of development control, including EIA and climate change resilience considerations (including early warning systems). Training of current and future human resources through University of Guyana, NAREI and integration with EIA and engineering training.

A strategic approach to coastal flood and erosion risk management is needed that incorporates traditional engineering approaches, natural defences (such as mangroves), the application of planning and development control measures and takes account of climate change predictions.

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Coastal Development Implementation Pathway

Suggested Strategic Requirement – Update Guyana's ICZM Plan (2000) to support and build on the plans and policies for sustainable coastal development including the updated LCDS. Include a SOBE to realise the full value for the economy, society and environment.

Track 1 – Manage the increasing risk of coastal hazards from climate change through existing and future climate resilient policies, plans and management of the coast.

Primary Issue(s): Integrate the LCDS, Climate Change Policy and ICZM through the implementation of LCDS priority actions for climate resilience and adaptation.

Primary Actors: Ministry of Public Works (MPW), Work Services Group (WSG), Sea and River Defence Committee, DECC, CDC, MARAD

The suggested timescale for this Track is 1 to 3 years.

Track 2 – Develop and implement development planning and control for coastal development. Integrate EIA, coastal protection and climate resilience and predictions into design and decision making; supported by capacity building in coastal defence.

Primary Issue(s): Raise awareness of the importance of EIA. Training and resource assessment and enforcement. Understand coastal change risk.

Primary Actors: MPW, WSG, Sea and River Defence Committee members, EPA, NDIA, University of Guyana, NEOC, SRDB, CHPA

The suggested timescale for this Track is 3 to 5 years.

Track 3 – Maximize the benefits of restoring and conserving mangroves to integrate into coastal protection and increase the resilience of communities and key assets.

Primary Issue(s): Incomplete understanding and consideration of mangroves in coastal defence.

Primary Actors: MPW, WSG, Sea and River Defence Committee, EPA, NDIA, NAREI, University of Guyana, GFC

The suggested timescale for this Track is 3 to 5 years.

Desired Outcomes – Protection of life and property from sea level rise and climate change and all supporting marine ecosystem services (in line with LCDS priorities and the National Climate Change Policy 2020-2030)

5.3.2. Shipping and Ports

Status – Bedrock (Established)

▲	**SUGGESTED PRIORITY** This work is well established and already very important to Guyana's sustainable maritime economy. Attention to implementation plan suggestions will further strengthen the sector.

Guyana is primarily serviced by smaller feeder vessels and cargo ships because of restrictions on the size of ships allowed in access channels, due to shallow navigable depths that constantly change as a result of heavy siltation from Amazon River outflows.

Key messages:

> Emphasis is required on improving the efficiency and speed of shipping routes to Guyana. Cargo ships often have to make multiple stops at various ports before they arrive in Georgetown. The possibility of establishing a more direct shipping route to Guyana should be explored.

> The ability to monitor, control and respond to human activity at sea is fundamental and needs to be enhanced in order to improve Guyana's ability to manage and plan marine resources, protect the marine environment and enforce the rule of law. Improved data and information management systems and skills are needed in order for the sector and regulators to improve compliance and enforcement, and emergency response. Guyana has international obligations to ensure safety at sea, to manage the risk of maritime pollution (including the

Aerial view of Georgetown and the Demerara river.

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risk of introducing invasive species through ballast waters), and to effectively respond to emergencies. Development and expansion of the oil and gas industry will increase shipping, data and risk of maritime emergencies.

> Guyana must ensure that adequate and up to date nautical charts and hydrographic services are in place in line with national, regional and international commitments. This includes developing hydrographic capabilities through capacity building programmes, regional cooperation and training, and ensuring effective hydrographic governance is in place. The CME Programme has undertaken a number of initial activities in connection with this, please refer to Section 1.5 for further information.

> MARAD needs to take into account and seek to minimise any negative impacts due to increased use of sea space on shipping activity, freedom of navigation and navigational safety. To this end, there is a need to develop National Shipping / Marine Transport Policy to strengthen the development of the shipping sector.

> Dredging is an ongoing requirement to maintain a safe navigable depth and to manage siltation and constantly changing sediment accretions along the coast and estuaries. There is a need to acquire a dredger and a multipurpose vessel (for buoy tendering, hydrographic surveys and fire-fighting) as well as to acquire and install adequate navigational aids.

> The Central Housing and Planning Authority's (CHPA) land use and planning permission function plays a pivotal role in the assessment and planning permission process for Port facilities.

> Strategic assessment of port and human capacity is needed to understand increased requirements driven by the oil and gas (O&G) sector and the associated increase in demand for cargo, passengers, etc. A skilled workforce is required to design and build infrastructure and to operate and manage ports through training, education, apprenticeships. Cooperation and collaboration between the Ministry of Education and Matpal Marine Institute is required. There are opportunities for regional collaboration on maritime training, such as working with the Caribbean Marine Institute in Jamaica. The AA Maritime & Offshore Training Institute approved by MARAD can play an important role in filling specific training requirements.

An understanding of infrastructure, technical and human capacity increases to safely support the increase in ports and shipping needs is required to inform development and investment in the infrastructure and workforce.

Shipping and Ports Implementation Pathway

Suggested Strategic Requirement – Shipping and ports capacity to increase in line with increasing demand driven by O&G development in a manner that does not put the environment at risk.

Track 1 – Strategic assessment of port and human capacity to understand and prioritise increased requirements driven by the O&G sector.

Primary Issue(s): Current capacity and training is insufficient to meet needs. Demand is set to increase. Infrastructure, workforce and regulatory capacity is required, including hydrographics, dredging, data, maintenance, ship building.

Primary Actors: Ports and Harbours Division, MARAD, MPW, Shippers Association of Guyana (SAG).

The suggested timescale for this Track is 1 to 3 years.

Track 2 – Support the establishment of new port and marine infrastructure to meet current and future demand for berths and storage space.

Primary Issue(s): Need to develop a modern, deep water terminal facilities on the Demerara, Berbice and Essequibo Rivers. Current facilities do not meet needs requirements. Dredging capacity is required to maintain current and future facilities.

Primary Actors: Ports and Harbours Division MARAD. MPW. Private Sector Comm.- Infrastructure and Transportation Sub Committee. CHPA.

The suggested timescale for this Track is 1 to 3 years.

Track 3 – Strategic development of training facilities for ports and shipping facilities and management.

Primary Issue(s): Demand for all areas of port and shipping workforce, from loading to management and covering government requirements, regulation and enforcement.

Primary Actors: Ports and Harbours Division, MARAD, MPW, Caribbean Marine Institute, and other initiatives that are being developed.

The suggested timescale for this Track is 3 to 5 years.

Track 4 – Draft integrated transport policy to (informed by a baseline assessment) to cover river and sea transport, including low carbon transport options.

Primary Issue(s): Substantial unused non-forest land in the hinterland with potential for cash export crops. There is great potential for inland waterways to contribute to sustainable marine economic development.

Primary Actors: Ports and Harbours Division, MARAD, MPW, Shippers Association of Guyana (SAG).

The suggested timescale for this Track is 5 to 10 years.

Desired Outcomes – Infrastructure and human capacity keeps pace with demand. Opportunities for a wide range of jobs and careers for all, in direct and supporting roles

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5.3.3. Fisheries

Status – Bedrock (Established)

▲	**SUGGESTED PRIORITY** This work is well established and already very important to Guyana's sustainable maritime economy. Attention to implementation plan suggestions will further strengthen the sector.

The private sector dominates the fishing sector, While there are many small fishing vessels operating in Guyana, only a few large private companies own processing plants. Guyana possesses an area of deep-water in its exclusive economic zone (EEZ) that is reserved for Guyanese fishers yet is relatively unexploited – there is only one company operating formally in this area. With the advent of offshore oil and gas drilling and production, fishing could be excluded from some areas. Operations do not appear to disrupt fisheries to any great extent, although seismic explorations have been reported to affect red snapper fisheries. The 500m safety zone around O&G installations is not considered to create a conflict with the development and use of the maritime space by this new industry. The LCDS does not cover the fisheries sector in much detail, which is a gap in information and policy.

Key messages:

> There is a need to promote sustainable fishing in the future with regards to this sector. Additionally, a system should be established that contemplates the imposition of penalties where fishermen harvesting certain species of fish in their spawning period with a view of sustainably maintaining the fish stock.

Skeldon, a small town in eastern Guyana on the Corentyne River.

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- There is potential for competition for space between the fishing and the oil and gas sectors. There is currently no formal legislation or policy to help support access arrangements or co-management initiatives. Consideration should be given to identifying and protecting important fisheries areas to prevent future conflicts between fishing and O&G exploitation. Determination of important fishing zones should be informed by scientific data and stock assessments as well as fishers' inputs to identify the most important resource areas, potentially making use of participatory geographic information systems.
- Deep water fishing is underdeveloped and there is no structured licensing covering the area. There is opportunity to develop under-exploited deep-water snapper, prawns, swordfish and tuna fisheries (this last species receiving increasing interest). This would require investment in the fleet and parallel fisheries management and enforcement resources. There is a lack of information on the geographical availability of resources, stock assessments and fishing effort, not only in the deep water area, but throughout the EEZ.
- Need to improve the capacity of the Fisheries Department. There is insufficient capacity to monitor the MSC certification, such that the Association of Trawler Owners and Seafood Processors must undertake their own monitoring. Additionally, there is a need for capacity building (technological and training) for fisheries enforcement / monitoring, and any efforts to solve this would be welcomed. The economic benefits of accreditation also need to be determined to show cost-effectiveness of the process and its maintenance. The recently produced Fisheries Management Plan and introduction of the Vessel Monitoring System (VMS) needs to be monitored for effectiveness[63], as illegal fishing is reported in some areas. An improved licensing and legal framework is needed. A sector-wide review of capacity and performance is needed to inform improvements in regulation, resource (human, technical and equipment) and skill requirements now (to implement the Fisheries Management Plan) and for succession / development planning. Conservation International has shown interest in supporting the fisheries sector / resources management in Guyana.
- Socio-economic data on the fisheries sector is poor, making it difficult to determine the importance of the sector to livelihoods and to adequately take account of this in decision making.

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Fisheries Implementation Pathway

Suggested Strategic Requirement – Recognition of the economic and social importance of the sector. Safeguarding fisheries for the future.

Track 1 – Support both artisanal and commercial producers to shift to more sustainable practices.

Primary Issue(s): Compliance with the Caribbean Community Common Fisheries Policy (CCCFP) and Caribbean Regional Fisheries Mechanism (CRFM). Fishing in protected areas.

Primary Actors: Fisheries Department Caribbean Regional Fisheries Mechanism (CRFM)

The suggested timescale for this Track is 1 to 3 years.

Track 2 – Develop and implement ocean governance and improvement training programme including fisheries management and to update the Fisheries Management Plan.

Primary Issue(s): Human and equipment resources required to manage and enforce fisheries legislation. Awareness raising of benefits of management. Use of technology and data.

Primary Actors: Fisheries Department, Fisheries Monitoring Centre

The suggested timescale for this Track is 3 to 5 years.

Track 3 – Support and manage increased use of under-exploited resources with stock assessment and regulation, supported by identification of data needs.

Primary Issue(s): Lack of information on the state of stocks, fishing effort and capacity to manage / regulate fisheries.

Primary Actors: Fisheries Department

The suggested timescale for this Track is 5 to 10 years.

Desired Outcomes – A growing fishing industry and artisanal fishing, supported by Government and science based decision making

5.3.4. Aquaculture & Mariculture

Status – Bedrock (Not Established)

●	**SUGGESTED PRIORITY** This work is new / needs attention. Sustainably developing it further now would help to build a future sustainable maritime economy 'game changer' for Guyana.

Currently aquaculture accounts for less than 1% of total fish production. Operations remain small-scale and are not sufficiently commercialised - producers have low bargaining power, limited access to production inputs and finance and low capacity to assure production quality.

Key messages:

> Feasibility studies are required to inform the development of the sector in the marine area. Studies need to consider the location, species and markets for products, taking account of climate change and the high coastal sediment loads / erosion and sediment transport. They should also consider the use / locations of fisheries aggregation devices (FADs), other marine infrastructure, and the interaction of aquaculture developments with other uses of the sea. Any development in the sector will need to ensure that aquaculture activities are conducted in a sustainable way.

> The National Aquaculture Policy, being developed, should provide clear guidance on developments, locations, spatial planning to reduce conflict64 and support available for new entrants to the sector. Attracting foreign direct investment (FDI) and bringing in international skills and experience may help producers to organise themselves and develop a clearer and more efficient value chain.

> The Fisheries Department could consider establishing a facility to support smaller scale farmers to access international markets including negotiating with trade importers, providing finance / export credit guarantees, monitoring quality and phyto-sanitary standards, and supporting compliance with voluntary sustainability standards. Cross-departmental support / collaboration with other ministries would be needed to assist with financing, export and marketing.

There is potential for mariculture development in Guyana. This requires strategic assessment and support to develop and could be combined with similar support for existing aquaculture sectors to help grow the whole sector (marine, brackish and freshwater).

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Aquaculture & Mariculture Implementation Pathway

Suggested Strategic Requirement – Understand the potential for aquaculture and mariculture development in Guyana in line with the priorities of the LCDS for investment and employment in low carbon economic sectors.

Track 1 – Implement feasibility assessments to inform the development of the aquaculture / mariculture industries to promote economic diversification.

Primary Issue(s): Need for clear, evidence-based sustainability standards and practices to develop certified and sustainable products to access international markets and spur development of a skilled local labour force (human capital).

Primary Actors: Fisheries Department

The suggested timescale for this Track is 1 to 3 years.

Track 2 – Build on successful FAO projects and encourage foreign investment to develop the sector.

Primary Issue(s): Need to better integrate aquaculture into small rice-based farming systems, and provide technical and business support for investors while assessing risk of farmed species to local wildlife.

Primary Actors: Fisheries Department, Associations of rice producers, Sea and River Defence Department (MPW)

The suggested timescale for this Track is 3 to 5 years.

Desired Outcomes – A growing aquaculture sector, supported by Government with employment and business opportunities for all

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5.3.5. Tourism

Sector Status – Bedrock (Established)

▲	**SUGGESTED PRIORITY** This work is new / needs attention. Sustainably developing it further now would help to build a future sustainable maritime economy 'game changer' for Guyana.

The LCDS highlights the tourism sector, particularly eco- and low-carbon tourism as a priority for development.

Key messages:

> The Guyana Tourism Association (GTA) remains as a semi-autonomous organisation under the Ministry of Tourism, Industry and Commerce and seeks to promote sustainable tourism in the country that is community-led, nature and adventure-based. Guyana is also connecting to heritage and traveller networks that embody these core values e.g. "SAVE" travel network (scientific, academic, volunteer and education).There is little specific focus on marine related tourism, but this could complement the existing strategy, especially in Region 1 (Moonsammy 2020).

> Assessment of the strategic requirements to develop the sector, in line with the revised LCDS. To incorporate and better integrate coastal and river related tourism into the strategy, the industry should consider what infrastructure is needed along the coast and rivers, with fiscal policies, incentives and subsidies in line with regional comparators allowing the sector to successfully compete in regional markets. One action is the need to assess the tourism potential along Guyana's rivers, including the need to improve yachting and boat facilities and docking infrastructure. Opportunities for communities and women to fully participate in the sector should be considered in any assessment and strategic plan.

> The Living Guyana Tourism Strategic Action Plan: 2018-2025 remains as a Draft. GTA is undertaking a review of the plan in line with the update of the LCDS. The new Action Plan document is scheduled to be completed in 2021.

> Tourism developments should not adversely affect the environment or ecosystem services (natural coastal protection from mangroves, water quality, fish stocks, etc.). A robust EIA, planning, building code and enforcement system is important, with capacity for the EPA to deliver / enforce.

> It is important to better determine the potential linkage of increased cruise ship terminals (and airports located near the coast) to the transportation infrastructure needs (through roads and riverine connections to the interior of the country). An improved understanding of this may hold many opportunities for growing a diverse and sustainable tourism offer in the future.

> Need institutional capacity building in environmental management (eco-friendly tourism), development planning and control, climate / flood resilient design and EIA in the decision-making process. This links to similar capacity building for coastal development and ports and shipping.

> Acknowledge the importance of integration of natural capital valuation of coastal tourism ecosystems and interactive Climate Smart public awareness activities.

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Tourism Implementation Pathway

Suggested Strategic Requirement – Coordinated implementation of the updated Guyana Tourism Strategic Action Plan. Growth and development of a sustainable tourism sector in line with the LCDS priority for eco-tourism development.

Track 1 – Strategic review of infrastructure and capacity needs for projected demand /growth. Include EIA, utilities, waste, land use needs.

Primary Issue(s): Accommodation demand expected to increase for business, O&G, leisure. Sport fishing and activity based tourism is growing. Infrastructure and skills are required.

Primary Actors: Ministry of Public Works, GTA, Guyana EPA, CHPA

The suggested timescale for this Track is 1 to 3 years.

Track 2 – Manage the risk of coastal hazards from climate change through existing and future climate resilient policies, plans and development control.

Primary Issue(s): Understand coastal change risk to current and developing tourism / visitor infrastructure. Need to design resilient developments and infrastructure and engage stakeholders at all levels. Link to Coastal Development.

Primary Actors: MPW, GTA, Guyana EPA, Sea and River Defence Committee, CHPA

The suggested timescale for this Track is 3 to 5 years.

Track 3 – Develop a 'Guyana' tourism brand with standards for visitor centres, key attractions and information, including 'coastal' and 'hinterland' tourism.

Primary Issue(s): Lack of brand identity / presence to promote the tourism sector and Guyana as destination / differentiate it from other Caribbean countries.

Primary Actors: Ministry of Public Works. Guyana Tourism Authority DECC

The suggested timescale for this Track is 3 to 5 years.

Track 4 – Undertake study to upgrade port infrastructure or create financial incentives for investment in marinas to attract more small cruiser and yachts to Guyana.

Primary Issue(s): Services for yachts, cruises and other leisure craft are limited and there is little promotion of the country as a tourism destination for market.

Primary Actors: GTA, Guyana EPA, Ports and Harbours Division, MARAD, CHPA, Central Transport Planning Unit (MPW)

The suggested timescale for this Track is 5 to 10 years.

Desired Outcomes – A well-trained tourism workforce, offering opportunities for all at a variety of business scales and locations. A climate resilient tourism sector to support growing demand sustainably

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5.3.6. Energy (including Renewable Energy)

Bedrock (Established) – diesel import / Emerging (Not Established) – renewables

▲	**SUGGESTED PRIORITY** This work is well established and already very important to Guyana's sustainable maritime economy. Attention to implementation plan suggestions will further strengthen the sector.

The oil and gas (O&G) industry is set to become Guyana's largest sector and has the potential to have positive spill-over benefits across the whole economy. The government's objective is to ensure that resource is used in the most beneficial way, supported by clear evidence-based assessments. It should consistently deliver the country's fair share of earnings, with investments made in the domestic economy and environmental risks minimised and controlled. Although the oil and gas sector can operate in relative isolation from the rest of the economy, there are opportunities to increase its impact through stronger links with other sectors.

The Ministry of Natural Resources is leading efforts in the energy sector development, including oversight of oil and gas production. It will coordinate, advise and bring coherence to policy implementation across existing energy sector agencies, including the proposed Petroleum Commission and electricity service providers currently under the MWP, e.g. the Hinterland Electricity Company, Inc., and the Guyana Energy Agency (GEA).

Key messages:

> Any proposals being reviewed for local refining of government's share of oil production must be carefully examined and studied against any alternative options.

> Training and skill-development for Guyana nationals and emigrants attracted back to Guyana to work in the O&G industry - both the industry itself and associated supply services. This focus should not be at the expense of other sectors e.g. agriculture, tourism and manufacturing, that are also targeted for restructuring, expansion and diversification.

> Development and skills training for the renewable energy sector, which the Government of Guyana aims to develop in part using revenue from the O&G sector. Guyana may need to consider what international support (technical and advisory) is needed in order to implement some of its renewable energy projects.

> A need to ensure that a regulatory framework is in place that will allow full consideration of the environmental, social and economic benefits of any new marine energy related activity before it is permitted. This applies to O&G and renewables.

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Energy Implementation Pathway

Suggested Strategic Requirement – An energy sector in compliance with the CARICOM Energy Policy and the Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS)

Track 1 – Carry out studies / assessments to determine the best way revenue from O&G can support local businesses and the whole economy.

Primary Issue(s): Understand the economic benefits and environmental impacts, including carbon emissions, from oil refining against the default option of directly exporting oil production.

Primary Actors: Ministry of Natural Resources Guyana Energy Agency DECC, EPA

The suggested timescale for this Track is 1 to 5 years.

Track 2 – Develop the policy and delivery infrastructure to monitor and manage risks of an oil spill.

Primary Issue(s): The O&G sector poses a risk to environment and livelihoods. The National Oil Spill Contingency Plan is not final. Human and technical resources are not sufficient.

Primary Actors: CDC, EPA, GLSC, DECC Ministry of Natural Resources, MARAD

The suggested timescale for this Track is 1 to 5 years.

Track 3 – Develop a strategic investment plan to support the transition to low carbon – renewable energy sources, including ORE where appropriate.

Primary Issue(s): Better understanding and action plan for the GEA to deliver the transition to renewable energy sustainably and in a climate resilient manner.

Primary Actors: Ministry of Natural Resources Guyana Energy Agency DECC

The suggested timescale for this Track is 1 to 5 years.

Desired Outcomes – Low carbon economic development and energy security for all citizens and businesses in line with the LCDS. Benefits from O&G development are shared with other sectors / communities

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5.3.7. Ecosystem Services

Status – Emerging (Not Established)

●	**SUGGESTED PRIORITY** This work is new / needs attention. Sustainably developing it further now would help to build a future sustainable maritime economy 'game changer' for Guyana.

While ecosystem services are ubiquitous and support both bedrock and emerging maritime economy sectors, their integration into decision making and attempts to quantify their value, are not yet mainstreamed. They are, therefore, described as 'emerging'.

Key messages:

> There is a need to include marine ecosystems in the LCDS to ensure that ecosystems and ecosystem services are fully integrated into the national strategy.

> The MEP supports the government in taking into account both the international commitments and the national priorities of Guyana in deciding how to best utilise the nations marine resources.

> Improve the conservation and sustainable use of coastal and marine resources by improving compliance with international and national environmental requirements including implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of marine and coastal resources, and the 'high seas'.

> Ensure that any coastal or marine spatial planning process, including coastal risk management plans, align with existing mechanisms by considering areas and features of importance for nature conservation and wider biodiversity in developing policies and locations for other marine activities, and in permitting new development.

> Natural capital valuation is needed to understand the value of ecosystem goods and services and use this information to inform decision making, including in coastal flood and erosion risk management.

> Set up a clear State of the Ocean report by collating marine related information already produced by the different government organisations.

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Ecosystem Services Implementation Pathway

Suggested Strategic Requirement – Ensure that marine and coastal ecosystems are taken into account in decision making so they are sustainably managed, protected or restored to avoid adverse impacts and increase their resilience in line with the LCDS.

Track 1 – Protect, maintain or restore the quality of the marine environment by managing the impact of human activity on ecosystems, ensuring biological diversity and sustainable use of marine resources.

Primary Issue(s): Need to maintain a balance between the use of the ecosystem assets and economic growth.

Primary Actors: Fisheries Department, GLSC Office of the Prime Minister, DECC, EPA

The suggested timescale for this Track is 1 to 3 years.

Track 2 – Update LCDS to include the importance of marine ecosystems. Identify and establish additional marine space for legal protection (MPAs).

Primary Issue(s): LCDS needs updating to include marine ecosystem. MPAs need to be set up to help the fisheries sector.

Primary Actors: Fisheries Department, GLSC

The suggested timescale for this Track is 3 to 5 years.

Track 3 – Develop novel financial instruments to support the delivery of environmental objectives such as habitat and species protection through ecosystem service payments.

Primary Issue(s): Financing, venture capital and export opportunities are required to deliver LCDS aims to support ecosystem services management.

Primary Actors: Fisheries Department, GLSC

The suggested timescale for this Track is 5 to 10 years.

Desired Outcomes – Importance of Ecosystem Services, including those from the marine and coastal environment, are mainstreamed into national decision making.

5.3.8. Summary of all recommended actions

The table below summarises the recommended actions and outcomes for all maritime economy sectors in Guyana.

Sector	Priority	Actions	Outcomes
Coastal development	This works is urgent. It is critical to both GDP and the ability to adapt to climate change	> Manage the increasing risk of coastal hazards from climate change through existing and future climate resilient policies, plans and management of the coast. This could include the production of strategic level Shoreline Management Plans to identify and prioritise coastal erosion and risk management projects, including mangrove restoration. Land based pollution is a major contributor to marine pollution in Guyana. This should be measured and quantified, with the view to introducing sustainable economic mitigation measures. An updated ICZM plan and resourced ICZM unit would contribute to this aim. > Prepare and implement development planning and control for coastal development. Integrate EIA, coastal protection, climate resilience and predictions into design and decision making through an integrated management approach, by updating the ICZM plan and ensure that development decisions take account of all the needs of developments – utilities, transport connections (terrestrial and marine), and links to the climate risk and resilience issues identified above. Development control that is linked to EIA processes. Awareness raising and training for EIA and enforcement for both development control and EIA, supported by capacity building in coastal defence.	> Protection of life and property from sea level rise and climate change and all supporting marine ecosystem services (in line with LCDS priorities and the National Climate Change Policy 2020-2030)

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Sector	Priority	Actions	Outcomes
		> Maximise the benefits of restoring and conserving mangroves to integrate into coastal protection and increase the resilience of communities and key assets. Ecosystem services valuation process. Link the findings to EIA and decision making processes. Awareness raising of the value of ecosystem services across Government and with economy sectors, and integration into decision making.	
Shipping and ports ▲	This work is well established and already very important to Guyana's maritime economy. These actions will help strengthen the sector	> Strategic assessment of port and human capacity to understand and prioritise increased requirements driven by the O&G sector. This includes capacity for the O&G sector itself, as well as increased cargo, passenger and supporting facilities (heliport, transport vessels, ferries, road transport links, etc.). Port operations management and planning, hydrographics, charting, dredge planning and execution. > Support the establishment of new port infrastructure to meet current and future demand for berths and storage space. Port / maritime structures engineers, port operations management and planning, and environmental management linked to EIA. > Strategic development of training facilities for ports and shipping facilities and management, including hydrographic needs, maintaining navigational safety, dredging requirements, port waste / waste water / environment / pollution control management and facilities.	> Infrastructure and human capacity keeps pace with demand. > Opportunities for a wide range of jobs and careers for all, in direct and supporting roles.

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Sector	Priority	Actions	Outcomes
		> There is great potential for inland waterways to contribute to sustainable marine economic development. An integrated transport policy (informed by a more detailed baseline assessment) is required to consider how river and sea transport can link up and contribute to a sustainable maritime economy, including low carbon transport options.	
Fisheries ▲	This work is well established and already very important to Guyana's maritime economy. These actions will help strengthen the sector	> Support both artisanal and commercial producers to shift to more sustainable practices , including continued support to the production of an Artisanal Fisheries Management Plan which would be of relevance to rural coastal community areas (e.g. Region 1). > Develop and implement ocean governance and improvement training programme including fisheries management and development of a Deep Sea Fishing Policy to complement the current Fisheries Management Plan and its associated review period[65]. > Support and manage increased use of under-exploited resources with stock assessment and regulation.	> A growing fishing industry and artisanal fishing, supported by government and science based decision making.
Aquaculture and mariculture ●	This work is new /needs attention. Sustainably developing it further would help to build a maritime economy 'game changer''	> Implement feasibility assessments to inform the development of the aquaculture / mariculture industries. > Build on successful FAO projects and encourage foreign investment to develop the sector.	> A growing aquaculture sector, supported by government with employment and business opportunities for all.

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Sector	Priority	Actions	Outcomes
Tourism ▲	This work is new /needs attention. Sustainably developing it further would help to build a maritime economy 'game changer''	> Strategic review of infrastructure and capacity needs for projected demand /growth. Include EIA, utilities, waste, land use needs. > Manage the risk of coastal hazards from climate change through existing and future climate resilient policies, plans and development control. > Develop a 'Guyana eco-tourism brand' with standards for visitor centres, key attractions and signage / information. > Undertake study to upgrade port infrastructure or create financial incentives for investment in marinas to attract more small cruiser and yachts to Guyana.	> A well trained tourism workforce, offering opportunities for all at a variety of business scales and locations. > A climate resilient tourism sector to support growing demand sustainably.
Energy (incl. Renewable energy) ▲	This work is well established and already very important to Guyana's maritime economy. These actions will help strengthen the sector	> Carry out studies / assessments to determine the best way revenue from O&G can support local businesses and the whole economy. > Develop the policy and delivery infrastructure to monitor and manage risks of an oil spill. Links to ports / shipping requirements. > Develop a strategic investment plan to support the transition to low carbon – renewable energy sources, including ORE where appropriate.	> Low carbon economic development and energy security for all citizens and businesses in line with the LCDS. Benefits from O&G development are shared with other sectors / communities.

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Sector	Priority	Actions	Outcomes
Ecosystem services	This work is new / needs attention. Sustainably developing it further would help to build a maritime economy 'game changer''	> Protect, maintain or restore the quality of the marine environment by managing the impact of human activity on ecosystems, ensuring biological diversity and sustainable use of marine resources. > Update LCDS to include the importance of marine ecosystems. Identify and establish additional marine space for legal protection (MPAs). > Develop novel financial instruments to support the delivery of environmental objectives such as habitat and species protection through ecosystem service payments.	> Importance of Ecosystem Services, including those from the marine and coastal environment, are mainstreamed into national decision making.

Maritime Economy Plan
Guyana

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6. Implementation

Commonwealth Marine Economies Programme
Enabling safe and sustainable marine economies across Commonwealth Small Island Developing States (SIDS)

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6. Implementation

6.1. Transition to a Blue Economy

Applying blue economy principles and strengthening the contribution that the maritime sector makes to national GDP is one of the most positive interventions that small island / coastal states can make in response to climate change. With its large rivers, heavy rainfall and low lying coast, in which most of the population and infrastructure is located, Guyana is at risk from sea level rise and negative climate change impacts. The more that Guyana is able to look to its sea and coast for its climate adaptation solutions, the more resilient it will be. This MEP seeks to provide a clear and implementable strategy that is aligned closely to the LCDS, with a move towards the production of an integrated results based framework. Under the national Maritime Zones Act (2010), the Ministry of Foreign Affairs has jurisdiction over the marine area, and it has produced a Draft National Ocean Policy Scoping Paper, which is intended to be tabled for Cabinet review in 2022. Alignment of all three documents (LCDS, NOP and this MEP) is an important next step that should also include a section that details the financial needs to make the plan a success.

There is a need for work to develop a roadmap for marine spatial planning in Guyana to draw together the various activities that have taken place or are underway (see Section 3.2).

Figure 6 below shows an example of a desirable blue economy framework. This shift in the way of thinking about the maritime economy allows a country to move away from a linear, compartmentalised, and sectoral approach to ocean management, with weak connections, linkages, and synergies between various scales of intervention (global, international, and national). It facilitates a move towards a more integrated, systemic, dynamic, inclusive, participatory, and ecosystem-based approach, in which sectoral barriers are minimised, at both the participants' and governance levels. This new way of thinking recognises that environmental, social, and economic dimensions are intertwined and pursued collectively for all maritime economy activities.

The blue economy (of which this Maritime Economy Plan represents a key building block) adheres closely to the principles of Integrated Coastal Zone Management (ICZM). This centres on the ecosystem approach and embeds the principles of the UNEP 'Green Economy in a Blue-World' report and sustainable development. It takes into account the three pillars of environmental, economic, and social sustainability, as highlighted in the 2012 Rio+20 outcome document, 'The Future We Want', and the UN five-year Action Agenda 2012–2016.

The blue economy promotes the conservation of aquatic and marine ecosystems and the sustainable use and management of resources. It builds on principles of equity, low carbon development, resource efficiency, and social inclusion.

The concept integrates the blue economy sectors through a socially inclusive process aimed at sparking a structural transformation, promoting integrated development, and improved regional cooperation and coordination.

The transformative work required to move towards full application of blue economy planning principles in governmental strategy, policy and implementation is potentially a difficult but necessary step. Whilst blue economy concepts are beginning to become mainstream, particularly across island nations, very few countries have begun to prepare national level Maritime Economy Plans, and all remain some way off implementation.

As a nation that is on the climate change front line, yet also growing significantly in terms of overall national GDP, Guyana is well placed to play an exemplary role in blue economic transformation. This Maritime Economy Plan lastly explores briefly the critical subject of accessing finance and concludes via a brief review of potential situation and distance to travel in embedding the Principles of a Sustainable Maritime Economy in societal decision-making. This is presented diagrammatically in section 6.3.transformation.

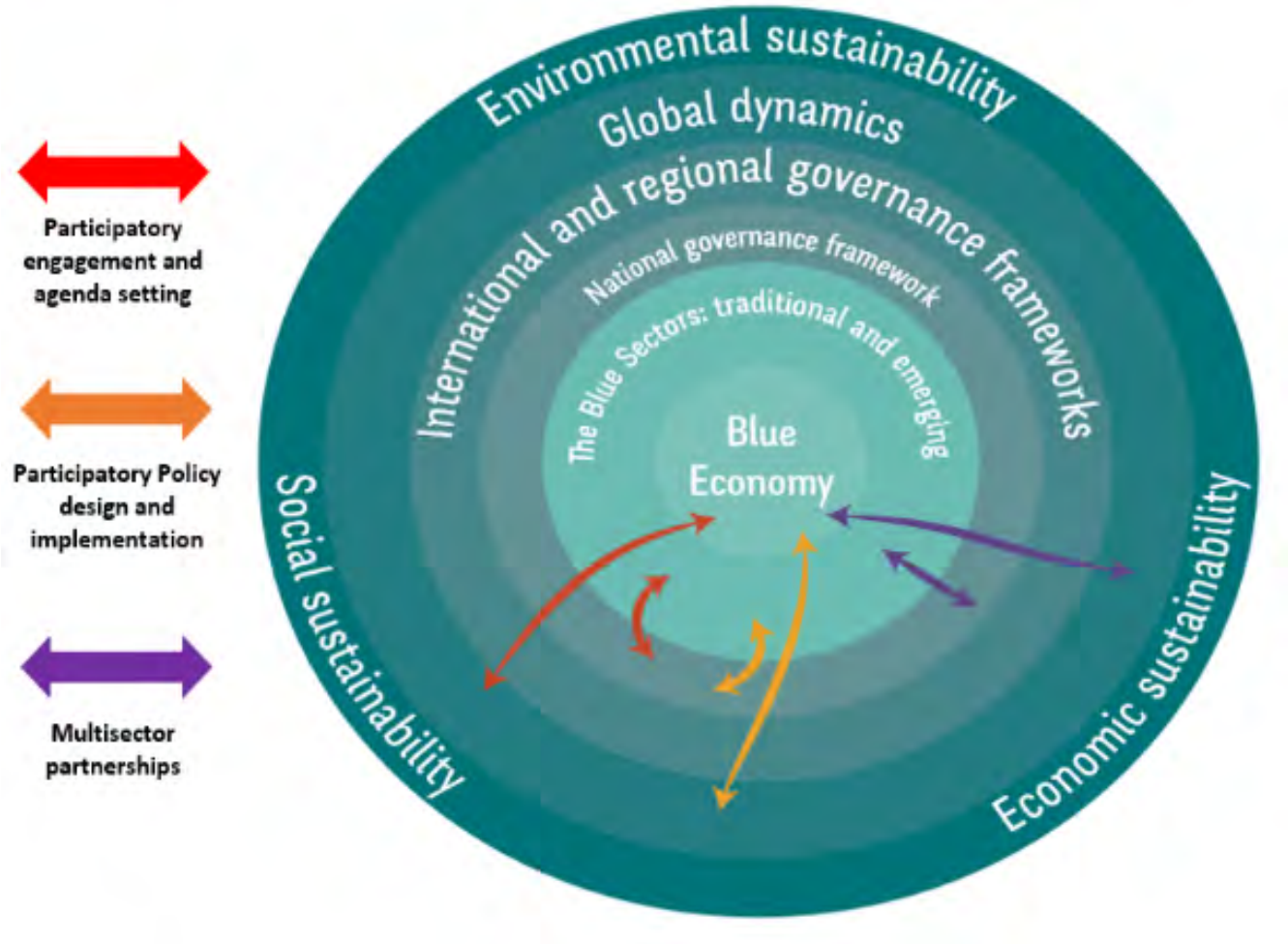

Figure 6 – A Desirable Blue Economy Framework

6.2. Accessing Oceans and Climate Finance

A key benefit of strategic planning of any kind is that it can provide greater clarity and strength as a basis for coordinated bilateral and multilateral funding. This Maritime Economy Plan has been drafted with an eye to potential funding streams and it is anticipated that following consultation and finalisation this plan may be used by the Government of Guyana to assist bid prioritisation and coordination. This MEP seeks to present alternative concessional financing options, which will not result in an additional fiscal burden on Guyana's economy.

Guyana already receives external funding support and has experienced success in this area. The following instruments and types of fund are likely to prove valuable at implementation stage:

- Guyana has a Natural Resource Fund for managing oil and gas income. The likely significant, rapid development of this industry can support directly and indirectly national economic growth. This fund could be targeted towards blue maritime sector development.
- Many development partners operate in the region and most include aspects of the maritime sector in their areas of support. Major development partners in the region include the **Caribbean Development Bank (CDB), Inter-American Development Bank (IDB), EU, UN, World Bank** as well national agencies such as **USAID (USA), GIZ (Germany), JICA (Japan)** and the **UK (FCDO, CME Programme).**
- Guyana has gained access to climate and sustainable development finance from a range of international funding sources. The following funds are particularly relevant to the implementation of this Maritime Economy Plan – **Global Climate Change Alliance; Global Environment Facility; Special Climate Change Fund (SCCF).**
- A **blue bond** is a debt instrument issued by governments, development banks or others to raise capital to finance marine- and ocean-based projects that have positive environmental, economic and climate benefit. Other small island /coastal nations are already exploring the potential of blue bond creation and revenue as part of their maritime economy support mechanisms e.g. Seychelles, Fiji. A blue bond could support decisions on how management actions can be financed. Guyana will benefit from the experience it has gained in ecosystem service payments if it wishes to establish a blue bond or similar financial instrument.

Assuming they remain a priority consideration for Guyana, following consultation on the draft Maritime Economy Plan, it is recommended that the following suggested **Implementation Pathway Activities** will benefit from coordinated proposals for development assistance:

- To implement the MEP, developing NOP and updated LCDS, there may be a need for new legislation or for existing legislation to be amended to provide powers or functions to undertake actions in the plans.
- Include provision for measures to be put in place to enable regular review of existing national economic sectors and that the implementation programme is updated where necessary. The results of the review may require updating or revision of laws where necessary.
- Examine the National Development Strategy or the National Competitiveness Strategy, to find a policy initiative under which to anchor the MEP, while the Government of Guyana formally endorses its NOP.
- A strategic understanding of the coastal erosion and flood risks to communities and infrastructure, including the state / level of protection offered by both built and natural defences (mangroves / beaches) to prioritise investment in protection. This should include an understanding of the human and institutional capacity in place and required – a training and development programme is needed to support engineering, policy development, EIA and enforcement.
- Strategic assessment of port and human capacity to understand and plan for increased demand. Dredging and navigational facilities, data acquisition and management, along with training and development of workforce and regulators is required to support safe navigation, expansion and management.
- Improve capacity of the Fisheries Department to support development of both fisheries and aquaculture, including stock assessments, feasibility studies, integration of fisheries into marine spatial management (MPAs and O&G use) and enforcement / management actions.
- Strategic review of infrastructure and capacity needed for the tourism sector to support the projected increased demand driven by economic growth. Development should not put the environment, communities or other sectors at risk. Capacity is needed to support EIA and climate resilience / design into development planning and decision making, including utilities, waste, land use needs.
- Ensure the O&G sector development provides benefits to other maritime economy sectors through, for example, Guyana's Natural Resources Fund, with investment to support sustainable development of other sectors and the transition to renewable energy in Guyana. The risks from O&G must be managed effectively through a regulatory system, training and equipment necessary for EIA, enforcement, monitoring and emergency response. Strongly linked to port related matters.
- A clear-results based framework is needed that aligns the MEP and the updated LCDS (2021) to enable the Government of Guyana to communicate needs and priorities to international donor agencies in order to access funding.
- Human resources and training are needed to support all marine sector activities across government; a centralised training hub could be considered (e.g. training of fisheries protection officers, training on marine ecosystems and mangrove protection under the Centre for Biodiversity Research, etc.).

6.3. Achieving the Principles of a Blue Economy

Blue Economy Principles	Guyana Low Carbon Development Strategy (LCDS)	Considerations for Guyana
GOOD GOVERNANCE	Coastal and marine spatial planning and integrated management of marine and coastal resources is adopted	Update the LCDS to ensure that economic growth aligns to the needs of a sustainable blue economy. Ensure that an investable blue economy strategy is pursued to attract foreign investment. Promote entrepreneurial approaches that are based on Guyana's strengths – supporting vocational training, business management, technical skills, and access to finance. Transparency in O&G sector is critical to support investment decisions for the whole economy.
ECONOMIC EFFICIENCY		
RESILIENCE	Renewable Energy	Ensure that governance and institutions linked to maritime economy sectors (at a regional level) are able to support the efficiency, effectiveness and growth of services in low carbon economic infrastructure and transport, renewable energy, the expansion of mangroves as sea defences, coastal protection, flood adaptation and drainage.
	Climate Resilience and Adaptation	
SOCIAL EQUITY	Amerindian Development Amerindian Land Titling	Continue a transparent and participative approach to Amerindian land tilting; and support economic development through small scale – renewable energy interventions and eco-tourism and manufacturing business as part of Community Development Plans, protecting the traditions of Amerindian communities.
PARTNERSHIPS	Expanding the Digital Economy and Avoiding a Digital Divide	Establish partnerships (public-private; cross-border with Brazil) for increasing the coverage of digital infrastructure and access to telecommunications, including internet and computer access.

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Blue Economy Principles	Guyana Low Carbon Development Strategy (LCDS)	Considerations for Guyana
RESEARCH & INNOVATION	Centre for Biodiversity Research and Curriculum Development	Develop a marine research strategy in partnership with the University of Guyana, regional academic institutions, CARICOM and the wider research community. Further potential for enhancing innovation and developing new technologies to pursue sustainable maritime economic activities, training and upskilling.
SUSTAINABILITY	Monitoring Reporting and Verification Systems and other LCDS supporting tasks	Update the LCDS so that it incorporates marine and coastal ecosystems, to ensure that Guyana preserves all its natural capital. This will help achieve SDGs 14 (life under water) and 15 (land use & biodiversity).

7. Footnotes

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[3] Region 1 - Barima Mora Passage Mangrove Forested Area which has research tourism potential with the indigenous Warraus

[4] SIDS Accelerated Modalities of Action

[5] Ecorys & European Agency for Small and Medium-sized Enterprises (EASME) Service contract: EASME/EMFF/1.3.1.13/SI2.718095. Study on the Establishment of a Framework for Processing and Analysing of Maritime Economic Data in Europe, Final Report, MARE/2014/45. https://www.msp-platform.eu/sites/default/files/ea0217517enn.en_.pdf. (Accessed October 2019.)

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[7] As of March 2022, a draft National Ocean Policy Scoping Paper was intended to be submitted by the Ministry of Foreign Affairs to the cabinet for review.

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[63] The timeline of the proposed actions pertaining to fisheries within this MEP all align with the 5-year duration of the Fisheries Management Plan review period.

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