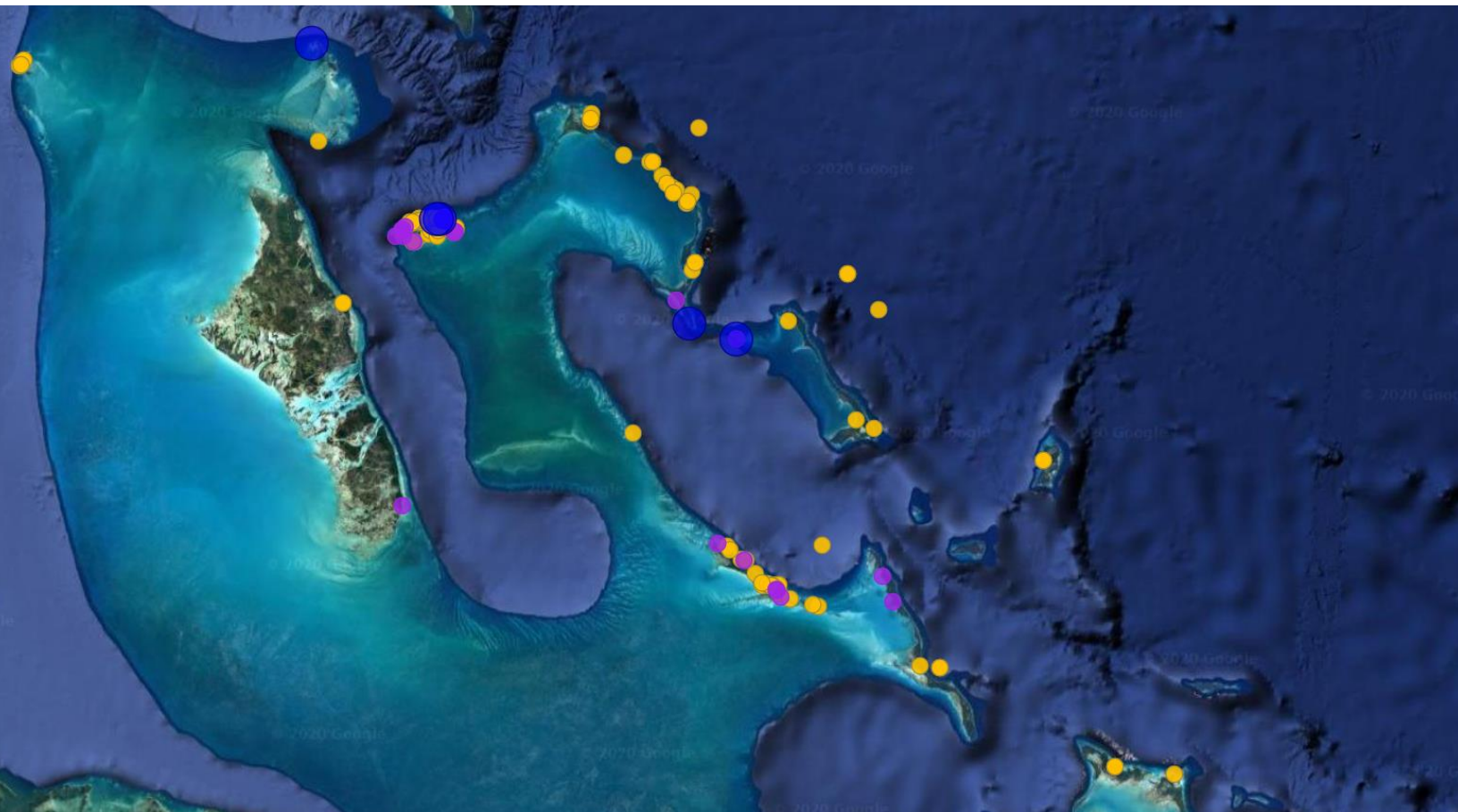


Online Economic Valuation Tool of blue economy activities in the Caribbean



December 2020

Background context

This tool has been produced in the frame of the IADB initiative *Economic Valuation Tool for the Blue Economy in The Bahamas, Barbados, Trinidad & Tobago, Guyana and Suriname*, developed by MCRIT (www.mcrit.com) between May and October 2020.

The objective is to produce an economic valuation tool of the current and potential blue economy activities in the Caribbean, along with a report of the economic valuation of economic activities.

The scope of the tool are the 5 selected Caribbean countries: The Bahamas, Barbados, Guyana, Suriname and Trinidad and Tobago. Jamaica has been incorporated in some cross-arching figures as a reference.

The online tool includes economic valuation figures in four key sectors, a geographic information system of blue economy activities and assets, and a knowledge repository containing blue economy studies, valuation methodologies, a catalogue of existing data of the Blue Economy, and other resources used for monitoring different aspects of the blue economy worldwide.

This note briefly documents the methodological approach followed and the origin of data used to build the economic valuation figures and the GIS system.

The online tool is available at <http://projects.mcrit.com/blueeconomy/>

Components of the Valuation Tool

The valuation online tool presents five main sections:

- **Dashboards**, including figures produced in the economic assessment. There are five dashboards available: the first dashboard includes a general over-view of Blue Economy in each Caribbean country analysed; there are four more dashboards, one for each sector analysed.
- **Geographic Information System (GIS)**, including geographic information for activities and assets related to Blue Economy for each sector assessed.
- **Knowledge Hub**, including all the reports, datasets, existing valuation methodologies and initiatives related to Blue Economy (globally and in the Caribbean) identified throughout the project.
- **Site Map**, presenting the valuation tool structure and all the entries available.
- **About** or Home page, including general information about Blue Economy in the Caribbean and the four main sectors assessed: coastal tourism, fisheries and aquaculture, shipping and shipbuilding and energy and sustainability.

Annex 1 shows in more detail the online valuation tool structure.



Methodological Note

Approach

Our methodology establishes an assessment of the magnitude of the Blue Economy in different countries. It is replicable in other cases and easily updatable along time. The development of an agile measurement framework for evaluating the actual and potential size of Blue Economy in Caribbean Countries can be very relevant for assessments and country profiles in a context where data availability is scarce.

The impact of the Blue Economy at the regional and local level has been measured asymmetrically so far, with different methods and levels of detail in different regions. A system of indicators based on reliable data measuring the precise effect of activities directly or indirectly relying on the sea, has yet to be developed. The review of recent initiatives aimed at measuring blue economy's impact indicated a high complexity of the exercise, as well as the lack of adequate indicators in many cases, for many regions in the world, especially at the sub-national level (*Committee of the Regions*, European Union 2017). The design of a systematic and comprehensive impact assessment methodology for blue economy at the regional level is deemed a particularly demanding task, requiring significantly high resources.

In general, three tiers of indicators are used for blue economy impact assessment in the literature:

- 1st tier indicators are the main indicators used to indicate the magnitude of blue economy's impact in terms of Gross Value Added (GVA) and employment. These are used when proper level of data disaggregation is available at the System of National Accounts (SNA); this approach can be further developed through the valuation of indirect impacts or induced impacts when an Input-Output framework is in place and even Satellite Accounts for some of the sectors exist, like tourism. This approach is only applied in few selected cases, like the study by the Caribbean Development Bank (CDB) for Jamaica in 2019, a singular case in the region, but work is initiating for other countries.
- 2nd tier indicators are used when limited data is availability or if further evidence is deemed necessary for assessing the economic/social impact in terms of turnover, revenue, investment, number of enterprises, and average wages per person employed. This approach is used to overcome data availability shortages. For example, in regional studies considering larger sets of countries, it is common when data is missing for some countries to estimate it using ratios obtained from similar countries where data is in fact available (labour, output, productivity...)¹.
- Proxies: In general, proxies can be used as a substitute for indicators missing sufficient data. Proxies are decided on the basis of data availability, assuming they are sufficiently correlated to the 1st or 2nd tier indicators they intend to substitute. Examples of proxies include: annual number of ferry/cruise passengers transported (proxy for employment in short-sea shipping, transport sector); tonnage of waterborne transported cargo (proxy for turnover in freight transport, transport sector); and number of nights spent at tourist accommodation establishments (proxy for turnover in accommodation activities, coastal tourism sector). This approach has been used in many studied to assess a particular sector relevance (*Committee of the Regions*, European Union 2017).

¹ This approach was used by the OECD report *the Ocean Economy 2030* to calculate GVA and Labour force of non-reporting countries based on production ratios within the income-specific country groups. Industries not defined by ISIC were collected through secondary sources.



Methodology for assessment of Direct Impacts

Although the data provided on the System of National Accounts (SNA) is relatively aggregated, it has been possible to obtain the GVA value for the sectors and countries below. SNA have been consulted for 4 of the 5 countries targeted.

- The Bahamas (2008-2018)
 - Fishing
 - Marine transport
- Barbados: no access obtained
- Guyana (2006-2017)
 - Fishing
- Suriname (2006-2017)
 - Fishery
- Trinidad and Tobago (2012-2018)
 - Agriculture, forestry and fishing

We have identified GVA from secondary sources for the following sectors (figures published in existing reports, or estimates obtained from expert interviews in the different countries).

- Tourism. Obtained from the World Travel and Tourism Council (WTTC) database, which has, among others, specific data related to Travel and Tourism Direct and Total contribution to GDP.
- Fishing and aquaculture. Obtained by combining the following 2 datasets:
 - Caribbean Regional Fisheries Mechanism (CRFM) Statistics and Information Report for 2016. Percentage contribution to gross domestic product (GDP) by the fishing industry of CRFM Member states 2010 – 2016 (in current prices).
 - FAO – Global Aquaculture Production 1950 – 2018. Data is provided in metric tons and thousands of current USD. Dataset specifically refers to output from aquaculture activities, which are designated for final harvest for consumption.
- Energy. Obtained from the World Bank database, which includes indicators estimating the natural resources rents as a percentage of GDP². In this study, the economic assessment considers water-based natural rents (oil and gas rents).

We have turned to the use of proxies based on key indicators for the shipping and shipbuilding sector.

- Shipping and shipbuilding. To estimate the direct impact of shipping and shipbuilding on the economy it is used a proxy based on Merchandise Trade as a % of GDP (World Bank, available for all world countries) and the % of shipping contribution to GDP in selected countries where data is available. In particular, a ratio between marine transport contribution to GDP and merchandise trade was used as a proxy based on the real figures of Jamaica and The Bahamas, where data was available from SNA and CDB³.

² Oil/Gas rents are the difference between the value of crude oil/natural gas production at world prices and total costs of production (World Bank).

³ Jamaica marine transport represented 2,0% of GDP in the period 2012-2017, for 49.5% of merchandise trade; The Bahamas, marine transport represented 1,6% of GDP in the period 2012-2017, for 34,0% of merchandise trade.

Figure 1. Tiers of indicators used for blue economy direct impact assessment

Indicators	Countries	Coastal Tourism	Fishing and aquaculture	Shipping and Shipbuilding	Energy
1 st Tier Indicators	The Bahamas	-	Fishing contribution to GDP from SNA (2008-2018)	Marine transport to GDP from SNA (2008-2018)	-
	Barbados	-	-	-	-
	Guyana	-	Fishing contribution to GDP from SNA (2006-2017)	-	-
	Suriname	-	Fishing contribution to GDP from SNA (2006-2017)	-	-
	Trinidad and Tobago	-	Agriculture, forestry and fishing contribution to GDP from SNA (2012-2018)	-	-
2 nd Tier Indicators	The Bahamas	Travel and Tourism Direct and Total contribution to GDP from World Travel and Tourism Council (WTTC, 2000-2025)	Aquaculture in USD thousands from FAO (2000-2018)	-	Oil and gas resources rents as a percentage of GDP, from the World Bank (2000-2018)
	Barbados		Fishing industry contribution to GDP from CRFM between 2010 – 2016	-	
	Guyana		Aquaculture in USD thousands from FAO (2000-2018)	-	
	Suriname		Aquaculture in USD thousands from FAO (2000-2018)	-	
	Trinidad and Tobago		Fishing industry contribution to GDP from CRFM between 2010 – 2012 Aquaculture in USD thousands from FAO (2000-2018)	-	
Proxies	The Bahamas	-	-	-	-
	Barbados	-	-	-	-
	Guyana	-	-	Proxy based on Merchandise Trade as a % of GDP (World Bank) and % of marine transport for Bahamas (SNA 2008-2018) and Jamaica (CDB, 2012-2017)	-
	Suriname	-	-	-	-
	Trinidad and Tobago	-	-	-	-

Methodology for assessment of Indirect impacts

Indirect impacts of specific blue economy sectors can be very high. They account for services that support blue economy (eg. food and beverage distribution associated with tourism, insurances, etc). They are usually deduced from the analysis of Input-Output tables and they account very much, even doubling or tripling direct impacts according to existing data and literature. Indirect impacts are much more diffused and are part of other ordinary economic activities, not necessarily being blue, but that are needed to support blue activities.

Indirect contribution to the Blue Economy is computed considering indirect contributions from tourism and from shipping and shipbuilding sectors. Indirect impact for the fishery sector is not considered, given the much smaller size of fisheries compared to others (making indirect impacts very small and uncertain to determine).

- **Tourism:** Indirect impacts for the tourism industry were obtained from the WTTC dataset, which includes indicators for Travel and Tourism Direct Contribution and Total Contribution (see descriptions below). Indirect impact was computed as the difference between these indicators.
 - Travel and Tourism Direct Contribution. It considers the GDP generated by industries that deal directly with tourists, including hotels, travel agents, airlines and other passenger transport services, as well as the activities of restaurant and leisure industries that deal directly with tourists. It is equivalent to total internal Travel & Tourism spending within a country less the purchases made by those industries (including imports)⁴.
 - Travel and Tourism Total Contribution. GDP generated directly by the Travel & Tourism sector plus its indirect and induced impacts. Indirect impacts considered Capital Investment, Government Collective Spending and Supply-Chain effects while induced impacts considered the broader contribution to GDP of spending by those who are directly or indirectly employed by Travel & Tourism.
- **Shipping and shipbuilding.** Shipping and shipbuilding activities have an important multiplier effect in the economy. Several studies have analysed shipping multipliers based on real cases.

⁴ Travel and Tourism Global Economic Impact and Trends. 2019. World Travel and Tourism Council. <https://ambassade-ethiopie.fr/onewebmedia/Tourism-WTTC-Global-Economic-Impact-Trends-2019.pdf>



The review of existing literature (available below) shows that for each monetary unit in direct impacts, additional indirect impacts generated around 1.13 and 3.15 monetary units. For this study, and according to the cases review listed below, it has been considered that each USD directly related to shipping and shipbuilding produces indirectly 2 USD to the GDP.

Globally. In 2007, shipping industry is estimated to have directly contributed US\$ 183.3 Billion and indirectly and induced supported an estimated US\$ 436.6 Billion⁵ (each direct dollar produced 2.38 dollars of extra output)

European Union: in 2013, shipping industry is estimated to have directly contributed €56 billion to EU GDP and indirectly and induced supported an estimated €91 billion contribution to GDP⁶ (each direct euro produced 1.625 euros of extra output).

United States: in the case of the United States merchant marine it was estimated that each dollar increase in the final demand for shipping services produces 2.5 dollars of extra output in the U.S. economy⁷

United Kingdom: in 2013 direct contribution of the shipping industry accounted for £ 3 billion while indirect and induced contributions reached £ 4.7 billion⁸ (each direct pound produced 1.56 pounds of extra output)

Spain: in 2016, for each euro of Port of Huelva direct impact, an additional 1.97 euros of GVA were generated in Huelva.

France: in 2013, it was estimated that the multiplier effect of the Marseille port was 2.01 and 2.47 for the Le Havre-Rouen port (each direct euro produced 2.01 and 2.47 of extra output for each port)⁹.

Turkey: in 2013 the multiplier effect of Mersin port was estimated at 1.79 (each direct euro produced 1.79 of extra output)¹⁰.

Germany: in 2013 the multiplier effect of Hambourg port was estimated at 1.71 (each direct euro produced 1.71 of extra output)¹¹.

Belgium: in 2013 the multiplier effect of Antwerp port was estimated at 1.18 (each direct euro produced 1.18 of extra output)¹².

The Netherlands: in 2013 the multiplier effect of Rotterdam port was estimated at 1.13 (each direct euro produced 1.13 of extra output)¹³.

Italy: in 2013, it was estimated that the port system of the Friuli-Venezia-Giulia (FVG) region produced 3.15 € for each direct euro produced¹⁴.

⁵ IHS Global insight. <https://www.worldshipping.org/benefits-of-liner-shipping/global-economic-engine>

⁶ The economic value of the EU shipping industry – update. Oxford Economics (2015).
<https://www.ecsa.eu/images/Studies/150220%20European%20Shipping%20Update.pdf>

⁷ The economic impact of shipping on the national economy. Hercules E Haralambides (1996)

⁸ The economic impact of the UK Maritime Services Sector: Shipping. Oxford Economics (2015).

⁹ La Economía Puerto-Ciudad Mediterránea: Los Casos de Marsella (Francia) y Mersin (Turquía). Olaf MERK, Région et Développement no 41-2015, 2015

¹⁰. Ibid

¹¹ Ibid

¹² Ibid

¹³ Ibid

¹⁴ Ibid



Indicators of the Economic Sectors Dashboard

Each of the estimates of the Valuation Tool comes accompanied, in the economic dashboards, with a series of key sectorial indicators, along with their sources, to properly contextualise the information provided. Figure below synthesis primary indicators included in each dashboard. Figure in the next page presents the background data associated to the project, also available in the valuation tool.

Figure 2. Key sectorial indicators considered

Sector	Indicator	Units	Source
Coastal tourism	Total size of the Tourism sector in millions of current USD	Millions of current USD and as % of national GDP	WTTC
	Employment in the Tourism sector	Jobs and as % national employment	WTTC
	Investment by type of stakeholder	Current USD	WTTC
	Visitor expenditure	Current USD	World bank
	Spending by type of tourism	%	WTTC
	International tourism	Arrivals	CEPAL
	Arrivals by type of visitor	Arrivals	CEPAL and World Bank
	Arrivals by mode	Arrivals	WTO, CEPAL and SNA
	Water-based travel	Trips	WTO, CEPAL and SNA
	Arrivals by purpose	Arrivals	WTO
	Total average length of stay	Days	WTO
	Number of overnight stays	Overnights	Estimated from World Bank and World Tourism Organization
	Expenditure per tourist	Current USD	Estimated from World Bank, WTTC and CEPAL
	Expenditure per overnight	Current USD	Estimated from World Bank, WTTC and World Tourism Organization
Fishing and Aquaculture	Total size of the Fishing and Aquaculture sector	Millions of current USD and as % of national GDP	National Accounts, CFRM and FAO
	Employment in the Fishing and Aquaculture sector in 2010	Jobs and as % national employment	FAO
	Global production	Tones	FAO
	Production by type	Production as % global production	FAO
	Fish extraction production	Tones	CEPAL
	Fish extraction production by specie	Tones	CEPAL
	Aquaculture production	Tones	FAO
	Aquaculture production by culture environment	Tones	FAO
	Exports and Imports in the Fishing and Aquaculture sector	Thousands of current USD and tones	FAO
	Exports by commodity	Tones	FAO
	Imports by commodity	Tones	FAO
	Processed by commodity	Tones	FAO
	Reexports by commodity	Tones	FAO
Shipping and Shipbuilding	Total size of Shipping and Shipbuilding sector	Millions of current USD and as % of national GDP	Estimations from National Accounts, WB and CDB
	Employment in the Shipping and Shipbuilding sector in 2015	Jobs and as % national employment	UNCTAD from BIMCO-ICS Manpower Report 2015
	Value of merchandise Exports and Imports	Millions of current USD	World Bank
	Trade balance (merchandise)	Millions of current USD	World Bank
	Ports movements	TEU	CEPAL (2000-2016). Forecast from CDB (2017-2025)
	Liner shipping connectivity index	Index (Maximum 2006 = 100)	UNCTAD
	Transshipment	% of total throughput	CEPAL (2018)
	Total fleet	Thousands dead weight tones	UNCTAD
	Type of commodity market	Thousands dead weight tones	UNCTAD
	Number of port calls of all ships in 2018	Calls	UNCTAD
	Number of port calls by type of ships in 2018	Calls	UNCTAD
	Average cargo carrying capacity (DWT) per vessel in 2018	DWT	UNCTAD
	Maximum cargo carrying capacity (DWT) of vessels in 2018	DWT	UNCTAD
	Average container carrying capacity (TEU) per container ship in 2018	TEU	UNCTAD
	Maximum container carrying capacity (TEU) of container ships in 2018	TEU	UNCTAD
	Median time in port in 2018	Days	UNCTAD
Energy and Sustainability	Total size of water-based energy sector (oil and gas)	Millions of current USD and as % of national GDP	World Bank
	Representativity of water-based energy resources (rents)	% of total natural rents	World Bank
	All natural resources rents by type	% of national GDP	World Bank
	Employment in the energy sector	Jobs and as % national employment	Central Bank TT, Barbados Statistical Centre and World Bank
	Primary and secondary energy supply	Thousands BOE	CEPAL
	Electricity production from water-based energy resources	% of total energy production	World Bank
	Fuel exports and imports	% of export and import merchandise	World Bank
	Energy imports	% of energy use	World Bank
	Primary and secondary energy consumption	Thousands BOE	CEPAL
	Renewable energy consumption	% of total final energy consumption	World Bank
	Energy consumption	Thousands BOE per millions dollars of GDP (in constant 2010 prices)	CEPAL
	CO2 intensity	kg per kg of oil equivalent energy use	World Bank
	CO2 emissions	kg per 2010 US\$ of GDP and index (China 1990 = 100)	World Bank
	Energy use	kg of oil equivalent per capita	World Bank
	Oil production and consumption	Barrels per day	U.S. Energy Information Administration (EIA)
	Oil proven reserves	Thousands of barrels	U.S. Energy Information Administration (EIA)
	Annual oil production	Production as % of oil proven reserves	U.S. Energy Information Administration (EIA)
	Dry natural gas production and consumption	Billion cubic feet	U.S. Energy Information Administration (EIA)
	Gas proven reserves	Gas proven reserves: Billion cubic feet	U.S. Energy Information Administration (EIA)
	Annual dry natural gas production	Annual gas production as % of gas proven reserves	U.S. Energy Information Administration (EIA)

**Figure 3. Background data and indicators**

SECTOR	SUBSECTOR	DATASET	SOURCE	YEARS
SHIPPING	Ports	Port movements	CEPAL	2000-2018
		Container per port throughput	UNCTAD STAT	2010-2019
		Port liner shipping connectivity index, annual	UNCTAD STAT	2006-2019
		Port call and performance statistics: number of arrivals, time spent in ports, vessel age and size, annual.	UNCTAD STAT	2018
		% of transshipment over throughput in 2018	CEPAL	2018
		gateway container demand forecast	CDB	2010-2025
	Fleet	Merchant fleet by flag of registration and by type of ship, annual.	UNCTAD STAT	1980-2019
		Merchant fleet by country of beneficial ownership, annual.	UNCTAD STAT	2014-2019
		Seafarer supply, quinquennial,	UNCTAD STAT	2015
	Trade	Liner shipping bilateral connectivity index, annual	UNCTAD STAT	2006-2019
		Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual	UNCTAD STAT	1995-2018
		Liner shipping connectivity index, annual.	UNCTAD STAT	2006-2019
		Merchandise trade as a percentage of GDP	World Bank	1960-2018
		Merchandise exports (current US\$)	World Bank	1960-2018
		Merchandise imports (current US\$)	World Bank	1960-2018
		Merchandise exports by product group and destination – annual (Million US dollar)	World Trade Organization	2013-2018
TOURISM	Arrivals	Inbound tourism arrivals.	CEPAL	2009-2017
		International tourism, number of arrivals (International inbound tourists (overnight visitors))	WORLD BANK	1995-2017
	Length of stay	Inbound tourism. Total average length of stay	WORLD TOURISM ORGANIZATION	1995-2018
		Inbound tourism. Average length of stay for all commercial accommodation services	WORLD TOURISM ORGANIZATION	1995-2018
		Inbound tourism - Average length of stay in hotels and similar establishments	WORLD TOURISM ORGANIZATION	1995-2018
		Inbound tourism - Average length of stay for non-commercial accommodation services	WORLD TOURISM ORGANIZATION	1995-2018
	Expenditures	Inbound tourism expenditure	CEPAL	2009-2017
		Inbound tourism expenditure over gross domestic product (GDP)	CEPAL	1980-2017
		International tourism, expenditures (current US\$)	WORLD BANK	1995-2017
		International tourism, expenditures (% of total imports)	WORLD BANK	1995-2017
		Outbound tourism expenditure over Gross Domestic Product. GDP	CEPAL	1980-2017
		Outbound tourism expenditure.	CEPAL	1980-2017
		International tourism, expenditures for passenger transport items (current US\$)	WORLD BANK	1995-2017
		Inbound tourism - Average expenditure per day	WORLD TOURISM ORGANIZATION	1995-2018
	Receipts	International tourism, receipts (current US\$)	WORLD BANK	1995-2017
		International tourism, receipts (% of total exports)	WORLD BANK	1995-2017
		International tourism, receipts for passenger transport items (current US\$)	WORLD BANK	1995-2017
		International tourism, receipts for travel items (current US\$)	WORLD BANK	1995-2017
	Departures	Outbound tourism, departures	CEPAL	2009-2017
		International tourism, number of departures	WORLD BANK	1995-2017
	Cruise traffic	Inbound tourism - Cruise passenger arrivals	WORLD TOURISM ORGANIZATION	1995-2018
		Caribbean port cruise traffic	CEPAL	2014-2016



	Forecasts	Traffic Flow Detail	BOEING	2018-2018
		Propensity to travel	AIRBUS	2019-2038
		Traffic Forecast - Passengers	AIRBUS	2019-2038
		Traffic Forecast - Freight	AIRBUS	2019-2038
	Sectorial Data	Economic Contribution of Cruise Tourism by destination, 2017-2018 cruise year	BRIA	2017-2018
		Tourism data	WTTC	2000-2017
		Tourism establishments	UNWTO	2010-2018
		The Direct contribution of tourism to employment in selected CDB BMC's	WTTC	2011-2017
FISHERY	Economy	Contribution to gross domestic product (GDP) by the fishing industry	CRFM	2010-2016
		Employment	FAO.	1980-2014
		Employment per country	Various	
	Trade	Fishery Commodities and Trade	FAO.	1950-2017
		NET FISHERIES EXPORT POSITION OF REGIONAL ECONOMIES	UN COMTRADE	VARIOUS
		Fisheries contribution to GDP	CDB	1984-2016
		Global production	FAO.	1950-2017
	Aquaculture	Aquaculture production	CEPAL (ECLAC).	1950-2016
		Global Aquaculture production	FAO.	1950-2016
	Capture production	Fish extraction	CEPAL (ECLAC).	1950-2016
		Fish extraction by type of fish	CEPAL (ECLAC).	1950-2016
		Global capture production	FAO.	1950-2017
	Commodity trade	Percentage contribution to gross domestic product (GDP) by the fishing industry of CRFM Member states (in current prices)	CRFM	2010- 2016
		Commodity Trade and production: quantity (t)	FAO	2000- 2017
		Commodity Trade and production: USD thousands	FAO	1990- 2017
ENERGY	Consumption	Energy consumption	CEPAL (ECLAC).	1970-2017
		Consumption of electric power.	CEPAL (ECLAC).	1970-2017
		Energy intensity of gross domestic product	CEPAL (ECLAC).	1970-2017
		Energy use (kg of oil equivalent per capita)	CEPAL (ECLAC).	1960-2015
		Total natural resources rents (% of GDP)	WORLD BANK	1960-2019
	Supply	Primary energy supply	CEPAL (ECLAC).	1970-2017
		Secondary Energy supply	CEPAL (ECLAC).	1970-2017
		Primary energy supply from renewable (combustible and non-combustible) and non-renewable sources by energy resource	CEPAL (ECLAC).	1970-2017
		Supply from renewable energy.	CEPAL (ECLAC).	1970-2017
	Renewable energy	Renewable proportion of the total energy supply	CEPAL (ECLAC).	1970-2017
		Renewable proportion of primary energy supply.	CEPAL (ECLAC).	1970-2017
	Production	Energy production	CEPAL (ECLAC).	1970-2017
		Installed capacity for producing electricity	CEPAL (ECLAC).	1970-2017
		Monthly report	OLADE.	1970-2017
		Energy matrix	IDB	2008 and 2010
		Power Plants	WTI	
	Imports/exports	Energy imports, net (% of energy use)	WORLD BANK	1960-2019
		Fuel exports (% of merchandise exports)	WORLD BANK	1960-2019
		Fuel imports (% of merchandise imports)	WORLD BANK	1962-2019
	Electricity production	Electricity production from coal sources (% of total)	WORLD BANK	1960-2015



		Electricity production from hydroelectric sources (% of total)	WORLD BANK	1960-2015
		Electricity production from natural gas sources (% of total)	WORLD BANK	1960-2015
		Electricity production from nuclear sources (% of total)	WORLD BANK	1960-2015
		Electricity production from oil sources (% of total)	WORLD BANK	1960-2015
		Electricity production from renewable sources, excluding hydroelectric (% of total)	WORLD BANK	1960-2015
		Electricity production from renewable sources, excluding hydroelectric (kWh)	WORLD BANK	1960-2015
	Sectorial data	Gas Data	US Energy Information Administration	1980-2017
		Natural rents disaggregated (% of GDP)	WORLD BANK	2000-2017
		Oil Data	US Energy Information Administration	1980-2017
		Total natural resources rents (% of GDP)	WORLD BANK	1970-2017
ATIONAL ACCOUNTS	The Bahamas	Gross Domestic Product by Economic Activity (\$ Millions, Current prices)	IADB	2008-2018
		Energy indicators	OLADE	2010 -2012
	Barbados	Barbados Labour Force	Barbados Statistical Service	2010 -2019
	Guyana	Annual Gross Domestic Product (GDP) at Current Prices (revised and rebased), Guyana: 2006 to 2017 (G\$Million)	Guyana Bureau of Statistics	2006-2017
	Suriname	Gross Value Added at basic prices (1000 SRD) by kind of Economic Activity at Current Prices	Suriname General Bureau of Statistics	2006-2017
	Trinidad and tobago	GDP at purchaser prices (current prices, Trinidad and Tobago currency)	Trinidad and Tobago Central Statistical Office	2012-2018
		Labour Force Annual	Central Bank of Trinidad and Tobago	1991-2017
	Multisectorial mesures	Blue Economy Sectors Measuring Datasets - CDB	CDB	Various
	Currency rates	USD Rates	IMF	2000-2018
	Gdp growth	GDP growth case studies	WORLD BANK	1961 -2018
	Gdp current usd	GDP current USD	WORLD BANK	1961 -2018
	Gdp deflator	GDP deflator	WORLD BANK	2000 -2015
	Consumer prices	Consumer prices	WORLD BANK	2000 -2015
	Regional gdp	Annual average growth rate per capita	UNCTAD	1971 -2018
	Gdp forecast	GDP CEPII Forecast 2050	CEPII	1980- 2050
	Exports	Exports of goods and services (% of GDP)	WORLD BANK	1960 -2030
	Trade of transport	Total trade in transport services	UNCTAD	2015 -2018
	Labour force	Labour force	WORLD BANK	1990-2019
	Volume merch	Volume growth rates of merchandise exports and imports, quarterly	UNCTAD	2005-2019
	Seaborne trade	World seaborne trade by types of cargo and by group of economies, annual	UNCTAD	1970 -2019
	Poverty	Regional comparison of poverty, vulnerability and inequality	CDB	Various
ENVIRON MENT		Ocean Health Index	National Center for Ecological Analysis and Synthesis (NCEAS) at the University of California, Santa Barbara (UCSB)	2012-2017
		Coastal Population and Coastal Area	CIESIN	1990-2000-2010
		Fisheries vulnerability to climate change	Blasiak & World Climate Research Programme	2016-2050 Scenario
		Marine and territorial protected areas	World Bank	2000-2018
		CO2 emissions (kg per 2010 US\$ of GDP)	World Bank	1960- 2016
		CO2 emissions (kt)	World Bank	1960- 2016
		CO2 intensity (kg per kg of oil equivalent energy use)	World Bank	1960- 2016

Indicators in the Geographic Information System

The online tool includes a Geographic Information System with data for each sector analysed, listed below.

Figure 4. Metadata for the Geographic Information System

Layer name	Data source	Date of creation
Airports	Self-elaboration based on various sources	May 2020
Establishments	Data retrieved from Booking	May 2020
Tourist locations	Data retrieved from TRIPAdvisor	May 2020
Cruise connections	Data retrieved from cruise industry data catalogues (Royal Caribbean, Celebrity, AIDA, Carnival, Princess Cruises, Costa, Holland America Line, P&O, Pullmantur, Norwegian Cruise Lines, Regent Seven Seas, MSC)	May 2020
Ferry lines	Self-elaboration based on Google Maps	May 2020
Ports	Self-elaboration based on various sources	May 2020
Yachting	Self-elaboration based on various sources	May 2020
Shipyard	Self-elaboration based on various sources	May 2020
Fishing zones	Self-elaboration based on various sources	May 2020
Fish Farms and markets	Self-elaboration based on various sources	May 2020
Energy Plants	Self-elaboration based on various sources	May 2020
Gas Pipelines	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Oil Pipelines	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Oil Refinery	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Platforms	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Oil and Gas fields	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017

ANNEX 1. ONLINE TOOL STRUCTURE

Home Page

The online tool is available at: <http://projects.mcrit.com/blueeconomy/> and it presents five main sections:

- About or Home page, where general information regarding Blue Economy can be found.
- Dashboard, including figures produced in the study.
- GIS, including geographic information for each one of the sectors assessed.
- Knowledge Hub, including all the reports, datasets, assessment methodologies and initiatives related to Blue Economy found throughout the project.
- Site Map, with the online tool structure.

Figure 5. Blue Economy Online Valuation Tool for the Caribbean



BLUE ECONOMY IN THE CARIBBEAN

The valorization of the oceans, seas and coasts and the sustainable use of its resources underpin the principles of the so-called **Blue Economy**, which includes diverse economic segments related to the sea, such as fishing, food production, maritime biotechnology, production energy, reuse of waste, tourism, environmental protection, trade, shipping, maritime security, among others.

In the Caribbean, the economic potential of the majority of the countries' maritime exclusive economic zone is significantly larger. The Caribbean's maritime area is almost 4.5 times the size of its land acreage, resulting in more than 70% of the Region's population settling along the coast and depending on the sea for subsistence and income. The Caribbean's Oceans Economy, which consists of traditional sectors such as shipping, tourism, oil and gas, fisheries and aquaculture, was estimated to contribute around 18% of GDP (2012).

<http://projects.mcrit.com/blueeconomy/>

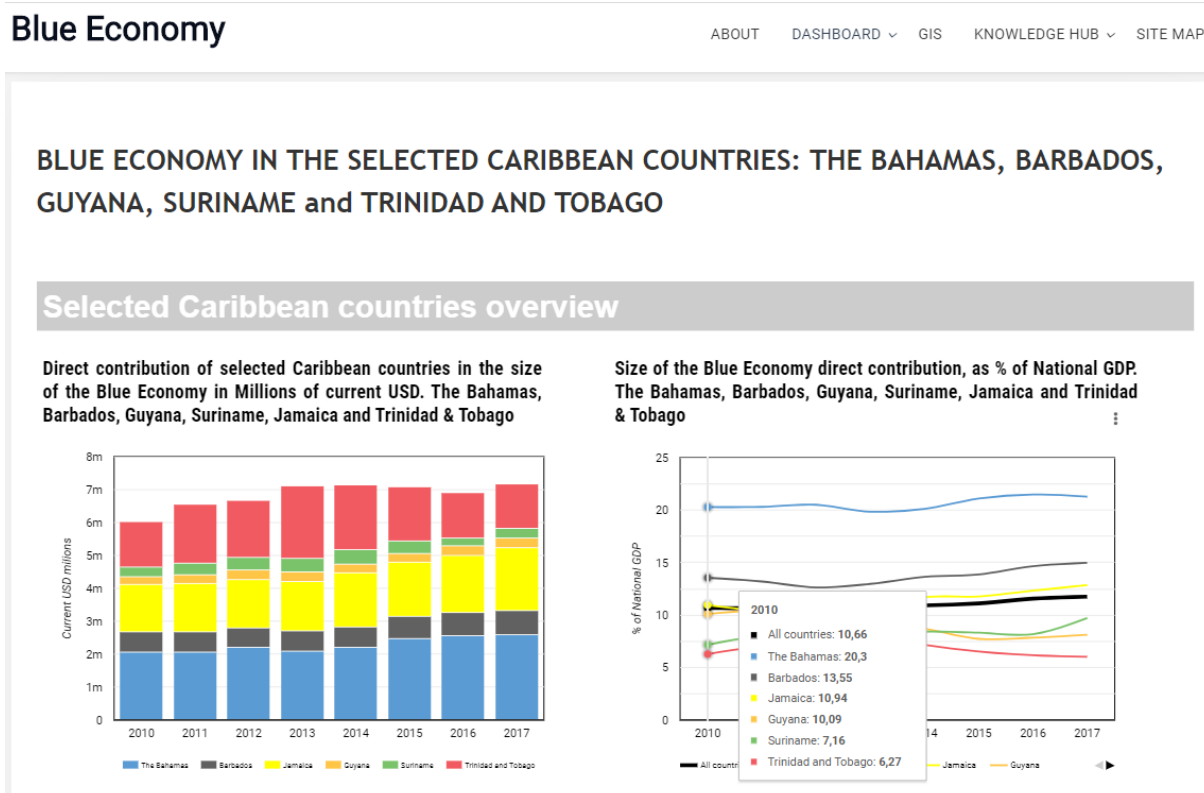
Dashboards

There are five dashboards:

- **Selected Caribbean countries:** it includes a general over-view of the five scope countries (and Jamaica), with its total contribution to the Blue Economy (in both current USD millions and as a percentage of national GDP), and a comparison for each country between Blue Economy in 2010 and 2017. It also includes 8 additional figures to have a wider picture of Blue Economy in each scope country.
- **Coastal Tourism:** it includes 16 figures for each one of the selected Caribbean countries.
- **Fishing and Aquaculture:** it includes 16 figures for each one of the selected Caribbean countries.

- **Shipping and Shipbuilding:** it includes 18 figures for each one of the selected Caribbean countries
- **Energy:** it includes 21 figures for each one of the selected Caribbean countries

Figure 6. Selected Caribbean countries dashboard



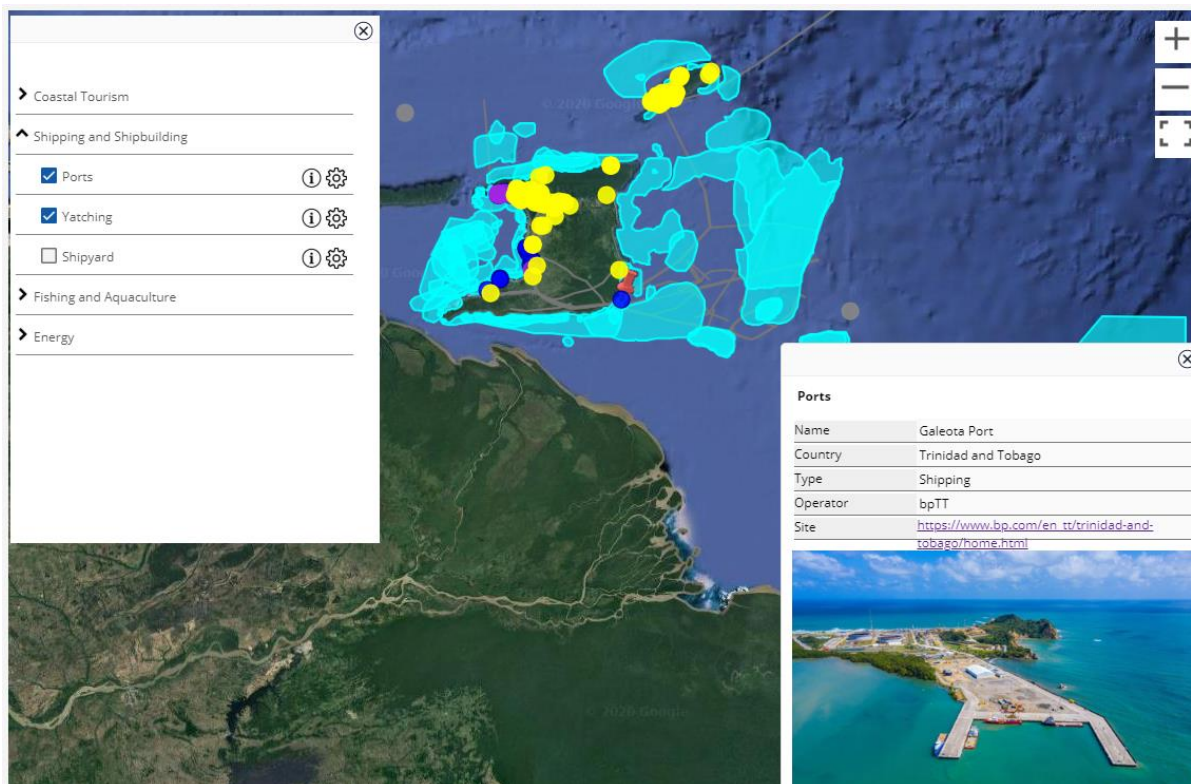
Geographic Information System (GIS)

The online tool includes a Geographic Information System with data for each sector analysed. Data included is listed below:

Figure 7. Metadata for the Geographic Information System

Layer name	Data source	Date of creation
Airports	Self-elaboration based on various sources	May 2020
Establishments	Data retrieved from Booking	May 2020
Tourist locations	Data retrieved from TRIPAdvisor	May 2020
Cruise connections	Data retrieved from cruise industry data catalogues (Royal Caribbean, Celebrity, AIDA, Carnival, Princess Cruises, Costa, Holland America Line, P&O, Pullmantur, Norwegian Cruise Lines, Regent Seven Seas, MSC)	May 2020
Ferry lines	Self-elaboration based on Google Maps	May 2020
Ports	Self-elaboration based on various sources	May 2020
Yachting	Self-elaboration based on various sources	May 2020
Shipyard	Self-elaboration based on various sources	May 2020
Fishing zones	Self-elaboration based on various sources	May 2020
Fish Farms and markets	Self-elaboration based on various sources	May 2020
Energy Plants	Self-elaboration based on various sources	May 2020
Gas Pipelines	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Oil Pipelines	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Oil Refinery	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Platforms	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017
Oil and Gas fields	Caribbean Energy Map (2015) and Trinidad and Tobago Energy Map (2017)	2015 and 2017

Figure 8. Geographic Information System (GIS) included in the online platform



Knowledge Hub

Repository online including:

- Blue Economy existing databases for each sector (coastal tourism, fisheries and aquaculture, shipping and shipbuilding and energy)
- Blue Economy reports (Global strategies, Caribbean strategies, valuation methodologies and specific sectorial reports for coastal tourism, fisheries and aquaculture, shipping and shipbuilding and energy)
- Innovation cases (Caribbean and other initiatives)
- Stakeholder
- Other visualization tools related to Blue Economy

Site Map

It includes the structure of the online tool and all the entries published.

Figure 9. Site Map included in the online tool

Blue Economy

[ABOUT](#)
[DASHBOARD](#)
[GIS](#)
[KNOWLEDGE HUB](#)
[SITE MAP](#)

Main Menu

- About
 - Blue Economy in the Caribbean
- Dashboard
 - Selected Caribbean Countries
 - Blue Economy Assessment in the Caribbean
 - Coastal Tourism
 - BLUE ECONOMY ASSESSMENT: COASTAL TOURISM
 - Fishing & Aquaculture
 - BLUE ECONOMY ASSESSMENT: FISHING AND AQUACULTURE
 - Shipping & Shipbuilding
 - BLUE ECONOMY ASSESSMENT: SHIPPING AND SHIPBUILDING
 - Energy
 - BLUE ECONOMY ASSESSMENT: ENERGY
- GIS
- Knowledge hub
 - Data
 - Coastal Tourism
 - CEPAL (ECLAC). Inbound tourism arrivals
 - CEPAL (ECLAC). Inbound tourism expenditure and Inbound tourism expenditure over Gross Domestic Product (GDP)
 - CEPAL (ECLAC). Outbound tourism, departures
 - CEPAL (ECLAC). Outbound tourism expenditure and Outbound tourism expenditure over Gross Over Product (GDP)
 - WORLD BANK. International tourism, expenditures (current US\$)
 - WORLD BANK. International tourism, expenditures (% of total imports)
 - WORLD BANK. International tourism, expenditures for passenger transport items (current US\$)
 - WORLD BANK. International tourism, number of arrivals
 - WORLD BANK. International tourism, number of departures
 - WORLD BANK. International tourism, receipts (current US\$)
 - WORLD BANK. International tourism, receipts (% of total exports)
 - WORLD BANK. International tourism, receipts for passenger transport items (current US\$)
 - WORLD BANK. International tourism, receipts for travel items (current US\$)
 - WORLD BANK. International tourism, receipts for passenger transport items (current US\$)
 - Fisheries & Aquaculture
 - CEPAL (ECLAC). Aquaculture production
 - CEPAL (ECLAC). Fish extraction and Fish extraction by type of fish
 - FAO. Fishery Commodities and Trade
 - FAO. Global Aquaculture Production
 - FAO. Global Capture Production
 - FAO. Global Fishery Production
 - FAO. Fishery and Aquaculture Country Profiles
 - Shipping & Shipbuilding
 - CEPAL (ECLAC). Port movements.
 - UNCTAD Stat. Container port throughput, annual
 - UNCTAD Stat. Liner shipping bilateral connectivity index, annual
 - UNCTAD Stat. Liner shipping connectivity index, annual
 - UNCTAD Stat. Merchant fleet by flag of registration and by type of ship, annual
 - UNCTAD Stat. Merchant fleet by country of beneficial ownership, annual
 - UNCTAD Stat. Port liner shipping connectivity index, annual
 - UNCTAD Stat. Port call and performance statistics: number of arrivals, time spent in ports, vessel age and size, annual
 - UNCTAD Stat. Ship scrapping by country of demolition, annual
 - UNCTAD Stat. Ships built by country of building, annual
 - UNCTAD Stat. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual
 - UNCTAD Stat. World seaborne trade by types of cargo and by group of economies, annual Data available for 20 group of countries since 1970 – 2019 (2006-2019 for some of them)
 - UNCTAD Stat. Volume growth rates of merchandise exports and imports, quarterly
 - WTO. Merchandise exports by product group and destination – annual (Million US dollar)
 - UNCTAD Stat. Seafarer supply, quinquennial, 2015
 - Energy
 - CEPAL (ECLAC). Energy consumption
 - CEPAL (ECLAC). Consumption of electric power.
 - CEPAL (ECLAC). Energy intensity of gross domestic product
 - CEPAL (ECLAC). Installed capacity for producing electricity
 - CEPAL (ECLAC). Energy production
 - CEPAL (ECLAC). Renewable proportion of the total energy supply
 - CEPAL (ECLAC). Primary energy supply from renewable (combustible and non-combustible) and non-renewable sources by energy resource