CARICOM

Caribbean Community (CARICOM)

Climate Change Statistics - 2020

Caribbean Community (CARICOM) Secretariat
August 2020

CARIBBEAN COMMUNITY (CARICOM)

CLIMATE CHANGE STATISTICS - 2020

THE REGIONAL STATISTICS PROGRAMME
CARIBBEAN COMMUNITY (CARICOM) SECRETARIAT

August 2020

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CLIMATE CHANGE STATISTICS -2020

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PREFACE

This is the first publication on the **Caribbean Community** (**CARICOM) Climate Change Statistics-2020** prepared by the CARICOM Secretariat, Regional Statistics Programme (RSP). The publication contains data up to 2019 for some tables, while for other tables the data are up to 2012/13. Some of the data were previously published in the publication, *The CARICOM Environment in Figures.* Therefore, while some new data series are included in this publication on Climate Change Statistics, it also constitutes the re-arrangement of past data submitted to the CARICOM Secretariat by Member States and Associate Members, from the United Nations Statistics Division (UNSD) and from other regional and International Organisations.

This publication, exploratory as it is, provides statistics on key aspects pertaining to Climate Change. It builds on the capacity building efforts that were undertaken over the years, starting with the UNSD/CARICOM project of 1999-2002, to develop the area of Environment and Social/Gender Statistics and continuing with support provided by other International Development Partners to the CARICOM Secretariat, such as, the European Union under the Ninth and Tenth European Development Fund (EDF) and the World Bank Trust Fund for Statistical Capacity- Building (TFSCB).

The publication, CARICOM Climate Change Statistics-2020, attempts to follow the UNSD Framework for the Development of Environment Statistics (FDES, 2013) and its refinements derived from the Inter-governmental Panel on Climate Change (IPCC) schematic framework, the latter of which summarises Climate Change into five (5) components - Drivers, Impacts, Adaptation, Mitigation and Vulnerability. The experience in producing this first publication brings out the need to continue to strengthen capacity in the area of Environment Statistics as a key means through which Climate Change Statistics can be developed. In fact, there have been four (4) rounds of data collection activities aimed at compiling data on Environment Statistics in the CARICOM Region, which revealed that there are data gaps that are required to be addressed more systematically in countries.

Past approaches to addressing the data gaps in CARICOM included capacity-building activities in countries and through regional training workshops on Environment Statistics, from which relevant Climate Change indicators were identified. Specifically, with the support received under the European Development Fund (EDF), in-country technical assistance was applied to strengthen the inter-agency collaboration of key stakeholders in the National Statistical Offices (NSOs) and Ministries, Departments and Agencies (MDAs) that relate to the Environment, in order to identify and facilitate the sharing of data to fill the data gaps. Additionally, collaborative support to member countries were provided by regional and international institutions, led by the UNSD, at

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the 2019 Workshop on Environment Statistics and Climate Change Statistics for the CARICOM Region in Grenada, to offer technical knowledge to statisticians from the NSOs and experts in the Ministries of Environment and to provide training on current methodologies in Environment and Climate Change Statistics.

A Technical Working Group (TWG) in Environment Statistics also exists in CARICOM to assist in the development of Environment and Climate Change Statistics. Currently, there are two (2) projects that are being executed collaboratively, the first funded by the Government of Italy through the Italian National Institute of Statistics (ISTAT) and the second project funded by the Inter-American Development Bank (IDB). Both projects include focus on Environment Statistics and specifically Climate Change Statistics. Additionally, the roll out of the Eleventh EDF, that has so far been impacted by the COVD-19 is also intended to provide support to strengthen statistical capacity on Environment and Climate Change Statistics including the indicators to monitor the Sustainable Development Goals (SDGs). Work is also in progress by the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) to provide support on Climate Change Statistics in CARICOM countries.

It is envisaged that this first publication CARICOM Climate Change Statistics-2020, will highlight the data gaps in Environment Statistics and encourage CARICOM countries to produce these statistics as a steppingstone to Climate Change statistics. In view of the fact that, much like Environment Statistics, Climate Change Statistics is a relatively new field of statistics, with a large number of data sources and institutions involved in its development, and with competing frameworks, it is anticipated that this publication would be ground-breaking in highlighting from the perspective of developing countries, some of the challenges in the production of these statistics but also the usefulness in producing data for decision-making in this area that is of high importance to CARICOM Small Island Developing States (SIDS). The publication also includes metadata and an overview of some of the data presented on Climate Change which will be incorporated in the online regional knowledge base which is being developed at the CARICOM Secretariat. It is expected that future publications will include both qualitative and quantitative data on Climate Change in the CARICOM Region. Some of the core areas included in the publication are - Forests, Freshwater Resources, Hazardous Events and Disasters, Waste Management and Climate Change Evidence.

The CARICOM Secretariat continues to encourage countries to strengthen inter-agency coordination to compile statistics and to fill the gaps in Environment and Climate Change Statistics, which are even more important as we monitor progress towards the SDGs and also treat with the issues surrounding the global Coronavirus pandemic. Apart from inter-agency collaboration, there is a continued call for dedicated

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personnel wherever feasible in NSOs, to enable concerted attention to this area of statistics, if these gaps are to be filled in CARICOM countries. The CARICOM Secretariat therefore welcomes feedback on this publication, **CARICOM Climate Change Statistics- 2020.**

ACKNOWLEDGEMENTS

The CARICOM Secretariat wishes to thank the National Statistical Offices and relevant Ministries of Environment of Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago, Anguilla, Bermuda, The British Virgin Islands, the Cayman Islands and Turks and Caicos Islands for contributing the data for the compilation of this publication.

The CARICOM Secretariat would also like to express their appreciation to The United Nations Statistics Division, The Caribbean Community Climate Change Centre, United Nations Framework Convention on Climate Change Regional Collaboration Centre (UNFCCC-RCC) and the Caribbean Cooperative MRV Hub. The Secretariat looks forward to the continued support of these Organisations in the preparation of future editions of this publication.

Special thanks to the staff of the Regional Statistics Programme for producing this publication.

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ABBREVIATIONS AND ACRONYMS

CARICOM Member States

AG	Antigua and Barbuda
BS	The Bahamas
BB	Barbados
BZ	Belize
DM	Dominica
GD	Grenada
GY	Guyana
HT	Haiti
JM	Jamaica
MS	Montserrat
KN	St. Kitts and Nevis
LC	Saint Lucia
VC	St. Vincent and the Grenadines
SR	Suriname
TT	Trinidad and Tobago

Associate Members

AI	Anguilla
BM	Bermuda
KY	Cayman Islands
TC	Turks and Caicos Islands
VG	British Virgin Islands

Other Acronyms

boe	Barrels of oil equivalent
CARIWIG	The Caribbean Weather Impacts Group

ABBREVIATIONS AND ACRONYMS

CCAP	Climate Change Adaptation Program
CARICOM	Caribbean Community
CCCCC	The Caribbean Community Climate Change Centre
CCRIF SPC	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company
CDEMA	The Caribbean Disaster Emergency Management Agency
CH_4	Methane
CIMH	The Caribbean Institute for Meteorology and Hydrology
CITES	The Convention on International Trade in Endangered Species
CO_2	Carbon dioxide
EDF	European Development Fund
FAO	The Food and Agriculture Organization of the United Nations
FDES	The Framework for the Development of Environment Statistics
GDP	Gross Domestic Product
GHGs	Greenhouse Gases
GHO	Global Health Observatory
HFC	Hydrofluorocarbon
IDB	Inter-American Development Bank
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard of Industrial Classification
ISTAT	Italian National Statistical Institute
Kwh	Kilowatt hour
LPG	Liquefied Petroleum Gas
m^3/y	cubic meters per year
MARPOL	Convention for Prevention of Marine Pollution
MEA	Multilateral Environmental Agreements
mm	Millimetre
MRV	Measurement, Reporting and Verification
mT	Metric Tonnes

ABBREVIATIONS AND ACRONYMS

N_2O	Nitrous Oxide
NMVOC	Non-Methane Volatile Organic compounds
NOx	Nitrogen oxides
NSOs	National Statistical Offices
OECD	The Organisation for Economic Co-operation and Development
REDD	Reducing Emissions from Deforestation and forest Degradation
SDGs	Sustainable Development Goals
SO_2	Sulphur Dioxide
TFSCB	Trust Fund for Statistical Capacity Building
TWG	Technical Working Group
UNCCD	United Nations Convention to Combat Desertification
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WC	Water Closet
WHO	World Health Organisation

NOTES AND SYMBOLS

NOTES

Unless otherwise stated, the charts refer to data shown in the accompanying table. Blank cells refer to no data submitted.

SYMBOLS

… Data not available

n/a Not applicable

0 Less than half of the unit specified

- Nil, magnitude zero

n.e.s ` not elsewhere specified

EXPLANATORY NOTES

Definitions of the five climate change areas according to the Inter-Governmental Panel on Climate Change (IPCC) framework[1]

There is currently no underlying framework linking the reporting requirements stemming from the Paris Agreement and the necessary statistics or indicators to support climate policy action. The Inter-governmental Panel on Climate Change (IPCC) has, however, developed a schematic framework which summarises the complexity of climate change as a sequence of events: **drivers, impacts, adaptation, vulnerability and mitigation**.

Drivers: Changes in the atmospheric concentrations of GHGs and aerosols, land cover and solar radiation that alter the energy balance of the climate system are drivers of climate change.

Impacts: Consequences of climate change on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts.

- Potential impacts: All impacts that may occur given a projected change in climate, without considering adaptation.
- Residual impacts: The impacts of climate change that would occur after adaptation.

Mitigation: An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases.

Adaptation: Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist, e.g. anticipatory and reactive, private and public, and autonomous and planned. Examples are raising river or coastal dikes, the substitution of more temperature-shock resistant plants for sensitive ones, etc.

Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

[1] IPCC (2007). AR4 Climate change 2007: synthesis report, IPCC., p. 37: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf
IPCC Third Assessment Report, 2001: https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_TAR_full_report.pdf, p.375
IPCC Third Assessment Report, 2001: https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_TAR_full_report.pdf, p.379
IPCC (2007). AR4 Climate change 2007: synthesis report, IPCC., p. 76: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf
IPCC Third Assessment Report, 2001: https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_TAR_full_report.pdf, p.225

COMPONENT 1:

DRIVERS

SUB-COMPONENT 1.1: EMISSIONS TO AIR

Topic 1.1.1: Emissions of Greenhouse Gases

Table 1.1.1.a.1: Carbon Dioxide Emissions (CO_2): 2000-2014

(Gg)

Country	2000	2001	2002	2003	2004	2005	2006
Antigua and Barbuda							945.54
Barbados	1134.00	1152.00	1152.00	1138.00	1166.00	1208.00	1225.00
Belize	11950.00			18168.00			17375.00
Dominica	106.00	118.00	113.00	111.00	111.00	119.00	
Grenada	207.50	216.70	226.40	238.70	232.20	243.40	251.40
Guyana	1734.00	1713.00	1684.00	1675.00	1731.00		
Haiti	2595.81						
Jamaica							11205.00
Saint Lucia							
St. Vincent and the Grenadines	155.15				217.41		

Table 1.1.1.a.1: Carbon Dioxide Emissions (CO_2): 2000-2014 (continued)

(Gg)

Country	2007	2008	2009	2010	2011	2012	2013	2014
Antigua and Barbuda								
Barbados	1305.00	1380.00	1427.00	1491.00				
Belize			13449.00					
Dominica								
Grenada	264.90	280.10	277.80	289.00	275.00	295.90	335.00	278.90
Guyana								
Haiti								
Jamaica	9857.00	10658.00	7918.00	7285.00	7870.00	7387.00		
Saint Lucia				493.00				
St. Vincent and the Grenadines								

Note: Gg refers to gigagrams

Source: National Communication to the UNFCCC

SUB-COMPONENT 1.1: EMISSIONS TO AIR

Topic 1.1.1: Emissions of Greenhouse Gases

Table 1.1.1.a.2: Nitrous Oxide (N_2O) Emissions: 2000-2014

(Gg)

Country	2000	2001	2002	2003	2004	2005	2006
Antigua and Barbuda							0.08
Barbados	52.00	49.00	48.00	47.00	54.00	50.00	47.00
Belize	0.00			0.00			0.00
Dominica	0.12	0.11	0.10	0.11	0.08	0.10	
Guyana	1.00	1.00	1.00	1.00	1.00		
Grenada	3.20	3.30	3.50	3.70	3.60	3.70	3.90
Haiti	5.05						
Jamaica							3870.00
Saint Lucia							
St. Vincent and the Grenadines	0.16				0.19		

Table 1.1.1.a.2: Nitrous Oxide (N_2O) Emissions: 2000-2014 (continued)

(Gg)

Country	2007	2008	2009	2010	2011	2012	2013	2014
Antigua and Barbuda								
Barbados	48.00	49.00	46.00	47.00				
Belize			0.00					
Dominica								
Guyana								
Grenada	4.00	3.80	3.90	4.10	3.70	3.80	4.00	4.00
Haiti								
Jamaica	4985.00	6874.00	6662.00	6643.00	4426.00	6594.00		
Saint Lucia				0.11				
St. Vincent and the Grenadines								

Note: Gg refers to gigagrams

Source: National Communication to the UNFCCC

SUB-COMPONENT 1.1: EMISSIONS TO AIR

Topic 1.1.1: Emissions of Greenhouse Gases

Table 1.1.1.a.3: Methane (CH_4) Emissions: 2000-2014

(Gg)

Country	2000	2001	2002	2003	2004	2005	2006
Antigua and Barbuda							0.64
Barbados	284.00	284.00	287.00	294.00	300.00	306.00	309.00
Belize	40.00			43.00			41.00
Dominica	1.57	1.57	1.56	1.55	1.56	1.56	
Grenada	2.10	2.20	2.30	2.40	2.40	2.50	2.60
Guyana	51.00	54.00	44.00	56.00	55.00		
Haiti	174.81						
Jamaica							818.00
Saint Lucia							
St. Vincent and the Grenadines	3.20				3.20		

Table 1.1.1.a.3: Methane (CH_4) Emissions: 2000-2014 (continued)

(Gg)

Country	2007	2008	2009	2010	2011	2012	2013	2014
Antigua and Barbuda								
Barbados	321.00	330.00	336.00	325.00				
Belize			40.00					
Dominica								
Grenada	2.60	2.50	2.50	2.60	2.60	2.60	2.60	2.70
Guyana								
Haiti								
Jamaica	835.00	841.00	857.00	847.00	831.00	852.00		
Saint Lucia				4.18				
St. Vincent and the Grenadines								

Note: Gg refers to gigagrams

Source: National Communication to the UNFCCC

SUB-COMPONENT 1.1: EMISSIONS TO AIR

Topic 1.1.1: Emissions of Greenhouse Gases

Table 1.1.1.a.4: Hydrofluorocarbon (HFC) Emissions: 2000-2014

(Gg)

Country	2000	2001	2002	2003	2004	2005	2006
Antigua and Barbuda							114.03
Barbados	4.00	8.00	15.00	21.00	31.00	34.00	45.00
Dominica	0.00	0.01	0.00	0.00	0.00	0.00	
Jamaica							87.00
Saint Lucia							

Table 1.1.1.a.4: Hydrofluorocarbon (HFC) Emissions: 2000-2014 (continued)

(Gg)

Country	2007	2008	2009	2010	2011	2012
Antigua and Barbuda						
Barbados	54.00	60.00	64.00	67.00		
Dominica						
Jamaica	92.00	95.00	95.00	93.00	92.00	89.00
Saint Lucia				0.02		

Table 1.1.1.b.1: Non-Methane Volatile Organic Compounds (NMVOC) Emissions: 2000-2006

(Gg)

Country	2000	2001	2002	2003	2004	2005	2006
Antigua and Barbuda							0.04
Dominica	1.64	3.85	2.77	2.30	3.22	2.30	
Guyana	24.00	26.00	27.00	26.00	27.00		
St. Vincent and the Grenadines	2.24				6.19		

Note: Gg refers to gigagrams

Source: National Communication to the UNFCCC

SUB-COMPONENT 1.1: EMISSIONS TO AIR

Topic 1.1.1: Emissions of Greenhouse Gases

Air emissions are predominantly produced from the combustion of fossil fuels, mainly from transport activities, power plants, refineries and other kinds of fuel combustion activities. These activities generate a large variety of air pollutants of which Carbon Dioxide (CO_2), Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_x) and Non-Methane Volatile Organic Compounds (NM-VOCs) are among the most significant ones. Industrial processes and agriculture also contribute to the emissions of the above-mentioned pollutants as well as to emissions of other greenhouse gases such as Nitrous Oxide (N_2O) and Methane (CH_4). Transport and energy production facilities are furthermore the main factors driving ambient air quality in cities.

Among CARICOM countries, Trinidad and Tobago, Jamaica and Suriname are the only countries with oil refineries and Barbados closed its refinery in 1998. These countries are also the top three with the highest manufacturing output in the region. Additionally, they are among countries with increasing annual quantities of transport of all types. Further, data on emissions of carbon dioxide (CO_2) provided in this chapter show relatively high emissions for Barbados and Jamaica however these figures are a fraction of what is emitted in developed countries. The remaining countries reported low emissions of CO_2 providing evidence that CARICOM SIDS do not contribute significantly to global greenhouse gas (GHG) emissions. In fact, Guyana and Suriname, due to their large forest areas, are both net carbon sinks.

Regarding the data in the tables presented, emissions of greenhouse gasses for CARICOM countries are limited since the computation of these data require specialised knowledge and resources. Most countries, therefore, rely on specialised projects, ad hoc studies and data from international organisations to gather data for reporting purposes as well as for effective participation in climate negotiations.

Definitions

Carbon Dioxide (CO_2) is a colourless, odourless and non-poisonous gas formed by combustion of carbon and in the respiration of living organisms and is considered to be the most common greenhouse gas produced by anthropogenic activities such as by burning fossil fuels from fossil carbon deposits, such as oil, gas and coal, of burning biomass, of land use changes (LUC) and of industrial processes (e. g., cement production).

Hydrofluorocarbons (HFCs) are compounds containing carbon, hydrogen, and fluorine which are generated by industrial processes as a substitute for chlorofluorocarbons (CFCs). HFCs largely are used in refrigeration, air conditioning equipment and semiconductor manufacturing.

Methane (CH_4) is the major component of natural gas and is associated with all hydrocarbon fuels. One of the major sources of methane emissions occur as a result of animal husbandry and agriculture.

Non-Methane Volatile Organic Compounds (NMVOCs): are a large variety of organic chemical air pollutants that under normal conditions can vaporise and enter the atmosphere. Compounds as benzene, xylene, propane and butane are classed as NMVOCs.

Nitrous Oxide (N_2O) emissions are largely due to agricultural activities, sewage treatment, burning of fossil fuels, and chemical industrial processes. There are natural sources of N_2O as well which is produced from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.
(Adapted from Working Group III contribution to the IPCC's Fifth Assessment Report (AR5) Annex)

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.1: Energy Supply

Table 1.2.1.1: CARICOM's Imports of Fossil Fuels: 1995-2018

US$Mn

MEMBER STATES	1995	1996	1997	1998	1999	2000
Antigua and Barbuda	…	…	…	…	37.3	55.1
Barbados	65.5	82.4	82.7	81.6	65.7	133.1
Belize	29.7	29.0	36.9	32.9	56.0	75.4
Dominica	6.6	8.5	9.1	3.4	8.4	14.2
Grenada	10.1	14.7	13.4	10.8	18.3	20.9
Guyana	0.0	0.0	97.6	75.5	89.0	127.5
Jamaica	394.6	444.3	408.5	291.7	380.5	586.3
Montserrat	…	…	…	…	0.8	2.5
Saint Lucia	23.3	25.9	28.1	24.0	24.1	38.1
St. Kitts and Nevis	5.8	8.4	10.9	7.5	8.8	14.9
St. Vincent and the Grenadines	8.1	9.9	10.7	10.8	11.1	15.6
Suriname	…	64.1	80.0	64.5	47.5	35.3
Trinidad and Tobago	197.3	422.7	399.0	397.3	569.8	1,079.5
Grand Total	**740.9**	**1,110.0**	**1,176.9**	**999.8**	**1,317.3**	**2,198.4**

Table 1.2.1.1: CARICOM's Imports of Fossil Fuels: 1995-2018 (continued)

US$Mn

MEMBER STATES	2001	2002	2003	2004	2005	2006
Antigua and Barbuda	…	…	…	…	181.5	246.4
Barbados	123.4	62.4	183.5	238.0	284.8	300.3
Belize	65.4	57.7	66.4	77.3	97.8	106.6
Dominica	12.9	10.9	13.8	16.1	21.9	25.8
Grenada	18.7	19.9	18.6	15.4	23.9	17.6
Guyana	117.7	133.1	149.7	173.4	247.9	258.7
Jamaica	615.5	643.0	754.5	892.7	1,384.2	1,233.0
Montserrat	1.4	5.3	4.4	5.6	7.4	8.8
Saint Lucia	39.6	31.0	41.9	91.2	67.0	76.3
St. Kitts and Nevis	14.2	9.0	17.7	18.1	18.6	19.6
St. Vincent and the Grenadines	16.7	15.4	8.6	24.8	33.3	39.5
Suriname	78.4	72.1	103.4	103.0	188.7	193.3
Trinidad and Tobago	932.8	854.9	1,071.6	1,181.8	1,992.2	2,281.4
Grand Total	**2,036.7**	**1,914.8**	**2,434.1**	**2,837.4**	**4,549.3**	**4,807.3**

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.1: Energy Supply

Table 1.2.1.1: CARICOM's Imports of Fossil Fuels: 1995-2018 (continued)

US$Mn

MEMBER STATES	2007	2008	2009	2010	2011	2012
Antigua and Barbuda	36.3	1.3	3.6	2.6	2.9	3.0
Barbados	19.0	311.2	260.7	411.5	484.3	501.2
Belize	109.8	135.2	104.7	115.4	144.4	143.2
Dominica	33.6	36.3	36.9	35.8	47.3	46.9
Grenada	60.9	76.0	51.3	69.1	88.6	50.8
Guyana	248.2	425.6	301.7	433.8	582.6	646.0
Jamaica	2,279.1	3,403.9	1,396.6	1,585.6	2,439.5	2,390.3
Montserrat	8.6	13.5	7.9	10.3	11.6	14.2
Saint Lucia	139.1	177.7	83.8	84.6	108.7	114.3
St. Kitts and Nevis	18.6	26.2	12.6	9.9	6.9	6.2
St. Vincent and the Grenadines	52.6	55.1	60.5	49.6	59.0	74.8
Suriname	166.5	202.9	216.9	264.1	382.9	268.8
Trinidad and Tobago	2,575.3	3,340.3	2,270.0	2,145.8	3,710.7	4,872.7
Grand Total	**5,747.7**	**8,205.4**	**4,807.3**	**5,217.9**	**8,069.3**	**9,132.4**

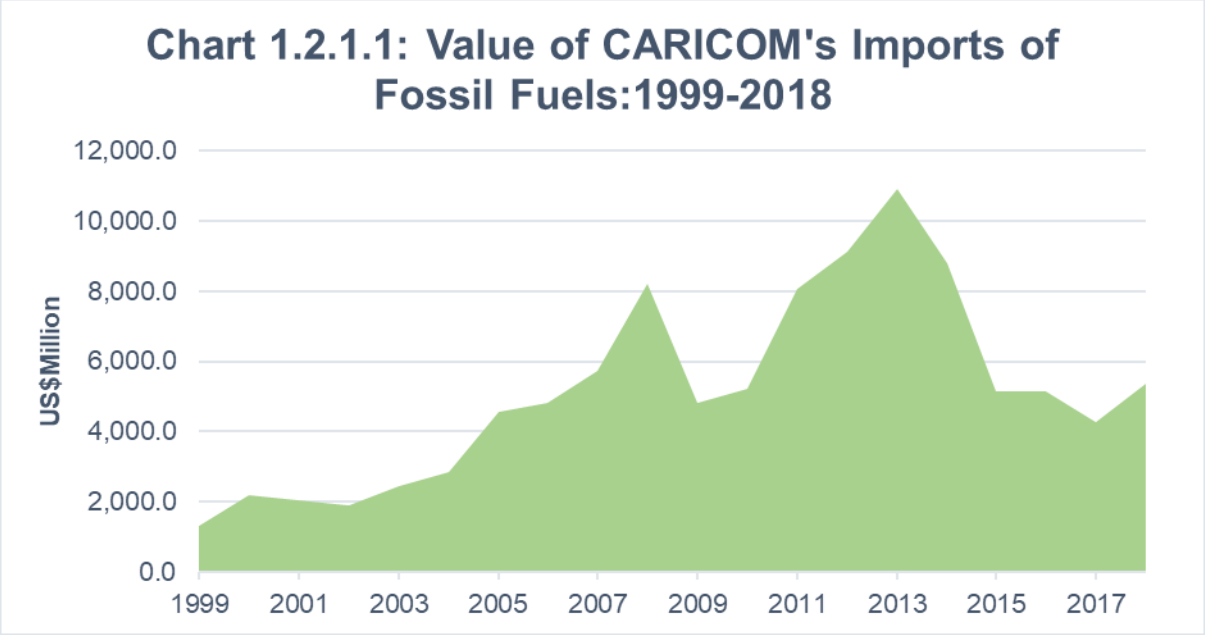
Table 1.2.1.1: CARICOM's Imports of Fossil Fuels: 1995-2018 (continued)

US$Mn

MEMBER STATES	2013	2014	2015	2016	2017	2018
Antigua and Barbuda	3.6	3.2	3.3	3.1	3.0	3.4
Barbados	482.8	438.8	301.8	251.5	313.1	371.7
Belize	141.3	148.4	110.9	94.0	103.0	141.8
Dominica	45.9	47.8	34.0	27.2	29.0	33.9
Grenada	84.3	55.4	58.0	96.5	64.0	58.2
Guyana	596.8	581.9	371.6	352.1	417.4	474.1
Jamaica	2,251.6	1,936.3	1,147.0	934.9	1,423.2	1,606.6
Montserrat	14.4	14.5	9.8	…	…	…
Saint Lucia	388.8	158.1	94.3	128.3	103.4	148.4
St. Kitts and Nevis	3.6	1.6	9.6	2.2	2.1	2.2
St. Vincent and the Grenadines	58.8	76.1	40.1	39.3	30.7	50.4
Suriname	501.3	383.6	265.1	222.5	132.2	99.0
Trinidad and Tobago	6,344.8	4,961.7	2,693.0	2,992.3	1,634.0	2,376.5
Grand Total	**10,918.0**	**8,807.5**	**5,138.6**	**5,143.7**	**4,255.2**	**5,366.1**

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.1: Energy Supply



The CARICOM Region depends heavily on imported fossil fuels as a main source of energy consumption and this contributes to a large number of countries' total imports. Fossil fuels are known to release large amounts of carbon dioxide into the atmosphere leading to concerns about climate change. Statistics presented in this chapter show that more than 90 per cent of households in CARICOM countries use fossil fuels as their main source of cooking and lighting with few exceptions. Although this trend is not expected to change significantly in the next ten years, member countries are endeavoring to change their energy mix to include renewable energy technologies to lower the cost of imports of fossil fuels.

The CARICOM Energy policy also encourages member countries to develop national policies that would promote the use of renewable energy sources. Countries have responded with varying courses of action. For example, Jamaica aims to have an energy mix which include 20 per cent renewables by 2030 while Barbados aims for an increase in renewable energy by 75 per cent by 2037. Meanwhile, Antigua and Barbuda has reportedly achieved its target of 15% renewable energy supply which was to be accomplished by 2030.

CARICOM countries have an abundant supply of renewable energy resources including solar, wind, geothermal energy and hydropower however investments into the development of these energy technologies remain low. This is despite the high cost of electricity in the region relative to developed countries. Government policy to support private investments can help to ensure renewable energy targets are met.

References

Barbados National Energy Policy 2017-2037 (2017) Government of Barbados

CARICOM Energy Policy (2013) The CARICOM Secretariat

Jamaica's National Energy Policy 2009 – 2030 (2009) Government of Jamaica

Renewable Readiness Assessment: Antigua and Barbuda (2016), International Renewable Energy Agency (IRENA)

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Energy Consumption

Table 1.2.2.1: Energy Consumption by Type and Year: 2009-2018

Country	Year	Solid Fuels	Liquid Fuels	Gaseous Fuels	Primary electricity ('000kwh)	Traditional fuels		
						Charcoal	Fuelwood	Bagasse
AG								
	2009	...	...	...	220,829	...	...	...
	2010	...	...	...	237,030	...	...	...
	2011	...	...	...	255,424	...	...	...
	2012	...	...	...	250,588	...	...	...
	2013	...	...	...	244,266	...	...	...
DM								
	2009	...	...	...	36,369	...	...	...
	2010	...	...	...	39,473	...	...	...
	2011	...	...	...	40,419	...	...	...
	2012	...	...	...	40,785	...	...	...
	2013	...	...	...	40,800	...	...	...
GY						(m^3)	(m^3)	
	2009	...	...	...	602,021	12,869	16,846	...
	2010	...	...	...	627,370	14,585	16,688	...
	2011	...	...	...	645,234	12,517	23,349	...
	2012	...	...	...	690,521	12,533	24,254	...
	2013	...	...	...	710,995	11,652	27,072	...
JM		(tonnes)						(boe)
	2009	63	...	...	3,233,154	...	...	402
	2010	54	...	...	3,235,183	...	...	418
	2011	65	...	...	3,175,490	...	...	579
	2012	56	...	...	3,103,023	...	...	570
	2013	89	...	...	3,045,049	...	...	626
VC								
	2009	...	...	...	142,213	...	...	...
	2010	...	...	...	139,988	...	...	...
	2011	...	...	...	140,708	...	...	...
	2012	...	...	...	142,788	...	...	...
	2013	...	...	...	...	...	...	...

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Energy Consumption

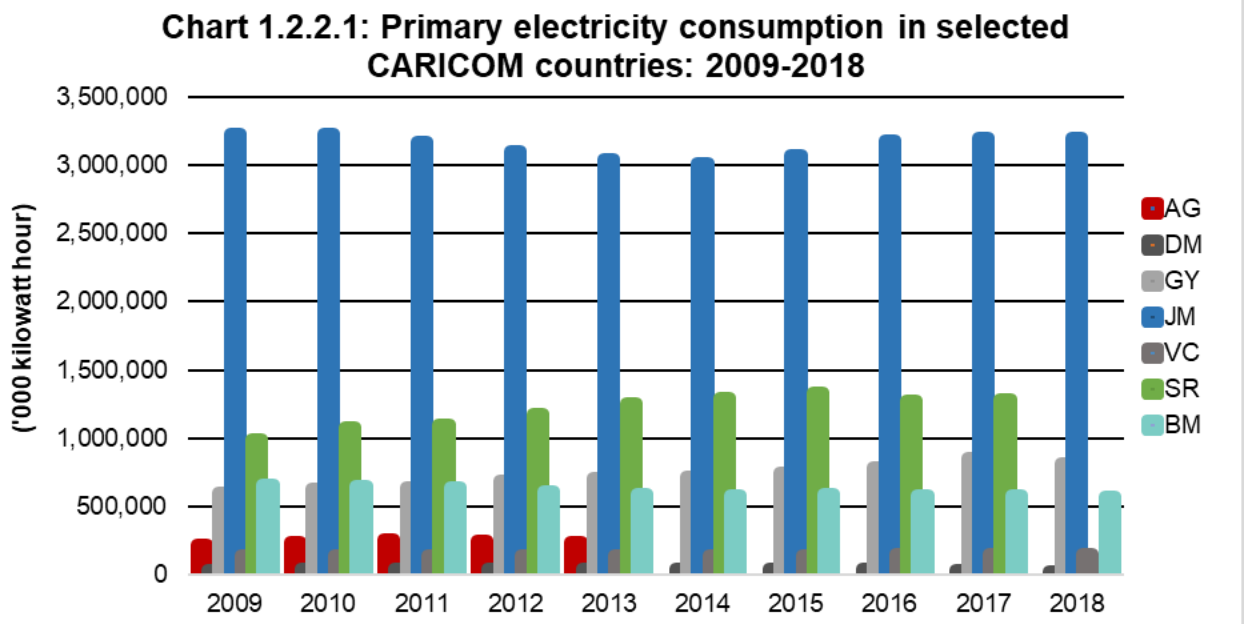
Table 1.2.2.1: Energy Consumption by Type and Year: 2009-2018 (continued)

Country	Year	Solid Fuels	Liquid Fuels	Gaseous Fuels	Primary electricity ('000kwh)	Traditional fuels		
						Charcoal	Fuelwood	Bagasse
				Cooking gas				
SR				(kg)				
	2009	...		14,273,465	993,881	...	...	...
	2010	...		14,763,113	1,085,237	...	...	...
	2011	...		15,639,819	1,099,954	...	...	...
	2012	...		16,138,486	1,173,634	...	...	...
	2013	...		16,668,861	1,253,711	...	...	...
TT			(mt)	(terrajoules)				
	2009		9,754,046	4,221				
	2010		7,884,987	4,411				
	2011		9,119,390	4,236				
	2012		6,497,094	4,205				
	2013		2,878,924	2176*				
BM								
	2009	...	...	...	656,082	...	...	...
	2010	...	...	...	650,571	...	...	...
	2011	...	...	...	636,517	...	...	...
	2012	...	...	...	606,346	...	...	...
	2013				586,704			

Notes:
m3 - cubic meter
mT - metric ton
boe - barrel of oil equivalent
kg - kilogram

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Energy Consumption



Concepts and Definitions:

Energy consumption refers to all the energy used for heat, power, and electricity generation, regardless of where the energy was produced.

Solid fuels include hard coal, lignite, peat, patent fuel, lignite briquettes, peat briquettes, coke and bituminous sands.

Liquid fuels include crude oil, natural gas liquids, plant condensate, gasoline, petroleum products, jet fuel, kerosene, liquefied petroleum gas, refinery gas, feedstock, naphtha, lubricants, gas/diesel oils and residual (heavy) fuel oils and bitumen.

Gaseous fuels include natural gas and other petroleum gases, such as gasworks gas, coke oven gas and blast furnace gas.

Primary electricity refers to electricity generated by noncombustible energy sources and includes electrical energy of geothermal, hydro, nuclear, tide, wind, wave/ocean and solar origin.

Traditional fuels include estimates of the consumption of charcoal, fuel wood and bagasse.

Charcoal is solid residue consisting mainly of carbon and obtained by the destructive distillation of wood in the absence of air.

Fuel wood is all wood in the rough that is used for fuel purposes.

Bagasse is the cellulosic residue left after sugar is extracted from sugar cane.

Energy Statistics: Definitions, Units of Measure, and Conversion Factors (see http://unstats.un.org/unsd/publication/SeriesF/SeriesF_44E.pdf [last accessed: June 20 2012]).

Fuel is defined as combustible matter used to maintain fire, such as coal, wood, oil, or gas, in order to create heat or power.

Fuel used for cooking refers to the fuel used predominantly for the preparation of principal meals.

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Energy Consumption

The number of households by type of fuel used for cooking describes the types of fuels that households use for cooking.

Types of Cooking Fuel

Charcoal (in the table format it is coal – the terms need to be harmonized) is a solid residue that consists mainly of carbon and is obtained by the destructive distillation of wood in the absence of air.

Wood refers to all wood in the rough that is used for fuel.

Liquefied Petroleum Gas (LPG)/Gas (Natural Gas): *LPG* is a combination of hydrocarbons (propane, butane and ethane) which are gaseous under conditions of normal temperature and pressure, but are liquefied by compression or cooling to facilitate storage, handling and transportation. *Natural gas* is a mixture of hydrocarbon compounds and small quantities of non-hydrocarbons existing in the gaseous phase or in solution with oil in natural underground re servoirs.

Kerosene is medium oil that is distilled between 150ºC and 300ºC. It is used as an illuminant and as a fuel and is often referred to as burning oil, vaporizing oil, power kerosene or illuminating oil.

Electricity is an electric current used as a source of power.

Other refers to types of cooking fuel not mentioned above.

Energy Statistics: Definitions, Units of Measure, and Conversion Factors (see http://unstats.un.org/unsd/publication/SeriesF/SeriesF_44E.pdf [last accessed: June 26 2020]).

Type of lighting refers to the source of lighting predominantly used by occupants of a housing unit.

The number of households by type of lighting describes the types of fuels that members of households use for lighting.

Types of Fuel Used for Lighting

Gas (Natural gas) is a mixture of hydrocarbon compounds and small quantities of non-hydrocarbons existing in the gaseous phase or in solution with oil in natural underground reservoirs.

Kerosene is medium oil that is distilled between 150ºC and 300ºC. It is used as an illuminant and as a fuel and is often referred to as burning oil, vaporizing oil, power kerosene or illuminating oil.

Electricity is an electric current used as a source of power.

Other is other types of lighting fuel not so far mentioned.

Energy Statistics: Definitions, Units of Measure, and Conversion Factors (see http://unstats.un.org/unsd/publication/SeriesF/SeriesF_44E.pdf [last accessed: June 26 2020]).

Units:

‘000kwh - Thousand Kilowatt hours
m^3 - cubic meters
Bbls - barrels
mT - metric Tonnes
boe - barrels of energy
kg - kilograms

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Energy Consumption

Table 1.2.2.2.a: Number of Households by Type of Fuel used for Cooking: 2000 and 2010 Round of Censuses

(Number)

Country	Year	Charcoal	Wood	LPG/Gas	Kerosene	Electricity	Solar Energy	None	Not Stated	Other	Total
AG											
	2001	306	84	19,564	33	141			63	259	20,450
	2011	n/a	294	29,132	11	408				368	30,213
BB											
	2000	72		75,869	1,883	2,491			2,257	454	83,026
	2010	60		73,348	384	3,543			1,344	257	78,936
BS											
	2000	293	388	65,126	898	19,563			1,474		87,742
	2010	68	239	80,010	217	20,873			1,351		102,758
BZ											
	2000		8,197	41,281	780	299			440	948	51,945
	2010		11,304	63,274	310	953			3,313	338	79,492
DM											
	2001	973	2,578	18,367	313	69			6	428	22,734
	2011	294		29,132	11	408		368			30,213
GD											
	2000	753	1,032	23,968	157	44				264	26,218
GY											
	2002	1,143	23,982	71,660	82,158	2,600			110	956	182,609
HT											
	2003	889,573	1,070,492	82,043	134,882	3,916				6,876	2,187,782
JM											
	2001	116,834		597,578	3,009	11,958				8,110	737,489
	2011	53,895	78,987	709,096	680	15,508		12,762	9,799	362	881,089
MS											
	2001	38	41	2,207	3	11				29	2,329

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Energy Consumption

Table 1.2.2.2.a: Number of Households by Type of Fuel used for cooking: 2000 and 2010 Round of Censuses (continued)

(Number)

Country	Year	Charcoal	Wood	LPG/Gas	Kerosene	Electricity	Solar Energy	None	Not Stated	Other	Total
KN	2001	159	233	14,521	140	393				234	15,680
LC	2001	3,288	1,880	41,105	96	189				472	47,030
	2010	2,007	1,301	53,337	97	224		697		1,257	58,920
VC	2001	1,193	927	27,585	129	320		-	-	404	30,558
	2012	593	742	34,531	42	261		364	256	40	36,829
SR	2004		19,941	97,166	916	993		937	3,329	181	123,463
	2012		15,999	115,488	922	2,066	106	1,047	3,961	778	140,367
TT	2000	2,237		282,408	1,555	13,219		1,710	2,435	307	303,871
	2011	879		373,803	534	21,559	3	2,498	1,752	354	401,382
AI	2001	51		3,468	3	45			128	35	3,730
	2011	28		4,765	1	70			38	33	4,935
BM	2010			9,832		17,091					26,923
KY	2010	8		8,663	n/s	13,975				114	22,760
VG	2001	21	6	7,891	5	400				63	8,386
TC	2001	217		3,711	112	3,214					7,254

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy

Table 1.2.2.2.b: Percentage distribution of Households by Type of Fuel used for cooking: 2000 and 2010 Round of Censuses

(Percent)

Country	Year	Charcoal	Wood	LPG/Gas	Kerosene	Electricity	Solar Energy	None	Not Stated	Other	Total
AG											
	2001	1.5	0.4	95.7	0.2	0.7		0.0	0.3	1.3	100.0
	2011	0.0	1.0	96.4	0.0	1.4		0.0	0.0	1.2	100.0
BB											
	2000	0.1	0.0	91.4	2.3	3.0		0.0	2.7	0.5	100.0
	2010	0.1	0.0	92.9	0.5	4.5		0.0	1.7	0.3	100.0
BS											
	2000	0.3	0.4	74.2	1.0	22.3		0.0	1.7	0.0	100.0
	2010	0.1	0.2	77.9	0.2	20.3		0.0	1.3	0.0	100.0
BZ											
	2000	0.0	15.8	79.5	1.5	0.6		0.0	0.8	1.8	100.0
	2010	0.0	14.2	79.6	0.4	1.2		0.0	4.2	0.4	100.0
DM											
	2001	4.3	11.3	80.8	1.4	0.3		0.0	0.0	1.9	100.0
	2011	1.0	0.0	96.4	0.0	1.4		1.2	0.0	0.0	100.0
GD											
	2000	2.9	3.9	91.4	0.6	0.2		0.0	0.0	1.0	100.0
GY											
	2002	0.6	13.1	39.2	45.0	1.4		0.0	0.1	0.5	100.0
HT											
	2003	40.7	48.9	3.8	6.2	0.2		0.0	0.0	0.3	100.0
JM											
	2001	15.8	0.0	81.0	0.4	1.6		0.0	0.0	1.1	100.0
	2011	6.1	9.0	80.5	0.1	1.8		1.4	1.1	0.0	100.0
MS											
	2001	1.6	1.8	94.8	0.1	0.5		0.0	0.0	1.2	100.0

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy

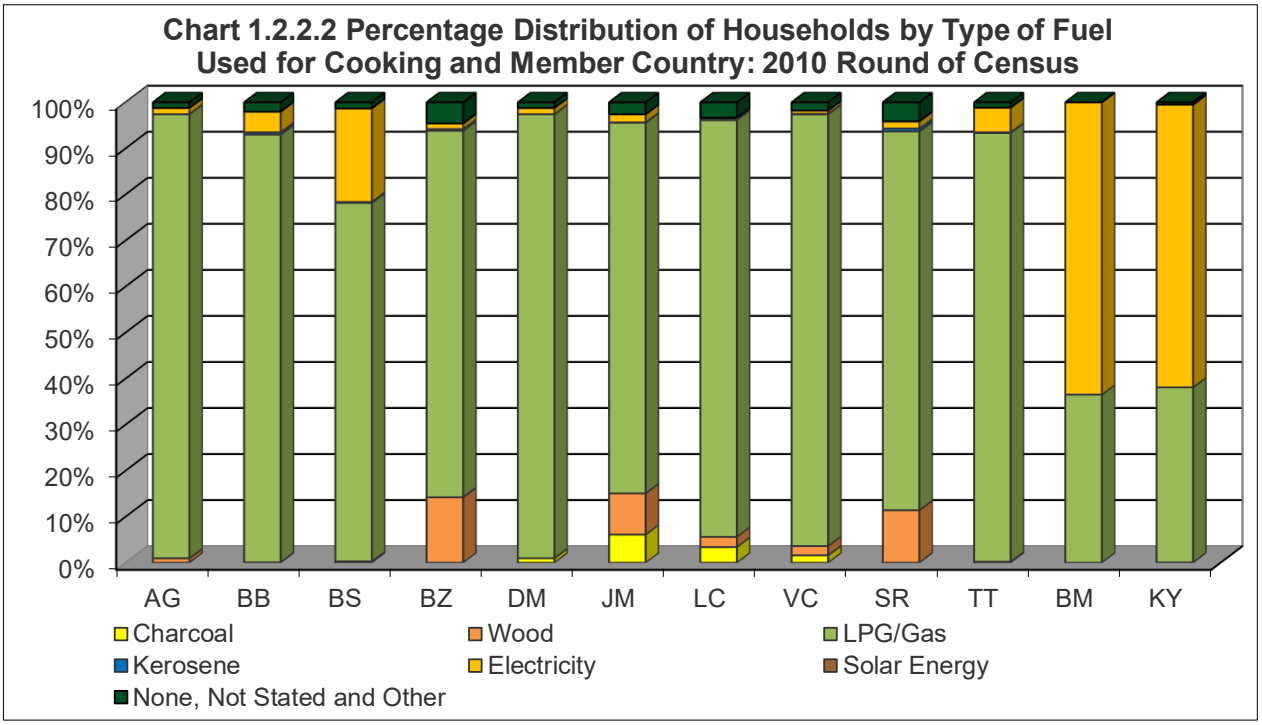
Table 1.2.2.2.b: Percentage distribution of Households by Type of Fuel used for cooking: 2000 and 2010 Round of Censuses (continued)

(Percent)

Country	Year	Charcoal	Wood	LPG/Gas	Kerosene	Electricity	Solar Energy	None	Not Stated	Other	Total
KN											
	2001	1.0	1.5	92.6	0.9	2.5		0.0	0.0	1.5	100.0
LC											
	2001	7.0	4.0	87.4	0.2	0.4		0.0	0.0	1.0	100.0
	2010	3.4	2.2	90.5	0.2	0.4		1.2	0.0	2.1	100.0
VC											
	2001	3.9	3.0	90.3	0.4	1.0		0.0	0.0	1.3	100.0
	2012	1.6	2.0	93.8	0.1	0.7		1.0	0.7	0.1	100.0
SR											
	2004	0.0	16.2	78.7	0.7	0.8	0.0	0.8	2.7	0.1	100.0
	2012	0.0	11.4	82.3	0.7	1.5	0.1	0.7	2.8	0.6	100.0
TT											
	2000	0.7	0.0	92.9	0.5	4.4	0.0	0.6	0.8	0.1	100.0
	2011	0.2	0.0	93.1	0.1	5.4	0.0	0.6	0.4	0.1	100.0
AI											
	2001	1.4	0.0	93.0	0.1	1.2		0.0	3.4	0.9	100.0
	2011	0.6	0.0	96.6	0.0	1.4		0.0	0.8	0.7	100.0
BM											
	2010	0.0	0.0	36.5	0.0	63.5		0.0	0.0	0.0	100.0
KY											
	2010	0.0	0.0	38.1	0.0	61.4		0.0	0.0	0.5	100.0
VG											
	2001	0.3	0.1	94.1	0.1	4.8		0.0	0.0	0.8	100.0
TC											
	2001	3.0	0.0	51.2	1.5	44.3		0.0	0.0	0.0	100.0

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy



SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy

Table 1.2.2.3.A: Number of Households by Type of Fuel used for Lighting: 2000 and 2010 Round of Censuses, 2009-2014

(Number)

Country	Year	Gas	Kerosene	Electricity	Solar	None	Not Stated	Other	Total
AG									
	2001	61	566	19,206		163	32	422	20,450
	2009	…	…	28,237		…	…	…	28,237
	2010	…	…	28,343	…	…	…	…	28,343
	2011	99	263	28,104				1,747	30,213
	2012	…	…	27,903	…	…	…	…	27,903
	2013	…	…	28,121	…	…	…	…	28,121
	2014	…	…	28731	…	…	…	…	28,731
BB									
	2000	69	1,807	80,126			559	465	83,026
BS									
	2000	837	2,075	84,115			72	643	87,742
	2010	2,128	833	99,054	64			679	102,758
BZ									
	2000	1,068	6,859	42,417			113	1,488	51,945
	2010		3,699	71,477		570	211	3,534	79,491
DM									
	2001	53	1,784	19,947		306	6	637	22,733
	2011	64		23,354	358	684	580	32	25,072
GD									
	2001	44	2,904	22,625		214		431	26,218
GY									
	2002	9,821	44,301	126,201			202	2,084	182,609
HT									
	2003	1,475,545		458,935				549,576	2,484,056
JM									
	2001		79,066	651,405				3,060	733,531
	2011		48,712	809,746			15,421	7,210	881,089
MS									
	2001		24	2,233		26		46	2,329

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy

Table 1.2.2.3.A: Number of Households by Type of Fuel used for Lighting: 2000 and 2010 Round of Censuses, 2009-2014 (continued)

(Number)

Country	Year	Gas	Kerosene	Electricity	Solar	None	Not Stated	Other	Total
KN	2001	54	655	14,665		129		177	15,680
LC	2001	112	2,411	41,890		490		2,128	47,031
	2010	143	733	54,951		691		2,402	58,920
VC	2001	71	3,877	24,940		432		1,198	30,518
	2012	241	939	32,824	33	373	416	2,003	36,829
SR	2004			101,814	-	10,248	2,867	5,228	120,157
	2012			124,172	196	1,083	2,101	6,777	134,329
TT	2000	711	22,392	277,413			1,809	1,546	303,871
	2011	56	4,958	394,682	113		557	1,017	401,382
AI	2001	1	95	3,491		23	110	10	3,730
	2011	38		4,836		17	44		4,935
BM	2010			26,923					26,923
KY	2010	25	5	22,638				66	22,734
VG	2001	30	11	8,320		7		18	8,386
TC	2001	21	167	6,938				128	7,254

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy

Table 1.2.2.3.B: Percentage distribution of Households by Type of Fuel used for lighting: 2000 and 2010 Round of Censuses (cont'd)

(Percent)

Country	Year	Gas	Kerosene	Electricity	Solar	None	Not Stated	Other	Total
AG									
	2001	0.3	2.8	93.9		0.8	0.2	2.1	100.0
	2011	0.3	0.9	93.0		0.0	0.0	5.8	100.0
BB									
	2000	0.1	2.2	96.5		0.0	0.7	0.6	100.0
BS									
	2000	1.0	2.4	95.9		0.0	0.1	0.7	100.0
	2010	2.1	0.8	96.4	0.1	0.0	0.0	0.7	100.0
BZ									
	2000	2.1	13.2	81.7		0.0	0.2	2.9	100.0
	2010	0.0	4.7	89.9		0.7	0.3	4.4	100.0
DM									
	2001	0.2	7.8	87.7		1.3	0.0	2.8	100.0
	2011	0.3	0.0	93.1	1.4	2.7	2.3	0.1	100.0
GD									
	2001	0.2	11.1	86.3		0.8	0.0	1.6	100.0
GY									
	2002	5.4	24.3	69.1		0.0	0.1	1.1	100.0
HT									
	2003	59.4	0.0	18.5		0.0	0.0	22.1	100.0
JM									
	2001		10.8	88.8				0.4	100.0
	2011		5.5	91.9	0.0	0.0	1.8	0.8	100.0
MS									
	2001		1.0	95.9		1.1		2.0	100.0

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy

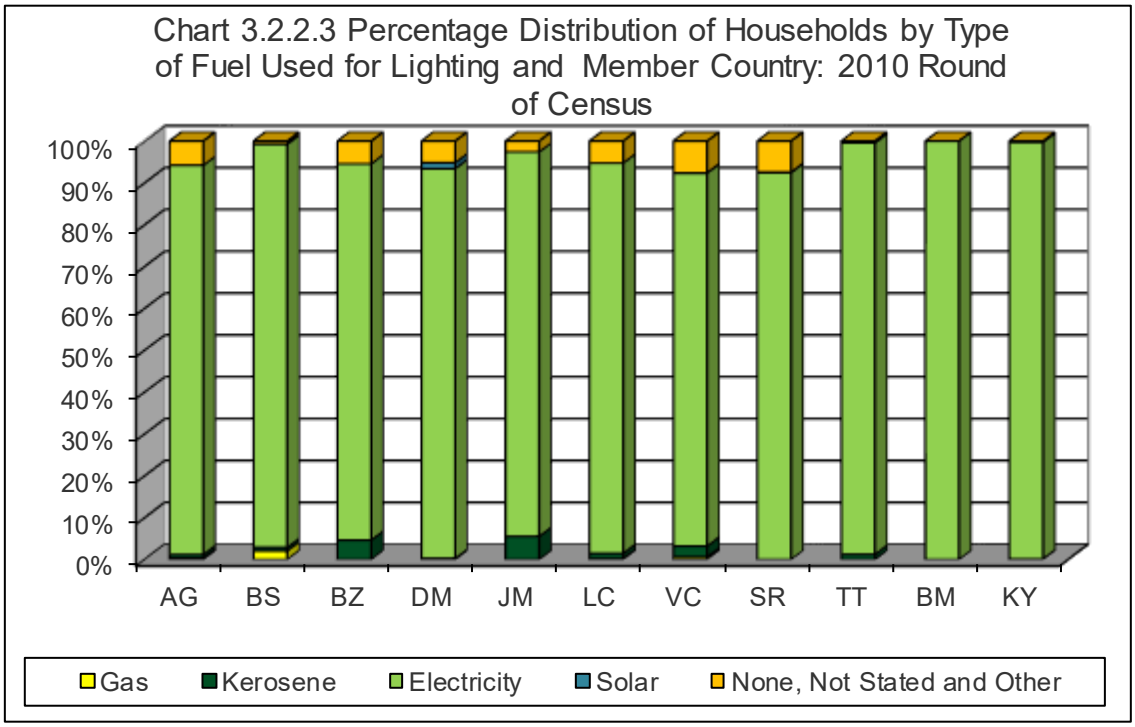
Table 1.2.2.3.B: Percentage distribution of Households by Type of Fuel used for lighting: 2000 and 2010 Round of Censuses (cont'd)

(Percent)

Country	Year	Gas	Kerosene	Electricity	Solar	None	Not Stated	Other	Total
KN	2001	0.3	4.2	93.5		0.8	0.0	1.1	100.0
LC	2001	0.2	5.1	89.1		1.0	0.0	4.5	100.0
	2010	0.2	1.2	93.3		1.2	0.0	4.1	100.0
VC	2001	0.2	12.7	81.7		1.4	0.0	3.9	100.0
	2012	0.7	2.5	89.1	0.1	1.0	1.1	5.4	100.0
SR	2004	0.0	0.0	84.7		8.5	2.4	4.4	100.0
	2012	0.0	0.0	92.4	0.1	0.8	1.6	5.0	100.0
TT	2000	0.2	7.4	91.3		0.0	0.6	0.5	100.0
	2011	0.0	1.2	98.3	0.0	0.0	0.1	0.3	100.0
AI	2001	0.0	2.5	93.6		0.6	2.9	0.3	100.0
	2011		0.8	98.0		0.3		0.9	100.0
BM	2010			100.0					100.0
KY	2010	0.1	0.0	99.6		0.0	0.0	0.3	100.0
VG	2001	0.4	0.1	99.2		0.1	0.0	0.2	100.0
TC	2001	0.3	2.3	95.6		0.0	0.0	1.8	100.0

SUB-COMPONENT 1.2: ENERGY RESOURCES

Topic 1.2.2: Production, trade and consumption of energy



SUB-COMPONENT 1.3: MINERAL RESOURCES

Topic 1.3.1: Production and trade of minerals

Table 1.3.1.1: Mineral Production by Type: 2009 - 2014

Country	Year	Gold	Iron	Nickel	Crude oil	Salt	Silver
BS		kg	mT	mT	mT	mT	mT
	2009	48.98	0.12	0.02	0.13	0.63	0.71
	2010	2.26	0.00	0.09	0.46	0.67	0.00
	2011	586.04	0.00	0.00	34.66	0.62	0.07
	2012	17.69	0.94	0.00	2.60	0.93	0.98
	2013	. . .	0.00	0.33	. . .	0.62	0.24
	2014	31,239.78	0.01	0.99	0.36	0.19	0.01

Country	Year	Bauxite	Sand	Gold	Aggregate	Loam
GY		mT	mT	kg	mT	mT
	2009	1,448,311	478,572	9,491.0	340,016	2,000
	2010	1,099,880	652,175	9,592.4	514,932	. . .
	2011	1,827,555	674,880	11,291.8	534,058	12,133
	2012	2,210,182	1,478,184	13,641.8	483,858	92,064
	2013	1,601,707	2,334,000	14,962.2	654,995	94,559
	2014	1,694,308	4,168,387	12,051.4	842,387	100,800

Country	Year	Bauxite	Sand & Gravel	Limestone	Clay	Pozzolan	Gypsum & Anhydrite	Shale	Silica sand	Marl & Fill
JM		mT	mT	mT	mT	mT	mT	mT	mT	mT
	2010	8,540	2,750	1,956.1	5.0	139.5	147.1	202	13.0	2,155.0
	2011	10,189	2,475	2,451.0	4.2	130.4	79.5	227	14.0	1,140.2
	2012	9,339	2,599	2,232.6	300.6	107.2	64.8	251	13.9	1,197.3
	2013	9,435	1,902	1,949.4	12.0	112.3	48.3	205	15.8	1,197.6
	2014	9,677	2,118	2,138.0	34.2	129.2	45.2	308	15.8	1,031.8

Country	Year	Bauxite	Aluminium	Sand & Gravel	Crude oil
SR		1000 mT	1000 mT	m^3	millions of barrels
	2009	3,388	1,536	177,433	5.86
	2010	3,097	1,486	316,432	5.80
	2011	3,236	1,421	1,037,750	5.99
	2012	2,874	1,203	300,310	5.94
	2013	2,671	1,149	913,887	5.98

Notes: mT - metric ton; kg - kilogram; m^3 - cubic meters

SUB-COMPONENT 1.3: MINERAL RESOURCES

Topic 1.3.1: Production and trade of minerals

Table 1.3.1.1: Mineral Production by Type: 2009 - 2014 (continued)

Country	Year	Sand	Sand & Gravel	Limestone	Clay	Porcellanite
TT		mT	mT	mT	mT	mT
	2009	874,861.4	2,373,308.5	3,306,460.0	139,602.0	16,027.1
	2010	1,314,779.7	2,423,591.6	3,035,809.7	157,477.7	26,967.3
	2011	1,605,152.7	2,968,010.4	5,520,452.8	366,300.6	33,262.6
	2012	1,643,932.6	2,431,962.5	5,224,069.1	400,529.9	44,626.0
	2013	1,644,413.5	2,711,978.8	3,438,366.1	374,506.7	44,558.8
	2014	1,467,388.4	1,596,921.0	2,032,600.9	204,036.9	29,803.9

Table 1.3.1.2 A: Mineral reserves by Type: 2012 and 2013

Country	Year	Unit	Bauxite	Sand & Gravel	Limestone	Porcellanite	Andesite	Gypsum	Clay	Plastering Sand
JM	2012	Million tonnes	1,600	600	8,565	…	…	29	160	…
TT	2013	metric Tonnes	…	326.0	79.1	6.5	6.5	…	9.8	39.2

Table 1.3.1.2 B: Crude oil reserves by Type: Various years

Country	Year	Unit	Crude oil
GY	2020	million barrels	8,000
SR	2017	million barrels	86.7
TT	2013	million barrels	728.0

'Mineral Reserve' is the economically mineable part of a measured or indicated mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined.

'Mineral Resource' is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust (a deposit) in such form and quantity that there are reasonable prospects for eventual economic extraction.

SOURCES AND NOTES

Sources of Data for Table 1.2.1.1: CARICOM's Imports of Fossil Fuels: 1995-2018

Country	Data Source
ALL COUNTRIES	CARICOM Secretariat Trade Database

Notes to Table 1.2.1.1: CARICOM's Imports of Fossil Fuels:1995-2018

Country	Notes
ALL COUNTRIES	The following Commodities from the SITC Classification are included under Fossil Fuels 321 - Coal, whether or not pulverized, but not agglomerated. 322 - Briquettes, lignite and peat. 325 - Coke and semi-coke (including char) of coal, of lignite or of peat, whether or not agglomerated; retort carbon 333 - Petroleum oils and oils obtained from bituminous minerals, crude. 334 - Petroleum oils & oils obtained from bituminous minerals (other than crude); Preparations, n.e.s., containing by weight 70% or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations. 335 - Residual petroleum products, n.e.s. and related materials. 343 - Natural gas, whether or not liquefied. 345 - Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons.

SOURCES AND NOTES

Sources of Data for Table 1.2.2.1: Energy Consumption by Type and Year: 2009-2018

Country	Data Source
ANTIGUA AND BARBUDA	Antigua and Barbuda Public Utilities Authority (APUA)
DOMINICA	Environmental Statistics 2014, Central Statistical Office Dominica
GUYANA	Guyana Bureau of Statistics
JAMAICA	Ministry of Science, Technology, Energy & Mining
SURINAME	General Bureau of Statistics
TRINIDAD AND TOBAGO	Ministry of Energy and Energy Industries
BERMUDA	Department of Statistics Bermuda Electric Light Company Ltd.

Notes to Table 1.2.2.1: Energy Consumption by Type and Year: 2009-2018

Country	Notes
ANTIGUA AND BARBUDA	Data is only available for Primary Electricity
JAMAICA	Figures refer to generation minus losses.
TRINIDAD AND TOBAGO	Gaseous Fuels for 2016 - Incomplete data collection

SOURCES AND NOTES

Sources of Data for Table 1.2.2.2.a and Table 1.2.2.2.b: Number of Households by Type of Fuel Used for Cooking and Percentage distribution of Households by Type of Fuel Used for Cooking: 2000 and 2010 Round of Censuses

Country	Year	Data Source
ALL COUNTRIES	2000-2004	2000 Round of Population and Housing Census
	2010-2012	2010 Round of Population and Housing Census

Notes to Table 1.2.2.2.a and Table 1.2.2.2.b: Number of Households by Type of Fuel Used for Cooking and Percentage distribution of Households by Type of Fuel Used for Cooking: 2000 and 2010 Round of Censuses

Country	Year	Notes
ANTIGUA AND BARBUDA	2011	Other. Not stated- None = 368 Wood/charcoal goes together in the census. Additionally, the other years are not available.
BELIZE	2000 and 2010	Wood refers to wood and charcoal
GRENADA	2001	Other includes not stated
HAITI	2003	Other includes 1500 households using solar panels
SURINAME	2004	None refers to Doesn't cook Not Stated refers to Unknown Wood refers to Wood/Charcoal
TRINIDAD AND TOBAGO	2000	Charcoal refers to Wood/Charcoal
ANGUILLA	2001	Charcoal refers to Wood/Charcoal
BERMUDA	2010	Bermuda Electric Light Company Ltd.
THE CAYMAN ISLANDS	2010	Other refers to Other/Not Stated
TURKS AND CAICOS	2001	Charcoal refers to Wood/Charcoal

SOURCES AND NOTES

Sources of Data for Table 1.2.2.3.a and Table 1.2.2.3.b: Number of Households by Type of Fuel Used for Lighting and Percentage distribution of Households by Type of Fuel used for Lighting: 2000 and 2010 Round of Censuses, 2009-2014

Country	Year	Data Source
ALL COUNTRIES	2000-2004	2000 Round of Population and Housing Census
	2010-2012	2010 Round of Population and Housing Census
ANTIGUA AND BARBUDA	2009-2013	Antigua Public Utilities Authority, Statistics Department

Notes to Table 1.2.2.3.a and Table 1.2.2.3.b: Number of Households by Type of Fuel Used for Lighting and Percentage distribution of Households by Type of Fuel used for Lighting: 2000 and 2010 Round of Censuses, 2009-2014

Country	Year	Notes
ANTIGUA AND BARBUDA	2011	Other/Not stated represents, electricity - private generator, solar, none, other and not stated.
GRENADA	2001	Other includes not stated
GUYANA	2002	Other includes generator/inverter and other.
JAMAICA	2001	Other includes not stated
BERMUDA	2010	Bermuda Electric Light Company Ltd.
THE CAYMAN ISLANDS	2010	Gas includes 16 households using Private Generators Other refers to Other/Not Stated

SOURCES AND NOTES

Sources of Data for Table 1.3.1.1: Mineral Production by Type: 2009-2014

Country	Data Source
THE BAHAMAS	Department of Statistics
GUYANA	Guyana Geology & Mines Commission
JAMAICA	Mines and Geology Division
SURINAME	General Bureau of Statistics
TRINIDAD AND TOBAGO	Ministry of Energy and Energy Industries

Notes to Table 1.3.1.1: Mineral Production by Type: 2012 and 2013

Country	Notes
GUYANA	Aggregate includes quarriable stone, crushed and uncrushed.

Sources of Data for Table 1.3.1.2: Mineral Reserves by Type: 2012 and 2013

Country	Data Source
JAMAICA	Mines and Geology Division
TRINIDAD AND TOBAGO	Ministry of Energy and Energy Industries

COMPONENT 2: IMPACTS

SUB-COMPONENT 2.1: AREAS IMPACTED BY CLIMATE CHANGE

Topic 2.1.1: Forests

Table 2.1.1.1: Total and Protected Forest Area: 2009-2013

km^2

Country	Year	Total Land area	Total Forest area	Protected Forest area	Protected Forest area as a % of Total Forest area	Protected Forest area as a % of Total Land area
AG						
	2009	442.0	137.1	32.4	23.65	7.33
BB						
	2009	430.0	74.4	0.2	0.27	0.05
BS						
	2009	13957.0	3266.0	259.0	8.00	1.86
BZ						
	2009	22800.0	16530.0	3726.8	22.50	16.30
DM						
	2010	750.0	446.6	59.7	13.36	7.96
	2015	750.0	433.3	59.7	13.77	7.96
GY						
	2009	211290.0	183970.0	4050.0	2.20	1.90
	2010	211290.0	183970.0	4050.0	2.20	1.90
	2011	211290.0	183780.0	4050.0	2.20	1.90
	2012	211280.0	158000.0	11000.0	6.90	5.20
	2013	211280.0	185000.0	10900.0	5.90	5.10
	2014	211280.0	185000.0	10900.0	5.90	5.10
JM						
	2009	1,095.3	337.5	113.2	33.60	10.30
	2010	1,095.1	337.1	113.1	33.60	10.30
	2011	1,094.9	336.7	113.0	33.60	10.30
	2012	1,094.7	336.4	112.9	33.60	10.30
	2013	1,094.5	439.9	122.7	27.90	11.20
	2014	1,094.5	438.8	122.7	28.00	11.20

SUB-COMPONENT 2.1: AREAS IMPACTED BY CLIMATE CHANGE

Topic 2.1.1: Forests

Table 2.1.1.1: Total and Protected Forest Area: 2009-2013 (continued)

km^2

Country	Year	Total Land area	Total Forest area	Protected Forest area	Protected Forest area as a % of Total Forest area	Protected Forest area as a % of Total Land area
SR						
	2009	163,820.0	152,335.0	22,665.0	15.00	14.00
	2010	163,820.0	152,257.0	22,665.0	15.00	14.00
	2011	163,820.0	152,180.0	22,665.0	15.00	14.00
	2012	163,820.0	152,103.0	22,665.0	15.00	14.00
	2013	163,820.0	152,026.0	22,665.0	15.00	14.00
TT						
	2009-2013	5,131.0	2,344.8	1,641.7	70.00	32.00
BM						
	2010	54.4	4.2	…	100.00	7.65

SUB-COMPONENT 2.1: AREAS IMPACTED BY CLIMATE CHANGE

Topic 2.1.1: Forests

Table 2.1.1.2: Forest Area (% of Land area): 1990, 2000, 2010 and 2016

Percent

Country	1990	2000	2010	2016
Antigua and Barbuda	23.4	22.7	22.3	22.3
The Bahamas	51.4	51.4	51.4	51.4
Belize	70.8	64.0	61.0	59.7
Barbados	14.7	14.7	14.7	14.7
Dominica	66.7	63.1	59.5	57.4
Grenada	50.0	50.0	50.0	50.0
Guyana	84.6	84.4	84.2	83.9
Haiti	4.2	4.0	3.7	3.5
Jamaica	31.8	31.5	31.1	30.9
St. Kitts and Nevis	42.3	42.3	42.3	42.3
Saint Lucia	35.7	34.8	33.8	33.2
Suriname	98.9	98.7	98.4	98.3
Trinidad and Tobago	46.9	45.5	44.1	46.0
St. Vincent and the Grenadines	64.1	66.7	69.2	69.2
Bermuda	18.5	18.5	18.5	18.5
Cayman Islands	52.9	52.9	52.9	52.9
British Virgin Islands	24.7	24.5	24.3	24.1
Turks and Caicos Islands	36.2	36.2	36.2	36.2

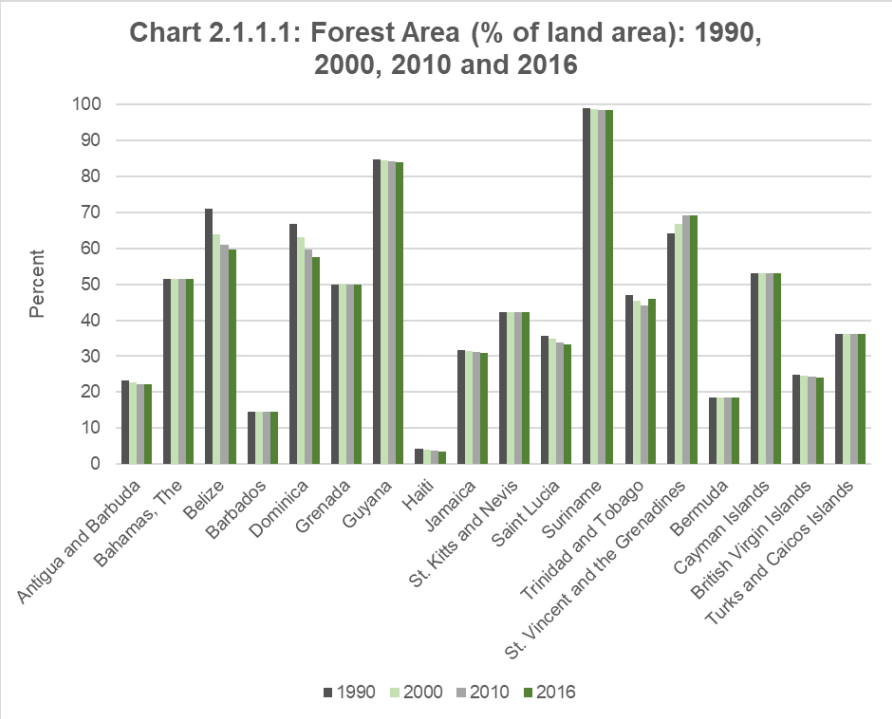
Source:
Food and Agriculture Organisation, electronic files and web site.

Note:

Forest area is land under natural or planted stands of trees of at least 5 meters in situ, whether productive or not, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agroforestry systems) and trees in urban parks and gardens.

SUB-COMPONENT 2.1: AREAS IMPACTED BY CLIMATE CHANGE

Topic 2.1.1: Forests



Forests are of critical importance to the countries of the CARICOM region in many aspects including providing a habitat for numerous species of plants and animals, livelihoods for humans and they play a major role in global climate change in relation to their carbon-absorption capacity. Forests consist of a great proportion of the land area of Guyana and Suriname, (see Table 2.1.1.1), followed by Dominica, Belize and St. Vincent and the Grenadines. The forested regions of Guyana and Suriname have traditionally been occupied by indigenous peoples who are heavily dependent on these resources. Therefore, climate change impacts, whether through deforestation or otherwise, will disproportionately affect this section of the population.

Countries in the region have therefore established protected forests, over the years, whether totally or partially, underscoring the importance of forests in climate change. These countries have also established forest management practices and regulations with a mixture of centralised and decentralised forestry governance. Guyana and Suriname have also adopted the Reducing Emissions from Deforestation and Forest Degradation (REDD+) program, which seeks to incentivise countries for maintaining low rates of deforestation and forest degradation and thereby contributing to climate change mitigation. Dominica has been seeking to adopt this strategy.

The REDD+ programs and forestry management for climate change mitigation require the compilation of numerous monitoring information including spatial data on deforestation and afforestation/reforestation which are collected using remote sensing technologies. The Food and Agriculture Organisation of the United Nations (FAO) works with CARICOM countries to support their data collection efforts and provides capacity building and training in a number of forestry-related areas.

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.1: Freshwater Resources

Table 2.2.1.1: Renewable Freshwater Resources: 2009-2012

million m^3/y

Country	Year	Precipitation	Actual evapotranspiration	Internal flow	Inflow of surface and groundwaters	Total renewable fresh water resources	Outflow of surface and groundwaters to neighbouring countries
		(1)	(2)	(3)=(1)-(2)	(4)	(5)=(3)+(4)	(6)
AG							
	2009	**276.9**		**276.9**		**276.9**	
	2010	**463.9**		**463.9**		**463.9**	
	2011	**450.2**		**450.2**		**450.2**	
	2012	**279.7**		**279.7**		**279.7**	
JM							
	2009	**17,830.0**		**17,830.0**		**17,830.0**	**0**
	2010	**25,247.0**		**25,247.0**		**25,247.0**	**0**
	2011	**20,205.0**		**20,205.0**		**20,205.0**	**0**
	2012	**18,488.0**		**18,488.0**		**18,488.0**	**0**
KN							
	2009	**161.4**		**161.4**		**161.4**	
	2010	**347.2**		**347.2**		**347.2**	
	2011	**279.6**		**279.6**		**279.6**	
	2012	**173.2**		**173.2**		**173.2**	
VC							
	2009	**5,616.3**		**5,616.3**		**5,616.3**	
	2010	**7,237.5**		**7,237.5**		**7,237.5**	
	2011	**8,289.2**		**8,289.2**		**8,289.2**	
	2012	**5,649.6**		**5,649.6**		**5,649.6**	
SR							
	2009	**1,833.8**		**1,833.8**		**1,833.8**	
	2010	**2,319.0**		**2,319.0**		**2,319.0**	
	2011	**2,074.6**		**2,074.6**		**2,074.6**	
	2012	**1,805.2**		**1,805.2**		**1,805.2**	
	2013	**2,076.0**		**2,076.0**		**2,076.0**	
ASSOCIATE MEMBER							
BM							
	2009	**77.4**	**0.3**	**77.1**	**0.0**	**77.1**	

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.1: Freshwater Abstraction and Use: 2009-2012

million m^3/y

Country	Year	Fresh surface water abstracted	Fresh groundwater abstracted	Freshwater abstracted	Desalinated water	Reused water
		(1)	(2)	(3) =(1)+(2)	(4)	(5)
AG						
	2009	**2.3**	**1.6**	**4.0**	**4.4**	
	2010	**2.2**	**1.6**	**3.8**	**4.3**	
	2011	**2.6**	**1.2**	**3.8**	**4.9**	
	2012	**2.6**	**1.2**	**3.8**	**5.1**	
BZ						
	2009	**7.6**	**1.9**	**9.4**	**0.6**	
	2010	**7.6**	**1.9**	**9.5**	**0.6**	
	2011	**7.7**	**1.9**	**9.6**	**0.6**	
	2012	**7.9**	**2.0**	**9.9**	**0.7**	
GY						
	2009			**109.2**		
	2012	**14.9**	**120.2**	**135.0**		
TT						
	2009	**4.9**	**2.2**	**7.1**	**0.0**	**0**
	2010	**4.3**	**3.1**	**7.4**	**0.0**	**0**
	2011	**4.4**	**3.7**	**8.1**	**0.0**	**0**
	2012	**4.2**	**3.5**	**7.7**	**0.0**	**0**
BM						
	2009			**6.8**	**1.9**	

Notes:
Figures may not add up due to rounding.
million m3/y refers to million cubic meters per year

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.1: Freshwater Abstraction and Use: 2009-2012 (continued)

million m^3/y

Country	Year	Imports of water	Exports of water	Total freshwater available for use	Losses during transport	Total freshwater use
		(6)	(7)	(8)= (3)+(4)+(5)+(6)-(7)	(9)	(10)=(8)-(9)
AG						
	2009			**8.4**	**3.4**	**5.0**
	2010			**8.1**	**3.2**	**4.9**
	2011			**8.6**	**3.5**	**5.2**
	2012			**8.9**	**3.6**	**5.4**
BZ						
	2009	**0.0**	**0.0**	**10.0**	**2.9**	**7.1**
	2010	**0.0**	**0.0**	**10.1**	**2.7**	**7.4**
	2011	**0.0**	**0.0**	**10.3**	**2.8**	**7.5**
	2012	**0.0**	**0.0**	**10.6**	**2.9**	**7.6**
GY						
	2009					
	2012					
TT						
	2009	**0**	**0**	**7.1**	**3.7**	**3.3**
	2010	**0**	**0**	**7.4**	**3.9**	**3.5**
	2011	**0**	**0**	**8.1**	**4.3**	**3.8**
	2012	**0**	**0**	**7.7**	**4.1**	**3.6**
BM						
	2009			**8.7**	**0**	**8.7**

Notes:
Figures may not add up due to rounding.
million m3/y refers to million cubic meters per year

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.1A: Freshwater Abstraction by Industry: 2009-2012

million m^3/y

Country	Year	Freshwater abstracted *of which abstracted by:*							Total Abstracted
		Water supply industry (ISIC 36)	Households	Agriculture, forestry and fishing (ISIC 01-03)	Manufacturing (ISIC 10-33)	Electricity industry (ISIC 351)	Other economic activities	Not Stated	
JM									
	2009	**299.0**							**299.0**
	2010	**285.0**							**285.0**
	2011	**303.0**							**303.0**
	2012	**302.0**							**302.0**
TT									
	2009						**4.9**	**2.2**	**7.1**
	2010						**4.3**	**3.1**	**7.4**
	2011						**4.4**	**3.7**	**8.1**
	2012						**4.2**	**3.5**	**7.7**
BM									
	2009	**1.8**	**3.9**	**0.0**	**0.0**	**0.0**	**1.1**	**1.1**	**6.8**

Notes:
Figures may not add up due to rounding.
million m3/y refers to million cubic meters per year

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.1B: Total Freshwater in Use by Industry: 2009-2012

million m^3/y

Country	Year	Total freshwater use *of which used by:*						
		Households	Agriculture, forestry and fishing (ISIC 01-03)	Manufacturing (ISIC 10-33)	Electricity industry (ISIC 351)	Other economic activities	Not Stated	Total
AG								
	2009						**5.0**	**5.0**
	2010	**2.8**	**0.0**	**0.0**	**0.0**	**1.5**	**0.7**	**4.9**
	2011	**2.7**	**0.0**	**0.0**	**0.0**	**1.6**	**0.8**	**5.2**
	2012	**2.7**	**0.0**	**0.0**	**0.0**	**1.5**	**1.1**	**5.4**
BM								
	2009	**6.2**	**0.0**	**0.0**	**0.0**	**2.5**		**8.7**

Notes:
Figures may not add up due to rounding.
million m3/y refers to million cubic meters per year

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.2: Water Supply by Industry (ISIC 36): 2009-2012

million m^3/y

Country	Year	Gross freshwater supplied by water supply industry (ISIC 36)	Losses during transport by (ISIC 36)	Net freshwater supplied by water supply industry (ISIC 36)	Net freshwater supplied by water supply industry (ISIC 36) *of which supplied to:*		
					Households	Agriculture, forestry and fishing	Manufacturing
		(1)	(2)	(3)=(1)-(2)		(ISIC 01-03)	(ISIC 10-33)
AG							
	2009	**8.4**	**3.4**	**5.0**			
	2010	**8.1**	**3.2**	**4.9**	**2.8**	**0.0**	**0.0**
	2011	**8.6**	**3.5**	**5.2**	**2.7**	**0.0**	**0.0**
	2012	**8.9**	**3.6**	**5.4**	**2.7**	**0.0**	**0.0**
BZ							
	2009	**10.0**	**2.9**	**7.1**			
	2010	**10.1**	**2.7**	**7.4**			
	2011	**10.3**	**2.8**	**7.5**			
	2012	**10.6**	**2.9**	**7.6**			
GY							
	2012	**135.0**	**8.0**	**127.0**			
JM							
	2009	**299.0**	**206.0**	**93.0**			
	2010	**285.0**	**187.0**	**98.0**			
	2011	**303.0**	**200.0**	**103.0**			
	2012	**302.0**	**208.0**	**94.0**			
SR							
	2009	**35.0**	**2.1**	**32.9**	**14.1**		**3.4**
	2010	**36.0**	**2.3**	**33.6**	**14.6**		**3.6**
	2011	**41.0**	**2.3**	**38.7**	**15.5**		**3.7**
	2012	**42.8**	**2.4**	**40.4**	**16.9**		**3.9**
	2013	**45.9**	**2.5**	**43.5**	**17.6**		**4.1**
BM							
	2009	**3.9**	**0.0**	**3.9**	**2.5**	**0.0**	**0.0**

Notes:

Figures may not add up due to rounding.

For Antigua and Barbuda and Suriname, Net freshwater supplied by water supply industry by category does not add up to Total Net freshwater supplied by water supply industry.

For Suriname, 2013 data was included in this table.

million m3/y refers to million cubic meters per year

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.2: Water Supply by Industry (ISIC 36): 2009-2012 (continued)

million m^3/y

Country	Year	Net freshwater supplied by water supply industry (ISIC 36) *of which supplied to:*			Population supplied by water supply industry (ISIC 36)
		Electricity industry (ISIC 351)	Other economic activities	Not stated	(%)
AG					
	2009			**5.0**	
	2010	**0.0**	**1.5**	**0.7**	
	2011	**0.0**	**1.6**	**0.8**	**82.0**
	2012	**0.0**	**1.5**	**1.1**	
BZ					
	2009				**56.8**
	2010				**57.3**
	2011				**57.4**
	2012				**57.6**
GY					
	2012				
JM					
	2009				
	2010				
	2011				
	2012				
SR					
	2009		**2.5**	**15.4**	
	2010		**2.7**	**15.4**	
	2011		**2.8**	**19.5**	
	2012		**2.9**	**19.6**	**67.9**
	2013		**3.1**	**21.8**	
BM					
	2009	**0.0**	**1.4**		**1.4**

Notes:

Figures may not add up due to rounding.

For Antigua and Barbuda and Suriname, Net freshwater supplied by water supply industry by category does not add up to Total Net freshwater supplied by water supply industry.

For Suriname, 2013 data was included in this table.

million m3/y refers to million cubic meters per year

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

Table 2.2.2.3: Population with Wastewater Treatment: 2009-2012

Country	Year	Population connected to wastewater collecting system	Population connected to wastewater treatment		Population with independent wastewater treatment (e.g., septic tanks)	Population not connected to wastewater treatment
			Total	of which at least secondary		
		% of population	%	%	% of population	% of population
		(1)	(2)	(3)	(4)	(5)=(100% - ((2) - (4))
BZ						
	2010	**60.4**	**10.6**		**49.8**	**39.6**
GY						
	2009	**7.2**	**0.0**	**0.0**	**0.0**	
	2012				**63.5**	**36.5**
KN						
	2009	**0.0**	**5.0**	**2.5**	**94.0**	**1.0**
	2010	**0.0**	**5.0**	**2.5**	**94.0**	**1.0**
	2011	**0.0**	**5.0**	**2.5**	**94.0**	**1.0**
	2012	**0.0**	**5.0**	**2.5**	**94.0**	**1.0**
BM						
	2009	**5.0**	**5.0**	**1.5**	**95.0**	**0.0**

NOTES TO THE TABLE

Population connected to wastewater collecting system: This refers to the percentage of the resident population connected to the wastewater collecting systems (sewerage). Wastewater collecting systems may deliver wastewater to treatment plants or may discharge it without treatment to the environment.

Population connected to wastewater treatment: This refers to the percentage of the resident population whose wastewater is treated at wastewater treatment plants.

Population with independent wastewater treatment (e.g., septic tanks): This refers to the percentage of the resident population whose wastewater is treated in individual, often private facilities such as septic tanks.

Population not connected to wastewater treatment: This refers to the percentage of the resident population whose wastewater is neither treated in treatment plants nor in independent treatment facilities.

Guyana's data refer to households.

SUB-COMPONENT 2.2: FRESHWATER RESOURCES

Topic 2.2.2: Freshwater Abstraction, Supply and Use

The scarcity of fresh water resources has been a major issue of concern in CARICOM countries, particularly in small islands such as Barbados, Jamaica, Dominica and St. Kitts and Nevis, since it impacts their growth and development. Moreover, water scarcity has impacted access to water supply in several critical sectors such as agriculture, households and other economic activities.

The agricultural sector, which is critical to Caribbean economies, utilizes a large proportion of water extracted to produce food for local consumption and exports, followed by households and industrial uses. It is important to note that households in the rural areas of some CARICOM countries continue to lack continuous access to potable water and that water scarcity would negatively impact rural households to a greater extent. On the other hand, the urban population in many CARICOM countries are increasing, along with the demand for water services.

Compounding these issues is the fact that the provision of water services has been affected by prolonged droughts in recent years, between 2014-2017, in various CARICOM countries leading to significant impacts to other systems such as food and energy. This has led to calls for strict water conservation practices and an improvement in the management of water resources.

Furthermore, the Intergovernmental Panel on Climate Change in its Fourth Assessment Report projects that climate change vulnerabilities will be significant in small islands and Caribbean countries will likely experience increased water stress due to increased salinity. This is expected to limit the availability of freshwater resources in multiple ways given the threat of sea level rises, increased droughts and temperature increases that will reduce it further.

These expected impacts have resulted in the development of concrete approaches for adaptation to climate change which will involve better water management practices. These approaches could include the use of storage reservoirs. desalination and water reuse.

The IPCC also notes that vulnerabilities in developing countries are related to a lack of relevant data on water resources and weak institutions. Data on water abstraction and use presented in the chapter were sourced from the UNSD and could be used to provide baseline data on the impact of climate change adaptation measures for the water sector in CARICOM countries.

Reference

IPCC (2018): *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, et al (eds.)].

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019

Country	Year	Disaster			Total Casualties		
		Type of Disaster	Name of Disaster	Date Started	Total	Dead / Killed	Injured
AG							
	1989	Hurricane	Hugo	17-Sep	…	…	…
	1995	Hurricane/ Tropical Storm/ Tropical Depression	Luis/ Marilyn/ Sebastian	3-Sep 15-Sep	> 3002	2	…
	1998	Hurricane	George	20-Sep	> 3234	…	234
	1999	Hurricane/ Tropical Storm	Jose/Lenny	20-Oct 18-Nov	1	…	…
	2008	Tropical Storm	Omar	16-Oct	1	…	…
	2017	Tropical cyclone	Irma	5-Sep		1	
BS							
	1992	Hurricane	…	17-Aug		4	…
	1995	Hurricane	…	31-Jul		0	…
	1996	Hurricane	…	18-Oct		0	…
	1999	Hurricane	…	13-Sep		1	…
	2001	Hurricane	…	04-Nov		0	…
	2004	Hurricane	…	01-Sep		1	…
	2004	Hurricane	…	25-Sep		0	…
	2005	Tropical Storm	…	21-Jul	…	0	…
	2005	Tropical Storm	…	24-Aug	…	0	…
	2005	Tropical Storm	…	19-Sep	…	0	…
	2007	Tropical Storm	…	30-Oct	…	1	…
	2012	Hurricane	Irene	22-Aug	…	…	…
	2015	Tropical cyclone	Joaquin	01-Oct	…	…	…
	2016	Tropical cyclone	Matthew	05-Oct	…	…	…
	2017	Tropical cyclone	Irma		…	…	…
	2019	Tropical cyclone	Dorian	01-Sep		67	
BZ							
	2000	Storm	…	…		14	…
	2001	Storm	…	…		30	…
	2005	Storm	…	…	…	3	…
	2007	Storm	…	…	…	0	…
	2008	Flood	…	…	…	1	…
	2008	Storm	…	…	…	7	…
	2016	Tropical cyclone	…	…	…	…	…

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Total Casualties		Total Population Affected (Number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US$ Million)
		Missing	Homeless			
AG						
	1989	…	…	…	…	74.1
	1995	…	> 3000	…	> 14272	119.6
	1998	…	> 3000	…	> 6489	77.8
	1999	…	1	…	…	76.7
	2008	…	1	…	5,088	17.4
	2017		1,400	1,400		250.0
BS						
	1992	0	…	192,596	…	…
	1995	0	…	60,203	…	…
	1996	0	…	16,443	…	…
	1999	0	…	303,611	…	…
	2001	0	…	227,567	…	…
	2004	0	…	283,278	…	150.0
	2004	0	…	60,164	…	50.0
	2005	0	…	13,170	…	…
	2005	0	…	68,163	…	…
	2005	0	…	2,992	…	…
	2007	0	…	6,563	…	10.0
	2012	…	…	…	…	…
	2015	…	…	6,710	…	90.0
	2016	…	…	…	…	600.0
	2017	…	…	…	…	2.0
	2019	282		29,472	…	2,500.0
BZ						
	2000	…	…	62,570	…	277.8
	2001	…	…	20,000	…	198.8
	2005	…	…	0	…	0.0
	2007	…	…	20,000	…	0.1
	2008	…	…	38,000	…	34.6
	2008	…	…	10,000	…	0.0
	2016	…	…	10,355	…	…

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Disaster			Total Casualties		
		Type of Disaster	Name of Disaster	Date Started	Total	Dead / Killed	Injured
DM							
	2004	Earthquake		21-Nov	…	0	…
	2007	Hurricane	Dean	17-Aug	29	3	26
	2008	Hurricane	Omar	16-Oct	0	0	…
	2010	Hurricane	Tomas	…	0	…	…
	2010	Landslide		…	…	3	…
	2011	Flooding		…	…	0	…
	2013	Flooding		…	…	0	…
	2017	Hurricane	Maria	18-Sep		64	100
GD							
	2002	Storm					
	2004	Hurricane		07-Sep		28	
	2005	Hurricane		14-Jul		1	
	2011	Torrential rainfall		12-Apr		…	
GY							
	2005	Flooding	…	18-Jan	5,034	34	…
	2006	Flooding	…	28-Jan	…	…	…
HT							
	2004	Cyclone	…	…	…	5,008	2,601
	2005	…	…	…	…	2,720	22
	2008	Cyclone	…	…	…	793	548
	2010	Earthquake	…	12-Jan	…	250,000	300,000
	2016	Cyclone				546	439

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Total Casualties		Total Population Affected (Number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US$ Million)
		Missing	Homeless			
DM						
	2004	0	…	19,527		90.00
	2007	0	50	…	…	64.3
	2008	0	…	253*	…	1.7
	2010	…	…	…	…	…
	2010	…	…	…	…	…
	2011	…	…	…	…	…
	2013	…	…	…	…	…
	2017			71,393		1,456.0
GD						
	2002					
	2004			81,553		815.0
	2005			3,905		51.9
	2011			60		0.2
GY						
	2005	…	*5000	***629492	…	465.0
	2006	…	…	**31807	…	30.0
HT						
	2004	900	160,000	300,000	…	265.0
	2005	16	500	165,000	…	
	2008	310	165,337	800,000	…	897.4
	2010	…	1,500,000	3,000,000	…	7,804.0
	2016		2,100,000	2,100,439	…	2,000.0

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Disaster			Total Casualties		
		Type of Disaster	Name of Disaster	Date Started	Total	Dead / Killed	Injured
JM							
	2005	Hurricane	…	07-Jul	…	…	…
	2005	Hurricane	…	16-Jul	…	…	…
	2005	Hurricane	…	13-Oct	…	…	…
	2006	Flooding	…	01-Feb	…	6	…
	2007	Hurricane	…	Jun Nov	…	1	…
	2007	Flooding	…	28-Aug	…	…	…
	2008	Storm	…	…	2446	44	122
	2009	Fires	…	…	2417	52	93
	2010	Tropical Depression 16/ Tropical Storm	Nicole	26-Sep		16	42
	2010	Tropical Storm		29-Sep	41	13	26
	2012	Hurricane		22-Oct	292	1	291
	2016	Cyclone					
	2017						
KN							
	1989	Hurricane	…	…	…	…	…
	1995	Hurricane	…	…	…	…	…
	1998	Hurricane	…	…	…	…	…
	1999	Hurricane	…	…	…	…	…
	1999	Flash Flood	…	…	…	…	…
	2008	Hurricane	Omar	01-Oct	…	…	…
	2017	Tropical cyclone	…	…	…	…	…
MS							
	2010	Hurricane	Earl	29-Aug	0	0	0
LC							
	2007	Hurricane	Dean	07-Aug	…	1	…
	2007	Earthquake	…	29-Nov	…	0	…
	2007	Flood	…	06-Oct	…	0	…
	2007	Earthquake	…	11-Dec	…	0	…
	2009	Fire at St Jude Hospital	…	09-Sep	…	3	…
	2009	Oil Spill in Corinth River	…	09-Oct	…	0	…
	2009	Drought	…	01-Oct	…	0	…
	2010	Oil Spill in Corinth River	…	16-Mar	…	0	…
	2011	Hurricane	Tomas	30-Oct	…	7	…
	2013	Flood		24-Dec		6	
	2016	Hurricane	Matthew	28-Sep			

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Total Casualties		Total Population Affected (Number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US$ Million)
		Missing	Homeless			
JM						
	2005	…	…	331,672	…	95.2
	2005	…	…		…	
	2005	…	…	…	…	…
	2006	…	…	…	…	358.3
	2007	…	…	179,552	…	9.4
	2007	…	6154	…	…	226.0
	2008	…	2280	…	…	94.3
	2009	…	2272	…	…	…
	2010	2	…	507,831	507,831	239.6
	2010	2		485 a	1,920 b	$8.1 billion
	2012			807 d	681,018 e	$9.7 billion
	2016			125,000		
	2017			5,000		
KN						
	1989	…	…	…	…	44.4
	1995	…	…	…	…	197.0
	1998	…	2750	…	…	402.1
	1999	…	…	…	…	45.7
	1999	…	…	…	…	3.9
	2008	…	…	25	…	6.3
	2017	…	…	…	…	20.0
MS						
	2010	0	0	…	…	…
LC						
	2007	…	0	…	…	…
	2007	…	0	…	…	…
	2007	…	0	…	…	…
	2007	…	0	…	…	…
	2009	…	-	…	…	…
	2009	…	0	…	…	…
	2009	…	0	…	…	…
	2010	…	0	…	…	…
	2011	…	2000	…	…	333.3
	2013		550	19,984	…	80.0
	2016			250 families		

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Disaster			Total Casualties		
		Type of Disaster	Name of Disaster	Date Started	Total	Dead / Killed	Injured
VC							
	1999	Storm surge		…	…	…	…
	2002	…		…	…	4	…
	2004	…		…	…	…	…
	2005	…		…	…	1	…
	2007	…		…	…	…	…
	2008	Landslide Hurricane/ Storm surge		…	…	1	…
	2009	Heavy rains		…	…	…	…
	2012	Heavy rains				0	
	2013	Flooding				12	
	2016	Tropical Storm	Matthew	28-Sep		1	
	2016	Flooding		9-Nov		1	
	2016	Flooding		29-Nov			
SR							
	2006	Flooding	…	01-Jun	…	…	…
	2013	Flooding	…	01-Jun	…	…	…
BM							
	2003	Hurricane		5-Sep	4	4	
	2014	Hurricane	Gonzalo	16-Oct	0	0	…
TC							
	2008	Hurricane		6-Sep	0	4	0
	2017	Hurricane	Irma				
VG							
	2017	Hurricane	Irma			9	

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019 (continued)

Country	Year	Total Casualties		Total Population Affected (Number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US$ Million)
		Missing	Homeless			
VC						
	1999	…	…	…		…
	2002	…	…	24 houses completely destroyed		0.4
	2004	…	…	56 houses completely destroyed		37.0
	2005	…	…			3.7
	2007	…	…	…		0.8
	2008	…	…	…		2.1
	2009	…	…	…	50% of population	…
	2012					
	2013			530 homes		122.1
	2016					2.6
	2016	1				
	2016					32.5
SR						
	2006	…	…	20000	…	…
	2013	…	…	300	…	…
BM						
	2003			50,000		300.00
	2014		…	53,426		300.00
TC						
	2008	0	**	10,270		216.6*
	2017					500.00
VG						
	2017					3,000.00

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

Tropical storms, excess rainfall, flooding and landslides associated with hurricanes are the most frequently occurring extreme events and disasters in the CARICOM region. These events take place primarily during the Atlantic hurricane season which officially begins June 30 and ends on November 30 each year. Most CARICOM countries are at high risk to the effects of hurricanes due to their locations in the Atlantic tropical cyclone basin, which includes the Caribbean Sea. However, those member countries in South America are generally at no risk. Some countries in the region also experience earthquake events of varying magnitude due to their location along the fault lines of the Caribbean tectonic plate. The convergence of the North American and Caribbean tectonic plates are said to be the main cause of seismic activity in the region.

Countries have reported that the economic cost of disasters have increased in recent years, in some cases costing more than double the annual GDP of the country, prompting requests for international financing aid. Recovery for these countries may take five to ten years and could be further impeded by additional occurrences of disasters. There are hidden costs and damaging effects of disasters, which include displacement, crippling of government services, loss of jobs and incomes, lack of inputs for critical sectors, destruction to critical infrastructure and widening of the poverty gap.

In addition to requests for financial aid, CARICOM countries have also purchased risk insurance policies provided by the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC) for tropical cyclone, earthquake and excess rainfall. This facility enables governments to bounce back after a disaster by limiting the financial impact of disasters so that the main government services can be available to the public. Hence the importance of post-disaster damage assessments which give a good indication of the extent of damages caused by extreme events and disasters. Data from these assessments feed into the disaster response within a country, identifying the needs of the affected population, the recovery strategy and providing guidance for donor funding.

Most CARICOM countries have a disaster management agency which serves to coordinate the local disaster response and execute the countries' plans and policies for disaster risk reduction. At the regional level. disaster management in the Caribbean is provided by The Caribbean Disaster Emergency Management Agency (CDEMA). This agency has as its main responsibility, the coordination of emergency response and relief efforts to its member countries.

In effecting disaster response, information management is of critical importance and accurate, up-to-date and easily accessible information should be available to partners and stakeholders. The information can be derived from a number of areas including population, water and sanitation, environmental health, education, public health institutions, transportation and public infrastructure which are available in a number of forms including numeric, non-numeric, geospatial, videography and photographic data. Countries are often urged to compile a centralised database for housing information on extreme events and disasters and information for rapid assessments.

(Continued on Page 54)

SUB-COMPONENT 2.3: HAZARDOUS EVENTS AND DISASTERS

Topic 2.3.1: Occurrence of Hazardous Events and Disasters

There are a number of data gaps for most countries in the available data in this publication. These have been reduced over the last few years following improvements in disaster assessment reports and with the availability of documented methodologies for the preparation of these reports. Where these reports are not available, data on critical variables such as the economic costs of disasters are lacking, leading to underestimations and lower than anticipated funds for disaster recovery.

Concepts and Definitions:

A **disaster** is a situation or event, which overwhelms local capacity, necessitating a request to the national or international level for external assistance or an unforeseen and often sudden event that causes great damage, destruction and human suffering. *(Please refer to International Strategy for Disaster Reduction's website at http:// www.unisdr.org/disaster-statistics/ introduction.htm.)*

A **casualty** is defined as any human accessing health or medical services, including mental health services and medical forensics/mortuary care (for fatalities), as a result of a hazard impact.

Of which:

Number of persons Killed: Persons confirmed as dead and persons missing and presumed dead.

Number of persons Injured: People suffering from physical injuries, trauma or an illness requiring medical treatment as a direct result of a disaster.

Homeless: These are persons who are in need of immediate assistance in the form of shelter as a consequence of a disaster.

Affected: People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance.

Total affected: The sum of persons that have been injured, affected and left homeless after a disaster.

Estimated damage: The economic impact of a disaster usually consists of direct (e.g. damage to infrastructure, crops, housing) and indirect (e.g. loss of revenues, unemployment, market destabilisation) consequences on the local economy.

International Agreed Glossary of Basic Terms Related to Disaster Management (1992) UN-DHA, IDNDR, Geneva and WHO Mass Casualty Management Systems Strategies and guidelines for building health sector capacity

SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

Topic 2.4.1: Atmosphere, Climate and Weather

Table 2.4.1.1 Average Temperature Per Annum: 1981-2018

Country	Average Temperature Per Annum (degrees Celsius)									
	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999
Antigua and Barbuda	27	27	26	27		26	26	26	26	26
Barbados						27	27	27	27	27
Bahamas	24				25	26	25	25	25	25
Belize	26	27	26	26	26	25	25	25	26	25
Dominica	24	24	25	26	26	25	25	25	25	25
Grenada				28	27	27	27	27	27	27
Guyana	27	27	27	28	27	26	25	26	26	26
Jamaica		27	27	28	27	25	26	26	26	25
Montserrat										
St. Kitts and Nevis	27	27	26	26	26	25	25	25	25	25
St. Lucia		27	27	28	27	26	26	26	26	26
St. Vincent and the Grenadines	28	28	27	28	27	27	27	27	27	27
Suriname						26	25	26	26	26
Trinidad and Tobago	27	28	27	28	28	26	26	27	26	26

Source: CARICOM Database

Table 2.4.1.1 Average Temperature Per Annum: 1981-2018 (continued)

Country	Average Temperature Per Annum (degrees Celsius)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Antigua and Barbuda	27	27	27	27	26	27	26	27	26	26	27	26
Barbados	26	27	27	27	27	27	27	27	26	27	27	27
Bahamas	25	25	26	26	25	26	25	26	26	26	25	26
Belize	26	26	26	26	26	26	26	26	26	26	26	26
Dominica	23	24	24	23	23	24	23	23	23	23	24	23
Grenada	27	27	27	27	27	27	27	27	27	27	27	27
Guyana	26	26	26	27	26	27	26	26	26	26	27	26
Jamaica	26	26	26	26	26	25	26	26	25	25	25	25
Montserrat	26	26	26	26	25	26	26	26	25	25	26	25
St. Kitts and Nevis	25	25	25	25	25	25	25	25	24	25	25	25
St. Lucia	26	27	27	27	27	27	27	27	27	27	27	27
St. Vincent and the Grenadines	27	28	28	28	28	28	28	28	28	28	28	28
Suriname	26	26	26	26	26	27	26	26	26	26	26	26
Trinidad and Tobago	26	26	26	27	26	27	26	26	26	27	27	26

Source: Caribbean Weather Impacts Group (CARIWIG)

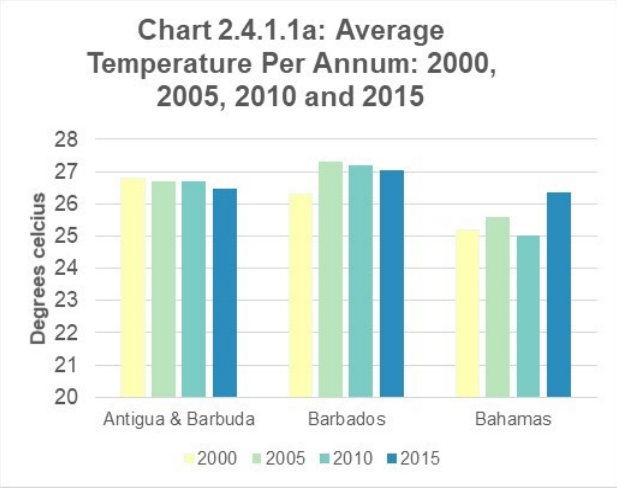
SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

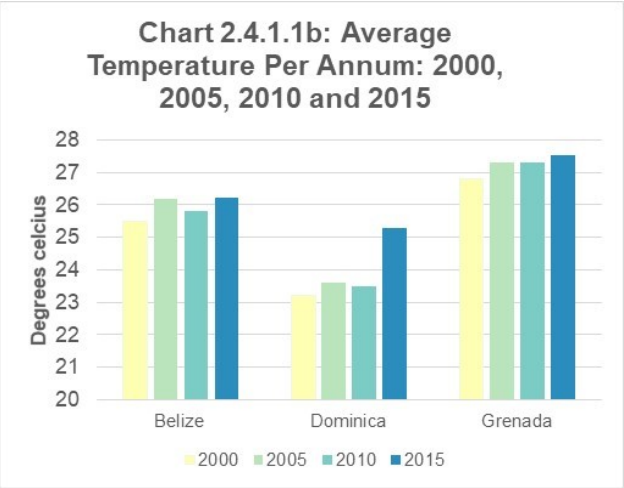
Topic 2.4.1: Atmosphere, Climate and Weather

Table 2.4.1.1 Average Temperature Per Annum: 1981-2018 (continued)

Country	Average Temperature Per Annum (degrees Celsius)						
	2012	2013	2014	2015	2016	2017	2018
Antigua and Barbuda	26	26	26	26	26	26	26
Barbados	27	27	27	27	27	27	27
Bahamas	25	26	26	26	26	26	26
Belize	26	26	26	26	26	27	27
Dominica	25	25	25	25	25	25	25
Grenada	27	27	27	28	28	28	28
Guyana	26	26	26	27	26	28	27
Jamaica	25	26	26	26	26	26	26
Montserrat							
St. Kitts and Nevis	25	25	25	26	26	26	26
St. Lucia	26	27	26	27	27	27	27
St. Vincent and the Grenadines	28	28	27	28	28	28	28
Suriname	26	26	26	26	26	28	28
Trinidad and Tobago	26	27	27	27	27	28	27

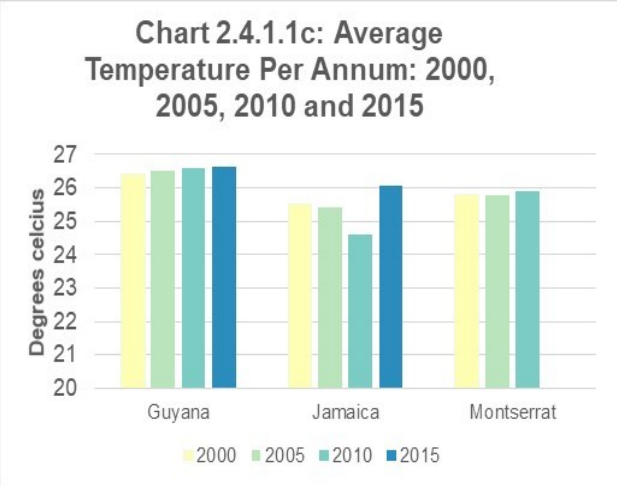
Note: Highlighted figures refer to data for the previous year
Sources: CARICOM database
The World Bank Group Climate Change Knowledge Portal

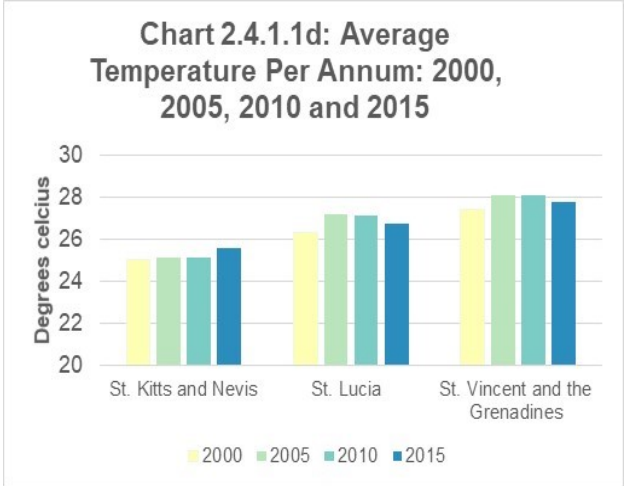


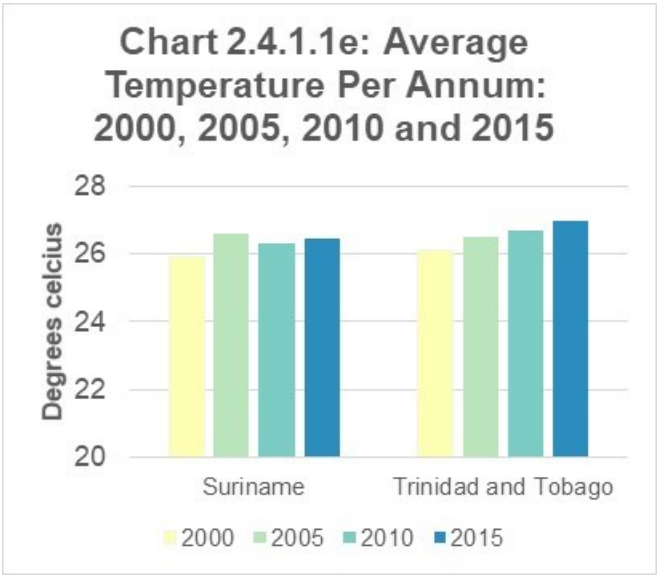


SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

Topic 2.4.1: Atmosphere, Climate and Weather







SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

Topic 2.4.1: Atmosphere, Climate and Weather

Table 2.4.2.1: Annual Averages of Rainfall: 1981-2018

Country	Average Rainfall Per Annum (mm)									
	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999
Antigua and Barbuda	121	47	…	…	…	179	210	190	191	220
Bahamas	91	103	73	89	86	109	113	142	119	89
Barbados						163	171	187	151	176
Belize	144	155	153	130	140	163	193	187	175	168
Dominica	229	187	216	213	217	270	273	277	211	240
Grenada	154	117	145	82	73	125	132	128	116	143
Guyana	218	157	151	144	201	187	210	187	182	217
Jamaica	160	137	137	171	133	136	226	197	126	190
Montserrat	168	88	125	126	…	158	192	170	178	209
St. Kitts and Nevis	119	110	71	152	111	158	192	170	178	209
St. Lucia	187	151	156	175	184	207	207	220	162	183
St. Vincent and the Grenadines	…	…	181	…	…	131	136	143	116	134
Suriname	…	…	…	…	…	185	207	163	174	192
Trinidad and Tobago	182	187	197	138	147	129	143	123	128	159

Sources : CARICOM Database; The World Bank Group Climate Change Knowledge Portal

Table 2.4.2.1: Annual Averages of Rainfall: 1981-2018 (continued)

Country	Average Rainfall Per Annum (mm)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Antigua and Barbuda	156	197	202	213	231	248	256	190	244	168	228	197
Bahamas	115	110	116	106	83	115	105	123	107	100	112	125
Barbados	193	185	150	172	255	214	173	189	210	159	256	200
Belize	174	181	169	148	157	171	255	171	193	146	194	212
Dominica	262	271	273	265	396	375	318	267	325	269	353	341
Grenada	135	91	121	117	152	150	133	104	121	101	137	159
Guyana	263	147	189	170	202	237	239	235	220	178	221	222
Jamaica	165	180	148	183	156	266	130	285	185	108	308	164
Montserrat	173	212	218	230	277	287	279	206	270	190	266	232
St. Kitts and Nevis	138	179	184	200	226	242	245	176	232	158	225	188
St. Lucia	180	162	164	170	268	249	195	178	197	170	242	241
St. Vincent and the Grenadines	131	110	120	116	168	160	138	121	135	112	161	163
Suriname	239	161	180	151	194	207	204	223	196	174	205	206
Trinidad and Tobago	169	139	158	119	167	164	170	151	146	128	178	167

Sources : CARICOM Database; The World Bank Group Climate Change Knowledge Portal

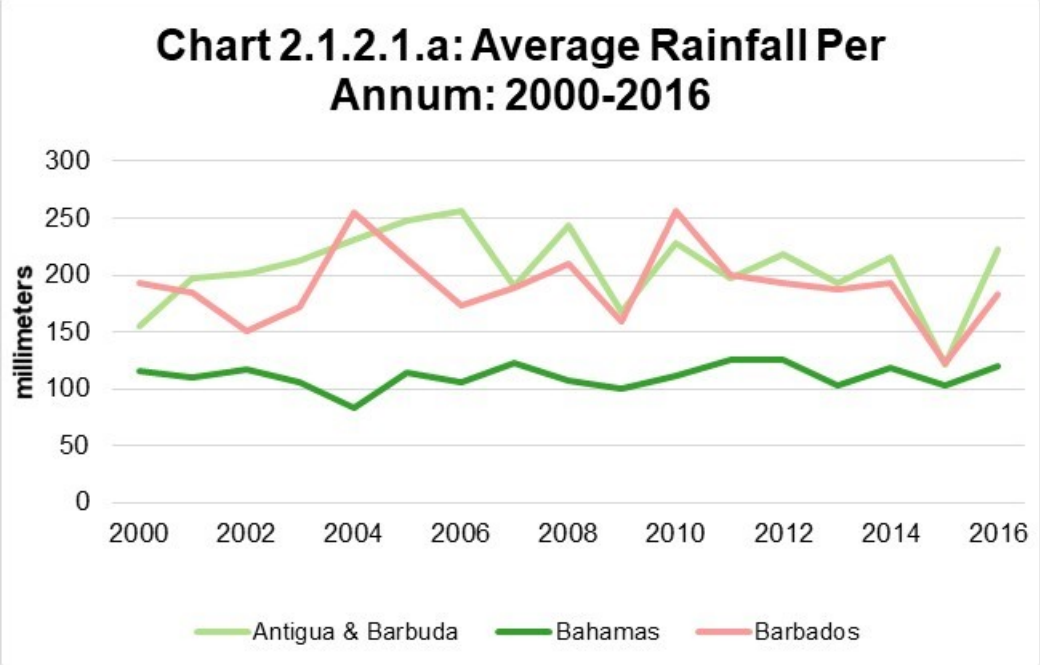
SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

Topic 2.4.1: Atmosphere, Climate and Weather

Table 2.1.2.1: Annual Averages of Rainfall: 1981-2018 (continued)

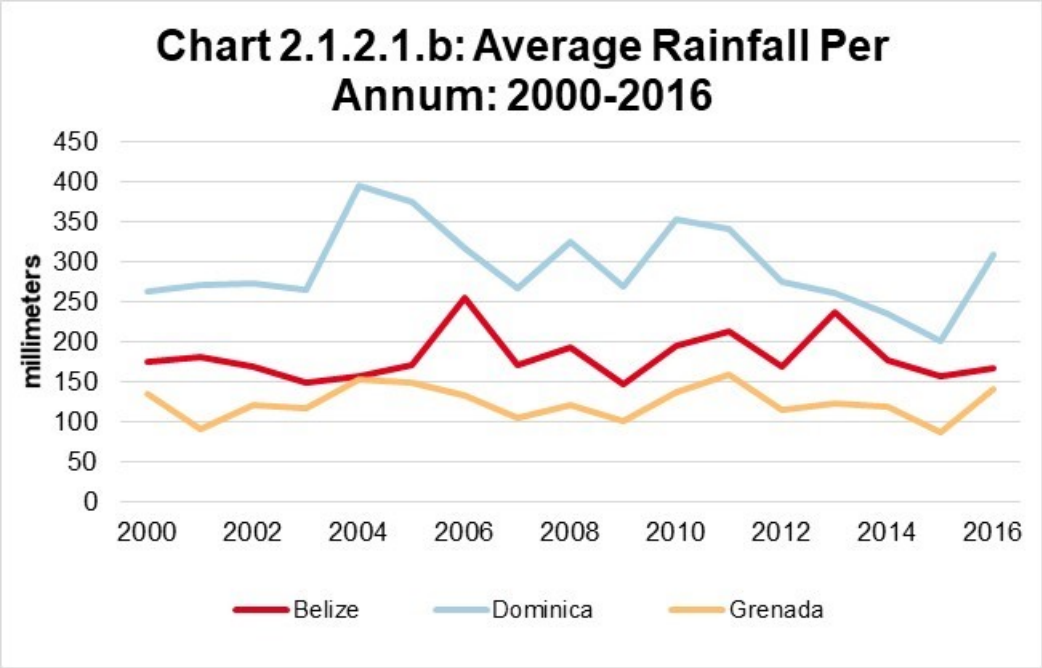
Country	Average Rainfall Per Annum (mm)						
	2012	2013	2014	2015	2016	2017	2018
Antigua and Barbuda	219	194	216	122	223	…	…
Bahamas	126	103	119	102	120	…	…
Barbados	193	188	193	122	183	…	…
Belize	169	237	177	157	166	157	163
Dominica	275	262	235	200	310	…	…
Grenada	115	123	118	88	141	…	…
Guyana	193	206	132	157	182	221	154
Jamaica	190	150	145	94	144	180	140
Montserrat	…	…	…	…	…	…	…
St. Kitts and Nevis	186	186	212	107	196	…	…
St. Lucia	205	206	178	152	237	…	…
St. Vincent and the Grenadines	128	134	122	93	150	…	…
Suriname	191	220	173	199	183	183	…
Trinidad and Tobago	123	131	117	100	136	169	148

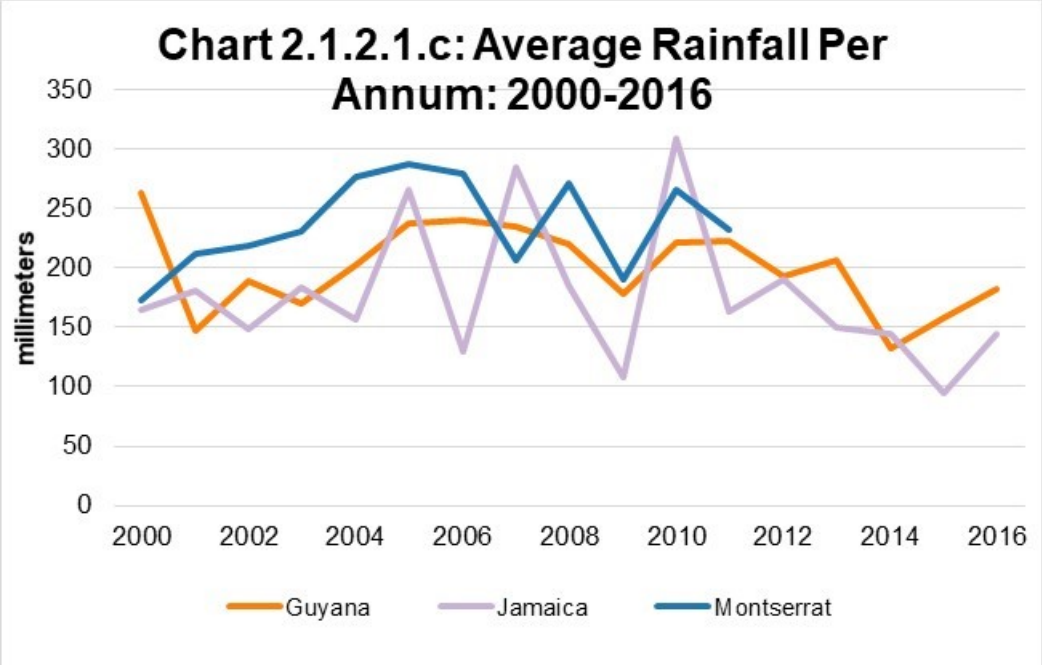
Sources : CARICOM Database; The World Bank Group Climate Change Knowledge Portal



SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

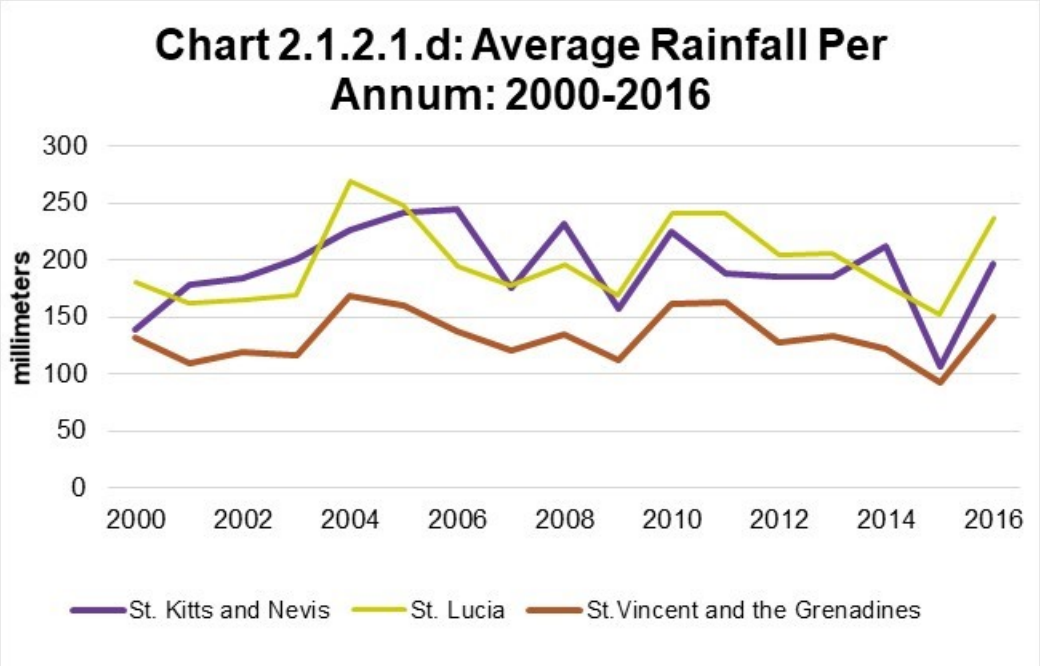
Topic 2.4.1: Atmosphere, Climate and Weather

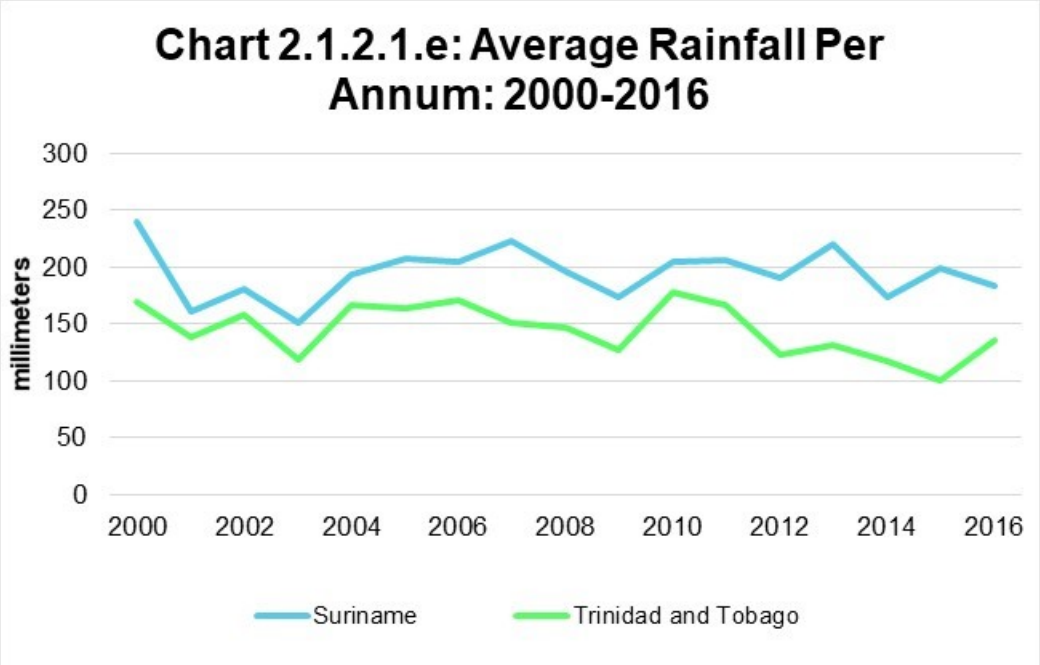




SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

Topic 2.4.1: Atmosphere, Climate and Weather





SUB-COMPONENT 2.4: CLIMATE CHANGE EVIDENCE

Topic 2.4.1: Atmosphere, Climate and Weather

The economies of CARICOM countries are highly dependent on the physical climate since either tourism and/or agriculture generally make up a large proportion of their Gross Domestic Product (GDP). Climate change evidence presented in the tables shows small changes in the annual temperature of most countries while rainfall patterns reveal visible fluctuations over the last two decades. It is anticipated that the mean surface temperatures will increase globally bringing about a change in regional rainfall and temperature and extreme climate. A 1-2 °C increase in temperature by the mid-2050s has been predicted for the Caribbean region under a business as usual scenario (Campbell et al, 2011).

Most Caribbean countries experience two climatic seasons, a dry and a wet season. During the dry season, monitoring drought conditions is also important as some countries are more likely to experience drought conditions during the dry season. Drought conditions impact agriculture, water supply to households and can contribute to bush and grass fires. The 2015 drought impacted sixteen (16) CARICOM countries and can be seen in the figure presented on annual average rainfall by the sharp decline for that year. An El Niño event was declared for 2015-2016 where ocean temperatures were stated to be abnormally warm causing changes to weather patterns and the associated droughts.

The wet season in CARICOM countries usually commences in may and may coincide with the Atlantic Hurricane Season which occurs annually, from June to November. There could be wet seasons where there is a little rain or one that has occurrences of strong winds and flood events. The latter is typical of wet seasons in the Guianas of the Caribbean, Guyana and Suriname. These countries are usually encouraged to prepare for above normal rainfall and more recently flash floods in the capital city and in the vulnerable interior areas where there is often extreme poverty.

Therefore, the implications of changing climatic conditions on countries that are highly dependent on the physical conditions is that there is need for improved data, research, climate model simulations and projections. An examination of the current state of meteorological data in CARICOM countries reveal that limited local meteorological data exists for a long series at a particular weather station. However, the region has seen a growing number of projects that have been developed to support countries with data gaps. These include the Caribbean Weather Impacts Group (CARIWIG), a collaborative project aimed at providing locally relevant information on weather impacts of Climate Change for a long time period.

Further, the USAID-funded Caribbean Climate Adaptation Programme (CCAP), in collaboration with the Caribbean Community Climate Change Centre (CCCCC), provided funding to upgrade existing weather stations in the region that would ultimately provide climatic data for use in decision-making.

More importantly regional cooperation has been developed with the formation of the Caribbean Institute for Meteorology and Hydrology (CIMH) that supports countries in the provision of meteorological and hydrological services and provide training and technical assistance. Meteorological and hydrological data from member countries as can also be obtained from CIMH including historic data which can support local weather forecasts

Reference

Campbell, J.D., et al. (2011). Future climate of the Caribbean from a regional climate model. *International Journal of Climatology*

SOURCES AND NOTES

Sources of Data for Table 2.1.1.1: Total and Protected Forest Area: 2009-2013

Country	Data Source
ANTIGUA AND BARBUDA	National Office for Disaster Services Director, Antigua National Parks Director, Barbuda National Parks
THE BAHAMAS	Dept. of Lands and Survey
BARBADOS	Ministry of the Environment, Water Resources, and Drainage Barbados Land Registry
BELIZE	Statistical Institute of Belize
GUYANA	Guyana Forestry Commission
JAMAICA	Forestry Department, June 2016
SURINAME	General Bureau of Statistics
TRINIDAD AND TOBAGO	Ministry of Environment and Water Resources, Forestry Division
BERMUDA	Department of Statistics

Notes to Table 2.1.1.1: Total and Protected Forest Area: 2009-2013

Country	Notes
THE BAHAMAS	The Table illustrates the amount of forest area kept and governed by the Bahamas Government. There are three distinct types of forest namely; protected forest, conservation forest and forest reserves. This table also shows the various types of forest as a percentage of total forest area and the amount of forest area as a percentage of total land. Historically, substantial plots of land were cleared for large scale commercial hotels, luxury houses, apartments, condominiums, and golf courses. Additionally, substantial amounts of forest land has been devoted to farming which includes crops such as cotton, pineapple, tomatoes, sugarcane, sisal and citrus.

SOURCES AND NOTES

Sources of Data for Table 2.2.1.1: Renewable Freshwater Resources: 2009-2012

Country	Data Source
ALL COUNTRIES	National

Notes to Table 2.2.1.1: Renewable Freshwater Resources: 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	The data on the precipitation was provided by the Meteorological Center.
SURINAME	Data unit is mm

Sources of Data for Table 2.2.2.1: Freshwater Abstraction and Use: 2009-2012, Table 2.2.2.1A: Freshwater Abstraction by Industry: 2009-2012, Table 2.2.2.1B: Total Freshwater Use by Industry: 2009-2012

Country	Data Source
ALL COUNTRIES	National

SOURCES AND NOTES

Notes to Table 2.2.2.1: Freshwater Abstraction and Use: 2009-2012, Table 2.2.2.1A: Freshwater Abstraction by Industry: 2009-2012, Table 2.2.2.1B: Total Freshwater Use by Industry: 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	The quantity of water lost during transport is estimated at 40% of the total freshwater available for use. Total Freshwater use represented the amount of water that the consumers actually used and were billed for. Zero (0) refers to values less than half the unit of measurement. Other Economic Activities include the sum from the commercial sector and the cruise ship industry.
BELIZE	Information consists only for the population connected to the main water systems.
JAMAICA	Refers to average production of water per day.
ST. KITTS AND NEVIS	All data in table are for St. Kitts only.
BERMUDA	Bermuda Government has a seawater RO desalination plant at 500,000 Imperil gallons per day = 0.83 million m3/y Leakage during transport might be around 15 to 20% but there are no supporting data.

SOURCES AND NOTES

Sources of Data for Table 2.2.2.2: Water Supply Industry (ISIC 36): 2009-2012

Country	Data Source
ALL COUNTRIES	National

Notes to Table 2.2.2.2: Water Supply Industry (ISIC 36): 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	The quantity of water lost during transport is estimated at 40% of the total freshwater available for use. Total freshwater use for all categories represented the amount of water that the consumers actually used and were billed for. Zero values relate to figures which were less than half the unit of measurement. Other Economic Activities include the sum from the commercial sector and the cruise ship industry.
BELIZE	Water loss is due to leakage, illegal connection, malfunctioning of meters, etc. Population supplied by water supply industry refers to population with access to water supplied by the Belize Water Services Limited and are estimates. Mostly Urban areas with a few villages that are connected to the system. . Rudimentary Water System for rural areas are not metered therefore information is not available.
JAMAICA	Data refers to public water supply only and is reported In megalitres (million liters). Losses during transport refers to non-revenue water which are losses from theft, leakage and underestimated consumption.
SURINAME	The unit is 1,000,000 m3. One million Cubic meters for water Production for the districts Paramaribo, Wanica, Para, Nickerie and Parts of Marowijne.
BERMUDA	Bermuda Government has a new seawater RO desalination plant at 500,000 Imp gpd = 0.83 million m3/y Leakage during transport might be around 15 to 20% but there are no supporting data.

SOURCES AND NOTES

Sources of Data for Table 2.2.2.3: Population with Wastewater Treatment: 2009-2012

Country	Data Source
ALL COUNTRIES	National

Notes to Table 2.2.2.3: Population with Wastewater Treatment: 2009-2012

Country	Notes
BELIZE	Information only available from the Population and Housing Census, 2010
GUYANA	Figures refer to households based on Population and Housing Census Data
BERMUDA	Population connected to wastewater collecting system data relates to The City of Hamilton, Town of St. George's and part of Prospect residential area have sewage collection systems (~ 1 million imperial gallons per day = 1.66 million m^3/y) Population with independent wastewater treatment refers to 21,000 cesspits - Total capacity of 3.5 million imperial gallons per day = 5.8 million m^3/y; b) 86 deep sealed boreholes - 300,000 million imperial gallons per day = 0.5 million m^3/y.

SOURCES AND NOTES

Sources of Data for Table 2.3.1.1: Hazardous Events and Disasters by year: 2009- 2019

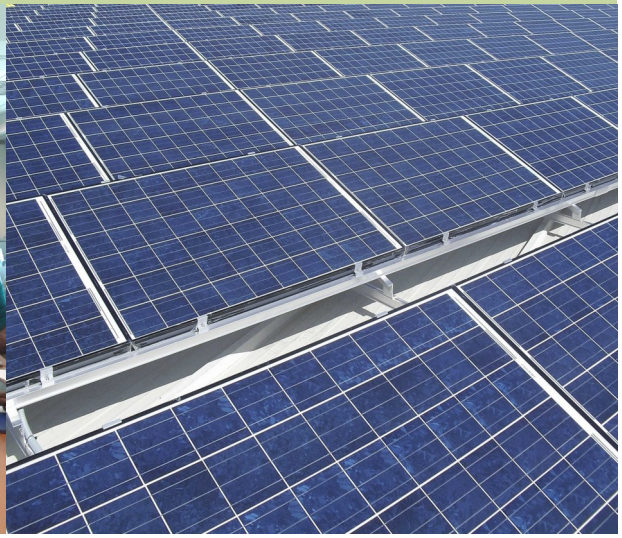
Country	Data Source
ANTIGUA AND BARBUDA	2017- EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED
THE BAHAMAS	Department of Statistics; 2015-2017, 2019- EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED
BELIZE	2016- EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED
DOMINICA	Dominica Environment Statistics 2014; 2017- EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED
GRENADA	National Disaster Management Agency - NaDMA
GUYANA	Civil Defence Commission (CDC)
HAITI	Ministère de l'Environnement (MDE) , Programa de las Naciones Unidas para el Desarrollo (PNUD)
JAMAICA	The Statistical Institute of Jamaica; State of the Environment Report 2010 Office of Disaster Preparedness and Emergency Management (ODPEM)
MONTSERRAT	Disaster Management and Co-ordination Agency
SAINT LUCIA	National Emergency Management Office
ST VINCENT AND THE GRENADINES	The Statistical Office, 2010; Environmental Statistics Report 2016
SURINAME	The General Bureau of Statistics Suriname; National Coordination Center For Disaster Relief in Suriname (NCCR)
BERMUDA	Department of Statistics
TURKS AND CAICOS ISLANDS	EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED
BRITISH VIRGIN ISLANDS	EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED

SOURCES AND NOTES

Notes to Table 2.3.1.1: Hazardous Events and Disasters by year: 2009-2019

Country	Notes
DOMINICA	2011: Mattier Dam- Layou Valley Flooding (destruction of agricultural lands) Massacre flooding (destruction of building and roads) 2013: Newtown Disaster (destruction of homes)
JAMAICA	a. maximum 485 persons sheltered b. family welfare assessment c. $8.1 billion does not include losses obtained by the Education, Tourism and Agriculture Sectors d. number of houses totally destroyed during the hurricane e. persons who were directly or indirectly affected Damages for 2010 and 2012 in Jamaican dollars.

COMPONENT 3:
ADAPTATION



SUB-COMPONENT 3.1: ENVIRONMENTAL GOVERNANCE AND REGULATION

Topic 3.1.1: Participation in MEAs and other Global Environmental Conventions

Table 3.1.1.1: CARICOM's Participation in Multilateral Environmental Agreements related to Climate Change

Country	Convention For The Protection of The Ozone Layer	Convention on Biological Diversity	CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora)	United Nations Convention to Combat Desertification (UNCCD)	Montreal Protocol
Antigua and Barbuda	✓	✓	✓	✓	✓
Bahamas	✓	✓	✓	✓	✓
Barbados	✓	✓	✓	✓	✓
Belize	✓	✓	✓	✓	✓
Dominica	✓	✓	✓	✓	✓
Grenada	✓	✓	✓	✓	✓
Guyana	✓	✓	✓	✓	✓
Haiti	✓	✓		✓	✓
Jamaica	✓	✓	✓	✓	✓
Montserrat				✓	
Saint Kitts and Nevis	✓	✓	✓	✓	✓
Saint Lucia	✓	✓	✓	✓	✓
Suriname	✓	✓	✓	✓	✓
Trinidad and Tobago	✓	✓	✓	✓	✓
Saint Vincent and the Grenadines	✓	✓	✓	✓	✓

SUB-COMPONENT 3.1: ENVIRONMENTAL GOVERNANCE AND REGULATION

Topic 3.1.1: Participation in MEAs and other Global Environmental Conventions (continued)

Table 3.1.1.1: CARICOM's Participation in Multilateral Environmental Agreements related to Climate Change (continued)

Country	United Nations Convention on The Law of The Sea	United Nations Framework Convention on Climate Change	International Convention for the Prevention of Pollution from Ships (MARPOL)	Basel	Stockholm	Rotterdam
Antigua and Barbuda	✓	✓	✓	✓	✓	✓
Bahamas	✓	✓	✓	✓	✓	
Barbados	✓	✓	✓	✓	✓	✓
Belize	✓	✓	✓	✓	✓	✓
Dominica	✓	✓	✓	✓	✓	✓
Grenada	✓	✓	✓			
Guyana	✓	✓	✓	✓	✓	✓
Haiti	✓	✓	✓	✓	✓	
Jamaica	✓	✓	✓	✓	✓	✓
Montserrat						
Saint Kitts and Nevis	✓	✓	✓	✓	✓	✓
Saint Lucia	✓	✓	✓	✓	✓	✓
Suriname	✓	✓	✓	✓	✓	✓
Trinidad and Tobago	✓	✓	✓	✓	✓	✓
Saint Vincent and the Grenadines	✓	✓	✓	✓	✓	✓

SUB-COMPONENT 3.1: ENVIRONMENTAL GOVERNANCE AND REGULATION

CARICOM countries have recognised that the protection of the environment from climate change effects requires effective governance and regulation. Consequently, CARICOM countries are participating in several Multilateral Environmental Agreements (MEAs) and all are signatories to the major MEAs related to climate change. This is largely due to the influence of international financial donor institutions who encourage countries to incorporate environmental concerns into projects and policies and effectively promote the concept of sustainable development. Presently there are more than 10 global MEAs and/or conventions related to climate change. The MEAs which are most important to the region are included in Table 3.1.1.1.

The table also reveals that there a number of global agreements that govern a myriad of environmental challenges which CARICOM SIDS have to overcome. However, due to a number of capacity constraints, CARICOM SIDS have found it difficult to fulfil their obligation under these agreements. The CARICOM Secretariat continues to provide support for member countries to effectively implement and comply with MEAs and related commitments through various project and through support from regional institutions such as the Caribbean Community Climate Change Centre (CCCCC). Moreover, it has been recognised that there is need for improved information management to support the harmonization of MEA reporting obligations in countries that will effectively minimise their reporting burden which is a growing concern.

The provision of data to support governments' regulations on the environment and on climate change cannot be overstated. A number countries are exploring a number of prospects for data driven climate change mitigation. These initiatives include the creation of centralised databases to gather and access climate change and environment information for monitoring and reporting on policies and measures. Moreover, the use of Big data and satellite imagery where data gaps exists may contribute to the scope of climate policy reporting and analysis.

The Intergovernmental Panel on Climate Change (IPCC) which provides guidance for Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in 2018 set an ambitious target to limit global warming to 1.5°C compared to 2°C in response to the threat of climate change. For CARICOM SIDS facing the risks of climate change which includes the impacts from extreme events and other threats, the availability of data to provide evidence of the effects of low GHG emission development strategies would demonstrate their commitment to efforts to combat climate change.

Reference

Summary for Policymakers. In: *Global Warming of 1.5°C. An IPCC Special Report* (2018) Intergovernmental Panel on Climate Change (IPCC)

SUBCOMPONENT 3.2: WASTE MANAGEMENT

Topic 3.2.1: Generation of Waste

Table 3.2.1.1: Generation of Waste by Source: 2009-2012

1000 t

Country	Year	Agric., forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas, steam and air conditioning	Construction	Other economic activities excluding	H/holds	Other, n.e.s	Total
		ISIC 01-03	ISIC 05-09	ISIC 10-33	ISIC 35	ISIC 41-43	ISIC 38			
AG										
	2009			0.2		7.9	9.6	22.7	96.0	136.4
	2010			0.3		4.9	9.4	24.3	97.7	136.6
	2011			0.2		3.6	9.2	22.3	85.9	121.2
	2012			0.1		4.8	9.4	20.9	87.3	122.5
KN										
	2009	0	0	1.8	0	8.2	24.1	11.8		45.9
	2010	0	0	1.4	0	9.5	24.5	11.8		47.2
	2011	0	0	0.7	0	6.7	23.0	11.4		41.9
	2012	0	0	0.6	0	5.9	20.5	10.3		37.3
LC										
	2009					8.0			76.0	84.0
	2010					7.0			75.0	82.0
	2011					5.0			77.0	82.0
	2012					4.0			74.0	78.0
SR										
	2009	12.2		29.5			4.5	30.5		76.6
	2010	14.7		26.5			5.0	36.1		82.2
	2011	14.5		24.2			4.1	41.1		84.0
	2012	11.9		23.7			3.6	37.9		77.2
	2013	11.9		24.5			4.4	38.2		79.0
BM										
	2009							30.2	60.3	90.5
	2010							30.2	60.4	90.6
	2011							27.0	54.0	81.0
	2012							27.0	55.0	82.0

Notes:

Figures may not add up due to rounding.

For Antigua and Barbuda, other sources not specified in the worksheet include, for example, 'clean bulk, bulk waste, street sweep, sewage and tyres'.

For Suriname, data for 2013 was included in this table.

Suriname - the Unit of measurement is 1000 m^3. The figures cover the capital city (district Paramaribo) and the second largest district of Wanica.

1000 t refers to 1000 tonnes

SUBCOMPONENT 3.2: WASTE MANAGEMENT

Topic 3.2.2: Management of Waste

Table 3.2.2.1: Management of Hazardous Waste: 2009-2012

Tonnes

Country	Year	Stock of hazardous waste at the beginning of the year	Hazardous waste generated during the year	Hazardous waste imported during the year	Hazardous waste exported during the year	Hazardous waste treated or disposed of during the year
AG						
	2009	0	102			102
	2010	0	70			70
	2011	0	204			204
	2012	0	55			55
LC						
	2012	17.3		0	0	0
SR						
	2009	0	4.2			4.2
	2010	0	4.3			4.3
	2011	0	3.5			3.5
	2012	0	3.4			3.4
	2013	0	3.7			3.7
BM						
	2009	87	623		598	598
	2010	112	582		585	585
	2011	109	590		601	601
	2012	98	525		501	501

Notes:
Figures may not add up due to rounding.
For Antigua and Barbuda and Suriname, all stock of hazardous waste accumulated during the year are assumed to be disposed of.
For Bermuda all hazardous waste at the beginning of the year and waste generated during the year are exported.
For Suriname, 2013 data was included in this table.

SUBCOMPONENT 3.2: WASTE MANAGEMENT

Topic 3.2.2: Management of Waste

Table 3.2.2.1: Management of Hazardous Waste: 2009-2012 (continued)

Tonnes

Country	Year	*Amounts of hazardous waste treated or disposed going to:*				Stock of hazardous waste at the end of the year
		Recycling	Incinerated	Landfilled	Other	
AG						
	2009	**49**		**53**		**0**
	2010	**47**		**23**		**0**
	2011	**47**		**157**		**0**
	2012	**47**		**8**		**0**
LC						
	2012	**0**	**0**	**0**	**0**	**17.3**
SR						
	2009					**0**
	2010					**0**
	2011					**0**
	2012					**0**
	2013					**0**
BM						
	2009	**370**	**6**	**222**		**112**
	2010	**365**	**5**	**215**		**109**
	2011	**352**	**7**	**242**		**98**
	2012	**362**	**5**	**209**		**122**

Notes:

Figures may not add up due to rounding.
For Antigua and Barbuda and Suriname, all stock of hazardous waste accumulated during the year are assumed to be disposed of.
For Bermuda, all hazardous waste at the beginning of the year and waste generated during the year are exported.
For Suriname, 2013 data was included in this table.

SUBCOMPONENT 3.2: WASTE MANAGEMENT

Topic 3.2.2: Management of Waste

Table 3.2.2.2: Management of Municipal Waste: 2009-2012

1000 t

Country	Year	Municipal waste collected from households	Municipal waste collected from other origins	Total amount of municipal waste collected	Municipal waste imported for treatment/ disposal	Municipal waste exported for treatment/ disposal	Hazardous waste treated or disposed of during the year
		(1)	(2)	(3)=(1)+(2)	(4)	(5)	(6)=((3)+(4)-(5))
AG							
	2009	22.7	113.7	136.4	0.0		136.4
	2010	24.3	112.3	136.6	0.0		136.6
	2011	22.3	98.9	121.2	0.0		121.2
	2012	20.9	101.6	122.5	0.0		122.5
LC							
	2009			45.0	0.0	0.0	45.0
	2010			46.0	0.0	0.0	46.0
	2011			52.0	0.0	0.0	52.0
	2012			45.0	0.0	0.0	45.0
SR							
	2009	30.5	46.2	76.6			
	2010	36.1	46.1	82.2			
	2011	41.1	42.8	84.0			
	2012	37.9	39.3	77.2			
	2013	38.2	40.8	79.0			
BM							
	2009	30.2	60.3	90.5	0.0		90.5
	2010	30.2	60.4	90.6	0.0		90.6
	2011	27.0	54.0	81.0	0.0		81.0
	2012	27.0	55.0	82.0	0.0		82.0

Notes:

Figures may not add up due to rounding.

For Suriname, 2013 data was included in this table.

1000 t refers to 1000 tonnes

SUBCOMPONENT 3.2: WASTE MANAGEMENT

Topic 3.2.2: Management of Waste

Table 3.2.2.2A: Management of Municipal Waste by Method: 2009-2012

1000 t

Country	Year	Municipal waste managed in the country *Amounts going to:*						Total
		Recycling	Composting	Incineration	Landfilling	*of which: Controlled landfilling*	Other	
AG								
	2009	**0.0**	**0.0**	**0.0**	**136.4**	**136.4**	**0.0**	**136.4**
	2010	**0.0**	**0.0**	**0.0**	**136.6**	**136.6**	**0.0**	**136.6**
	2011	**0.0**	**0.0**	**0.0**	**121.2**	**121.2**	**0.0**	**121.2**
	2012	**0.0**	**0.0**	**0.0**	**122.5**	**122.5**	**0.0**	**122.5**
LC								
	2009				**45.0**			**45.0**
	2010				**46.0**			**46.0**
	2011				**52.0**			**52.0**
	2012				**45.0**			**45.0**
BM								
	2009	**1.6**	**15.0**	**63.9**	**10.0**			**90.5**
	2010	**1.6**	**15.0**	**64.0**	**10.0**			**90.6**
	2011	**1.6**	**15.0**	**54.4**	**10.0**			**81.0**
	2012	**1.6**	**15.0**	**55.4**	**10.0**			**82.0**

Note:

Figures may not add up due to rounding.

1000 t refers to 1000 tonnes

SUBCOMPONENT 3.2: WASTE MANAGEMENT

Topic 3.2.2: Management of Waste

Table 3.2.2.3: Percentage Composition of Municipal Waste: 2009-2013

Percent

Country	Year	Paper, paperboard	Textiles	Plastic	Glass	Metals	Other inorganic material	Organic material	*Organic material of which: food and garden waste*	TOTAL
		(1)	(2)	(3)	(4)	(5)	(6)	(7)		8=(1)+(2)+(3)+(4)+(5)+(6)+(7)
BZ	2010	16.0		19.0	8.0	5.0	14.0	38.0	33.0	100.0
GY	2009	10.0	5.0	18.0	5.0	4.5	4.5	53.0	50.0	100.0
JM	2013	14.8	5.1	12.2	2.8	2.4	0.5	62.2		100.0
BM	2010	29.0	17.0	13.0	9.0	6.0	9.0	17.0		100.0

Table 3.2.2.4: Management of Municipal Waste - City Data: 2009-2012

Country	Year	Total population of the city	Percentage of city population served by municipal waste collection	Municipal waste collected from households	Municipal waste collected from other origins	Total amount of municipal waste collected	Municipal waste managed in the country *Amounts going to:*	
							Recycling	Landfilling
		1000 inh.	%	1000 t	1000 t	1000 t	1000 t	1000 t
				(1)	(2)	(3)=(1)+(2)		
BZ - Belize City								
	2010	57.2	100.0			17.3	0.3	16.9
	2011	58.0	100.0			17.5	0.3	17.2
	2012	58.7	100.0			17.7	0.3	17.4
GY - Georgetown								
	2009		95.0	35.5	51.7	87.2	1.2	86.0
SR - Paramaribo								
	2009		98.0					
	2012	240.9	90.0					

SUBCOMPONENT 3.2: WASTE MANAGEMENT

This subcomponent examined the climate change adaptation strategy of waste management on the vulnerable human settlements and human health in the CARICOM region. The proper management of solid waste is considered an adaptation strategy as waste management sites are vulnerable to climate impacts such as flooding and fires caused by temperature increase or drought. Excess flooding from extreme storms could undermine landfill foundations if no proper water catchment systems exist, while temperature increases would require rigorous landfill management practices to prevent strong, obnoxious odours from affecting nearby communities.

It is critical that landfill waste must be properly managed to minimize the risk of contaminated water and to protect human health and the environment. Municipal cities and towns generate large amounts of waste and as the data show, within most CARICOM countries, landfills are the most commonly used method of waste disposal for solid waste authorities. Landfills require long-term care and management as some discarded items take a few years, decades or even longer to decompose.

The World Bank estimates that emissions from landfills account for almost five per cent of total global greenhouse gas emissions and that its contribution to global emissions of methane could be as much as 12 per cent. The global strategy for reducing emissions from landfills is therefore the reduction of waste is transported to landfills through efficient waste management practices. These include composting, recycling and converting waste to energy or bioenergy, which involves converting the chemicals found in waste to energy.

Simultaneously, climate related changes such as sea level rises, changes in temperature and rainfall are expected to lead to increased threats to human settlements and human health, particularly to those concentrated on the coast and in urban areas. In the Caribbean, damage by tropical cyclones pose major threats to human settlements including its supporting physical infrastructure such as water and sanitation services .

Definitions & Technical notes:

Municipal waste, collected by or on behalf of municipalities, by public or private enterprises, includes waste originating from: households, commerce and trade, small businesses, office buildings and institutions (schools, hospitals, government buildings). It also includes bulky waste (e.g., white goods, old furniture, mattresses) and waste from selected municipal services, e.g., waste from park and garden maintenance, waste from street cleaning services (street sweepings, the content of litter containers, market cleansing waste), if managed as waste. The definition excludes waste from municipal sewage network and treatment, municipal construction and demolition waste.

Total municipal waste collected refers to waste collected by or on behalf of municipalities, as well as municipal waste collected by the private sector. It includes mixed waste, and fractions collected separately for recovery operations (through door-to-door collection and/or through voluntary deposits).

Population served by municipal waste collection is the proportion of the total population covered by regular municipal waste removal service in relation to the total population of the country.

References

Kaza, Silpa et al. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development;. World Bank.

UNSD/UNEP Questionnaires on Environment Statistics, Waste section

SOURCES AND NOTES

Sources of Data: Table 3.2.1.1 Generation of Waste by Source: 2009-2012

Country	Data Source
ANTIGUA AND BARBUDA	Antigua and Barbuda Waste Recycling Corporation (ABWRC)
SAINT LUCIA	The Ministry of Agriculture, Food Production, Fisheries and Rural Development
SURINAME	Ministry of Public Works Division Garbage and Processing and GBS
BERMUDA	Department of Statistics

Notes to Table 3.2.1.1: Generation of Waste by Source: 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	Manufacturing refers to the Industrial Sector. The other economic activities are commercial, institutes, medical and cruise ships. These values for total waste generated, which were provided by the National Solid Waste Management Authority (NSWMA), includes waste generated from other sources not specified in the worksheet, for example, 'clean bulk, bulk waste, street sweep, sewage and tyres'.
SAINT LUCIA	Data is provided for fiscal years - April to March. Information for Agriculture, forestry and fishing (ISIC 01-03), Manufacturing (ISIC 10-33), Electricity, gas, steam and air conditioning supply (ISIC 35), Other economic activities excluding ISIC 38 and Households is included in the total waste generated available. Household waste is collected together with other municipal waste.
SURINAME	For the categories Agriculture, forestry and fishing, Manufacturing, Other economic activities, Households and Total waste generation, the unit of measurement is thousand cubic meters. For the categories Agriculture, forestry and fishing, Manufacturing, Other economic activities, Households and Total waste generation, all figures cover the capital city (district Paramaribo) and the second largest district of Wanica. For the category Agriculture, forestry and fishing, figures cover data for the Agricultural Waste, Waste of Fish and Meat and Dangerous Waste Materials. Household data include the sectors Expired Foodstuff and Asbestos and Glass.
BERMUDA	Electricity, gas, steam and air conditioning supply data refers to Total ash generated by incineration of ash (R1.7) to generate electricity which included metals improperly disposed of by the public. Households data refers to Public Works municipal waste collected from households plus the household waste dropped by members of the public at the public drop off located at Tynes Bay Waste-to-Energy Facility.

SOURCES AND NOTES

Sources of Data: Table 3.2.2.1 Management of Hazardous Waste: 2009-2012

Country	Data Source
ANTIGUA AND BARBUDA	Antigua and Barbuda Waste Recycling Corporation (ABWRC)
SAINT LUCIA	The Ministry of Agriculture, Food Production, Fisheries and Rural Development
SURINAME	Ministry of Public Works Division Garbage and Processing

Notes to Table 3.2.2.1: Management of Hazardous Waste: 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	Data for Hazardous waste was provided by the Antigua and Barbuda Waste Recycling Corporation (ABWRC) . This includes only car batteries (3518 batteries @ an estimated 30 lbs each). Hazardous waste gone to landfill is all waste generated from the medical sector so it is partly hazardous material but not all hazardous. The specific amount of how much medical waste is hazardous is unknown.
SAINT LUCIA	This stock of hazardous waste does not include 31,700 litres which is currently in a shipping container awaiting shipment overseas for disposal.
SURINAME	For the categories : agriculture, forestry and fishing, manufacturing, other economic activities, households and total waste generation the unit of measurement is in thousand cubic meters All figures cover the capital city (district Paramaribo) and the second largest district of Wanica. The data is from the Ministry of Public Works Division Garbage and Processing.
BERMUDA	All waste materials designated under this category are sent off Island for recycling/disposal. None are treated or disposed off on island therefore Hazardous waste exported during the year and Hazardous waste treated or disposed of during the year are the same.

SOURCES AND NOTES

Sources of Data: Table 3.2.2.2 Management of Municipal Waste: 2009-2012 and Table 3.2.2.2 A: Management of Municipal Waste by Method: 2009-2012

Country	Data Source
ANTIGUA AND BARBUDA	National Solid Waste Management Authority (NSWMA) and Antigua and Barbuda Waste Recycling Corporation.
SURINAME	Ministry of Public Works Division Garbage and Processing

Notes to Table 3.2.2.2 Management of Municipal Waste: 2009-2012 and Table 3.2.2.2 A: Management of Municipal Waste by Method: 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	Data were provided by the National Solid Waste Management Authority (NSWMA). Data refer to total waste generation. Waste collected by the National Solid Waste Management Authority (NSWMA) is not recycled. The only waste that is recycled is what is collected by the Antigua and Barbuda Waste Recycling Corporation. Data were provided by the Antigua and Barbuda Waste Recycling Corporation. his estimate of the total population served by municipal waste was based on the entire country. There is no estimation by urban and rural populations. Population estimate was taken from the 2011 Population and Household Census.
SAINT LUCIA	Municipal waste from all sources is collected together and as a result there is no characterization by origin.
SURINAME	For the categories : agriculture, forestry and fishing, manufacturing, other economic activities, households and total waste generation the unit of measurement is in thousand cubic meters All figures cover the capital city (district Paramaribo) and the second largest district of Wanica. The data is from the Ministry of Public Works Division Garbage and Processing.

SOURCES AND NOTES

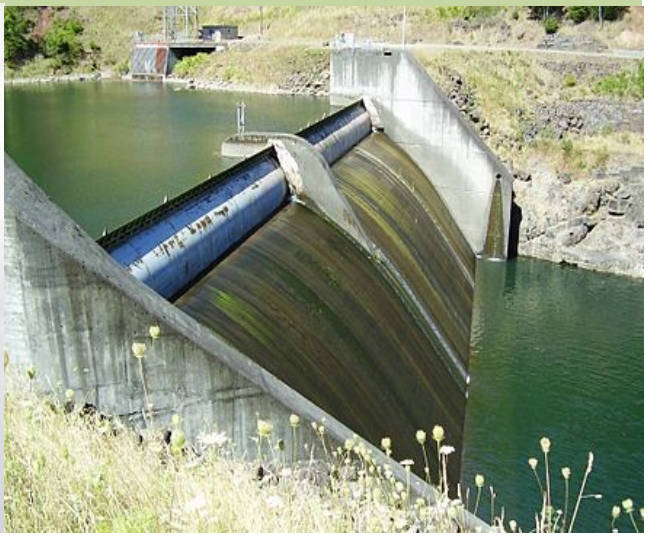
Notes to Table 3.2.2.3: Percentage Composition of Municipal Waste: 2009-2013

Country	Notes
BELIZE	Other inorganic material includes textile waste.

Notes to Table 3.2.2.4: Management of Municipal Waste - City Data: 2009-2012

Country	Notes
BELIZE	Total amount of municipal waste collected is estimated
SURINAME	Population data is 2012 Census data for all 10 districts.

COMPONENT 4:
MITIGATION



SUBCOMPONENT 4.1: RENEWABLE ENERGY

Topic 4.1.1: Clean Fuels and Technology

Table 4.1.1.1: Proportion of Population with Primary Reliance on Clean Fuels and Technology: 2000-2017

(%)

Country	2000	2005	2010	2015	2016	2017
Antigua and Barbuda	95	95	95	95	95	95
Bahamas	95	95	95	95	95	95
Barbados	95	95	95	95	95	95
Belize	78	81	84	86	86	87
Dominica	78	83	87	91	91	91
Grenada	94	95	95	95	95	95
Guyana	36	49	62	73	75	77
Haiti	5	5	5	5	5	5
Jamaica	72	80	86	90	91	92
Saint Kitts and Nevis	95	95	95	95	95	95
Saint Lucia	87	91	95	95	95	95
Saint Vincent and the Grenadines	95	95	95	95	95	95
Suriname	80	84	87	90	90	91
Trinidad and Tobago	95	95	95	95	95	95

Note: Estimated data

Source: Global Health Observatory (GHO), World Health Organisation (WHO).

SUBCOMPONENT 4.1: RENEWABLE ENERGY

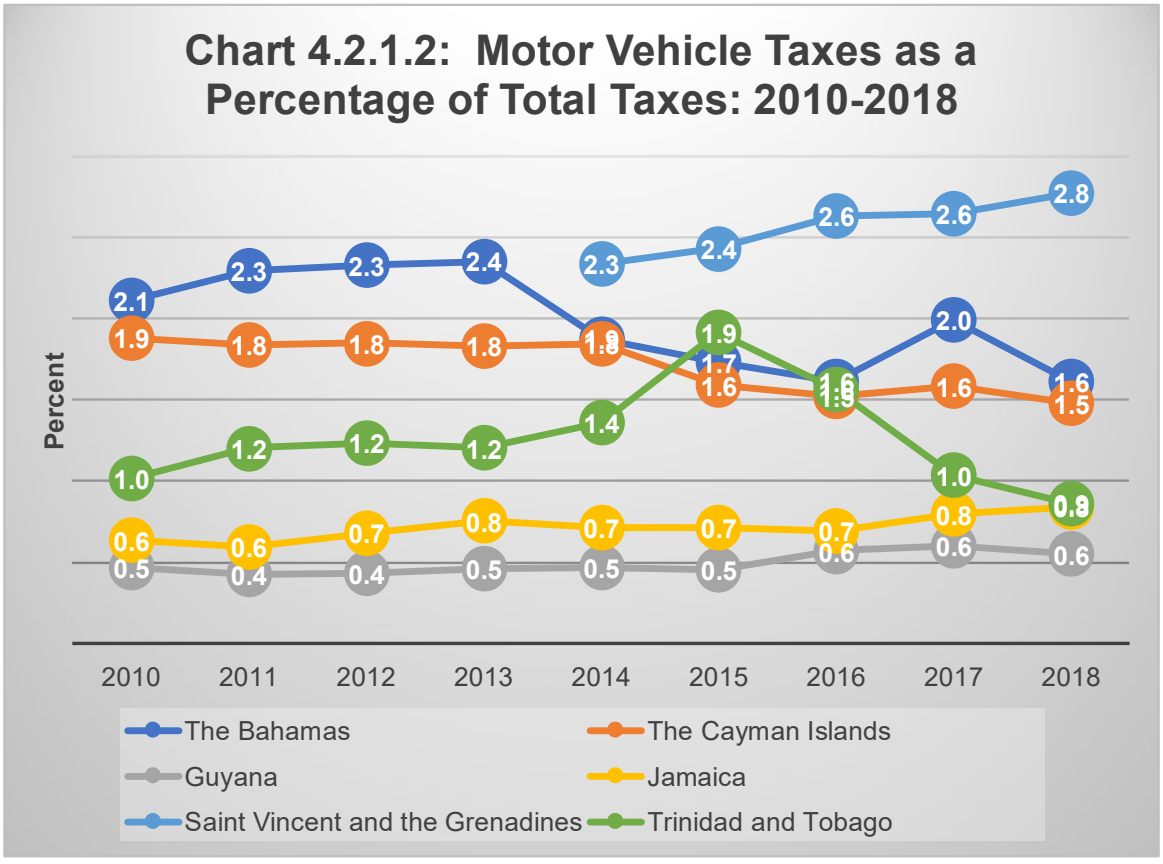
Topic 4.1.2: Climate Change Mitigation Policies, Strategies and Plans

Table 4.1.2.1: Share of Energy and Transport related Taxes as a Percentage of Total Taxes and Social Contributions [Motor Vehicle Taxes as a Percentage of Total Taxes]: 2010-2018

(%)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018
The Bahamas	2.1	2.3	2.3	2.4	1.9	1.7	1.6	2.0	1.6
The Cayman Islands	1.9	1.8	1.8	1.8	1.8	1.6	1.5	1.6	1.5
Guyana	0.5	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
Jamaica	0.6	0.6	0.7	0.8	0.7	0.7	0.7	0.8	0.8
Saint Vincent and the Grenadines					2.3	2.4	2.6	2.6	2.8
Trinidad and Tobago	1.0	1.2	1.2	1.2	1.4	1.9	1.6	1.0	0.9

Source: CARICOM Regional Statistics Database



SUBCOMPONENT 4.1: RENEWABLE ENERGY

Topic 4.1.1: Clean Fuels and Technology

In the last two decades most of the population within countries of the Caribbean Community (CARICOM) have transitioned from the use of solid fuels and kerosene, which are known to be associated with increased cases of respiratory diseases, to the use of clean fuels for household and commercial uses. The result has been an increased dependence on fossil fuel combustion with petroleum products for energy consumption which research has shown to be unsustainable.

Fossil-fuel related activities are associated with increased emissions of gases which are harmful to the environment. However, with the current Global shift towards the use of cleaner energy, it is anticipated that more countries in the region will transition to renewable energy technologies to provide commercial energy whilst reducing carbon dioxide (CO_2) emissions.

There has been evidence that promoting cleaner fuels and technologies would mitigate health issues in children associated with lead, through the campaign to eliminate lead poisoning. “Clean” is defined by the United Nations according to “emission rate targets and specific fuel recommendations (i.e. against unprocessed coal and kerosene) included in the normative guidance WHO guidelines for indoor air quality: household fuel combustion”. Similarly, the global campaign to promote the use of cleaner fuels is expected to achieve greater environmental and health impacts. Meanwhile, the CARICOM region has produced an Energy policy which includes as an objective to accelerate deployment of renewable and clean sources of energy supplies.

The indicator, *Proportion of Population with Primary Reliance on Clean Fuels and Technologies (%)*, is calculated as the number of people using clean fuels and technologies divided by the total population, expressed as a percentage.

The indicator, *Share of Energy and Transport related Taxes as a percentage of Total Taxes and Social Contributions* is a measure of environmental taxes that are intended to, *inter alia*, dissuade environmentally negative behaviours and mitigate the effects of environmental damages. A proxy indicator, *Motor Vehicle Taxes as a percentage of Total Taxes*, was used to represent this indicator where information was available for member countries. As seen in the Tables presented, data for this component are very limited

Reference

UNSD SDG Indicators Metadata Repository https:// unstats.un.org/sdgs/metadata/

The Organisation for Economic Co-operation and Development (OECD) (2011) Environmental Taxation A Guide for Policy Makers

COMPONENT 5:
VULNERABILITY

SUBCOMPONENT 5.1: VULNERABLE POPULATION

Topic 5.1.1: Generation of Waste

Table 5.1.1.1: Percentage of Total Population served by Municipal Waste Collection: 2009-2012

Country	Year	Percentage of total population served by municipal waste collection (%)	Percentage of urban population served by municipal waste collection (%)	Percentage of rural population served by municipal waste collection (%)
AG				
	2009	**95.0**		
	2010	**95.0**		
	2011	**99.0**		
	2012	**99.0**		
LC				
	2009	**100**	**100**	**100**
	2010	**100**	**100**	**100**
	2011	**100**	**100**	**100**
	2012	**100**	**100**	**100**
SR				
	2012	**79.5**	**93.4**	**65.6**
BM				
	2009	**100**	**100**	**100**
	2010	**100**	**100**	**100**
	2011	**100**	**100**	**100**
	2012	**100**	**100**	**100**

SOURCES AND NOTES

Sources of Data: Table 5.1.1.1: Percentage of Total Population served by Municipal Waste Collection: 2009-2012

Country	Data Source
ANTIGUA AND BARBUDA	National Solid Waste Management Authority (NSWMA) and Antigua and Barbuda Waste Recycling Corporation.
SURINAME	Ministry of Public Works Division Garbage and Processing
SAINT LUCIA	National Sources
BERMUDA	National Sources

Notes to Table 5.1.1.1: Percentage of Total Population served by Municipal Waste Collection: 2009-2012

Country	Notes
ANTIGUA AND BARBUDA	Data were provided by the National Solid Waste Management Authority (NSWMA). Data were provided by the Antigua and Barbuda Waste Recycling Corporation. his estimate of the total population served by municipal waste was based on the entire country. There is no estimation by urban and rural populations. Population estimate was taken from the 2011 Population and Household Census.
SURINAME	All figures cover the capital city (district Paramaribo) and the second largest district of Wanica. The data is from the Ministry of Public Works Division Garbage and Processing.

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