

Generating climate change and disasters indicators for policy decision-making in Saint Lucia



The CARICOM Sub-regional Experience in Producing its First Climate Change Statistics Publication –CARICOM Secretariat –16-18 November 2021

BACKGROUND

- **UNSD/CARICOM PROJECT:**
- Introduction of Environment Statistics in the Caribbean Community (CARICOM) was in 1999 under a UNSD/CARICOM Project- “**Strengthening Capacity in Social /Gender and Environment Statistics for Conference Follow-up**”. (First Development Account project).
- At that time, one country, **Belize**, had produced an Environment Statistics report in 1999 and **Jamaica** was also commencing work in this area of statistics;
- Project launch for ENV component took place in Belize and a **core set of statistics and indicators** were identified to be compiled by Member States based on **environmental issues** that were considered critical to CARICOM.

BACKGROUND

- **UNSD/CARICOM PROJECT:**
- The first regional publication, “The CARICOM Environment in Figures -2002” was published as a main project output.
- There was also technical assistance, training in IT, equipment provision and also support from international experts.
- Sustainability considerations led to the formation of a **CARICOM Advisory Group on Statistics** and the development of a **CARICOM Programme in Environment and Social/Gender Statistics** to encourage regional and national data compilation.

BACKGROUND

- **SELECTED CAPACITY BUILDING UNDERTAKEN:**
- Documentation of metadata/Adoption of the FDES;
- Training workshops- in collaboration with UNSD, funded by IDPs including World Bank and EU;
- In-country Technical Assistance focusing on Interagency collaboration;
- Establishment of a Technical Working Group for the Development of Environment Statistics – First meeting (virtual) in 2016 with representatives from Antigua and Barbuda, Jamaica, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Bermuda, the BVI, and Turks and Caicos Islands. Outputs included TOR and work plan.
- Assessment of Data availability by country and indicators

Environment list of indicators

MAPPING			
Topic	Sub-topic	Indicators	Framework
Hazardous events and disasters			
	Occurrence of hazardous events and disasters		
		Natural disasters by type and year	CARICOM Programme, CSMDG
		Percentage of coral reefs destroyed by human activity and by natural disasters	CSMDG
		Number of deaths, missing people, injured, relocated or evacuated due to disasters per 100,000 people	CC SDG
		Social dislocation resulting from natural disasters	CSMDG
		Economic losses resulting from natural disasters	CSMDG
		Direct disaster economic loss in relation to global gross domestic product (GDP)	CC SDG
		Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of base services	CC SDG
	Adaptation policies /strategy /plans		
		Number of countries with national and local disaster risk reduction strategies	CC SDG

Environment list of indicators

		MAPPING	
Topic	Sub-topic	Indicators	Framework
Environmental Health			
	Water Quality		
		Level of Water Stress: freshwater withdrawal as a proportion of available freshwater resources	CC SDG
		Amount of water and sanitation related Official Development Assistance that is part of a government coordinated spending plan	CC SDG
	Human health		
		Number of Reported Cases of Environmentally Related Diseases	CARICOM Programme
	Vulnerable population		
		Number of Households by Type of Water Supply	CARICOM Programme
		Number of Households by Type of Sanitation Facilities	CARICOM Programme
		Number of Households by Size of Household	CARICOM Programme
		Proportion of population using safely managed sanitation services including a hand washing facility with soap and water.	CC SDG
		Proportion of population using safely managed drinking water services	CC SDG
		Proportion of population with access to electricity	CC SDG
		Number of Households by Type of Fuel Used for Lighting	CARICOM Programme
		Number of families in coastal areas	CARICOM Programme
		Proportion of urban population living in slums, informal settlement or inadequate housing .	CC SDG

Environment list of indicators

		MAPPING	
Topic	Sub-topic	Indicators	Framework
Waste			
	Solid Waste		
		Percentage of urban solid waste regularly collected and with adequate final discharge with regards to the total waste generated by cities	CC SDG
		Annual mean levels of fine particulate matter (e.g. PM2.5 and PM 10) in cities population weighted	CC SDG
		Number of Parties to international multilateral environmental agreements on hazardous and other chemicals and waste that meet their commitments and obligations in transmitting information as required by each relevant agreement	CC SDG
Biodiversity			
	Protected Species		
		Proportion of fish stocks within biologically sustainable levels	CC SDG
		Red List Index	CC SDG
	Protected Areas		
		Coverage of protected areas in relation to marine areas	CC SDG
		Proportion of important sites for terrestrial and freshwater Biodiversity that are covered by protected areas by ecosystem type	CC SDG
		Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems,	CC SDG
Population and Households			
	Building and infrastructure vulnerable to Climate Change		
		Number of Households by Type of Dwelling	CARICOM Programme
		Number of Households by Type of Tenure	CARICOM Programme
		Proportion of Households with Own Dwelling	CSDMGs
		Number of Households by Type of Material of Outer Walls	CARICOM Programme
		Number of Households by Type of Material Used for Roofing	CARICOM Programme
		Number of Households by Number of Bedrooms	CARICOM Programme

Environment list of indicators

Topic	Sub-topic	MAPPING Indicators	Framework
Tourism			
	Tourist arrivals	Same-day visitor (or excursionist)	CARICOM Programme
		Tourist (or overnight visitor)	CARICOM Programme
		Cruise passengers	CARICOM Programme
		Number of tourist nights spent	CARICOM Programme
		Tourist Intensity Ratio	CARICOM Programme
		Tourism Penetration Ratio	CARICOM Programme
		Tourist Arrivals by Country of Origin	CARICOM Programme
		Tourist Arrivals by Type of Accommodation	CARICOM Programme
	Hotels	Number of Hotels Classified by Size	CARICOM Programme
		Total number of beds	CARICOM Programme
		Total number of rooms occupied	CARICOM Programme
		Room occupancy rate	CARICOM Programme
		Visitor expenditure (in US\$)	CARICOM Programme
		Total directly employed in tourism (total, women, men)	CARICOM Programme
Energy and Minerals			
	Energy Production and Consumption	Energy Consumption by Type and Year	CARICOM Programme
		Number of Households by Type of Fuel Used for Cooking	CARICOM Programme
	Minerals	Mineral Production by Type	CARICOM Programme
		Mineral Reserves by Type	CARICOM Programme
Land Use and Agriculture			
	Land Use	Land Use by type and year	CARICOM Programme, FDES
		Ratio of land consumption rate to population growth rate	CC SDG
	Agricultural Crops	Use of Fertilizers by Type and Year	CARICOM Programme, FDES
		Use of Pesticides by Type and Year	CARICOM Programme, FDES

Environment list of indicators

Topic	Sub-topic	MAPPING Indicators	Framework
Coastal and Marine resources			
	Marine resources		
		Total marine area	CARICOM Programme, FDES
		Fish landings by type	CARICOM Programme, FDES
		Protected marine area	CARICOM Programme, FDES
Forest			
		Protected Area as a Percentage of Total Territorial Area	
		Forest area as a proportion of total land area	FDES, CC SDG
		Total Territorial Area	CARICOM Programme, FDES
		Total Protected Area (terrestrial and marine)	CARICOM Programme, FDES
		Total forest area	CARICOM Programme, FDES
		Protected forest area	CARICOM Programme, FDES
		Total land area	CARICOM Programme, FDES
		Protected Forest Area as a percentage of Total Forest Area	CARICOM Programme, FDES
		Protected Forest Area as a percentage of Total Land Area	CARICOM Programme, FDES
Air			
	GHG emissions		
		CO2 emission per unit of value added.	CC SDG
		Emissions of Sulfur Dioxide (SO2)	CARICOM Programme, FDES
		Emissions of Nitrogen Oxides (NOx)	CARICOM Programme, FDES
		Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs)	CARICOM Programme, FDES
		Emissions of Carbon Dioxide (CO2)	CARICOM Programme, FDES
		Emissions of Methane (CH4)	CARICOM Programme, FDES
		Emissions of Nitrous Oxide (N2O)	CARICOM Programme, FDES
		Emissions of Lead (Pb) and Consumption of Leaded Petrol	CARICOM Programme, FDES

STATUS -CURRENT WORK

- **ITALIAN PROJECT/ IDB PROJECT:**
- “Capacity Building in Statistics” project funded by the Italian Agency for Development Cooperation (AICS) and implemented by the Italian National Institute of Statistics (Istat). Jointly with the CARICOM Secretariat.
- The Italian project is complimented by the “Support to Statistical Capacity in CARICOM Countries” initiative funded by the Inter-American Development Bank (IDB)
- Both projects are aimed at providing the RSP of the CARICOM Secretariat and NSOs with being able to compile a range of complete and reliable information concerning 3 fields – Agriculture, Gender and Environment

STATUS -CURRENT WORK

- **ITALIAN PROJECT:**

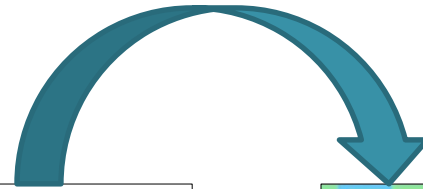
- Outputs for both projects:
 - **Training Workshop on, Environment Statistics Climate Change Framework and Sendai Framework**
 - **Training Workshop on SDGs Framework**
 - **TA** (advice and sharing experience) to **enhance the NSOs' role within the NSS**
 - **Integrated database system** developed and training undertaken to enable **access to administrative data within the NSS.**,including on Agriculture, Environment and Gender Statistics
 - **Protocols for the exchange of data** on Environment and the other areas developed
 - Contribution to the **CARICOM online knowledge base** of these areas of statistics facilitated;

STATUS-CURRENT WORK

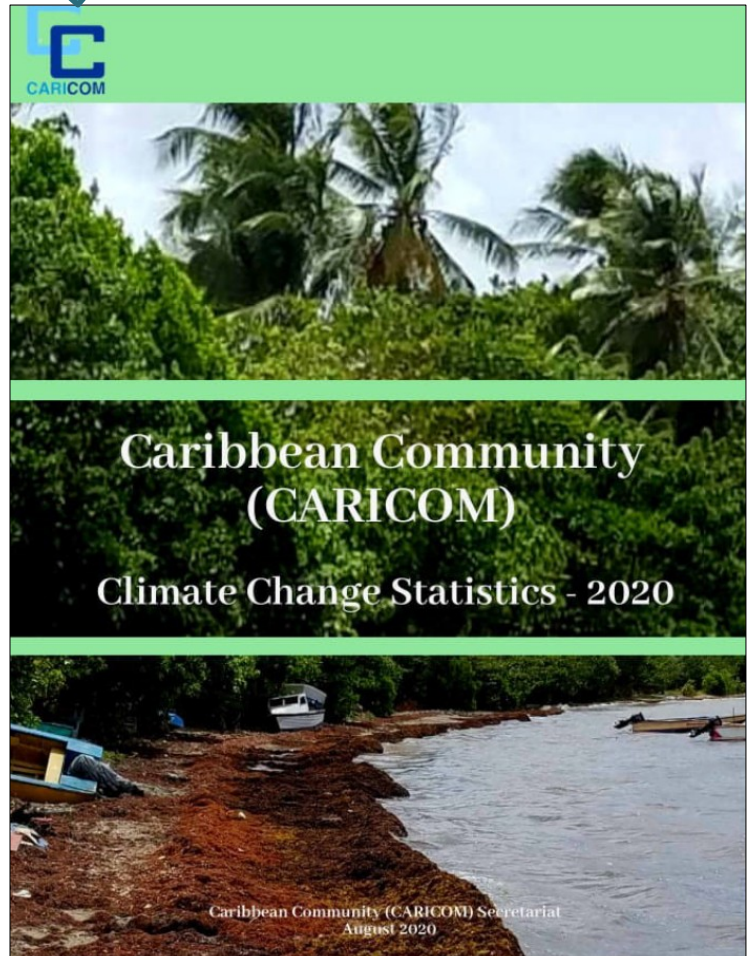
• Italian Project recommendations:

- Organise specifically the metadata, mapping of methodology, definitions, data sources and quality checks, on **Environment Statistics** and connecting these to the **SDGs, Climate Change and Hazardous Events**;
- Strengthening the **knowledge on SDGs'** definitions and metadata and the **linkages** between environmental indicators, climate change indicators, Sendai indicators and SDGs metadata, data and indicators.
- Stronger MOUs between NSOs and agencies
- Better use of data already available from the existing administrative sources
- Encourage countries to produce the minimum set of core environmental indicators

From Environment to Climate Change Statistics



THE CARICOM ENVIRONMENT IN FIGURES 2014



From Environment to Climate Change Statistics

- The Secretariat has now produced a total of four (4) CARICOM Environment in Figures publication plus its first **Climate Change Statistics Publication**.
- The CARICOM Climate Change Statistics Publication- **which is largely exploratory** is based on the fact that Climate Change is of high importance to CARICOM Small Island Developing States and it is hoped that this first publication can **lay the groundwork for future work** in this area.
- The approach to the production of Climate Change Statistics utilised the framework of the **FDES 2013** and specifically the **IPCC schematic framework**;

From Environment to Climate Change Statistics

- **APPROACH TO PUBLICATION ON CLIMATE CHANGE STATISTICS**
- The tables previously published under environment statistics were rearranged under the five (5) components- Drivers, Impacts, Adaptation, Mitigation and Vulnerability;
- New tables were identified where required and the series in the existing tables were updated (up to 2019 for some tables).
- **Key Lesson learnt: Strengthening Environment Statistics can lead to the production of Climate Change Statistics**

Highlights from Climate Change Statistics Publication

- **DRIVERS (Selected Tables)**
- **Sub-component 1.1: Emissions to Air**
- **Topic 1.1.1: Emissions of greenhouse gases**
- 1.1.1.a: Total emissions of direct greenhouse gases (GHGs), by gas:
 - 1.1.1.a.1: Carbon dioxide (CO₂)
- *Table 1.1.1.a.1: Carbon dioxide emissions (CO₂): 2000-2014*
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Highlights from Climate Change Statistics Publication

Topic 1.1.1: Emissions of greenhouse gases

Table 1.1.1.a.1: Carbon dioxide emissions (CO₂): 2000-2014

Country	(Gg)						
	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		

Highlights from Climate Change Statistics Publication

- DRIVERS (Selected Tables)
- **Sub-component 1.1: Emissions to Air**
- 1.1.1.a.2: Nitrous oxide (N₂O)
- Table 1.1.1.a.2: Nitrous Oxide (N₂O) emissions: 2000-2014
- 1.1.1.a.3: Methane (CH₄)
- Table 1.1.1.a.3: Methane (CH₄) emissions: 2000-2014
- 1.1.1.a.4: Hydrofluorocarbons (HFCs)
- Table 1.1.1.a.4: Hydrofluorocarbon (HFC) Emissions: 2000-2014

Highlights from Climate Change Statistics Publication

- **DRIVERS (Selected Tables)**
- **Sub-component 1.1: Emissions to Air**
- 1.1.1.b: Total emissions of indirect greenhouse gases (GHGs), by gas:
 - 1.1.1.b.1: Non-methane volatile organic compounds (NM-VOCs)
 - Table 1.1.1.b.1: Non-Methane Volatile Organic compounds (NMVOCs) emissions: 2000-2014
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Highlights from Climate Change Statistics Publication

- **DRIVERS (Selected Tables)**
- **Sub-component 1.2: Energy Resources**
- **Topic 1.2.1: Energy production, supply and consumption**
-
- 1.2.1: Energy supply
- Table 1.2.1.1: CARICOM's Imports of Fossil Fuels:1995-2018
- Chart 1.2.1.1: Value of CARICOM's Imports of Fossil Fuels:1995-2018

Highlights from Climate Change Statistics Publication

- **IMPACTS (Selected Tables)**
- **Subcomponent 2.1: Areas impacted by climate change**
-
- **Topic 2.1.1: Forests**
-
- 2.1.1: Forest area
- Table 2.1.1.1: Total and Protected Forest Area: 2009-2013
- Table 2.1.1.2: Forest Area (% of land area)
- Chart 2.1.1.1: Forest Area (% of land area): 1990, 2000, 2010 and 2016
- <http://statistics.caricom.org/climatepub.html>

Highlights from Climate Change Statistics Publication

Topic 2.1.1: Forests

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

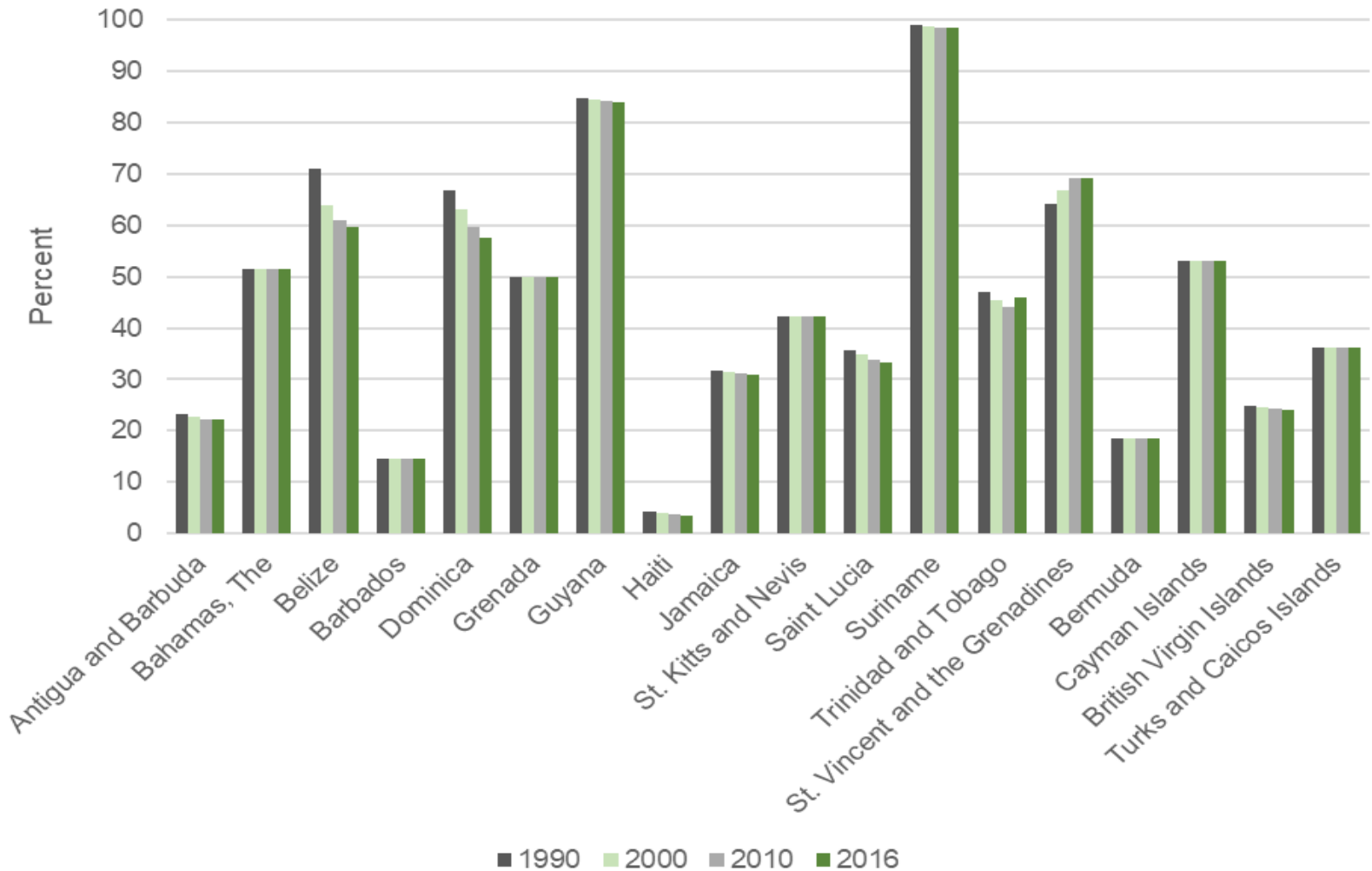
Country	Percent			
	1990	2000	2010	2016
Antigua and Barbuda	23.4	22.7	22.3	22.3
The Bahamas	51.4	51.4	51.4	51.4
Belize	70.8	64.0	61.0	59.7
Barbados	14.7	14.7	14.7	14.7
Dominica	66.7	63.1	59.5	57.4
Grenada	50.0	50.0	50.0	50.0
Guyana	84.6	84.4	84.2	83.9
Haiti	4.2	4.0	3.7	3.5
Jamaica	31.8	31.5	31.1	30.9
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 Organization, electronic files and web site.

Highlights from Climate Change Statistics Publication

Chart 2.1.1.1: Forest Area (% of land area): 1990, 2000, 2010 and 2016



Highlights from Climate Change Statistics Publication

- **IMPACTS (Selected Tables)**
 - **Sub-component 2.2: Freshwater resources**
 -
 - **Topic 2.2.1: Freshwater resources**
 -
 - Table 2.2.1.1: Renewable Freshwater Resources: 2009-2012
 -
 - **Topic 2.2.2: Freshwater abstraction, supply and use**
 -
 - 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
 - Table 2.2.2.2: Water Supply Industry (ISIC 36): 2009-2012
 - Table 2.2.2.3: Population with Wastewater Treatment: 2009-2012

Highlights from Climate Change Statistics Publication

- **IMPACTS (Selected Tables)**
- **Sub-component 2.3: Hazardous events and disasters**
-
- **Topic 2.3.1: Occurrence of hazardous events and disasters**
- 2.3.1: People affected and Economic losses due to natural extreme events and disasters
- Table 2.3.1.1: Hazardous Events and Disasters by Year: 2009-2019
 - COUNTRY, TYPE OF DISASTER, NAME OF DISASTER, DATE STARTED, TOTAL CASUALTIES of which killed, Injured
 - Data for Several Countries – as far back as 1989 to 2019.

Highlights from Climate Change Statistics Publication

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
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	...	...	...

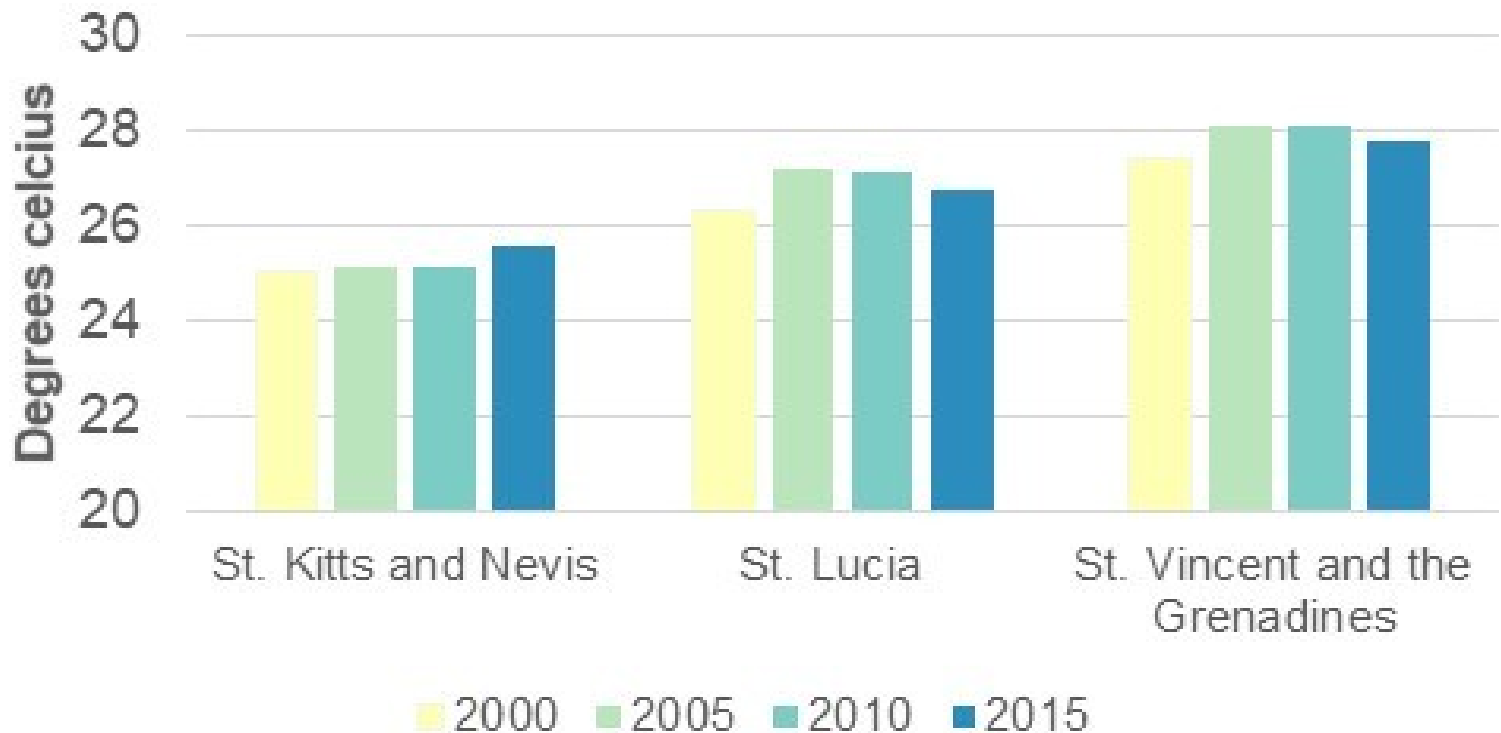
Highlights from Climate Change Statistics Publication

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

Country	Year	Total Casualties		Total Population Affected (Number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US\$ Million)
		Missing	Homeless			
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	...	...

Highlights from Climate Change Statistics Publication

Chart 2.4.1.1d: Average Temperature Per Annum: 2000, 2005, 2010 and 2015



Highlights from Climate Change Statistics Publication

- **ADAPTATION (Selected Tables)**
- **Sub-component 3.1: Environmental Governance and Regulation**
- **Topic 3.1.1: Participation in MEAs and other global environmental conventions**
- 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
- **Subcomponent 3.2: Waste Management**
-
- **Topic 3.2.1: Generation of Waste**
- Table 3.2.1.1: Generation of Waste by Source: 2009-2012

Highlights from Climate Change Statistics Publication

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	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	✓	✓	✓	✓	✓

Highlights from Climate Change Statistics Publication

- MITIGATION (Selected Tables)
- **Sub-component 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).

Highlights from Climate Change Statistics Publication

- **VULNERABILITY**
- **Sub-component 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**

Challenges and Best Practices

- Major Data Gaps – Data we have
 - Drivers - Almost all topics covered except AFOLU drivers (IPCC) such as deforestation
 - Impacts - 4 out of 13 topics only
 - Mitigation - 1 out of 3 topics (3 indicators)
 - Vulnerability - 1 out of 5 topics (1 indicator)
 - Adaptation - 2 out of 7 topics (waste and water management indicators)
- Use of data in the National Communications to the UNFCCC
- Use of Proxy data – Energy Statistics, Trade data
- Use of data from international sources - Disaster Statistics
- There is also a **Technical Work Group** on Environment Statistics that continue to operate to sustain the production of these statistics
- **Strengthening Inter-agency collaboration within the NSS**



Thank you!