ISSN: 2788-5836

UNITED NATIONS

ECLAC

ECLAC Statistical Briefings

No. 14 | August 2024

Opportunities and challenges in the construction of indicators on climate change and disasters in the small island developing States of the English-speaking Caribbean

Contents

The Latin American and Caribbean region has the lowest greenhouse gas emissions and its impact on climate change represents only 8% of global emissions (IPCC, 2023). However, the region's countries, especially the Caribbean small island developing States (SIDS), are very vulnerable to the adverse impacts of climate change. In the Caribbean, 14.5% of people live in coastal areas less than 10 metres above sea level, and over 50% of the population lives within 1.5 kilometres of the coastline (ECLAC, 2018). In 2017, the Caribbean hurricane season brought two category 5 hurricanes (Irma and Maria) that left 177 people dead and affected over 10 million (CRED, 2023). Some estimates suggest that the economic cost of a 2.5°C temperature rise will be between 1.5% and 5% of gross domestic product (GDP) in the Caribbean (ECLAC, 2015).

Although the region is very vulnerable to the effects of climate change and disasters, the production of statistics and indicators on climate and disasters is unfortunately still insufficient to meet the growing demand for national policymaking in this respect, particularly in the case of Caribbean countries. The scant development of statistics and indicators on climate change and disasters also complicates the implementation

and comprehensive monitoring of international agendas such as the 2030 Agenda for Sustainable Development, the Paris Agreement and other international agreements including the Sendai Framework for Disaster Risk Reduction 2015-2030, the New Urban Agenda and the SIDS Accelerated Modalities of Action (SAMOA) Pathway. All these frameworks serve as a basis for countries to develop evidence-based policies, preferably using the data available in accessible, reliable, inclusive, integrated and coordinated national statistical systems.

1. The Global Set of Climate Change Statistics and Indicators

The Global Set of Climate Change Statistics and Indicators[1] is a comprehensive statistical framework, including statistics, indicators and metadata, designed to help countries develop their own sets of climate change statistics and indicators according to their needs, priorities and resource availability. In this regard, the Global Set serves as a basis for countries that are beginning to develop climate change statistics programmes, providing climate-relevant scope and coverage. It may also be useful for countries that have already progressed in this area of statistics, providing a reference list for comparison and further development. Furthermore, the Global Set is a flexible scheme that can be easily applied or adapted to national circumstances.

The Global Set of Climate Change Statistics and Indicators covers aspects defined by the five areas identified by the Intergovernmental Panel on Climate Change (IPCC): drivers, impact, vulnerability, mitigation and adaptation. Its structure is based on these five areas of IPCC and the Framework for the Development of Environment Statistics, and refers to relevant articles of the Paris Agreement and the decisions adopted in Katowice within the framework of the Paris Agreement work programme, as well as the related indicators of the Sustainable Development Goals (SDGs) and the Sendai Framework.

The Global Set has 158 indicators that support the development and monitoring of national climate policies and international reporting requirements. It has a tiered system that groups indicators according to their relevance to climate change, their methodological soundness and data availability. Thus, tier 1 indicators are relevant, methodologically sound, and those for which data are commonly available. Tier 2 indicators are relevant, methodologically sound, and those for which data are less frequently available. Finally, tier 3 indicators are relevant, but not methodologically sound, and country data may not be available.

2. Climate and disaster indicators relevant to the development of evidence-based policies in Caribbean small island developing States, 2023

Between 2021 and 2023, the Economic Commission for Latin America and the Caribbean (ECLAC) implemented the Development Account project, twelfth tranche, "Caribbean SIDS relevant climate change and disasters indicators", to apply the Global Set of Climate Change Statistics and Indicators. The aim of the project was to strengthen statistical and institutional capacities in the field of climate change and disaster risk reduction in eight countries of the English-speaking Caribbean, to improve policy coherence in the implementation of the SDGs, the Samoa Pathway, the Paris Agreement and the Sendai Framework. The countries were Antigua and Barbuda, Belize, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Suriname.

[1] See [online] https://unstats.un.org/unsd/statcom/53rd-session/documents/BG-3m-Globalsetandmetadata-E.pdf.

The project identified possible data sources and evaluated the existence and availability of institutional arrangements for producing data and indicators on climate and disasters in those Caribbean countries. It also provided technical assistance to countries for conducting a self-assessment of the state of environmental statistics at the national level, using existing specialized statistical tools, such as the Environment Statistics Self-Assessment Tool and the Global Set of Climate Change Statistics and Indicators, both developed by the United Nations Statistics Division. All this was done with the aim of helping to strengthen statistical and institutional capacities for building solid statistical information into policymaking on climate change and disasters, to achieve sustainable development in the subregion.

3. Indicators selected and built by the countries

As part of the project, national workshops were held with data users and producers, such as national statistical offices, ministries, environmental authorities, universities and the private sector, among others. These workshops, held in hybrid and in-person formats, aimed to strengthen the sustained production of relevant climate change and disaster risk reduction indicators based on inter-institutional collaboration, bringing together decision makers, producers and users of indicators. Each workshop included the completion of tailored practical exercises. The Global Set of Climate Change Statistics and Indicators was used as a basis to identify the situation in the Caribbean region, since the countries were able to select the environment, climate change and disaster indicators that were of interest to them, based on their needs, priorities and availability of statistics at the national level.

Table 1 shows the indicators selected and constructed during the workshops, the IPCC area they serve and the country that calculated them. As may be seen, in total 33 indicators were calculated in the national workshops by the various countries, 20 of them different. In addition, indicators 31, 125 and 156 of the Global Set were calculated in more than one country. Among these indicators, indicator 156 "Municipal waste collected per capita" was calculated in five of the eight countries. The selection made arose from the availability of national level data in these countries.

» Table 1. Indicators on environment, climate change and disasters built by country

Number	Indicator	Area	Country
1	Total greenhouse gas emissions per year	Drivers	Suriname Saint Lucia
10	Total primary energy production from fossil fuels	Drivers	Dominica Belize
12	Share of fossil fuels in total energy supply	Drivers	Saint Vincent and the Grenadines
18	Urban population as a proportion of total population	Drivers	Belize
19	Number of (fossil-driven) vehicles per capita	Drivers	Grenada
24	Livestock units per agricultural area	Drivers	Antigua and Barbuda
Proxy	Dependence on imported energy in total energy consumption	Drivers	Antigua and Barbuda
31	Forest area as a proportion of total land area	Impact	Dominica Belize Saint Kitts and Nevis
42	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	Impact	Suriname
53	Temperature records	Impact	Belize Saint Lucia
58	Total rainfall anomaly	Impact	Grenada

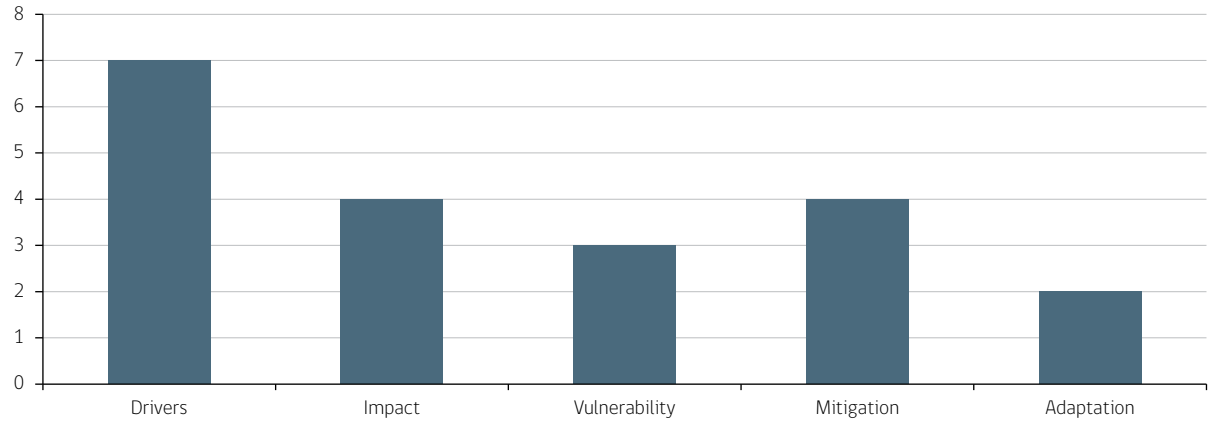
Number	Indicator	Area	Country
90	Ecosystem carbon stocks	Vulnerability	Grenada
98	Proportion of population using safely managed drinking water services	Vulnerability	Suriname
100	Proportion of population living in coastal areas	Vulnerability	Dominica Saint Vincent and the Grenadines
109	Production of renewable energy as a proportion of total energy production	Mitigation	Belize
110	Renewable energy share in the total final energy consumption	Mitigation	Antigua and Barbuda
125	Increase in forest area	Mitigation	Grenada Suriname Saint Vincent and the Grenadines
Proxy	CO_2 emissions from land use, land use change and forestry	Mitigation	Saint Kitts and Nevis
144	Proportion of important sites covered by protected areas	Adaptation	Antigua and Barbuda
156	Municipal waste collected per capita	Adaptation	Grenada Suriname Saint Lucia Saint Kitts and Nevis Saint Vincent and the Grenadines

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, "Global Set of Climate Change Statistics and Indicators", 2022 [online] https://unstats.un.org/unsd/statcom/53rd-session/documents/BG-3m-Globalsetandmetadata-E.pdf.

Figure 1 shows the number of indicators selected and calculated as part of the project for each area identified by the IPCC. As may be seen, the largest number —seven— belong to the drivers area of IPCC. For impact and mitigation, four indicators were calculated respectively, for vulnerability three indicators were calculated, and for adaptation two, one of them being the indicator calculated by most countries (indicator 156). The selection of these indicators arose from prioritizing relevance to the country and data availability for at least two points in time. It is clear from this that the region has the most information about the causes and impacts of climate change.

» Figure 1. Indicators from Global Set of Climate Change Statistics and Indicators calculated by project participant countries, by IPCC area

(Number)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators".

Note: For definitions of areas and lists of topics see [online]https://unstats.un.org/unsd/statcom/53rd-session/documents/BG-3m-Globalsetandmetadata-E.pdf.

As mentioned earlier, the countries prioritized those climate indicators that were addressed in each workshop, on the basis of the Global Set, along with their needs, priorities and the availability of data in each case. Eight examples of these indicators, one for each country, are presented below.

Saint Lucia

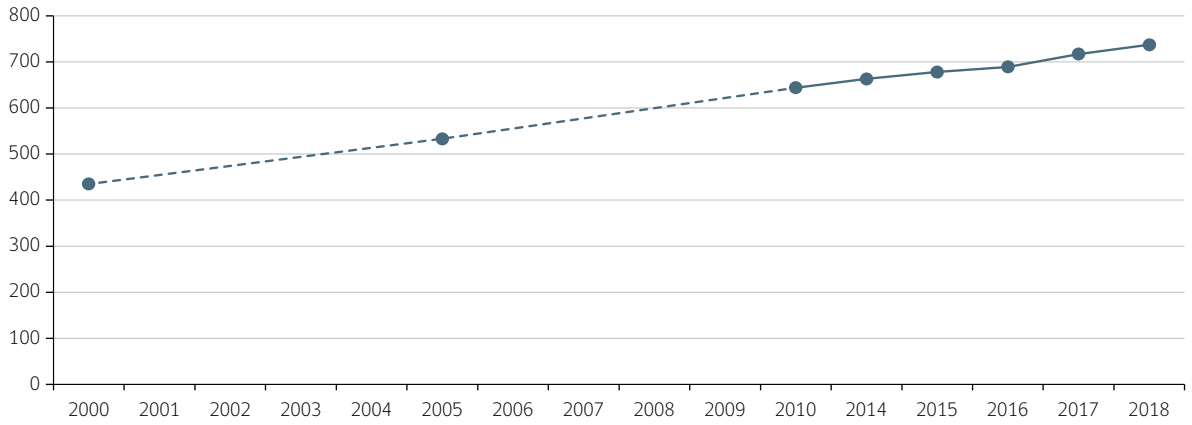
Area: Drivers
Indicator number and name: 1. Total greenhouse gas emissions per year
Adapted indicator name: Total greenhouse gas emissions per year, 2000-2018

Saint Lucia chose this indicator because of its relevance in relation to its National Adaptation Plan, its importance at the regional and international level for international reporting and its connection to international commitments, such as the Paris Agreement. This indicator measures greenhouse gas emissions from the energy sector, industrial processes and use of products, the agricultural sector and waste, which cause warming in the lower atmosphere and the land/ocean surface.

Figure 2 shows that total greenhouse gas emissions in Saint Lucia portray a rising trend over the years. It is important to note, however, that the data for the period 2000-2014 are not broken down by year. In addition, annual data are available only from 2014 to 2018, as seen in the figure; and, from 2000 to 2010, data are available only every five years. Finally, these data include only four sectors, leaving aside other sectors such as transportation and manufacturing, for which no data are available at the country level.

» Figure 2. Saint Lucia: total greenhouse gas emissions, 2000-2018

(Tons of CO_2 equivalent)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Ministry of Infrastructure, Ports, Energy and Labour, Central Statistics Office, Ministry of Agriculture, Fisheries, Food Security and Rural Development and Saint Lucia Solid Waste Management Authority.

Belize

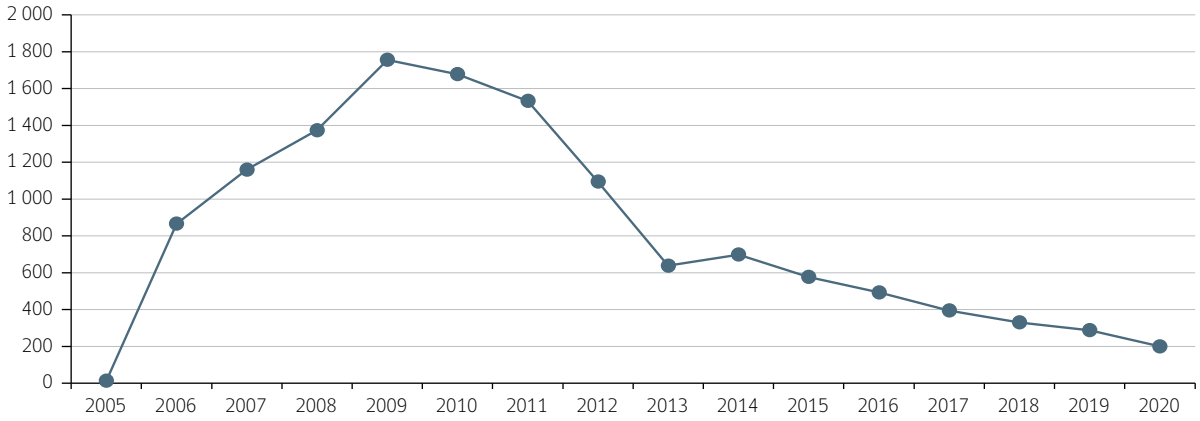
Area: Drivers
Indicator number and name: 10. Total primary energy production from fossil fuels
Adapted indicator name: Total primary energy production from fossil fuels, 2005-2020

Belize selected this indicator because local fossil fuel production is linked to domestic consumption and exports, which in turn is connected to national energy sufficiency and carbon emissions. Accordingly, the indicator measures energy production at the national level, and shows the amount of energy from all local fossil fuel resources extracted within the given time period.

Figure 3 shows that energy from fossil fuels peaked in 2009, then decreased over the decade. A slight increase occurred between 2013 and 2014, after which production decreased again.

» Figure 3. Belize: total primary energy production from fossil fuels, 2005–2020

(Thousands of barrels of oil equivalent)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Latin American Energy Organization (OLADE), Energy Economic Information System (SIEE).

Dominica

Area: Drivers

Indicator number and name: 12. Share of fossil fuels in total energy supply

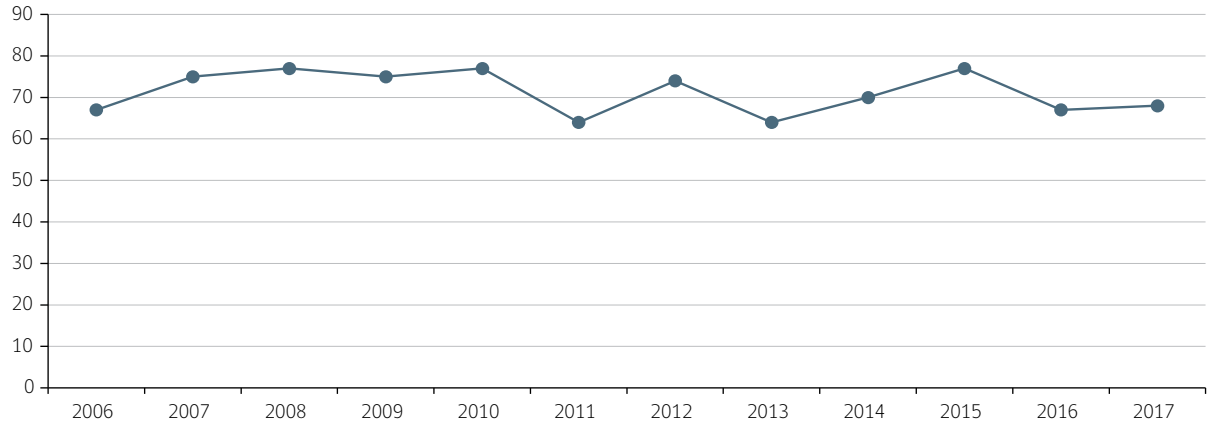
Adapted indicator name: Share of diesel in total electrical power supply, 2006–2017

This indicator measures the contribution of diesel fuel to total electrical energy generation in Dominica and its relationship to greenhouse gas emissions.

The data in figure 4 show that diesel generally contributed over 65% of Dominica's electrical energy generation from 2006 to 2017.

» Figure 4. Dominica: contribution of diesel fuel to total electrical energy supply, 2006–2017

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Central Statistics Office of Dominica.

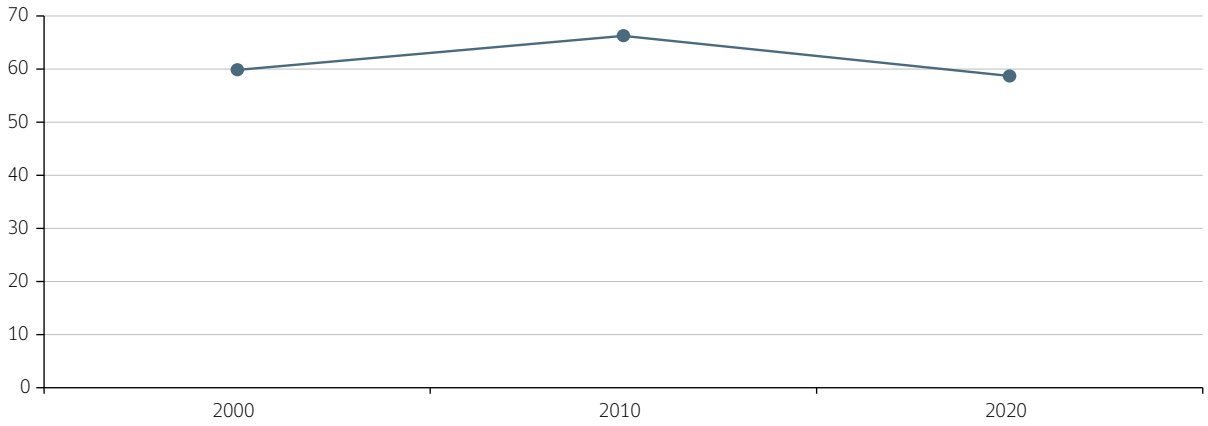
Saint Kitts and Nevis

Area: Impact
Indicator number and name: 31. Forest area as a proportion of total land area
Adapted indicator name: Forest area as a proportion of total land area, 2000, 2010, 2020

This indicator measures the total area of land covered by forests in Saint Kitts and Nevis, which selected this indicator because of the importance of forested areas in absorbing greenhouse gas emissions and their contribution to the country's biodiversity. Figure 5 shows a decrease in the proportion of land area covered by forests from 2010 to 2020 in Saint Kitts and Nevis. It is important to mention that the country did not provide the data, and, therefore, the methodologies used for collection are not described, there are no annual data and the information was not separated by island. It is also worth noting that the data do not capture the causes of forest gain or loss.

» Figure 5. Saint Kitts and Nevis: forest area as a proportion of total land area, 2000, 2010 and 2020

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Global Land Cover [online] http://www.globallandcover.com/.

Saint Vincent and the Grenadines

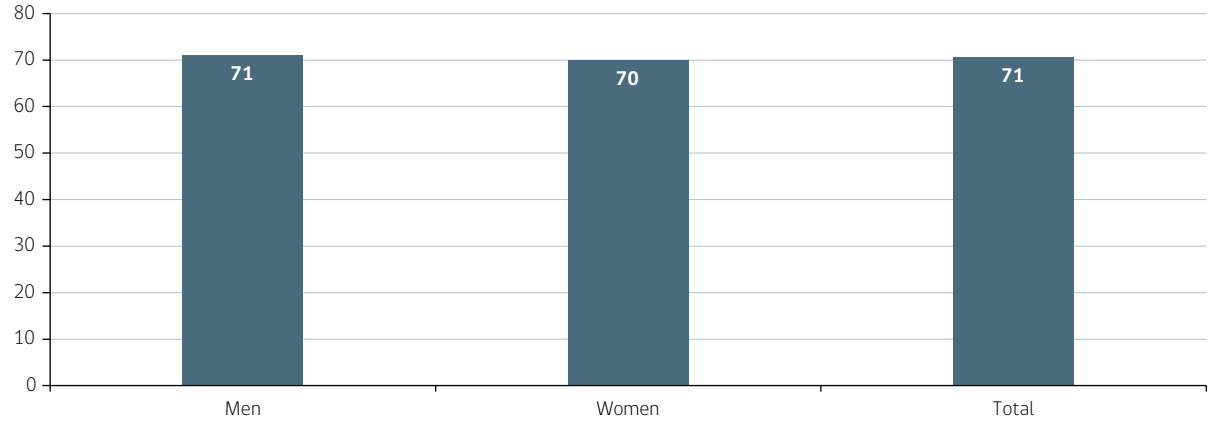
Area: Vulnerability
Indicator number and name: 100. Proportion of population living in coastal areas
Adapted indicator name: Proportion of population living in coastal areas, 2012

The indicator measures the proportion of the population living in coastal areas in Saint Vincent and the Grenadines, where the coastal area is defined as being within 1,000 metres of the coastline. The indicator also differentiates coastal settlement patterns between men and women. Saint Vincent and the Grenadines selected this indicator because of its importance in identifying populations at risk from sea level rise, and is also very useful for vulnerability assessments at the national level.

Figure 6 does not show an identifiable trend, since the data are for the year 2012 only, when the proportion of men and women living in coastal areas was 71.1% and 70.1%, respectively. It is important to note that the total population excludes people residing in institutions such as nursing homes.

» Figure 6. Saint Vincent and the Grenadines: proportion of population living in coastal areas, 2012

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Population and Housing Census, 2012.

Suriname

Area: Vulnerability

Indicator number and name: 98. Proportion of population using safely managed drinking water services

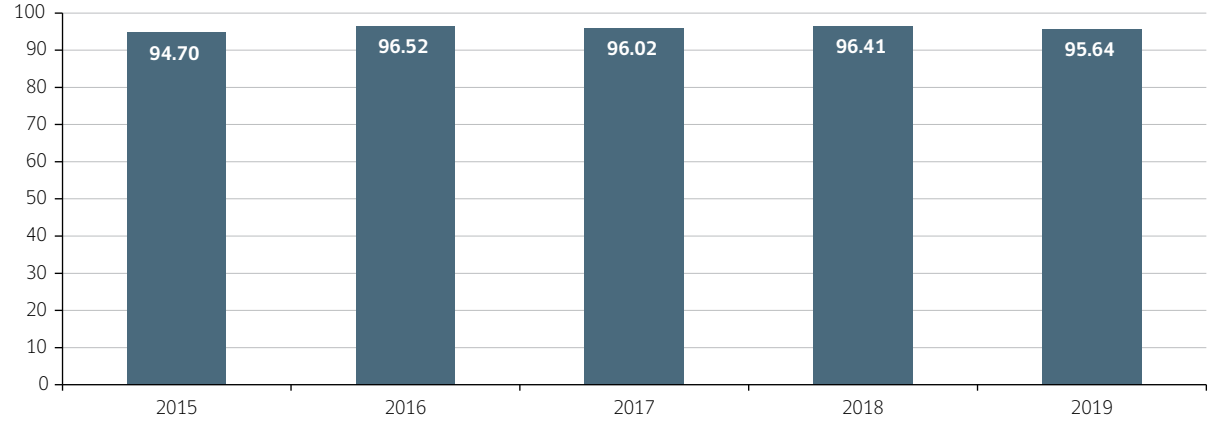
Adapted indicator name: Proportion of households in Paramaribo and Wanica using improved drinking water sources, 2015–2019

The indicator data are of great importance because they are used to report and monitor compliance with the SDGs concerning access to drinking water. The indicator also reports on the state of vulnerability to climate change, which is information the government can use to work on drinking water provision in areas of greatest need.

Figure 7 shows that the proportion of households using safely managed drinking water services remained relatively constant between 2015 and 2019 in Suriname. However, it is important to note that the safety of improved drinking water sources was not determined by laboratory testing and is therefore not fully reflected in the data.

» Figure 7. Suriname: proportion of households in Paramaribo and Wanica using improved drinking water sources, 2015–2019

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of General Bureau of Statistics, "Household Surveys and Cartography" [online] https://statistics-suriname.org/en/household-surveys-and-cartography/.

Antigua and Barbuda

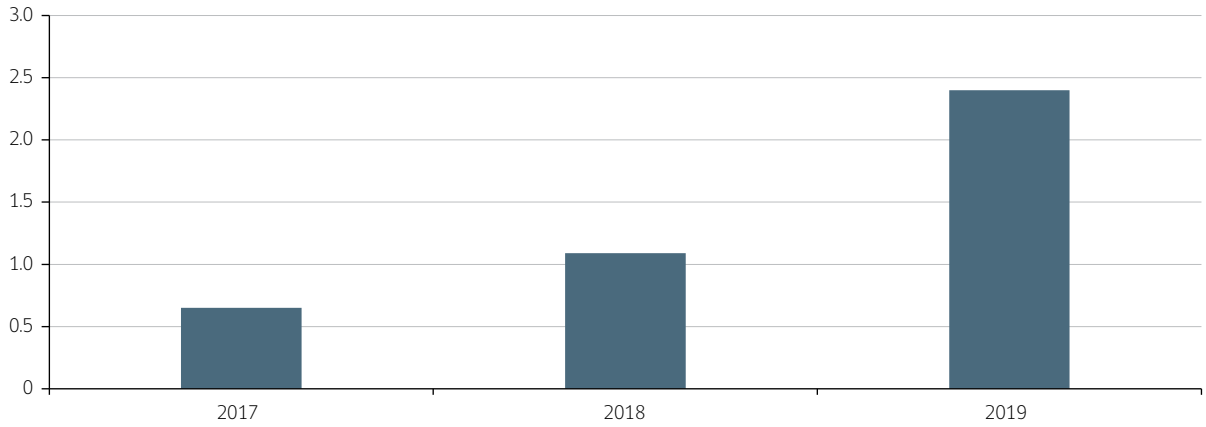
Area: Mitigation
Indicator number and name: 110. Renewable energy share in the total final energy consumption
Adapted indicator name: Renewable energy share in the total final energy consumption, 2017-2019

This indicator shows the share of renewable energy in total energy generation for Antigua and Barbuda as the total renewable energy generated by various plants from 2017 to 2019. This indicator was selected as relevant since it supports monitoring to identify national challenges, design policies and plans, and meet international commitments.

Figure 8 shows an increase in the percentage of renewable energy in total final energy consumption. It is worth noting that the indicator shows data at the national level, however, it does not include data on commercial renewable energy generated by solar panels installed in homes and schools.

» Figure 8. Antigua and Barbuda: renewable energy share in total final energy consumption, 2017-2019

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Antigua Public Utilities Authority (APUA).

Grenada

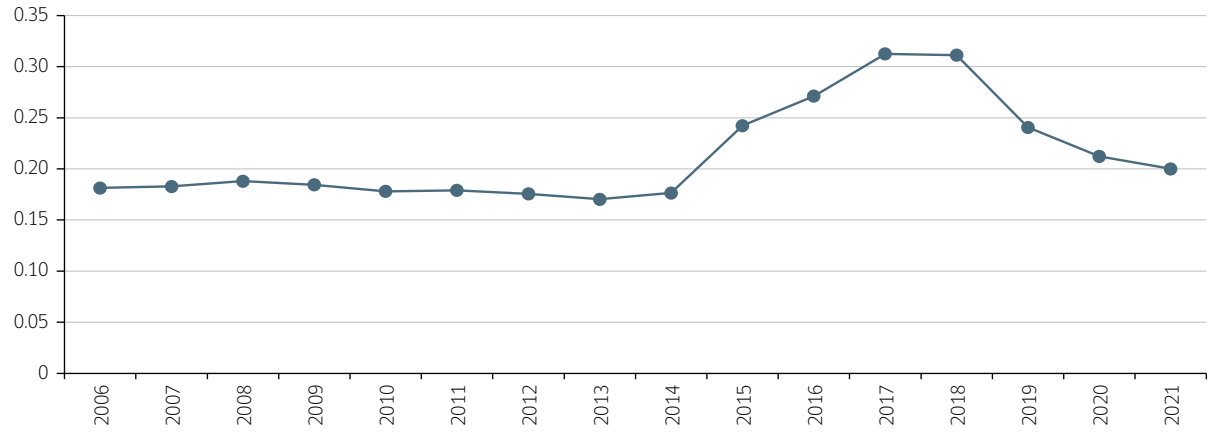
Area: Adaptation
Indicator number and name: 156. Municipal waste collected per capita
Adapted indicator name: Municipal waste collected per capita, 2006-2021

This indicator measures the total amount of municipal waste collected, divided by the country's population. It was selected because it testifies to the impact of the coronavirus disease (COVID-19) pandemic and the country's adaptation efforts.

The amount of municipal waste collected began to rise in 2015, as seen in figure 9, owing to the addition of commercial waste. The decrease in total municipal waste from 2019 may be attributed, on the one hand, to the downturn in commercial activities amid the COVID-19 pandemic, and to many people undertaking gardening and composting at home. It may also be explained by the introduction of the Ministry of Agriculture's Climate Smart Agriculture and Rural Enterprise Programme, which advised farmers to start composting, and many of them continue to do so. Another reason could be the government's ban on the use of plastics and Grenada's 3R's Project (Reduce, Reuse and Recycle).

» Figure 9. Grenada: municipal waste collected per capita, 2006-2021

(Tons)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), project "Caribbean SIDS relevant climate change and disasters indicators", on the basis of Ministry of Health, Wellness and Religious Affairs, Central Statistics Office and Grenada Solid Waste Management Authority.

4. Opportunities and challenges to improve the production and use of statistics and indicators on climate change and disasters

The project "Caribbean SIDS relevant climate change and disasters indicators" strengthened statistical and institutional capacities in the field of climate change in the eight Caribbean countries mentioned. As part of these technical capabilities, the countries' technical teams identified the information that their institutions already have on climate change and the information they are interested in generating. They also identified the institutions with which they need to collaborate better to pool efforts to generate basic information and calculate indicators such as those included in the Global Set.

The Global Set of Climate Change Statistics and Indicators was a very useful tool to strengthen the statistical capacities of the national institutions participating in the workshops. Having a defined set of indicators made it possible to focus efforts on identifying the information needed to calculate them, leading to an initial mapping of the data available in each country. Furthermore, by identifying the missing data, it became clearer which institutions could have the technical, human and financial capacity to generate that information. The Global Set thus also serves as a basis for defining a climate change information agenda to be included in the design of a country's national statistical plan.

In addition, a number of conclusions were drawn from the lessons learned and experiences shared by participants during the national workshops: coordination to collect and share data between agencies is minimal, especially as there is no data-sharing protocol to facilitate and govern this process. Limited data availability is one of the main constraints for the production of new indicators for the countries in the Caribbean. Often the data may exist, but as they are not publicly available, they may be difficult for users to find or even know about. Data formats are not user-friendly; for example, national agencies publish their data from reports or statistical compendiums in PDF format, which limits the options for expanding their use for other purposes, such as creating indicators on climate and disasters for decision-making. Finally, participants mentioned that the lack of standardized data collection formats limits data use for the creation of indicators, as inconsistencies in data collection within and between

national agencies can result, for example, in variables with different levels of disaggregation that constrain the production of a given indicator.

Finally, the following may be mentioned as opportunities and challenges in terms of improving the production and use of statistics and indicators on climate change:

- *Strengthen interinstitutional collaboration*: encourage cooperation between national and regional institutions to collect and exchange data, ensuring the availability of quality information.
- *Foster training:* provide ongoing training to professionals working on the collection and analysis of climate change statistics and indicators to improve their skills and knowledge.
- *Improve data availability:* ensure timely and accurate data collection, to support informed decision making.
- *Foster standardization:* adopt international standards on data collection and presentation, to facilitate comparability between countries and regions.
- *Involve all stakeholders:* consult stakeholders, including decision makers, in identifying data needs and evidence-based policymaking.
- *Strengthen communication:* improve the communication of statistical and indicator results to ensure that information is accessible and understandable to a broader audience.
- *Monitor and evaluate progress:* set up monitoring and evaluation systems to continually monitor data quality and the effectiveness of evidence-based policies.
- *Ensure sustainability:* ensure the continuity of production and use of long-term statistics and indicators through appropriate resource allocation and strategic planning.
- *Foster transparency:* make the data and methodologies used to calculate the indicators available for public review and evaluation.
- *Adapt to climate change:* incorporate climate change adaptation approaches into the collection and analysis of statistics and indicators to reflect evolving environmental and climate conditions.
- *The following approach is recommended to address data gaps:* in the short term, make all statistics partially compatible. In the medium term, start collecting statistics that are not currently being collected. In the long term, ensure that all statistics are compatible with international standards.

Bibliography

CRED (Centre for Research on the Epidemiology of Disasters) (2023) Emergency Events Database (EM-DAT) [online] https://www.emdat.be/.

ECLAC (Economic Commission for Latin America and the Caribbean) (2018), *The Caribbean Outlook, 2018* (LC/SES.37/14/Rev.1), Santiago.

_____(2015), *The economics of climate change in Latin America and the Caribbean: paradoxes and challenges of sustainable development* (LC/G.2624), Santiago.

IPCC (Intergovernmental Panel on Climate Change) (2023), "Sections", *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, H. Lee and J. Romero (eds.), Geneva.

This bimonthly publication is produced by the Statistics Division of the Economic Commission for Latin America and the Caribbean (ECLAC) under the general coordination of Rolando Ocampo, Director of the Division. This number was prepared by Georgina Alcantar.

https://www.cepal.org/en/work-areas/statistics
S.2301229[E]

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