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DA12 Project: Climate Change and Disaster Statistics in the Caribbean

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Abstract

This working paper has been prepared to provide an overview of the statistical capacity development in the Caribbean Region, working environment and climate change statistics and its use for the national statistical systems building. ECLAC work are based on a comprehensive assessment of the statistical capacity of regional countries with respect to planning, production, dissemination, and use. It is not a cross-country comparison designed to rank Statistical Capacity Development countries. Instead, this analysis provides a first assessment of the situation in the financial strategies that will be needed to respond to the growing demands for more and better data.

This document is a valuable contribution to the key issues related to the present and future challenges of data production, especially the capacity of data providers. As well as the strengths and opportunities for statistical institutes and ministries to have the tools, capacities and mechanisms in place to meet and keep pace with new data demands.

BACKGROUND

Latin America and the Caribbean (LAC) has historically made a minor contribution to climate change compared to other regions (LAC emitted only 7% of the 2018 global greenhouse gas (GHG) emissions¹). Nevertheless, the LAC countries are acutely vulnerable to its negative consequences, particularly in the case of Small-Island Developing States (SIDS) of the Caribbean, hit by hurricanes, storms, floods and landslides. In view of this complex set of factors, there is an urgent need in the Caribbean region for sustainable development policies based on sound evidence and, therefore, comparable, timely and good quality statistics and indicators on climate change and disasters.

A three-year project funded by the 12th tranche of the United Nations Development Account “2023Q Caribbean SIDS relevant climate change and disasters indicators for evidence-based policies”, which is being implemented during the period 2021-2023 by Statistics Division and Sub-regional Headquarters for the Caribbean of Economic Commission for Latin America and the Caribbean (ECLAC) in close collaboration with the United Nations Statistics Division, the Organisation of Eastern Caribbean States (OECS) Secretariat and the Caribbean Community (CARICOM) Secretariat to

¹ Economic Commission for Latin America and the Caribbean (ECLAC), Statistical Yearbook 2021, Santiago, 2022. GHG total, excluding land use change and forestry

improve the production and use of climate change and disaster indicators in Caribbean member-States.

The Caribbean subregion is a priority in ECLAC's programme of work, as embodied in the "Caribbean First" strategy and has been articulated by its Executive Secretary on numerous occasions. With this project, ECLAC ensures the development of specific capacities on climate change and disaster statistics at the national and subregional level. Also, this project respond directly to Resolution 98 (XXVII) of the Caribbean Development and Cooperation Committee (CDCC) entitled "Enhancing Support for Capacity-Building in Disaster Assessment and Resilience-Building Strategies in the Caribbean" (LC/CAR/2018/2), adopted in April 2018 and which "Calls for expanded risk analysis and disaster assessment training activities in CDCC member States and associate members to increase their capacity to gather baseline information and estimate the costs associated with disasters".

It includes an identification of potential sources of data and an assessment of the existence and effectiveness of the current institutional arrangement for producing climate change and disasters data and indicators. ECLAC's specialized team build on its experience performing these missions within the region and provide technical assistance to the countries for own assessments using existing specialized statistical tools, such as the Environment Statistics Self-Assessment Tool (ESSAT) and the Global Set of Climate Change Statistics and Indicators, both developed by UNSD.

Finally, in the framework of the Memorandums of Understanding (MoU), the Escazú Agreement, the Statistics Division, the Sub regional Office for the Caribbean and the Sustainable Development and Human Settlements Division of the ECLAC established a synergy activity work since 2021 to support OECS Regional Environmental Information System (REIS): an ongoing study on Enhancing the generation, collection, and systemization of environmental information in the Eastern Caribbean, and roadmap.

The partnerships within the UNSD, OECS, CARICOM has been involved in all ECLAC activities, they have been a key actor that has provide valuable expertise; other partners as CDEMA, UN-DRR LAC Regional Office, UNFCCC and UN-GGIM Americas will be involved, to allow the sustainability of the project for future participation of the Caribbean countries.

ADVANCES TO STRENGTHEN CLIMATE CHANGE AND DISASTER STATISTICS IN THE CARIBBEAN:

ECLAC has been working with Caribbean Small Island Developing States (SIDS) to strengthen national statistical and institutional capacities to sustainably produce and disseminate relevant internationally agreed indicators on climate change and disasters at the country level. Therefore, ECLAC is also working at regional level with the objectives of strengthened capacities of Caribbean practitioners to use the indicators for sustainable evidence-based development policies, and to establish a geo-referenced resilience database of the occurrence and impact of hazardous events and disasters in the Caribbean.

Accordingly, ECLAC is conducting a diagnosis on the availability of environmental statistics using the Environmental Statistic Self-Assessment Tool (ESSAT) in Suriname, St. Lucía, Antigua & Barbuda, St. Kitts & Nevis, Dominica, St. Vincent & the Grenadines, Grenada, and Belize. In addition, ECLAC is carrying on hybrid workshops and exercises, which are design for target audience (data producers and users) such as NSO, Ministries, Environmental Authorities, universities, private sector among others. During those hybrid workshops, ECLAC work on methodological presentations related to

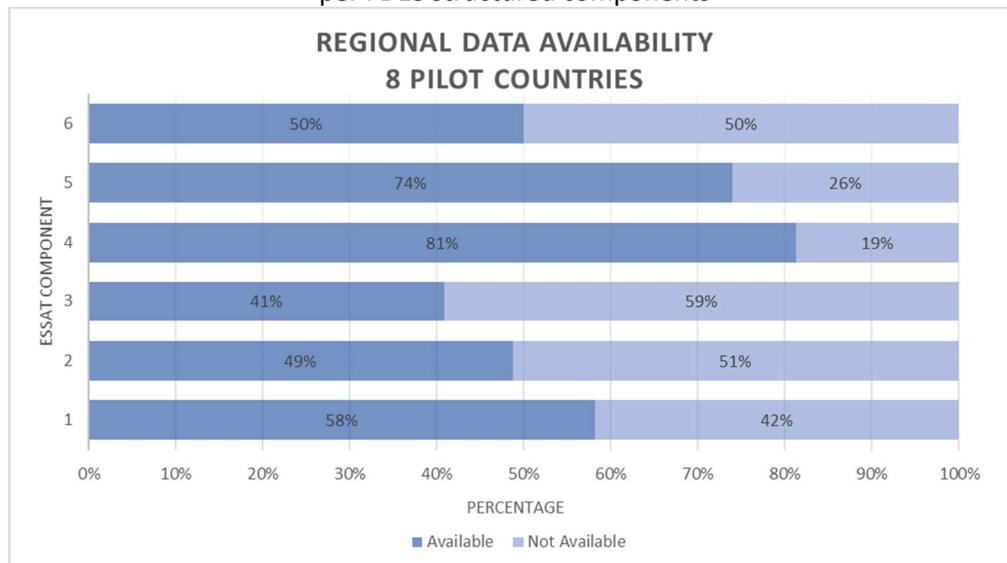
statistics techniques, build indicators, and develops its methodological sheets. Finally, ECLAC foster certain follow- up activities to come along with the countries reviewing the methodological sheets of the indicators built during the workshop, providing feedback, developing a report where the availability of national information is evaluated and synthesized, and strengthen further indicators selected by the country.

Environmental Statistic Self-Assessment Tool (ESSAT)

The Environment Statistics Self- Assessment Tool (ESSAT) is a questionnaire used as a guide for a multi-stakeholder’s consultation and discussion process to identify the current state of environmental statistics in countries. Using the ESSAT, ECLAC have been able to obtain critical information on the national environmental production and use of environmental statistics, their relevance, availability, sources of statistics, gaps, and needs for their development at the country level.

The ESSAT consists of two parts, Part I: Institutional Dimension of Environment Statistics, and Part II: Statistics Level Assessment. Part I of the ESSAT provide an overall institutional and organizational structure of national statistics in the country and identify specific information regarding environment statistics in terms of, inter alia, policy frameworks, mandates, institutional setup, organization, collaboration, resources, international cooperation and uses. Meanwhile, Part II is based on the Basic Set of Environment Statistics (BSES) of the FDES 2013. The BSES includes three tiers of statistics, although, in this project the statistics consider are only the 100 included in Tier 1. Tier 1 is the basic minimum set of environment statistics which all countries, at any stage of development, are recommended to consider producing in the short term. They are of high priority and relevance and have a sound methodological foundation.

Figure 1: Environmental Statistics available compiled for 8 Caribbean Countries, per FDES structured components



Source: Elaborate by the authors, based on project information. FDES component abbreviations: 1. Environmental conditions and quality; 2. Environmental resources and their use; 3. Residuals; 4. Extreme events and disasters; 5. Human Settlements and Environmental Health; 6. Environmental protection, management, and engagement. This data does not consider the total amount of statistics per component, only the 100 statistics included in the Tier 1.

Figure 1 shows the regional trend of the percentage of environment statistics available per component in the Caribbean region according to the ESSAT. Component 4 had the most statistics at 81% while the component with the least available statistics at 41% was Component 3. Component 4 directly relates to extreme events and disaster while Component 3 brings together statistics related to residuals. Component 5 consists of human settlements and environmental health. The quantity of available statistics in Component 5 is 74%. Component 1, 2 and 6 follows with 58%, 49% and 50% respectively. Note that this does not consider the total amount of statistics per component, only the 100 statistics included in the Tier 1.

During the collection of ESSAT feedback among the countries, it was discovered that the coordination for collecting and sharing data between agencies is currently minimal, especially because there is no data exchange protocol to facilitate and govern this process. Figure 2 specify the behaviour by country for each component. The graphs show the percentages of environment statistics available and not available per component among Antigua & Barbuda, Belize, Grenada, St. Lucia, Suriname, Dominica, St. Kitts and Nevis and St. Vincent & the Grenadines.

The ESSAT is fully completed for Antigua & Barbuda, Belize, Grenada, St. Lucia, and Suriname. It is significant to mention that for the case of Grenada and Belize the ESSAT has been fill out by themselves in 2018 with the support of UNSD. Nevertheless, ECLAC is working to validate and update ESSAT part I and II for Grenada and Belize. Regarding to Dominica, St. Kitts & Nevis, and St. Vincent & the Grenadines the ESSAT is partially completed, and ECLAC is still working on their ESSAT completion. For this reason, the graph for these countries shows the environmental statistics available per component at this moment.

Workshops (hybrid and virtual):

The ECLAC's Environment and Climate Change Statistics Unit in collaboration with the Sub regional Office for the Caribbean are working to strengthened statistical capacities in the Caribbean region through a series of technical workshops. The objectives of the workshops are:

- Training participants to build new environment, climate change and disasters indicators and its metadata,
- Identifying data and capacity gaps to develop an Environmental Information System or strengthening existing ones, and
- Having a better understanding of how geospatial data can enhanced the use of environment, climate change and disaster indicators for effective policy making.

Implementation of workshops have taken in place in six (6) countries: Antigua and Barbuda, Dominica, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, and Suriname. And towards the end of the year, it is expected that similar workshops will be conducted in Belize and Grenada.

As a results of the workshops, ECLAC has identified regional trends on the most common and relevant climate change and disasters statistics and indicators for the Caribbean as well as the areas with major data gaps along the policy cycle. These new indicators are constructed during the national workshops according to identified policy needs and data availability. Similarly, during the workshops with the

Figure 2: Environmental Statistics available compiled by the 8 Countries, per FDES structured components



Source: Elaborate by the authors, based on project information. FDES component abbreviations: 1. Environmental conditions and quality; 2. Environmental resources and their use; 3. Residuals; 4. Extreme events and disasters; 5. Human Settlements and Environmental Health; 6. Environmental protection, management, and engagement. This data does not consider the total amount of statistics per component, only the 100 statistics included in the Tier 1. ESSAT in Grenada and Belize were filled in 2018 with the support of UNSD.

participation of decision-makers, the main challenges that limit the production of the information needed for the construction of new indicators for policy decision-making are identified and prioritized. Results might hint the priority areas for the Caribbean region and where quality data is most needed.

The Global Set of Climate Change Statistics and Indicators endorsed by the Statistical Commission² in 2022 has been the guiding set for identifying the trends in the Caribbean region. The Global Set proposes a list of 158 indicators covering the following areas relevant to climate change: drivers, impacts, vulnerability, mitigation, and adaptation³. The purpose is that countries use the list as a guidance to develop indicators that are relevant to the national context and priorities. Selection of new indicators to build during the national workshops was based on two main criteria: 1) availability of national data, and 2) a relevant indicator for the country. Table 1 shows the indicators built by country according to the policy areas of the Intergovernmental Panel on Climate Change, namely drivers, impacts, vulnerability, mitigation, and adaptation.

Table 1: Climate Change and Disaster Indicators by country

New Climate Change and Disaster Indicators built in the Caribbean Region		
No	Countries	Built indicators during national workshops
1	Antigua and Barbuda	<ol style="list-style-type: none"> 1. <u>Drivers</u> – Ind 24: Livestock units per agricultural area 2. <u>Vulnerability</u> – Ind 94: Net energy imports as a proportion of total energy supply 3. <u>Mitigation</u> – Ind 110: Renewable energy share in the total final energy consumption 4. <u>Adaptation</u> – Ind 144: Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
2	Dominica	<ol style="list-style-type: none"> 1. <u>Drivers</u> – Ind 12: Share of fossil fuels in total energy supply 2. <u>Mitigation</u> – Ind 156: Municipal waste collected per capita 3. <u>Vulnerability</u> – Ind 100: Proportion of population living in coastal areas 4. <u>Mitigation</u> – Ind 125: Increase in forest area
3	Saint Lucia	<ol style="list-style-type: none"> 1. <u>Drivers</u> – Ind 1: Total greenhouse gas emissions per year 2. <u>Impacts</u> – Ind 53: Temperature records 3. <u>Adaptation</u> – Ind 156: Municipal waste collected per capita
4	Saint Kitts and Nevis	<ol style="list-style-type: none"> 1. <u>Drivers</u> – Ind 12: Share of fossil fuels in total energy supply 2. <u>Drivers</u> – Ind 3: Greenhouse gas emissions from land use, land use change and forestry 3. <u>Mitigation</u> – Ind 125: Increase in forest area 4. <u>Adaptation</u> – Ind 156: Municipal waste collected per capita
5	Saint Vincent and the Grenadines	<ol style="list-style-type: none"> 1. <u>Adaptation</u> – Ind 156: Municipal waste collected per capita 2. <u>Vulnerability</u> – Ind 100: Proportion of population living in coastal areas 3. <u>Mitigation</u> – Ind 125: Increase in forest area
6	Suriname	<ol style="list-style-type: none"> 1. <u>Drivers</u> – Ind 1: Total greenhouse gas emissions per year 2. <u>Impact</u> – Ind 42: Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population 3. <u>Vulnerability</u> – Ind 98: Proportion of population using safely managed drinking water services 4. <u>Mitigation</u> – Ind 125: Increase in forest area 5. <u>Adaptation</u> – Ind 156: Municipal waste collected per capita

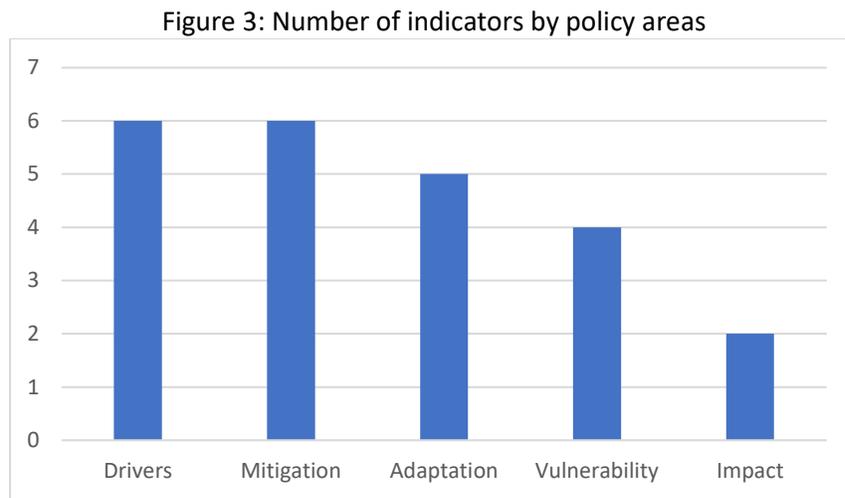
Source: Elaborate by the author, based on results from national workshops

² <https://unstats.un.org/unsd/statcom/53rd-session/side-events/22022022-M-global-set-of-climate-change-statistics-and-indicators>

³ <https://unstats.un.org/unsd/statcom/53rd-session/documents/BG-3m-GlobalConsultationontheGlobalSet-E.pdf>

Regarding specific indicators, the one on *Municipal waste collected per capita* from the adaptation area and the one on *Increase in forest area* from the mitigation area rise as the most common indicators built across countries. These results implies that the availability of national data on waste and forest is strong. But as shown in the following sub-section, there are other indicators relevant for countries and for which there is no data available.

As summarized in Figure 3, most of the new indicators fall in the areas of drivers and mitigation, leaving the areas of impact and vulnerability with the least number of new indicators. It only shows that impact and vulnerability are the areas with more significant data gaps.



Source: Elaborate by the authors, based on results from national workshops

As part of the workshop activities, participants reviewed the 158 indicators listed in the Global Set and identified those they believed were most relevant for their country and the institution they were representing. The main purpose of this activity was to get participants to be more familiar with the indicators list and for them to explore its potential for national purposes. Results from this activity in terms of identified indicators are not exhaustive nor representative of national priorities as they reflect the opinion only of those participants who attended the workshops. However, they provide indicative trends of the indicators demand for policymaking. These first results can serve as a basis for further follow ups and more in-depth analysis of regional and national priorities.

Table 2 shows that most relevant drivers of climate change in Caribbean countries might come from population growth, fossil fuel dependency and deforestation. Different from other regions, GHG emissions, although relevant, does not seem to be the main driver of climate change for the Caribbean islands.

Table 2: Prioritized climate change and disaster indicators per policy area

Policy Area	Most voted indicators by countries in national workshops
Drivers	<ul style="list-style-type: none"> • Ind 17 – Population growth • Ind 15 – Fossil fuel dependency • Ind 22 – Deforested area as a proportion of total forest area
Impacts	<ul style="list-style-type: none"> • Ind 33 – Reduction of surface water bodies • Ind 38 – Water quality • Ind 47 – Sea level-rise
Vulnerability	<ul style="list-style-type: none"> • Ind 88 – Vulnerable or fragile ecosystems • Ind 100 – Proportion of population living in coastal areas • Ind 106 – Coastal area vulnerable to climate change • Ind 108 – Water bodies vulnerable to climate change impacts
Mitigation	<ul style="list-style-type: none"> • Ind 109 - Production of renewable energy as a proportion of total energy production • Ind 120 – Climate change mitigation technology • Ind 125 – Increase in forest area
Adaptation	<ul style="list-style-type: none"> • Ind 136 - Coverage of early warning systems • Ind 153 – Water monitoring systems

Source: Elaborate by the author, based on results from national workshops

In terms of impacts, reduction of surface water bodies, water quality and sea level rise are the most critical areas highlighted by the selected countries. However, it should be noted that none of these indicators was calculated during the national workshops indicating a data gap. Although these indicators might be a priority for countries, there is no available data at the national level to measure them.

For the vulnerability area, selected indicators show that priorities in the selected Caribbean countries are on fragile ecosystems, the proportion of the population living in coastal areas, and coastal areas and water bodies vulnerable to climate change. Comparing these priorities with the built indicators, the proportion of the population living in coastal areas is one the only indicator for which data is available in two countries: Dominica and Saint Vincent and the Grenadines.

Finally, for the mitigation and adaptation areas, the only indicator highlighted as a priority and for which data is available is the one on the forest area. Nonetheless, in most cases, data for this indicator comes from international databases, which do not necessarily match the national context and forest categories. The primary data gaps identified by looking at the prioritized indicators and those built during the workshops are in areas such as climate change mitigation technology, coverage of early warning systems and water monitoring systems.

The table 3 shows the advances on the activities and products that ECLAC has been following during this project with the SIDS. In this sense, ECLAC completed all the activities and products with Suriname, St. Lucia, and Antigua & Barbuda. Meanwhile, ECLAC did the hybrid workshop in St. Kitts & Nevis, Dominica, and St. Vincent & the Grenadines, but it still working on the ESSAT completion and the rest of the activities and products. Grenada and Belize are the countries with the least progress in the proposed activities and products. It is important to highlight that in Belize the ESSAT was completed in 2018, nevertheless ECLAC is working to updated.

Table 3: Summarize advances by target country, DA12 Project

Activities and products	Suriname	St. Lucia	Antigua & Barbuda	St. Kitts & Nevis	Dominica	St. Vincent & The Grenadines	Grenada	Belize
1. ESSAT	✓	✓	✓	✓	✓	✓	✓	✓
2. Report analysis ESSAT	✓		✓					
3. Hybrid Workshops	✓	✓	✓	✓	✓	✓		
4. Report analysis workshop	✓		✓					
5. Follow-up activities	✓	✓	✓					

Source: Elaborate by the author, based on results from national workshops

During the implementation of the national workshops, the ECLAC team identified the following challenges as the main barriers limiting the production and dissemination of new and relevant indicators over time in the selected Caribbean countries:

- **Limited data availability** is one of the main constraints to produce new indicators for countries in the Caribbean region. Often, data might exist, but since it is not publicly available, for example, on a website, data might be unknown or difficult to obtain by data users.
- **Not data user friendly formats** are another critical limitation observed. For example, many national agencies publish their data through reports or statistical compendia in PDF formats, limiting data management to expand their use for other purposes such as building climate change and disaster indicators for decision making.
- **Lack of standardise formats of data collection** limit the use of data for building indicators. Inconsistencies in data collection because of the use of different formats within and between national agencies might result, for example, in variables under different levels of disaggregation limit the production of a given indicator.

THE WAY FORWARD:

To assess the national relevance, importance, availability, and sources of the individual statistics contained in the BSES, ESSAT is serving as a tool t. It also helped ECLAC to identify relevant quantitative and qualitative data gaps in each country. The purpose of the ESSAT is to assist countries in developing their environment statistics programmes; collecting their own data on the environment; and assessing the state of environment statistics and the needs for their development at the national level while being consistent with the scope of the FDES 2013.

The systematization of environmental information by using the ESSAT will allow to elaborate a plan for the development of environment statistics based on the needs, capacities, and resources of each country. The ESSAT is a means for countries to assess their current position with respect to environmental data and set a basis for strengthening the environment statistics programs within the national statistical system.

General recommendations to improve production and use of statistics and indicators

Building on the knowledge and lessons learnt shared by the participants during the national workshops, and by the competition process of the ESSAT, the following lists a set of recommendations for national statistical offices and data units from line ministries to facilitate data sharing and produce better indicators to address and adapt to climate change.

Strengthen data sharing protocols by establishing formal data sharing agreements or MoU, and by creating a centralized data repository, or harmonizing existing ones.

Create a data documentation culture among data producers from the various national agencies that promote the development and use of metadata and the value added of harmonized data collection forms.

Standardize the collection of data so that data from different agencies are comparable and can be suitably used to calculate indicators.

Ensure continuity in data collection. Disseminate those statistics to the relevant authorities.

Need to promote environment statistics in countries and the necessity of compiling climate change and disaster statistics.

Climate action priorities should be framed and funded through long-term programmes, on national, local and sector level and should link different policy domains, e.g., health, transport, infrastructure, and social welfare.

Increase use of environment statistics in the evaluation of public policies. Encourage the better use of evidence in policy making; look at how to improve the timeliness and relevance of research and data collection evidence. Note that there are barriers to demand, the incentives and culture of civil servants and politicians may be more significant barriers to a better use of evidence.

Raise awareness on the national data demand for climate change and disaster indicators by linking national mitigation and adaptation plans to global and regional agendas and commitments such as the 2030 Agenda, the Paris Agreement, the SGD 2040, the Escazú Agreement among others.

With the purpose of addressing data gaps, it is recommended to follow this manner:

- In the short term make all partially compliant statistics compliant.
- In the medium term start to collect statistics not currently being collected.
- In the long term ensure that all statistics are compliant with international standards.