



# FRAMEWORK FOR THE DEVELOPMENT OF ENVIRONMENT STATISTICS (FDES) AND ITS IMPLEMENTATION TOOLS

National workshop: Generating climate change and disasters indicators for  
policy decision-making in Grenada  
(17-19 October 2022)



# OUTLINE

- ❑ Framework for the Development of Environment Statistics (FDES 2013)
- ❑ Basic Set of Environment Statistics (BSES) and BSES manual
- ❑ Environment Statistics Self-Assessment Tool (ESSAT)
- ❑ SDG indicators + Basic Set (FDES) matrix
- ❑ FDES and the Global Set of Climate Change Statistics and Indicators
- ❑ Concluding remarks



FRAMEWORK FOR THE DEVELOPMENT  
OF ENVIRONMENT STATISTICS (FDES 2013)



- The UN Statistical Commission endorsed the revised **FDES 2013** at its 44th session in 2013 as the framework for strengthening environment statistics programmes in countries.
- The Statistical Commission also recognized the FDES 2013 as a useful tool in the context of **sustainable development goals (SDGs)** and the post-2015 development agenda.
- The objectives are:
  - Help international and regional institutions to **support strengthening capacity in countries** to develop environment statistics
  - Enhance **comparability** and availability of environment statistics using a common framework
  - Better inform policy making decisions

Download FDES 2013 at <https://unstats.un.org/unsd/envstats/fdes.cshtml> in English, Spanish, Arabic, Portuguese, Russian.



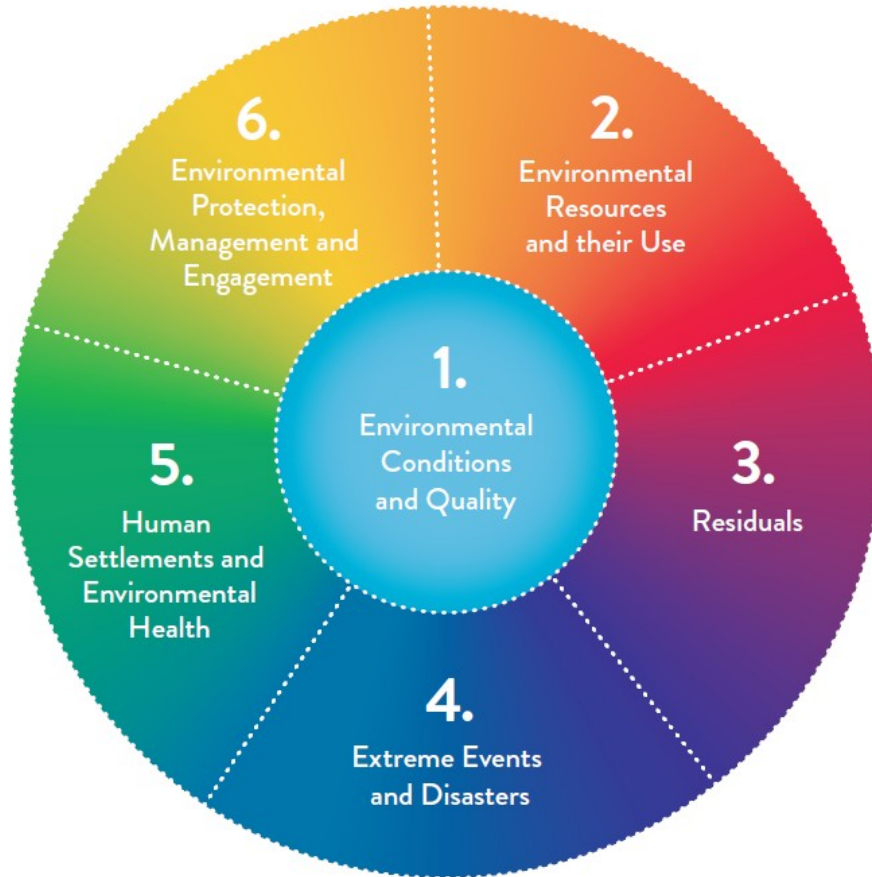
# Countries applying the FDES to environment statistics and climate change statistics compendia



All compendia available at <https://unstats.un.org/unsd/envstats/fdescompendia.cshtml>

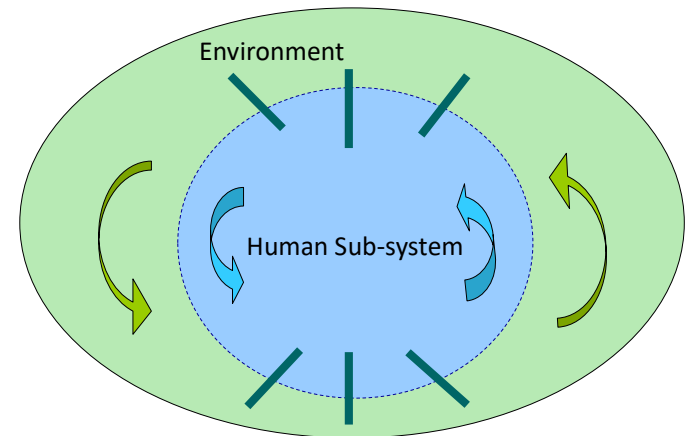


## FDES is structured into 6 components



- ❖ FDES covers **biophysical** aspects of the environment; aspects of the **human sub-system** that directly influence the state and quality of the environment, and the **impacts** of the changing environment on the human sub-system.
- ❖ It includes interactions within and among the environment, human activities and natural events.

- ❖ The FDES can be applied to inform about cross-cutting policy issues important to countries at any given time.
- ❖ Examples:
  - ❖ Water and the environment
  - ❖ Energy and the environment
  - ❖ Climate change
  - ❖ Agriculture and the environment



Processes within the environment

Processes within the human sub-system

Interactions between the environment and the human sub-system

# Main Attributes of the Components of the FDES

FDES Component	Description	Types of Data	Main Sources and Institutions	Relation to DPSIR and the SEEA
<b>1 Environmental Conditions and Quality</b>	Meteorological, hydrographical, geological, geographical, biological, physical and chemical conditions and characteristics of the environment that determine ecosystems and environmental quality	<ul style="list-style-type: none"> <li>• <b>Geospatial</b></li> <li>• <b>Physical</b></li> <li>• <b>Qualitative</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Monitoring and remote sensing data</b></li> <li>• Environmental, meteorological, hydrological, geological and geographical authorities or institutions</li> </ul>	<ul style="list-style-type: none"> <li>• <i>State and Impact element in DPSIR</i></li> <li>• <i>Experimental ecosystem accounts of the SEEA</i></li> </ul>
<b>2 Environmental Resources and their Use</b>	Quantities of environmental resources and their changes, and statistics on activities related to their use and management	<ul style="list-style-type: none"> <li>• <b>Physical</b></li> <li>• <b>Geospatial</b></li> </ul>	<ul style="list-style-type: none"> <li>• Statistical surveys, administrative records, field surveys, land registers</li> <li>• Sector statistics on production and consumption activities, infrastructure</li> <li>• Remote sensing data</li> <li>• Statistics databases of respective <b>national authorities and institutions such as mining, energy, agriculture, water and forest</b></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Driving force, Pressure and State elements in DPSIR</i></li> <li>• <i>Asset and physical flow accounts of the SEEA-CF</i></li> </ul>
<b>3 Residuals</b>	Generation, management and discharge of residuals to air, water and soil	<ul style="list-style-type: none"> <li>• <b>Physical</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Administrative records</b></li> <li>• Estimates based on activity statistics and technical coefficients</li> <li>• Sector statistics</li> <li>• Monitoring data</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Pressure and Response elements in DPSIR</i></li> <li>• <i>Physical flow accounts of the SEEA-CF</i></li> </ul>



## Main Attributes of the Components of the FDES (cont.)

FDES Component	Description	Types of Data	Main Sources and Institutions	Relation to DPSIR and the SEEA
<b>4 Extreme Events and Disasters</b>	Occurrence and impact of natural extreme events and disasters, and technological disasters	<ul style="list-style-type: none"> <li>• <b>Physical</b></li> <li>• <b>Monetary</b></li> <li>• <b>Geospatial</b></li> <li>• <b>Qualitative</b></li> </ul>	<ul style="list-style-type: none"> <li>• Administrative records</li> <li>• Remote sensing</li> <li>• <b>National emergency and disaster authorities</b></li> <li>• Seismic, meteorological monitoring and research centres</li> <li>• Industrial complexes that work with hazardous substances and processes</li> <li>• Insurance companies</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Pressure, Impact and Response elements in DPSIR</i></li> <li>• <i>Asset accounts of the SEEA-CF</i></li> </ul>
<b>5 Human Settlements and Environmental Health</b>	The built environment in which humans live, particularly with regard to population, housing, living conditions, basic services and environmental health	<ul style="list-style-type: none"> <li>• <b>Geospatial</b></li> <li>• <b>Physical</b></li> </ul>	<ul style="list-style-type: none"> <li>• Population and housing censuses, household surveys, administrative records, and remote sensing</li> <li>• Health and administrative records</li> <li>• Housing and urban planning and oversight authorities</li> <li>• Cartographic authorities</li> <li>• Transport authorities</li> <li>• <b>Health authority</b></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Driving force, Pressure and Impact elements in DPSIR</i></li> </ul>
<b>6 Environmental Protection, Management and Engagement</b>	Environmental protection and resource management expenditure, environmental regulation, both direct and via market instruments, disaster preparedness, environmental perception, awareness and engagement of the society	<ul style="list-style-type: none"> <li>• <b>Monetary</b></li> <li>• <b>Qualitative</b></li> </ul>	<ul style="list-style-type: none"> <li>• Administrative records</li> <li>• Surveys</li> <li>• Entity producing government expenditure statistics</li> <li>• Statistical entity in charge of national or sub-national surveys</li> <li>• <b>Environmental authority</b> and other sector authorities</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Response element in DPSIR</i></li> <li>• <i>Environmental activity accounts and related flows of the SEEA-CF</i></li> </ul>





# Methodological Development and Dissemination of Know-how on UNSD website

## Work Programme

The Environment Statistics Section of the United Nations Statistics Division (UNSD) is engaged in the development of methodology, data collection, capacity development, and coordination in the fields of environmental statistics and indicators.

### Methodology

**Methodological work** includes the elaboration of frameworks, concepts, methods, definitions, and data compilation guidelines to support the development and harmonization of national and international statistics on the environment.

- [FDES 2013](#)
- [Basic Set of Environment Statistics](#)
- [Environment Statistics Self-Assessment Tool](#)
- [Expert Group on Environment Statistics](#)
- [Manual on the Basic Set of Environment Statistics](#)
- [International Recommendations for Water Statistics](#)
- [Environmental surveys](#)
- [Concepts and Methods of Environment Statistics](#)
- [Glossary](#)

### Capacity Development

**Technical cooperation, training and capacity development** is provided through regional and sub-regional projects, international training workshops, fellowship arrangements and assistance to countries. Recent projects covered the countries of the CARICOM, ESCWA, ECOWAS and EAC regions.

- [COMESA](#)
- [EAC project](#)
- [ECOWAS project](#)
- [ESCWA project](#)
- [CARICOM project](#)

### Data

**Data collection** is implemented through the biennial Questionnaire on Environment Statistics. Data collection started in 1999. UNSD environmental indicators derived from these data, as well as for the eight other themes, are now available.

- [UNSD environmental indicators](#)
- [Country Snapshots](#)
- [Country Files \(waste and water\)](#)
- [Questionnaires \(waste and water\)](#)

### Coordination

**Coordination of international activities** in the field of environmental statistics and indicators is provided through the Intersecretariat Working Group on Environment Statistics (IWG-Env) with UNSD as the Secretariat.

- [Intersecretariat Working Group on Environment Statistics](#)
- [Inventory of environmental data collection, reporting and dissemination](#)
- [Inventory of capacity development events and activities in the area of Environment Statistics](#)

- [Basic Set of Environment Statistics](#)
- [FDES 2013 brochure](#)
- [Blueprint for Action](#)
- [Environment statistics compendia applying FDES 2013](#)
- [Environment Statistics Self-Assessment Tool](#)
- [Framework for the Development of Environment Statistics \(FDES 2013\)](#)
- [SDG indicators + Basic Set \(FDES\) matrix](#)
- [Manual on the Basic Set of Environment Statistics](#)



Expert Group on Environment Statistics

## Quick links

- [ENVSTATS newsletters](#)
- [Brochure on Environment Statistics](#)
- [Climate Change Statistics](#)
- [Frequently asked questions](#)
- [Reports to the Statistical Commission](#)
- [Environmental accounting](#)
- [National data sources](#)
- [International and regional data sources](#)

## Featured Database



<https://unstats.un.org/unsd/envstats/fdes.cshtml>  
<https://unstats.un.org/unsd/envstats/index.cshtml>



# Basic Set of Environment Statistics

- BSES is available in all UN official languages:  
<https://unstats.un.org/unsd/envstats/fdes/basicset.cshtml>
- All statistical tables from chapter 3 included, on 44 pages document
- From Basic set to core set in chapter 4

Basic Set of Environment Statistics

28 August 2018

Component 1: Environmental Conditions and Quality					
Sub-component 1.1: Physical Conditions					
Topic	Statistics and Related Information (Bold Text - Core Set/Tier 1, Regular Text - Tier 2, <i>Italicized Text - Tier 3</i> )		Category of Measurement	Potential Aggregations and Scales	Methodological Guidance
Topic 1.1.1: Atmosphere, climate and weather	a.	Temperature		• National • Sub-national	• World Meteorological Organization (WMO) • Intergovernmental Panel on Climate Change (IPCC) • National Oceanic and Atmospheric Administration (NOAA)/National Aeronautics and Space Administration (NASA)
	1.	Monthly average	Degrees		
	2.	Minimum monthly average	Degrees		
	3.	Maximum monthly average	Degrees		
	b.	Precipitation (also in 2.6.1 a)			
	1.	Annual average	Height		
	2.	Long-term annual average	Height		
	3.	Monthly average	Height		
	4.	Minimum monthly value	Height		
	5.	Maximum monthly value	Height		
	c.	Relative humidity			
	1.	Minimum monthly value	Number		
	2.	Maximum monthly value	Number		
	d.	Pressure		• National • Sub-national • By station	
	1.	Minimum monthly value	Pressure unit		
	2.	Maximum monthly value	Pressure unit		
	e.	Wind speed		• National • Sub-national	
	1.	Minimum monthly value	Speed		
	2.	Maximum monthly value	Speed		
	f.	Solar radiation			
	1.	Average daily value	Area, Energy unit	• WMO • IPCC • NOAA/NASA	
	2.	Average monthly value	Area, Energy unit		






- generating national sets or databases of environment statistics.
- reporting on environment (MEAs) or sustainable development (SDGs).
- calculating environmental indicators.
- generating environmental-economic accounts.

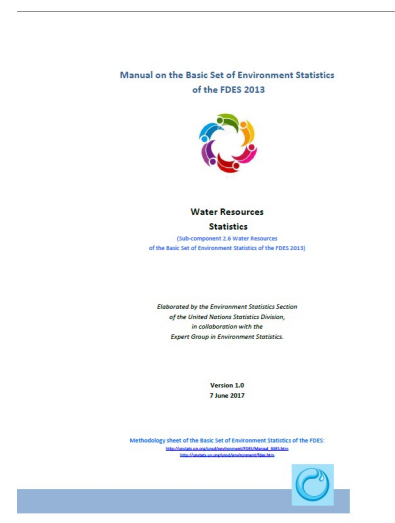
Number of Statistics	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Total
Tier 1	32	30	19	4	12	3	100
Tier 2	58	51	34	11	22	24	200
Tier 3	51	43	5	16	20	23	158
Total	141	124	58	31	54	50	458



# Manual on the Basic Set of Environment Statistics

[https://unstats.un.org/unsd/envstats/fdes/manual\\_bses.cshtml](https://unstats.un.org/unsd/envstats/fdes/manual_bses.cshtml)

-  MS 1.1.4 Soils
-  MS 1.2.2 Ecosystems and Biodiversity Statistics
-  MS 1.2.1 & 2.3.1 Land Cover and Land Use
-  MS 1.2.3, 2.3.2, 2.5.1 & 2.5.5 Forests
-  MS 1.3.1 Air Quality
-  MS 1.3.1 and 3.1.1 GHG Statistics
-  MS 1.3.3 Marine Water Quality Statistics
-  MS 2.1 Mineral Resources
-  MS 2.2 Energy Resources
-  MS 2.5 Crops and Livestock Statistics
-  MS 2.6 Water Resources
-  MS 3.2 Wastewater new
-  MS 3.3.1 & 3.3.2 Generation and Management of Waste
-  MS 5.1 Human Settlements
-  MS 6.1.1 Environmental Protection Expenditures



Includes: definitions, classifications, statistical methods for collection and/or compilation, dissemination and main uses of the sets of the respective environment statistics.

Forthcoming: Freshwater quality, Environmental Health, Disasters



# Environment Statistics Self-Assessment Tool

- Introduction  
English, Arabic\*, Chinese\*, French\*, Portuguese\* (new), Russian\*, Spanish\*
- Part I: Institutional dimension of Environment Statistics  
English, Arabic\*, Chinese\*, French\*, Portuguese\* (new), Russian\*, Spanish\*
- Part II: Statistics Level Assessment  
English, Arabic\*, Chinese\*, French\*, Portuguese\* (new), Russian\*, Spanish\*



# ESSAT Part I

- A. Identification of institutions
- B. Existing national policies relevant to the environment
- C. Mandate and organization of national statistics
- D. Mandate and organization of environment statistics
- E. Production of environment statistics
- F. Uses of environment statistics
- G. Inter-institutional collaboration for the production of environment statistics
- H. Existing and required resources for environment statistics
- I. International and regional network
- J. Technical assistance and training
- K. The way forward in environment statistics



# ESSAT Part II

### Component 1: Environmental Conditions and Quality

	Statistics and Related Information	<p><b>Bold Text - Core Set/Tier 1</b></p> <p>Regular Text - Tier 2</p> <p><i>Italicized Text - Tier 3</i></p>	Category of Measurement	Potential Aggregations and Scales	<p>Relevance of Statistic at the National Level (High /Medium /Low/Not Relevant/Not Applicable)</p> <p>Priority for National Data Collection (High /Medium /Low/Not a Priority)</p> <p>Availability of Statistic at the National Level (Identical/Similar/Not Available)</p>	Primary Institution(s) Responsible for Collecting Statistic Check all that apply	Requirements or User Requests for Collection/ Reporting on this Statistic Check all that apply	<p><b>Type of Data Source</b></p> <p>Sub-national</p> <p>National</p> <p>Regional</p> <p>International</p>	<p><b>Periodicity</b></p> <p>(Annual/Monthly/Daily/Hourly/Other [specify])</p>	<p><b>Earliest Year Available</b></p>	<p><b>Latest Year Available</b></p>	<p><b>Format of Statistic</b> (Publication/Excel/Database/Website/Individual records)</p>	Unit of Measurement	Main Reasons why Statistic is not Available Check all that apply
	NSO					Ministry of Environment or equivalent institution								

### Sub-component 1.1: Physical Conditions

### Topic 1.1.1: Atmosphere, climate and weather

[illegible]

# SDG indicators + Basic Set (FDES) matrix

[https://unstats.un.org/unsd/envstats/fdes/SDG\\_FDES%20matrix.pdf](https://unstats.un.org/unsd/envstats/fdes/SDG_FDES%20matrix.pdf)

SDGs		FDES			
Target	SDG Indicators	Location in the FDES: Component Sub-Component and Topic	Statistics used in the SDG Indicator corresponding to BSES (SDG Indicator can be compiled either fully or partially from BSES statistics)	Statistics related to but not directly used in SDG Indicators OR Statistics related to Tier III indicators (either fully or partially linked to BSES)	Supporting Information
15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1 Proportion of land that is degraded over total land area (Tier I)	Component 1: Environmental Conditions and Quality, Sub-component 1.1: Physical Conditions, Topic 1.1.4: Soil characteristics	1.1.4.a. Soil characterization <b>1.1.4.a.1. Area by soil types</b> 1.1.4.b. Soil degradation <b>1.1.4.b.1. Area affected by soil erosion</b> <b>1.1.4.b.2. Area affected by desertification</b> 1.1.4.b.3. Area affected by salinization 1.1.4.b.4. Area affected by waterlogging 1.1.4.b.5. Area affected by acidification 1.1.4.b.6. Area affected by compaction 1.1.4.c. Nutrient content of soil, measured in levels of: 1.1.4.c.1. Nitrogen (N) 1.1.4.c.2. Phosphorous (P) 1.1.4.c.3. Calcium (Ca) 1.1.4.c.4. Magnesium (Mg) 1.1.4.c.5. Potassium (K) 1.1.4.c.6. Zinc (Zn) 1.1.4.c.7. Other		The indicator proposes sub-indicators of land cover and land cover change; land productivity and carbon stocks above and below ground.
		Component 1: Environmental Conditions and Quality, Sub-component 1.2: Land Cover, Ecosystems and Biodiversity, Topic 1.2.1: Land cover	<b>1.2.1.a. Area under land cover categories</b>		





# FDES and the Global Set of Climate Change Statistics and Indicators

## Main decisions of the UN Statistical Commission, 47<sup>th</sup> session, March 2016:

For countries: Use the FDES 2013 to guide the development of climate change statistics and indicators given the close interrelationship between environment statistics and climate change statistics.

In UNSD's global consultation to countries, every statistic and indicator that had metadata applicable to the Basic Set of Environment Statistics of the Framework for the Development of Environment Statistics was referenced as such. For example:

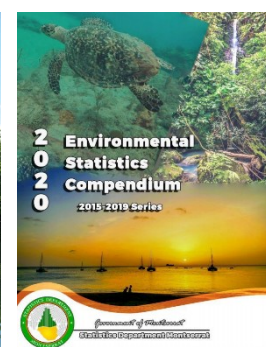
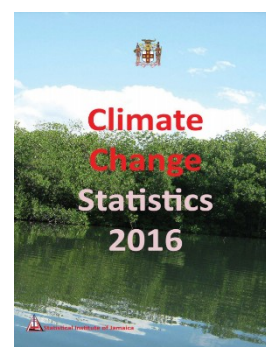
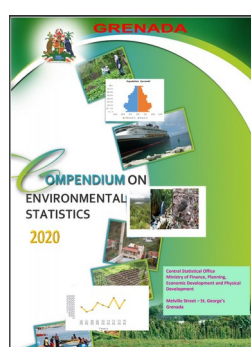
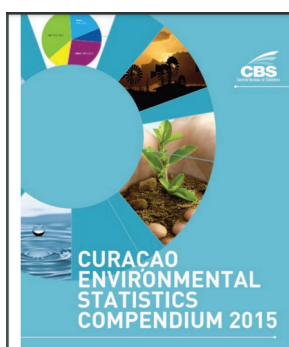
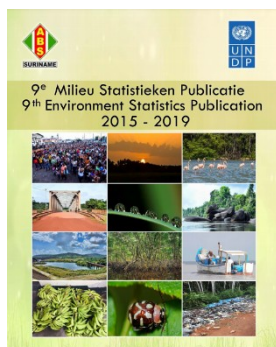
### 1. Total greenhouse gas emissions per year

Field	Description			
Code	1020	1021	1022	1023
Indicator	Total greenhouse gas emissions per year (SDG 13.2.2)			
Statistics		Total emissions of direct greenhouse gases (GHGs, excluding LULUCF) (FDES 3.1.1.a)	Total emissions of indirect greenhouse gases (GHGs) (FDES 3.1.1.b)	Greenhouse gas emissions from land use, land use change and forestry (LULUCF) (UN-ECE 11)
FDES		3.1.1.a	3.1.1.b	



# Concluding Remarks

- FDES offers guidance to countries to develop standalone environment statistics, which
  - applied to support national policies on environmental management,
  - assisted international reporting requirements (MEA, SDGs, Sendai Framework).
- Countries have developed their own frameworks based on the FDES.
- Countries are encouraged to publish compendia and dissemination outputs according to the FDES to help policy makers address policy questions.
  - In the region: Suriname, Curaçao, Grenada, Jamaica, Montserrat, etc.



- Component 4 (on disasters) remains challenging to complete, because of very dynamic developments on terminology and classifications.
  - Disasters: Hazard Definition Classification Review has been launched, <https://www.undrr.org/publication/hazard-definition-and-classification-review>
- Cross cutting themes, as climate change (in chapter 5) are continuously evolving therefore UNSD initiated its work on the Global Set.



# Thank You!

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- <https://unstats.un.org/unsd/envstats/>

