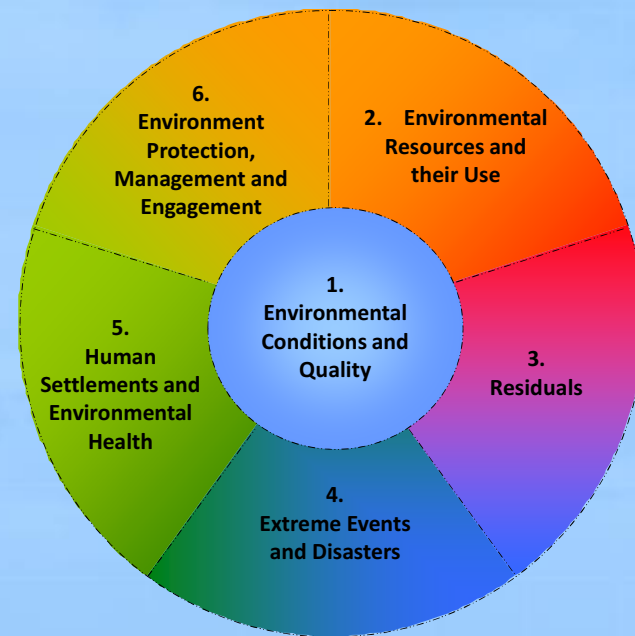# The Framework for the Development of Environment Statistics (FDES 2013)

UNCEEA 21 June, 2013
Environment Statistics Section
Environment and Energy Statistics Branch
UNSD

Revision of FDES and Development of a Core Set of Environment Statistics

SC mandate: The 41st (2010) session of the UN Statistical Commission endorsed revision of the 1984 FDES and the development of a Core Set of Environment Statistics.

SC endorsement: The 44th (2013) session endorsed the FDES 2013 and recognized it as a useful tool to adequately respond to the increasing demand for environmental information in the follow-up to Rio+20 and the post-2015 development agenda.
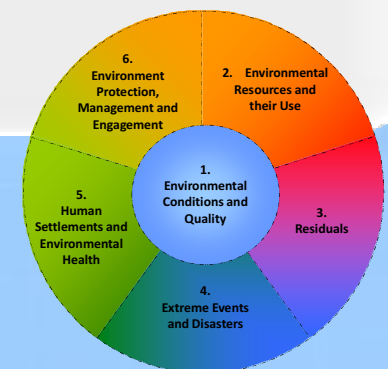
What is the FDES 2013?

- The FDES 2013 is a flexible, multi-purpose conceptual and statistical framework that enables and facilitates the compilation, collection and production of environment statistics.

- It provides an organizing structure to guide the collection and compilation of environment statistics at the national level, bringing together data from the various relevant subject areas and sources.

- It is broad, comprehensive and integrative. It covers the issues and aspects of the environment that are relevant for policy analysis and decision making and it can be applied to inform about cross-cutting issues such as climate change.
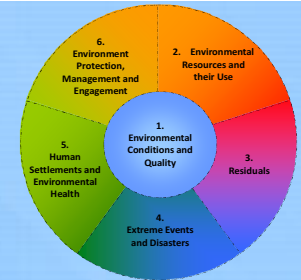
Scope of the FDES

Covers biophysical aspects of the environment and those aspects of the human sub-system that directly influence and interact with the state and quality of the environment.

Objective of the FDES

- Mark out the scope of environment statistics
- Mark out the role of the different stakeholders producing environmental data
- Provide a structure to its organization

Specific objectives of the FDES include:

- ➢ Identifying the main quantifiable aspects of the environment;
- ➢ Identifying the components, sub-components and topics that are relevant and statistically feasible according to defined needs and priorities;
- ➢ Facilitating the development of a national programme of environment statistics;
- ➢ Contributing to the assessment of data requirements, sources, availability and gaps;
- ➢ Guiding the development of databases that can be used for multiple purposes; and
- ➢ Assisting in the co-ordination and organization of environment statistics given the inter-institutional nature of the domain.

The FDES 2013 structure
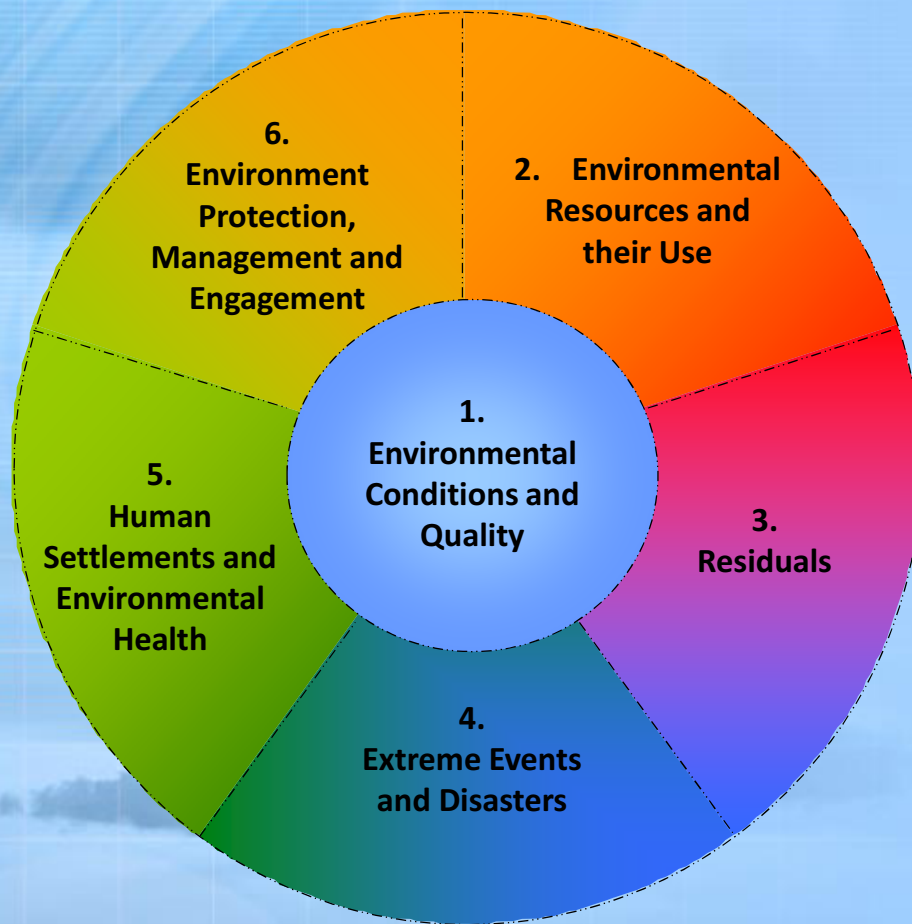
- Six components

- At the centre of the FDES: Environmental conditions and quality; and how these are affected by human activities and natural events, and how the changes in environmental conditions affect humans

- All of the components relate to each other

- Multi-layered

- Flexible

- Adaptable

Structure of the FDES

Component 1: Environmental Conditions and Quality	Sub-component 1.1: Physical Conditions Sub-component 1.2: Land Cover, Ecosystems and Biodiversity Sub-component 1.3: Environmental Quality
Component 2: Environmental Resources and their Use	Sub-component 2.1: Non-energy Mineral Resources Sub-component 2.2: Energy Resources Sub-component 2.3: Land Sub-component 2.4: Soil Resources Sub-component 2.5: Biological Resources Sub-component 2.6: Water Resources
Component 3: Residuals	Sub-component 3.1: Emissions to Air Sub-component 3.2: Generation and Management of Wastewater Sub-component 3.3: Generation and Management of Waste
Component 4: Extreme Events and Disasters	Sub-component 4.1: Natural Extreme Events and Disasters Sub-component 4.2: Technological Disasters
Component 5: Human Settlements and Environmental Health	Sub-component 5.1: Human Settlements Sub-component 5.2: Environmental Health
Component 6: Environment Protection, Management and Engagement	Sub-component 6.1: Environment Protection and Resource Management Expenditure Sub-component 6.2: Environmental Governance and Regulation Sub-component 6.3 : Extreme Event Preparedness and Disaster Management Sub-component 6.4: Environmental Information and Awareness

Main Attributes of the Components of the FDES

FDES Component	Description	Types of Data	Main Sources and Institutions	Relation to DPSIR and the SEEA
1 Environmental Conditions and Quality	Conditions and characteristics of the environment (meteorological, hydrographical, biological, physical and chemical, geological, geographical) that determine ecosystems and environmental quality	· *Geospatial* · *Physical* · *Qualitative*	• Monitoring and remote sensing data • Environmental, meteorological, hydrological, • Geological and geographical authorities/ institutions	• *State and Impact element in DPSIR* • *Experimental ecosystem accounts* •*of the SEEA*
2 Environmental Resources & their Use	Quantities of environmental resources and their changes; as well as statistics on activities related to their use and management	· *Physical* · *Geospatial*	• Statistical surveys, administrative records, field surveys, land registers • Sector statistics on production and consumption activities, infrastructure • Remote sensing data • Statistics databases of respective national authorities and institutions such as mining, energy, agriculture, water and forest	• *Driving force, Pressure and State elements in DPSIR* • *Asset and physical flow accounts of the* •*SEEA Central Framework*
3 Residuals	Generation, management and discharge of residuals to air, water and soil	· *Physical*	• Administrative records •Estimates based on activity statistics and technical coefficients •Sector statistics •Monitoring data	• *Pressure and Response elements in DPSIR* • *Physical flow accounts of the* •*SEEA Central Framework*
4 Extreme Events & Disasters	Occurrence and impact of natural extreme events and disasters, and technological disasters	· *Physical* · *Monetary* · *Geospatial* · *Qualitative*	• Administrative records • Remote sensing • National emergency and disaster authorities • Seismic, meteorological monitoring and research centres • Industrial complexes that work with hazardous substances and processes	• *Pressure, Impact and Response* •*Elements in DPSIR* • *Asset accounts of the SEEA Central* •*Framework*

Main Attributes of the Components of the FDES

FDES Component	Description	Types of Data	Main Sources and Institutions	Relation to DPSIR and the SEEA
5 Human Settlements & Environmental Health	The built environment in which humans live, particularly with regard to population, housing, living conditions, basic services and environmental health	• *Geospatial* • *Physical*	• Population and housing censuses, household surveys, administrative records, and remote sensing • Housing and urban planning and oversight authorities • Cartographic authorities • Transport authorities • For health, administrative records, the health Authority	• *Driving force, Pressure and Impact elements in DPSIR*
6 Environment Protection, Management & Engagement	Environment protection and resource management expenditure; environment regulation both direct and via market instruments; disaster preparedness; environmental perception, awareness and engagement of the society	• *Monetary* • *Qualitative*	• Administrative records • Surveys •The entity producing government expenditure statistics • The statistical entity in charge of national or sub-national surveys • The environmental authority and other sector authorities	• *Response element in DPSIR* • *Environmental activity accounts and related flows of the SEEA Central Framework*

Multi-layered structure of the FDES

Levels of the FDES

1 digit	2 digits	3 digits	4 or 5 digits
Component	Sub-component	Statistical Topic	Statistics

|	
Component 1: Environmental Conditions and Quality	Sub-component 1.1: Physical Conditions Sub-component 1.2: Land Cover, Ecosystems and Biodiversity Sub-component 1.3: Environmental Quality
Component 2: Environmental Resources and their Use	Sub-component 2.1: Non-energy Mineral Resources Sub-component 2.2: Energy Resources Sub-component 2.3: Land Sub-component 2.4: Biological Resources Sub-component 2.5: Water Resources
Component 3: Residuals	Sub-component 3.1: Emissions to Air Sub-component 3.2: Generation and Management of Wastewater Sub-component 3.3: Generation and Management of Waste
Component 4: Extreme Events and Disasters	Sub-component 4.1: Natural Extreme Events and Disasters Sub-component 4.2: Technological Disasters
Component 5: Human Settlements and Environmental Health	Sub-component 5.1: Human Settlements Sub-component 5.2: Environmental Health
Component 6: Environment Protection, Management and Engagement	Sub-component 6.1: Environment Protection and Resource Management Expenditure Sub-component 6.2: Environmental Governance and Regulation Sub-component 6.3: Extreme Event Preparedness and Disaster Management Sub-component 6.4: Environmental Information and Awareness

Basic Set of Environment Statistics

Component 1: Environmental Conditions and Quality	
Sub-component 1.2: Land Cover, Ecosystems and Biodiversity	
Topic	**Statistics and Related Information** (**Bold Text - Core Set/Tier 1**; Regular Text - Tier 2; *Italicized Text - Tier 3*)
Topic 1.2.3: Biodiversity	a. Flora - terrestrial, freshwater and marine (also in 1.2.2.c) 　1. **Number of known species by status category** 　2. Species population 　3. Number of endemic species 　4. Number of invasive alien species 　5. *Habitat fragmentation* b. Fauna - terrestrial, freshwater and marine (also in 1.2.2.c) 　1. **Number of known species by status category** 　2. Species population 　3. Number of endemic species 　4. Number of invasive alien species 　5. *Habitat fragmentation*

Flexibility and adaptability: prioritizing components, sub-components and topics

Flexibility and adaptability: tiers

The Basic Set of Environment Statistics

- The **Basic Set of Environment Statistics** organizes a comprehensive (though not exhaustive) list of environment statistics
- The Basic Set is organized in **three tiers**, based on the level of relevance, availability and methodological development of the statistics.

Tier 1
(Core Set)

Tier 2

Tier 3
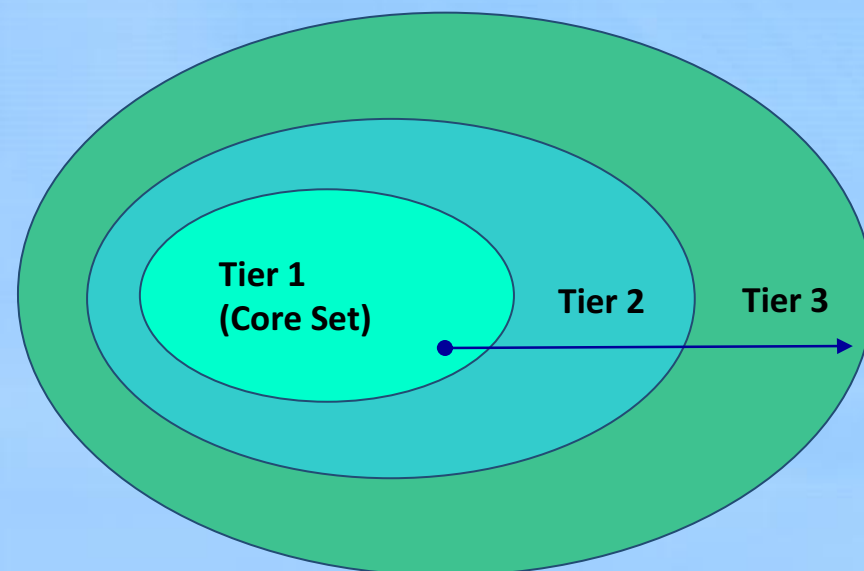
- **Tier 1** is the **Core Set of Environment Statistics** which are of high priority and relevance to most countries and have a sound methodological foundation
- **Tier 2** includes environment statistics that are of priority and relevance to most countries but need more investment in time, resources or methodological development.
- **Tier 3** includes environment statistics which are either of less priority or require significant methodological development.

The Core Set of Environment Statistics

- The objective of the Core Set of Environment Statistics is to serve as an agreed, limited set of environment statistics that are of high priority and relevance to most countries

- It is flexible and adaptable to the countries circumstances

- The Core Set is organized and presented in accordance to the FDES 2013 structure

The Core Set
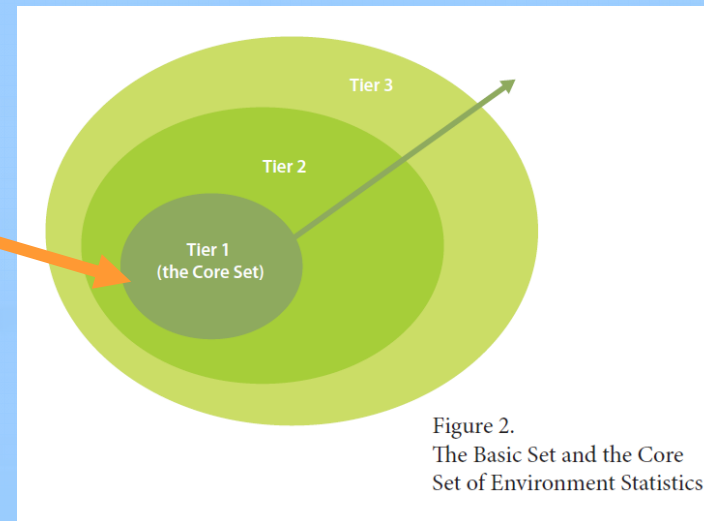
Tier 3

Tier 2

Tier 1
(the Core Set)

Figure 2.
The Basic Set and the Core Set of Environment Statistics

Self assessment tool

A self-assessment tool has been developed based on the Core and Basic Set, that can be used by countries ex ante and ex post to measure the state and progress in developing their environment statistics

Number of statistics in the Basic and Core Set of Statistics

Core Set = 107

Basic Set = 492

Tier 1 (Core Set)
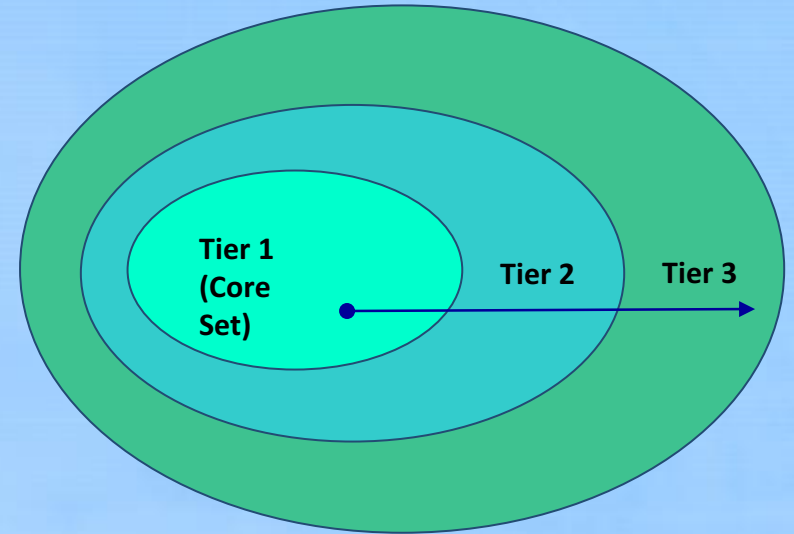
Tier 2

Tier 3

	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Total
Tier 1	35	35	19	4	11	3	107
Tier 2	83	46	33	12	17	21	212
Tier 3	64	43	5	17	21	23	173
Total	182	124	57	33	49	47	492

The Basic Set is presented into the FDES structure, supplemented with additional guidance

Component 4: Extreme Events and Disasters

Sub-component 4.1: Natural Extreme Events and Disasters

Topic	Statistics and Related Information (Bold Text - Core Set/Tier 1; Regular Text - Tier 2; *Italicized Text - Tier 3*)	Category of Measurement	Potential Aggregations and Scales	Methodological Guidance
Topic 4.1.1: Occurrence of natural extreme events and disasters	a. Occurrence of natural extreme events and disasters:		• By event • National • Sub-national	• Centre for Research on the Epidemiology of Disasters Emergency Events Database (CRED EM-DAT) • Economic Commission for Latin America and the Caribbean (ECLAC) Handbook for Estimating the Socio-economic and Environmental Effects of Disasters
	1. **Type of natural disaster** (geophysical, meteorological, hydrological, climatological, biological)	Descriptive		
	2. **Location**	Location		
	3. Magnitude (where applicable)	Intensity		
	4. Date of occurrence	Date		
	5. Duration	Time period		
	6. Hazard prone areas	Area		
	7. Population living in hazard prone areas	Number		
Topic 4.1.2: Impact of natural extreme events and disasters	a. People affected by natural extreme events and disasters			
	1. **Number of people killed**	Number		
	2. Number of people injured	Number		
	3. Number of people homeless	Number		
	4. Number of people affected	Number		
	b. **Economic loss due to natural extreme events and disasters** (e.g., damage to buildings transportation networks, loss of revenue for businesses, utility disruption, etc.)	Currency	• By event • By International Standard Industrial Classification of all Economic Activities (ISIC) economic activity • National • Sub-national • By direct and indirect damage	
	c. Physical loss/damage due to natural extreme events and disasters (e.g., area and amount of crops, livestock, aquaculture, biomass etc.)	Area, Descriptive, Number		
	d. Effects of natural extreme events and disasters on integrity of ecosystems		• By event • By ecosystem • National • Sub-national	
	1. *Area affected by natural disasters*	Area		
	2. *Loss of vegetation cover*	Area		
	3. *Area of watershed affected*	Area		
	4. *Other*	Descriptive		
	e. *External assistance received*	Currency	• By event • National	

Sample of the Core Set of Environment Statistics

Component	Sub-component	Topic	Core Set / Tier 1 Statistics	
Component 1: Environmental Conditions and Quality	Sub-component 1.1: Physical Conditions	Topic 1.1.1: Atmosphere, climate and weather	a. Temperature	**1. Monthly averages**
				2. Minimum monthly average
				3. Maximum monthly average
			b. Precipitation (also in 2.6.1.a)	**1. Annual averages**
				2. Long-term annual averages
		Topic 1.1.2: Hydrographical characteristics	d. Watersheds	**1. Description of main watersheds**
		Topic 1.1.3: Geological and geographical information	a. Geological, geographical and geomorphological conditions of terrestrial areas and islands	**2. Area of country or region**
			b. Coastal area (includes area of coral reefs, mangroves, etc.) (also in 2.3.1.c)	
			c. Length of marine coastline	
		Topic 1.1.4: Soil characteristics	a. Soil characterization	**1. Area of soil types**
			b. Degradation	**1. Area affected by soil erosion**
				2. Area affected by desertification
	Sub-component 1.2: Land Cover, Ecosystems and Biodiversity	Topic 1.2.1: Land cover	a. Extent and spatial distribution of main land cover categories	**1. Area of land cover**
				2. Location of land cover
		Topic 1.2.2: Ecosystems	a. General ecosystem characteristics, extent and pattern	**1. Area of ecosystems**
			c. Biological components of ecosystems (also in 1.2.3.a-b)	**4. Threatened species**
		Topic 1.2.3: Biodiversity	a. Flora - terrestrial, freshwater and marine (also in 1.2.2.c)	**1. Number of known species by status category**
			b. Fauna - terrestrial, freshwater and marine (also in 1.2.2.c)	**1. Number of known species by status category**
			c. Protected areas	**1. Protected terrestrial (including inland water) and marine area** (also in 1.2.4.a)
		Topic 1.2.4: Forests	a. Forest area (also in 1.2.1.a and 1.2.2.a)	**1. Total**
				5. Area deforested

Application of the FDES to cross-cutting issues: Climate Change
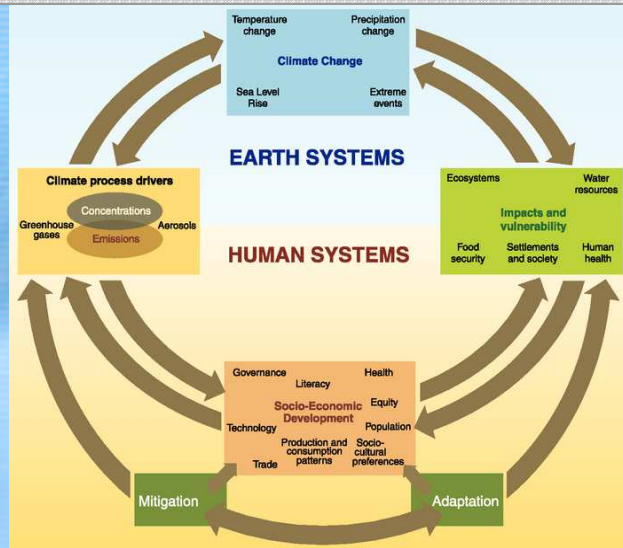
Source: Intergovernmental Panel on Climate Change

Climate Process Drivers

Sub-component 1.3: Environmental Quality	Sub-component 3.1: Emissions to Air
1.3.1.d Global atmospheric concentrations of greenhouse gases	3.1.1.a-b Total emissions of direct and indirect greenhouse gases (GHGs), by gas 3.1.2.a Consumption of ozone depleting substances (ODS), by substance

Climate Change Evidence

Sub-comp. 1.1: Physical Conditions	Sub-comp. 4.1: Natural Extreme Events and Disasters
1.1.1.a Temperature 1.1.1.b Precipitation 1.1.2.e.4 Sea level	4.1.1.a Occurrence of natural extreme events and disasters

Climate Change Impacts and Vulnerability

Sub-comp. 1.1: Physical Conditions	Sub-comp. 1.2: Land Cover, Ecosystems and Biodiversity	Sub-comp. 1.3: Environmental Quality	Sub-comp. 2.3: Land	Sub-comp. 4.1: Natural Extreme Events and Disasters	Sub-comp. 5.2: Environmental Health
1.1.2.a-c, g Lakes, rivers, reservoirs, glaciers 1.1.2.e.6 Area of sea ice 1.1.4.b.2 Area affected by desertification	1.2.1.a.1 Area of land cover 1.2.2.a-c Ecosystem characteristics and biological components 1.2.3.a Flora 1.2.3.b Fauna 1.2.4.a-b Forests	1.3.3.b Organic matter in marine water bodies 1.3.3.f Physical and chemical characteristics (of marine water bodies) 1.3.3.g Coral bleaching	2.3.1.1. Land use change	4.1.2.a-d People affected, economic loss, physical loss and effects on integrity of ecosystems	5.2.3.a Vector borne diseases

Mitigation and Adaptation

Sub-comp. 2.2: Energy Resources	Sub-comp. 6.1: Environment Protection and Resource Management Expenditure	Sub-comp. 6.2: Environmental Governance and Regulation	Sub-comp. 6.3: Extreme Event Preparedness and Disaster Management
2.2.2.a Production of energy from non-renewable and renewable sources	6.1.1.a Government environment protection and resource management expenditure 6.1.2.a Private sector environment protection and resource management expenditure	6.2.2.a Direct regulation 6.2.2.b Economic instruments 6.2.3.a Participation in MEAs and other global environmental conventions	6.3.1.a National natural extreme event and disaster preparedness and management systems

Links to social and economic statistics

- The FDES 2013 is structured in a way that allows links to economic and social domains.
- As a multipurpose information system it supports several users and therefore it seeks to be compatible with other frameworks and systems.
    - Special care was given to establish clear links to and consistency with the SEEA
- It uses existing concepts and relies on existing statistical classifications where applicable
- As such, the FDES facilitates data integration within environment statistics and with economic and social statistics.

Structure of the FDES 2013 publication

- Overview of environment statistics – characteristics and challenges
- The Framework for the Development of Environment Statistics
- Components of the FDES and the Basic Set of Environment Statistics
- The Core Set of Environment Statistics
- Application of the FDES to cross-cutting issues

FDES Future Work

Following the endorsement of the FDES 2013, work will focus on:

- Final review and submission of the document for publishing (end of July 2013)

- Development of detailed methodological guidance for the Core Set of Environment Statistics and the Basic Set of Environment Statistics, including classifications, definitions and data collection and compilation methods. It will build on existing methodologies as well as on ongoing methodological work in the field of environment statistics and environmental-economic accounting.

- Expert Group on Environment Statistics 2013 ->

- Programme of technical assistance and capacity building to member States using the FDES 2013 and associated tools. Coordination with SEEA implementation to build synergies..

Main Elements of the Plan of Work

At the national level

- Participating in capacity building using the FDES and the CSES
- Promoting environment statistics in national statistical systems and national policy planning and development
- Developing horizontal collaboration among partner institutions for producing environment statistics

At the regional level

- Developing and implementing regional projects for development of environment statistics
- Collaborating in developing further methodological and capacity building material
- Strengthening regional expert groups and networks on environment statistics

At the global level

- Disseminating of FDES, CSES, Manual on CSES, and the Self-Assessment Tool.
- Developing and carrying out a long term programme of technical assistance and capacity building to countries with collaborating partners
- Constructing a global network of experts and institutions working on environment statistics

All

- Promoting vertical collaboration among global, regional and national partners
- Mobilizing new resources
- Formulating technical assistance and capacity building projects

Thank you