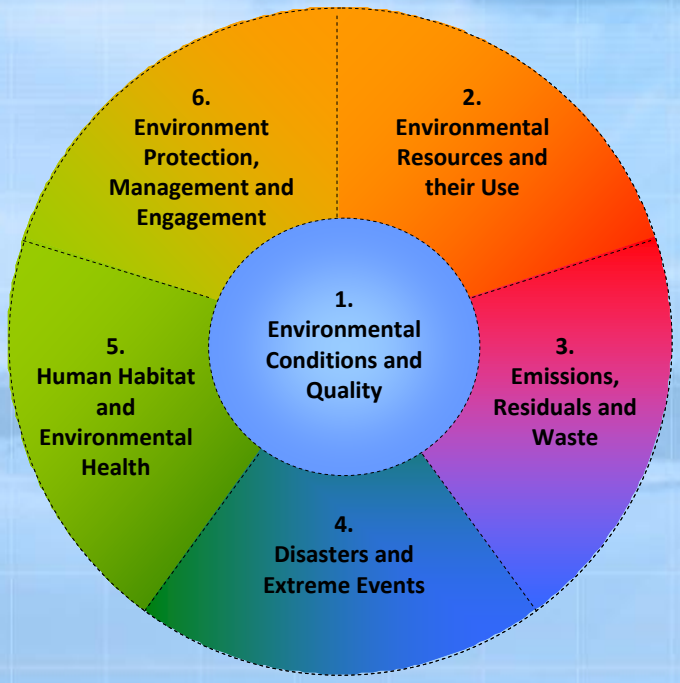
# Revised Framework for the Development of Environment Statistics (FDES)



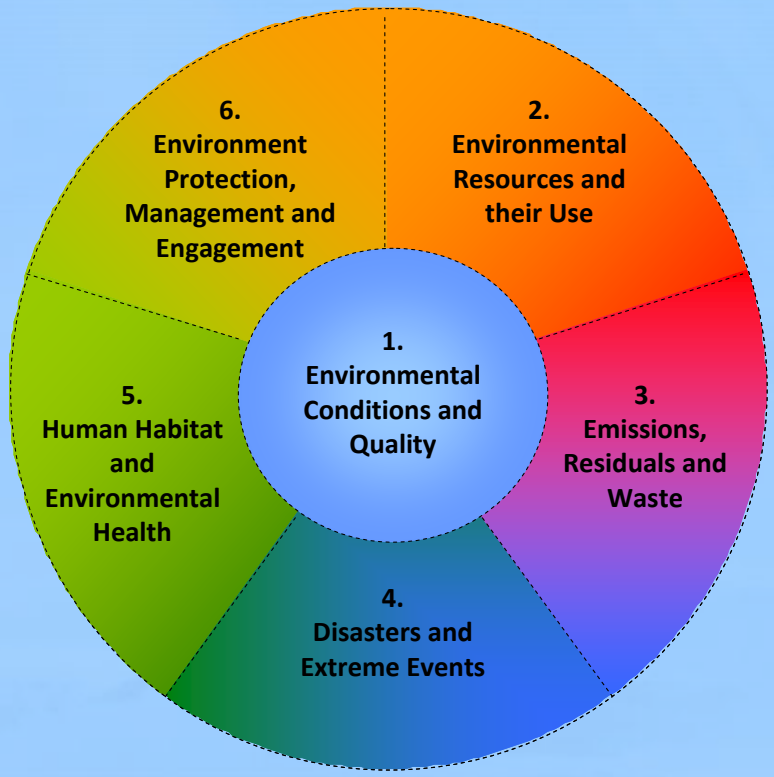

*UNCEEA Meeting, Rio de Janeiro, 11-13 June, 2012.*

***The FDES is a work in progress and is subject to revision.***

# What is the FDES?

- **The FDES is a flexible framework that enables and facilitates the production and development of environment statistics.**

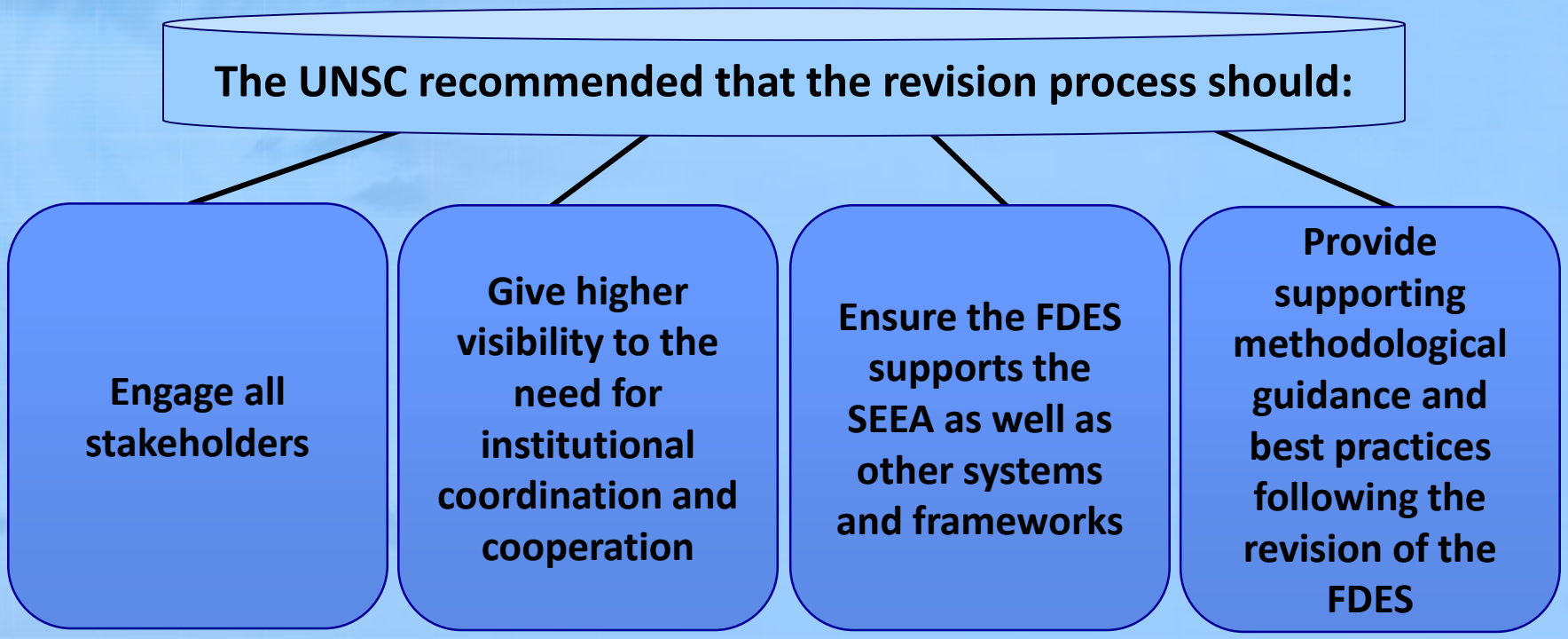
- **It provides an organizing structure for quantitative and qualitative statistics on the environment in a comprehensive, consistent and coherent manner.**




*The FDES is a work in progress and is subject to revision.*

# Mandate from UNSC 2010

**The 41st (2010) session of the UNSC endorsed the programme of work for the revision of the FDES and the development of a core set of environment statistics.**




*For details see E/CN.3/2010/9 http://unstats.un.org/unsd/statcom/sc2010.htm*

# Criteria for the revision

**In consultation with the EG, it was decided that the FDES needs to:**

- **Be adaptable, applicable, easy to understand and follow, and flexible enough to accommodate the priorities and capacities of countries in different stages of statistical development and environmental endowment;**
- **Clearly align with the objective of environment statistics – which is to provide quality statistical information for policy and decision making about the state of the environment and changes to this state, and its links with human wellbeing, and economic and social development;**
- **Help organize the main components of environment statistics;**
- **Clearly identify the scope and dimensions of environment statistics by describing the components, sub-components and statistical topics;**
- **Provide a basis for definitions and classifications through a well defined structure;**
- **Be coherent with other internationally agreed frameworks and accounting systems as appropriate;**
- **Help identify data gaps and a core set of environment statistics;**
- **Facilitate the identification of roles and responsibilities of various actors and institutions related to the regular production of environment statistics;**
- **Be scientifically based, up-to-date and reflecting the current state of the art with regard to the policy and statistical developments over the past three decades; and**
- **Guide countries at an early stage of development of environment statistics.**

# Special characteristics of environment statistics

1. **Multiple sources and users**
2. **Spatial and temporal considerations**
3. **Use of data from non-traditional sources** (e.g., monitoring stations, remote sensing, GIS)
4. **Specific methods** (e.g., aggregation)
5. **Institutional dimension**
6. **The need for a framework**

# Objectives of the FDES

- **The main purpose of the revised FDES is to serve as a reference and guide for the development of environment statistics at the national, regional and international levels.**

- **The FDES is designed to provide guidance to countries in the early stages of developing environment statistics, but it can also guide the evaluation of the coverage and focus of more advanced countries.**

- **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.**

# Users of the FDES

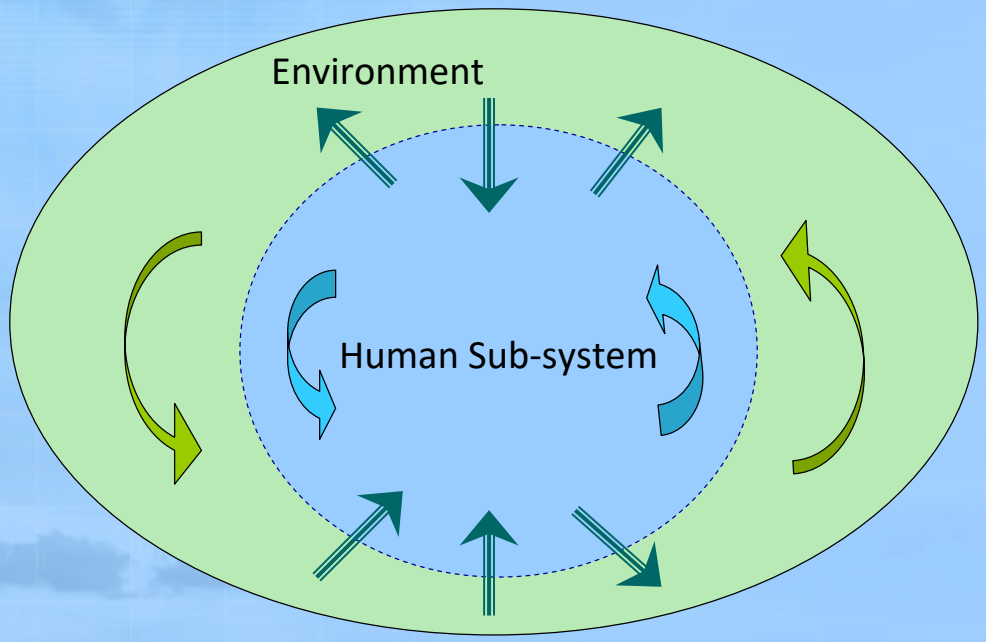
**The FDES is primarily designed to assist environmental statisticians within national statistical offices, environmental ministries and other agencies that are in charge of, or participate in, developing environment statistics – *particularly those in early stages of development.***

**The FDES is also aimed at assisting regional and global international agencies involved in the production of environment statistics.**

**It supports inter-agency collaboration, mitigating challenges presented by the cross-cutting nature of environment statistics.**

# Conceptual foundation of the FDES

- **The ecosystem approach and the natural capital approach to environmental data collection and organization have both been taken into consideration when developing the foundation for the FDES.**
- **The FDES is based on a conceptual foundation that considers humans and the human sub-system as integral parts of, and interacting with, the environment.**




***Human societies and their methods of extraction, production, consumption and disposal of residuals impact the environment that supports them and other life forms in general.***

***The changing environment, in turn, impacts humans in different ways.***

***The interactions between and within the different systems are often complex and interwoven.***

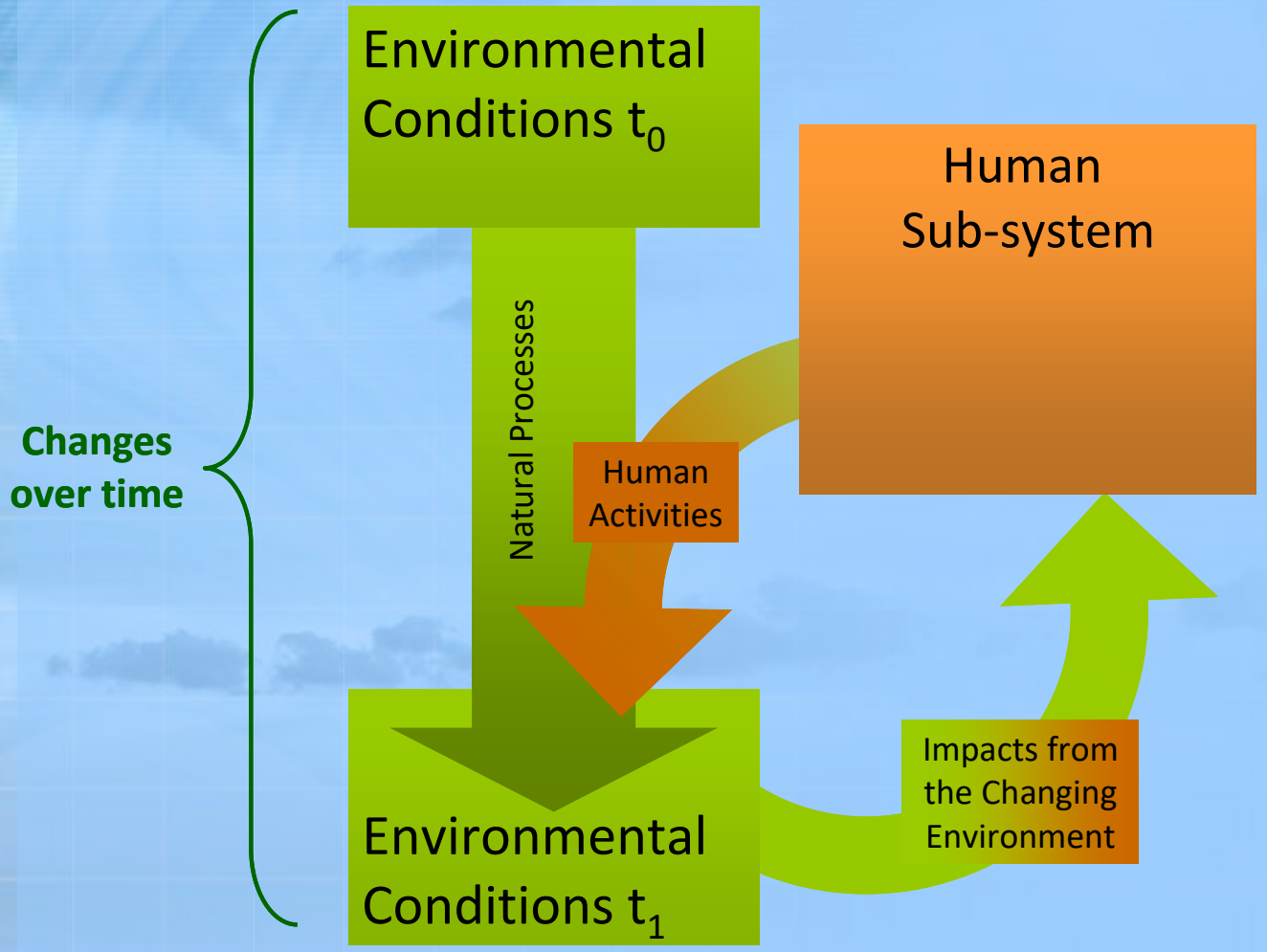
Processes within the environment

Processes within the human sub-system

Interactions between the environment and the human sub-system

# Conceptual foundation of the FDES (2)

- **To break down the complex processes of the environment into simpler aspects for statistical purposes, a structured sequence has been developed:**




***Humans use the environment for both production and consumption.***

***Environmental conditions vary as a result of both natural processes and human activities. In turn, the human sub-system is changed by the changing environmental conditions.***

***Due to the interconnectivity between all of the different systems, changes in one part can influence a variety of different parts of the system typically through feed-back type mechanisms.***

# Scope of the FDES

- The scope of environment statistics 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.

- Environment statistics quantitatively and qualitatively describe the state and quality of the environment as well as the interactions among the environment, human activities, and natural events.

- While the human sub-system exists within the context of the environment, not all social and economic processes within the human sub-system fall within the scope of the FDES. The statistics which describe the human sub-system in isolation from their environmental context belong to the realm of social or economic statistics.

# Structure of the FDES

- **The FDES organizes environment statistics into components, sub-components and statistical topics using a multi-layered approach.**

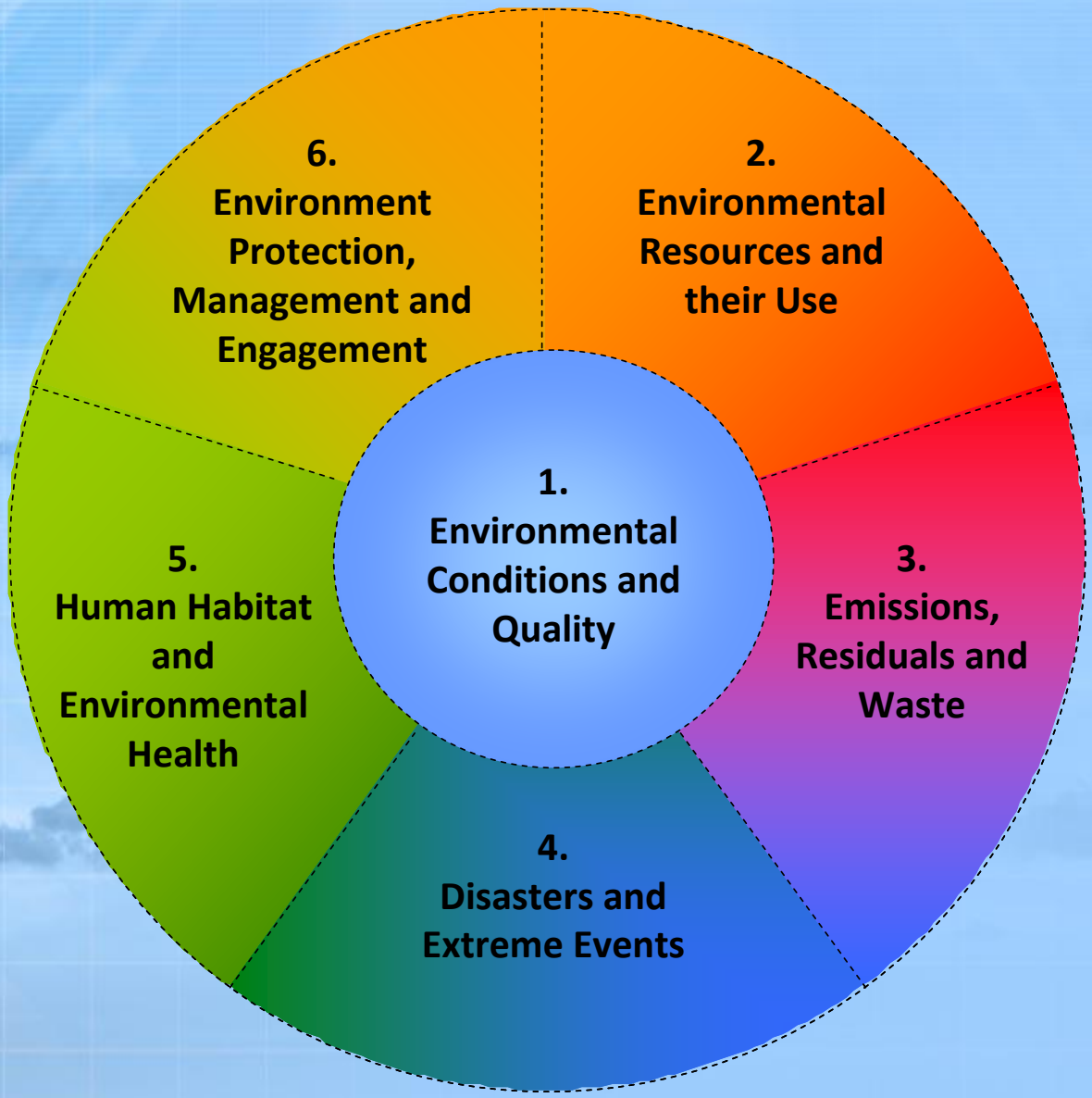
**The first layer of the structure is composed of six fundamental components describing the state of the environment, its changes, and interactions with human activities**

**The second layer describes the subcomponents which constitute the six fundamental components.**

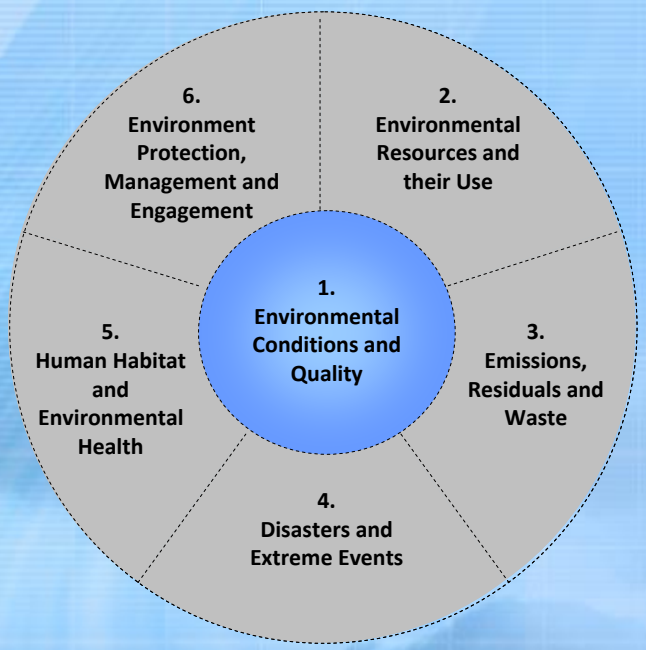
**The third, most disaggregated layer presents the statistical topics which are grouped under the sub-components.**

***The FDES is a work in progress and is subject to revision.***

# The Six Components of the FDES




*The FDES is a work in progress and is subject to revision.*




# Component 1: Environmental Conditions and Quality – Subcomponents and Topics

**Sub-component 1.1: Physical Conditions**

- *Topic 1.1.1: Atmosphere, climate and weather*
- *Topic 1.1.2: Hydrological systems*
- *Topic 1.1.3: Geological and geographic information*

**Sub-component 1.2: Soil and Land Cover**

- *Topic 1.2.1: Soil characteristics*
- *Topic 1.2.2: Land cover*

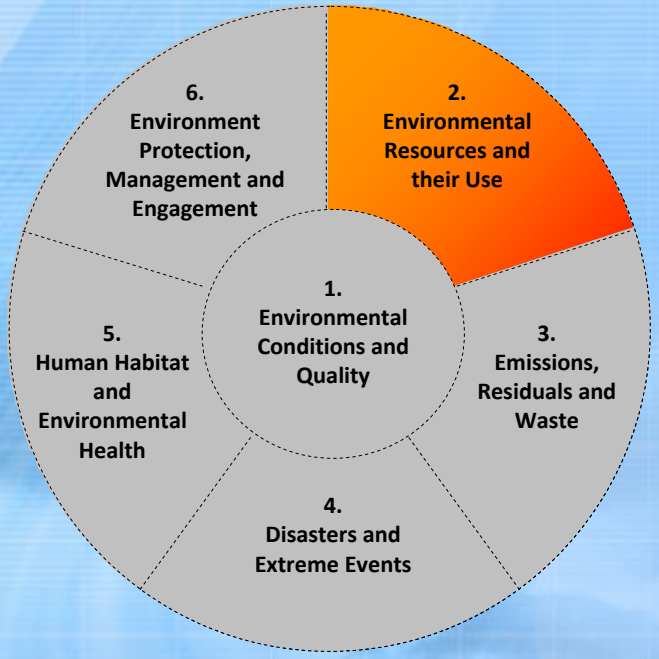
**Sub-component 1.3: Biodiversity and Ecosystems**

- *Topic 1.3.1: Biodiversity*
- *Topic 1.3.2: Ecosystems*
- *Topic 1.3.3: Forests*

**Sub-component 1.4: Environmental Quality**

- *Topic 1.4.1: Air quality*
- *Topic 1.4.2: Freshwater quality*
- *Topic 1.4.3: Marine water quality*
- *Topic 1.4.4: Soil quality*
- *Topic 1.4.5: Noise*

*The FDES is a work in progress and is subject to revision.*




# Component 2: Environmental Resources and their Use

**Sub-component 2.1: Non-Energy Mineral Resources**

- *Topic 2.1.1: Stocks and changes of non-energy mineral resources*
- *Topic 2.1.2: Extraction of non-energy mineral resources and related activities*

**Sub-component 2.2: Energy Resources**

- *Topic 2.2.1: Stocks and changes of mineral energy resources*
- *Topic 2.2.2: Extraction of mineral energy resources and related activities*
- *Topic 2.2.3: Production and use of energy resources and related activities*

**Sub-component 2.3: Land**

- *Topic 2.3.1: Land use*
- *Topic 2.3.2: Land use changes*

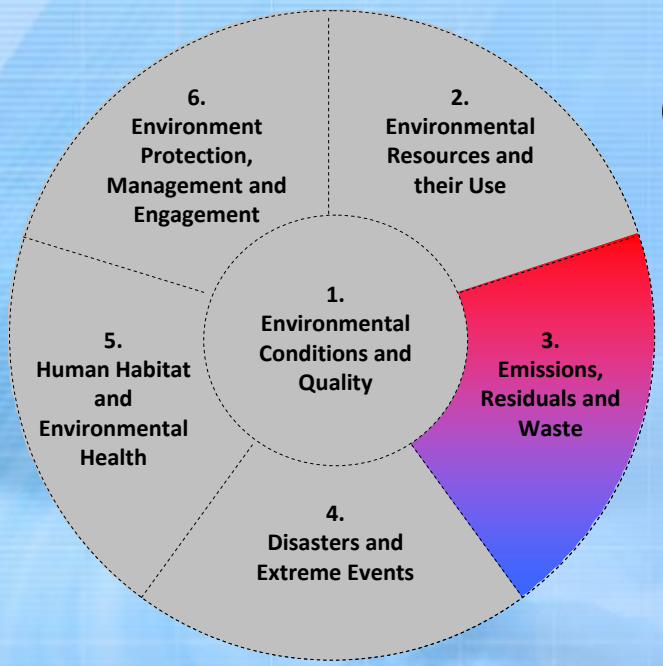
**Sub-component 2.4: Soil Resources**

- *Topic 2.4.1: Soil Resources*

**Sub-component 2.5: Biological Resources**

- *Topic 2.5.1: Timber resources and their use*
- *Topic 2.5.2: Aquatic resources and their use*
- *Topic 2.5.3: Crops*
- *Topic 2.5.4: Livestock*
- *Topic 2.5.6: Wild, uncultivated biological resources*

*The FDES is a work in progress and is subject to revision.*




# Component 3: Emissions, Residuals and Waste

## Sub-component 3.1: Emissions to Air

*Topic 3.1.1: Emissions to air*

## Sub-component 3.2: Generation, Management and Discharge of Wastewater

*Topic 3.2.1: Generation and pollutant content of wastewater*

*Topic 3.2.2: Collection and treatment of wastewater*

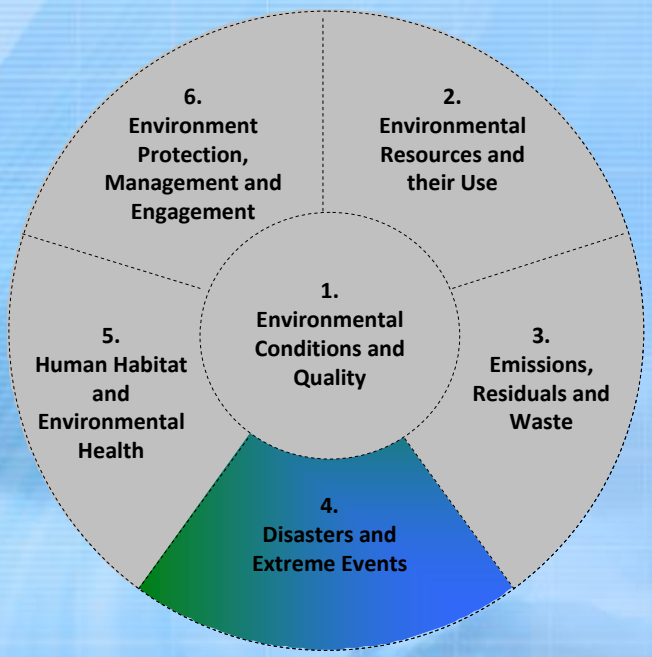
*Topic 3.2.3: Discharge of wastewater to the environment*

## Sub-component 3.3: Generation and Management of Waste

*Topic 3.3.1: Generation of waste*

*Topic 3.3.2: Management of waste*

*The FDES is a work in progress and is subject to revision.*




# Component 4: Disasters and Extreme Events

## Sub-component 4.1: Natural Disasters and Extreme Events

***Topic 4.1.1: Occurrence of natural disasters and extreme events***

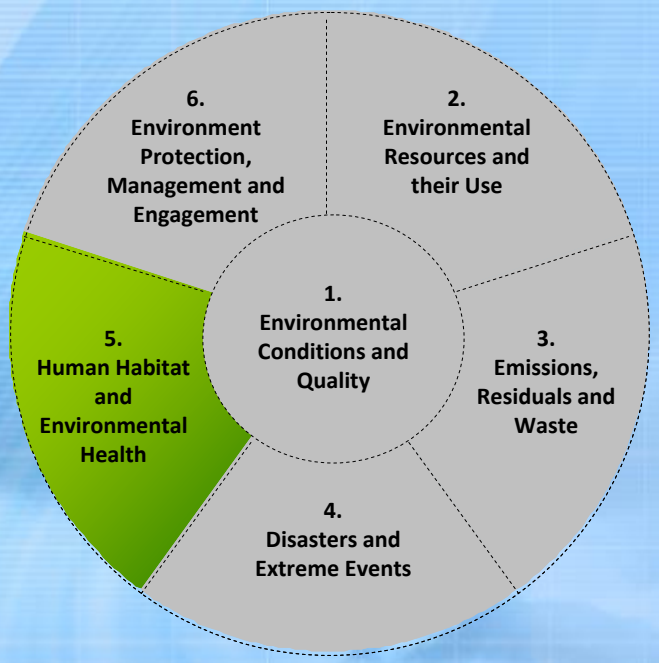
***Topic 4.1.2: Impact of natural disasters and extreme events***

## Sub-component 4.2: Anthropogenic/technological Disasters

***Topic 4.2.1: Occurrence of anthropogenic/technological disasters***

***Topic 4.2.2: Impact of anthropogenic/technological disasters***

*The FDES is a work in progress and is subject to revision.*




# Component 5: Human Habitat and Environmental Health

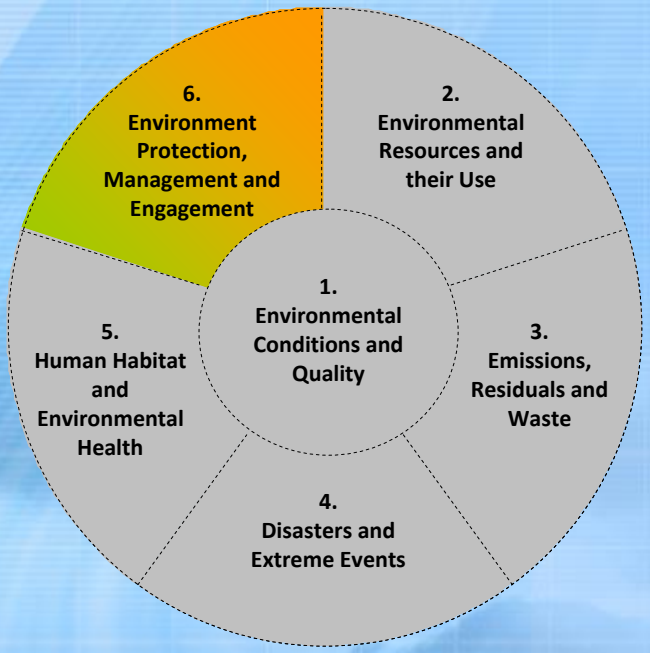
## Sub-component 5.1: Human Habitat

- *Topic 5.1.1: Urban and rural population*
- *Topic 5.1.2: Water and sanitation*
- *Topic 5.1.3: Housing conditions*
- *Topic 5.1.4: Exposure to ambient pollutants related to spatial location of population*
- *Topic 5.1.5: Other urban habitat concerns*

## Sub-component 5.2: Environmental health

- *Topic 5.2.1: Airborne diseases and conditions*
- *Topic 5.2.2: Water-related diseases and conditions*
- *Topic 5.2.3: Vector-borne diseases*
- *Topic 5.2.4: health problems associated with excessive UV radiation exposure*
- *Topic 5.2.5: Toxic substance related diseases and conditions*
- *Topic 5.2.6: Nuclear radiation related diseases and conditions*

*The FDES is a work in progress and is subject to revision.*




# Component 6: Environment Protection, Management and Engagement

**Sub-component 6.1: Environment Protection and Management Expenditure**

- *Topic 6.1.1: Government environment protection and management expenditure*
- *Topic 6.1.2: Corporate, non-profit institution and household environment protection and management expenditure*

**Sub-component 6.2: Environmental Governance, Regulation and Engagement**

- *Topic 6.2.1: Institutional strength*
- *Topic 6.2.2: Environmental regulation and instruments*
- *Topic 6.2.3: Participation in multilateral environmental agreements (MEAs) and environmental conventions*

**Sub-component 6.3: Disaster Preparedness and Management**

- *Topic 6.3.1: Disaster preparedness and management for natural disasters and extreme events*
- *Topic 6.3.2: Disaster preparedness and management for anthropogenic/technological disasters*

**Sub-component 6.4: Environmental Information, Education and Perception**

- *Topic 6.3.1: Environmental information*
- *Topic 6.3.2: Environmental education and awareness*
- *Topic 6.3.3: Environmental participation and perception*

*The FDES is a work in progress and is subject to revision.*

# Relationship with social and economic statistics

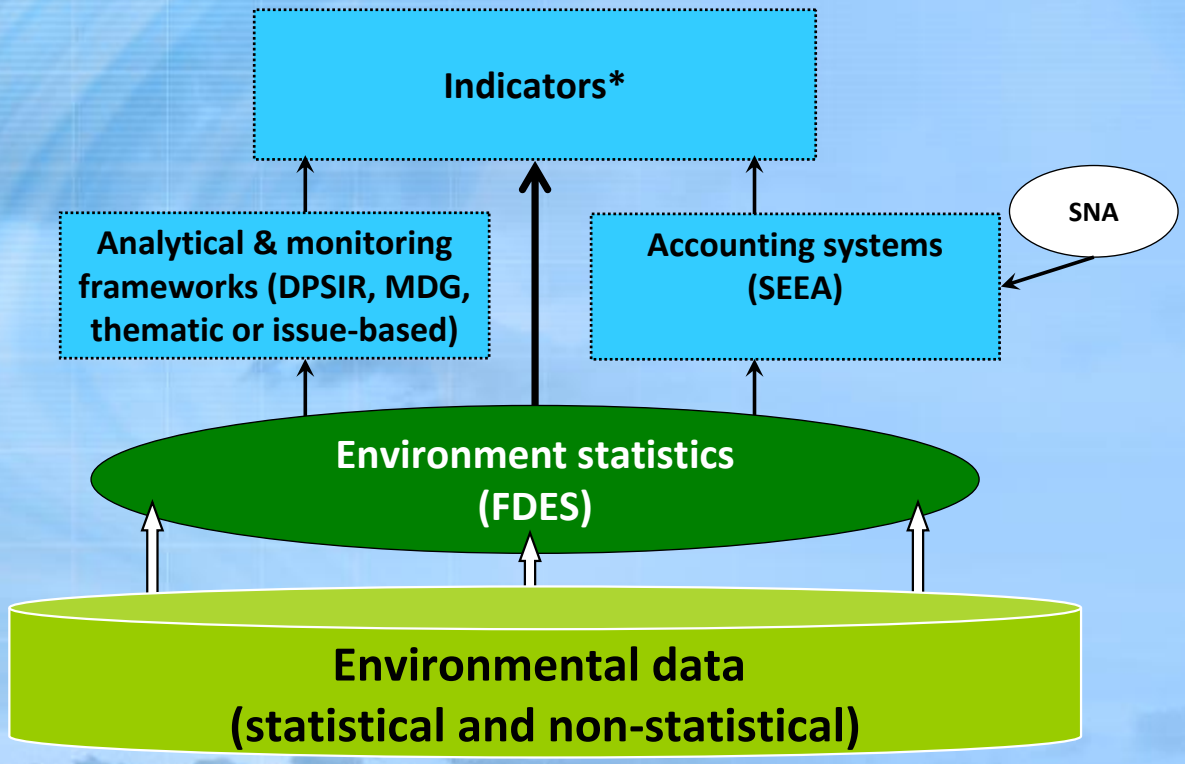
**The subject of environment statistics is closely related to social and economic statistics.**

- When properly integrated, data and other inputs from both these domains can enrich the analyses of environmental data.
- For example, basic environment statistics can be combined with both economic and social statistics to produce environmental and sustainable development indicators.

**Economic and social statistics describing activities that have a direct impact on the environment are considered part of environment statistics.**

- Other relevant economic and social statistics are also required to put environmental issues in context but those are not considered environment statistics.
- The use of consistent classifications among these fields helps their integration.

# Relationship of the FDES to other frameworks, systems and indicator sets




*Note: Size of figures does not correlate to volume of data, statistics, indicators, etc.*
DPSIR = Driving forces-Pressures-State-Impacts-Responses
SEEA = System of Environmental-Economic Accounting
SNA = System of National Accounts
*Economic and/or social statistics may also be needed

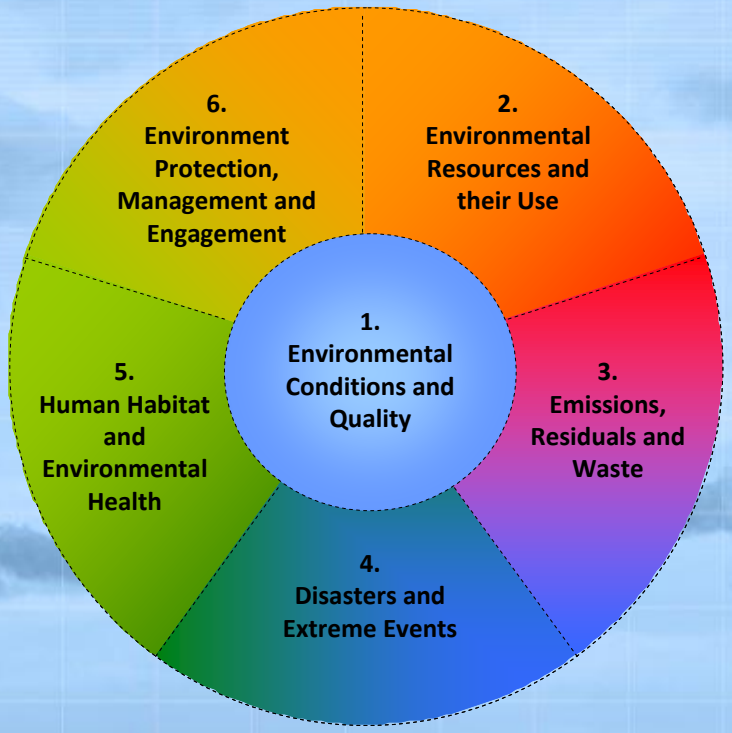
***Environmental data are large amounts of unprocessed observations and measurements about the environment.***

***Environment statistics aggregate, synthesize and structure environmental data.***

***For specific analytical purposes, environment statistics may be further processed according to:***

- ***Different analytical frameworks such as the SEEA or the DPSIR framework;***
- ***Issue-based frameworks;***
- ***Indicator frameworks (e.g., MDG reporting framework);***
- ***Frameworks such as ecological footprint accounting, material flows or life cycle analysis.***

# The Core Set of Environment Statistics




*The Core Set of Environment Statistics is a work in progress and is subject to revision.*

# Mandate from SC 2010

In response to requests from many developing countries, it was recommended by the Expert Group Meeting (EGM) in New York in 2009, and further approved by the UNSC in 2010, that UNSD develop a Core Set of Environment Statistics.

It was also decided that the revised FDES would contain the Core Set of Environment Statistics but more detailed information, for example, methodological description and guidance for data collection, would be provided in subsequent manuals.

The Core Set is being designed to provide guidance on the collection of a minimum set of environment statistics to countries that have very limited resources and are at the early stages of developing environment statistics.

# Definition and Characteristics of the Core Set

- **The Core Set of Environment Statistics:**
  - **Proposes a minimum set of relevant and useful environment statistics that can be used for analysis and reporting on the environment;**
  - **Should include a limited number of statistics, all of which are globally relevant; and**
  - **Should include statistics not indicators.**

- **The Core Set does not constitute an exhaustive collection of environment statistics. It gives guidance for prioritizing data collection for environment statistics and has been designed to be methodologically sound and easily understood.**

- **Each country can and should complement the Core Set with environment statistics according to its own circumstances as well as policy and reporting needs.**

# Objectives of the Core Set

**The primary objectives of the Core Set of Environment Statistics are:**

- **To provide guidance to countries with limited resources and at early stages in the development of environment statistics;**
- **To serve as a comparable minimum set of environment statistics that most countries will be able to produce;**
- **To supply national and international policy-makers with the most necessary information on issues of interest to countries, but also on issues that go well beyond national boundaries;**
- **To facilitate the assessment of international data collection and monitoring of major global and regional indicator initiatives;**
- **To consider the most pertinent data needs created by global environmental conventions and MEAs; and**
- **To serve as the underlying statistics for deriving environmental indicators.**

# The process of development of the Core Set

- By May 2011, UNSD compiled and analyzed 2575 statistics/indicators from 37 sources (65 lists/sets) comprising international, regional institutions, conventions etc., selected 10 themes (and sub-themes) under which to organize them, and then presented a more refined list of statistics/indicators to the EG.
- The EG:
  - Agreed with the process being followed;
  - Agreed upon criteria for selection of the Core Set (see next slide); and
  - Recommended that UNSD continue the work following the evolving structure of the revised FDES.
- UNSD, the EG, and a special subgroup of the EG have continued working on the development of the Core Set during 2011 and 2012.

# Criteria for selection

**The EG agreed that:**

- **The Core Set should be based on the *UNSD List of Environmental Indicators* (adopted by the UNSC in 1995) and on assessment of international data collections, major global/regional indicator initiatives;**

- **A core statistic should be one that is either important in its own right or one that is needed for the derivation of a multitude of indicators;**

- **The selection of statistics should consider pertinent data needs created by global environmental conventions and MEAs; and**

- **The key criteria for the selection of the Core Set should be policy relevance, measurability and methodological soundness.**

# Current state of the Core Set

- **A preliminary list of environment statistics has been prepared, the allocation to topics and identification of the Core Set statistics are subject to extensive expert consultation and revision.**

**Component 1: Environmental Conditions and Quality**

**Sub-component 1.1: Physical Conditions**

| Topic | Statistics |
|---|---|
| **Topic 1.1.2: Hydrological systems** | a. Lakes<br>1. **Number**<br>2. **Surface area**<br>3. **Volume**<br>4. **Location**<br>5. Surface water inflow<br>6. Inflows from and outflows to other major water bodies<br>b. Rivers<br>1. **Number**<br>2. **Surface area**<br>3. **Volume**<br>4. **Location**<br>5. Surface water inflow<br>6. Inflows from and outflows to other major water bodies<br>c. Reservoirs<br>1. **Number**<br>2. **Surface area**<br>3. **Volume**<br>4. **Location**<br>5. Surface water inflow<br>6. Inflows from and outflows to other major water bodies<br>d. Watersheds<br>1. **Description of main watersheds**<br>e. Seas<br>1. Surface area<br>2. Depth<br>3. Location<br>4. Inflows from rivers<br>f. Groundwater<br>1. Number of aquifers<br>2. Extent<br>3. Volume<br>4. Groundwater outflow<br>5. Groundwater inflow |

**Component 2: Environmental Resources and their Use**

**Sub-component 2.6: Water Resources**

| Topic | Statistics |
|---|---|
| **Topic 2.6.1: Water resources** | a. **Inflow of water to inland water resources**<br>1. **Precipitation**<br>2. **Inflow from neighbouring territories**<br>b. **Outflow of water from inland water resources**<br>1. **Evapotranspiration**<br>2. **Outflow to neighbouring territories**<br>3. **Outflow of water to the sea**<br>c. Inland water stocks<br>1. Surface water stocks in artificial reservoirs<br>2. Surface water stocks in lakes<br>3. Surface water stocks in rivers and streams<br>4. Surface water stocks in wetlands<br>5. Surface water stocks in snow, ice and glaciers<br>6. Groundwater stocks |
| **Topic 2.6.2: Abstraction, use and returns of waters** | d. **Water abstraction by economic activity**<br>e. **Water abstraction from surface water**<br>f. **Water abstraction from groundwater**<br>1. **From renewable groundwater resources**<br>2. **From non-renewable groundwater resources**<br>g. **Water abstracted for own use**<br>h. **Water abstracted for distribution**<br>i. **Desalinated water**<br>j. **Reused water**<br>k. **Water use by supply category**<br>l. **Water use by economic activity**<br>m. Collection of precipitation<br>n. Water abstraction from the sea<br>o. Losses in distribution<br>p. Exports of water<br>q. Imports of water<br>r. (Waste)water returned by economic activity<br>s. Cooling water returned by economic activity<br>t. Other returns (e.g., from hydropower, etc) |

*The Core Set of Environment Statistics is a work in progress and is subject to revision.*

# Remaining tasks in the development of the FDES and the Core Set

- **For the FDES:**
  - Finalize revised FDES in consultation with the EG
  - Global consultation

- **For the Core Set of Environment Statistics:**
  - Finalize Core Set in consultation with the EG and the IWG-ENV
  - Resources permitting, potential piloting with selected countries
  - Global consultation

- **For the entire document:**
  - Development of an implementation plan
  - Presentation to the 44th session of the UNSC in 2013
  - Development of handbooks which detail the types, sources and content of data needed to provide statistics on the Components of the FDES

# The FDES is a multi-purpose statistical framework serving many different user needs