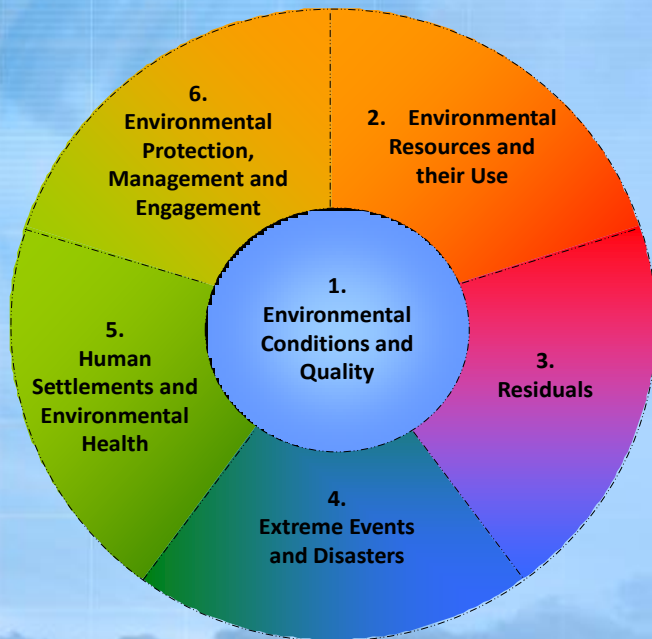
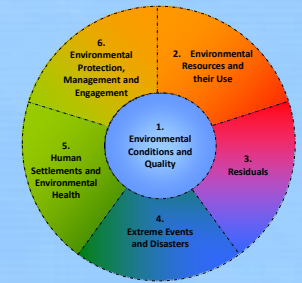


Components, sub-components and statistical topics of the FDES 2013

Component 1: Environmental conditions and quality



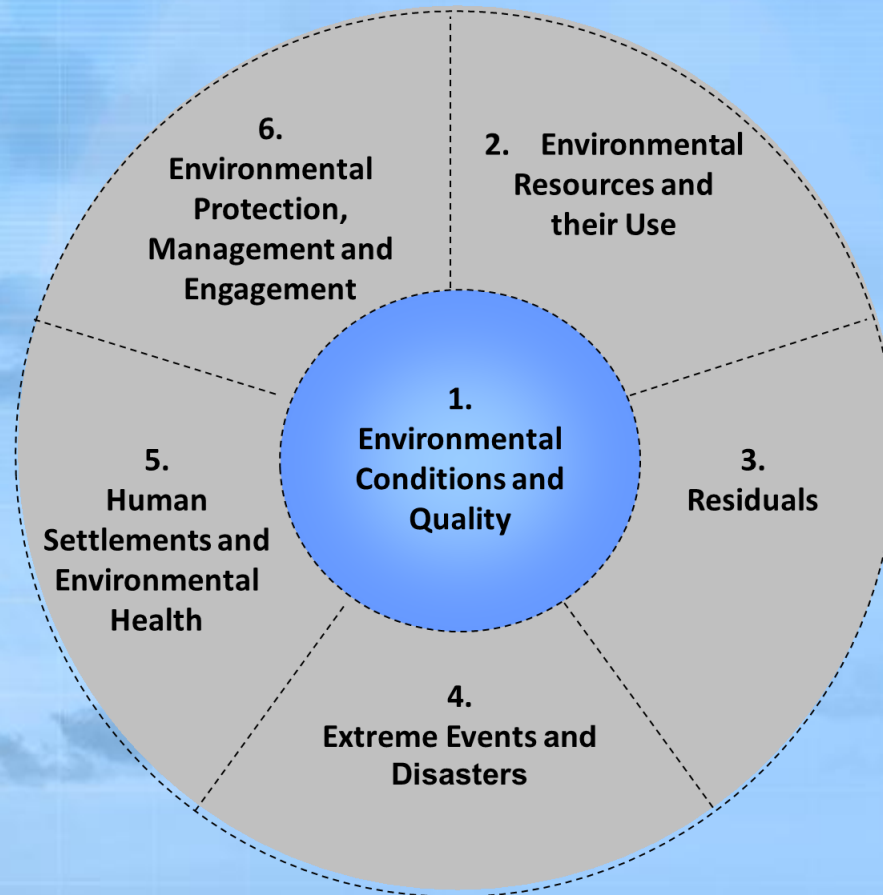
**Workshop on Environment Statistics in support of the
implementation of the Framework for the Development of
Environment Statistics (FDES 2013)
(Lomé, Togo, 19-23 October 2015)**



- This presentation has been elaborated by the Environment Statistics Section of the United Nations Statistics Division.
- Based on Chapter 3 of the Framework for the Development of Environment Statistics (FDES 2013).



Component 1: Environmental Conditions and Quality





Contents of Component 1: Environmental Conditions and Quality

- ❖ It includes statistics about the physical, biological and chemical characteristics of the environment and their changes over time.
- ❖ These fundamental background conditions are strongly interrelated and determine the types, extent, conditions and health of ecosystems.
- ❖ The source of the data is usually remote sensing and monitoring by environmental, meteorological, hydrological, geological and geographical authorities or institutions.

- ❖ Relationship with other frameworks:
 - Component 1 includes statistics relevant to the State and Impact elements of the DPSIR framework.
 - It also provides basic statistics for the SEEA Experimental Ecosystem Accounting.

- ❖ *Exclusions: Stocks and flows of environmental resources are discussed in Component 2.*





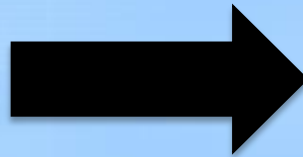
Component 1: Overview

Component 1 Environmental Conditions and Quality	Sub-Component 1.1 Physical Conditions (4 topics, 62 statistics)	Topic 1.1.1: Atmosphere, climate and weather Topic 1.1.2: Hydrographical characteristics Topic 1.1.3: Geological and geographical information Topic 1.1.4: Soil characteristics
	Sub-Component 1.2 Land Cover, Ecosystems and Biodiversity (3 topics, 20 statistics)	Topic 1.2.1: Land cover Topic 1.2.2: Ecosystems and biodiversity Topic 1.2.3: Forests
	Sub-Component 1.3 Environmental Quality (5 topics, 59 statistics)	Topic 1.3.1: Air quality Topic 1.3.2: Freshwater quality Topic 1.3.3: Marine water quality Topic 1.3.4: Soil pollution Topic 1.3.5: Noise



Sub-Component 1.1: Physical Conditions

Sub-Component 1.1
Physical Conditions



Topic 1.1.1

Atmosphere, climate
and weather

Topic 1.1.2

Hydrographical
characteristics

Topic 1.1.3

Geological and
geographical
information

Topic 1.1.4

Soil characteristics





Sub-Component 1.1: Physical Conditions

- ❖ It was designed to capture those physical aspects of the environment which change relatively slowly due to human influence.
- ❖ It contains statistics on meteorological, hydrographical, geological and geographical conditions, and soil characteristics.





Sub-Component 1.1: Physical Conditions

Topic 1.1.1: Atmosphere, climate and weather

- ❖ This topic covers data on atmospheric, climatic and weather conditions across territories and over time.
- ❖ Weather information describes the atmosphere's behaviour over a given territory in the short term. It is recorded by countries through a network of monitoring stations. Climate is determined by long-term weather conditions over that territory.
- ❖ Relevant data usually include aspects such as temperature, precipitation, humidity, pressure, wind speed, solar radiation, ultraviolet (UV) radiation and the occurrence of El Niño and La Niña events.
- ❖ In most countries, atmospheric, weather and climate authorities monitor and record these types of environmental data over long periods using a network of monitoring stations scattered throughout the country.
- ❖ *Statistics on air quality are covered under Sub-component 1.3: Environmental Quality.*





Sub-Component 1.1: Physical Conditions

Topic 1.1.2: Hydrographical characteristics

- ❖ This topic includes hydrographical information on the extent, location and characteristics of lakes, rivers and streams, artificial reservoirs, watersheds, seas, aquifers and glaciers.
- ❖ This information is best presented in map form.
- ❖ The main sources are hydrographical and hydrological information systems that are usually managed by national geographical, hydrological institutions and water authorities.
- ❖ *Statistics on water quality are covered in Topic 1.3.2 and Topic 1.3.3. Statistics on water resources and their use are covered under Component 2.*





Sub-Component 1.1: Physical Conditions

Topic 1.1.3: Geological and geographical information

- ❖ This topic includes general geological and topographic information on the extent and characteristics of the country's territory and relief.
- ❖ Because of their nature, these geological (e.g., bedrock, fault lines and volcanoes), geographical (e.g., territorial borders, area of country, elevation and length of marine coastline) data are often presented in map form.
- ❖ The main data sources are information systems operated by national geographical and geological institutions and authorities.
- ❖ *Statistics on stocks of mineral resources and their extraction are included in Component 2*





Sub-Component 1.1: Physical Conditions

Topic 1.1.4: Soil characteristics

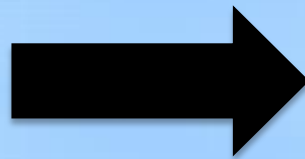


- ❖ Soil:
 - provides the physical base to support the production and cycling of biological resources,
 - provides the foundation for buildings and infrastructure,
 - constitutes the source of nutrients and water for agriculture and forestry systems,
 - provides a habitat for diverse organisms,
 - plays an essential role in carbon sequestration and fulfils a complex buffering role against environmental variability.
- ❖ The topic covers information on soil characterization, soil degradation and nutrient content of soil.
 - Statistics on soil characteristics includes the area by soil types.
 - Degradation include measures of erosion, desertification, salinization, waterlogging, acidification and compaction of specific soil types in particular parts of the country.
 - The nutrient content of soil is typically assessed using data on levels of nitrogen(N), phosphorous(P), calcium(Ca), magnesium(Mg), potassium(K), zinc(Zn) and other substances.
- ❖ *Soil pollution statistics are included under Topic 1.3.4: Soil pollution.*



Sub-Component 1.2: Land Cover, Ecosystems and Biodiversity

Sub-Component 1.2
Land Cover,
Ecosystems and
Biodiversity



Topic 1.2.1
Land cover

Topic 1.2.2
Ecosystems and
biodiversity

Topic 1.2.3
Forests



Sub-Component 1.2: Land Cover, Ecosystems and Biodiversity

- ❖ Organizes environment statistics on land cover, ecosystems and biodiversity, as well as their recordable changes over time and across locations.

Exclusions

- ❖ Because of the importance of forests worldwide, the most important aspects and statistics required to describe them are organized under a separate topic, Topic 1.2.3: Forests.
- ❖ Statistics on biological resources (such as timber and fish) and their harvesting are contained in Component 2: Environmental Resources and their Use.



Sub-Component 1.2: Land Cover, Ecosystems and Biodiversity

Topic 1.2.1: Land Cover

- ❖ This topic includes statistics on the extent, and the physical and spatial characteristics of land cover.
- ❖ The main source of land cover information is remote sensing data that maps the different categories of land cover.
- ❖ Land cover is “the observed (bio) physical cover on the earth's surface”. (FAO)
- ❖ The Land Cover Classification System (LCCS) was developed by FAO. An interim classification composed of 14 classes was developed in the SEEA-CF following a comprehensive global consultation process. These 14 classes were generated using the LCCS approach and thus provide a comprehensive set of land cover types, all of which are mutually exclusive and unambiguous, with clear boundaries and systematic definitions.
 - The aim of the classification is to provide a common framework to compile and aggregate land cover information available at the national level and enabling its comparability at the international level, and to provide a structure to guide data collection and the creation of land cover databases for countries that are developing land cover statistics.





Sub-Component 1.2: Land Cover, Ecosystems and Biodiversity

Topic 1.2.2: Ecosystems and biodiversity

Ecosystems

- ❖ This topic covers physical quantitative as well as qualitative information and statistics about a country's main ecosystems, including the extent, chemical and physical characteristics, and biological components (biodiversity) of the ecosystems.
- ❖ Ecosystems are dynamic complexes of plant, animal and microorganism communities and the non-living environment interacting as a functional unit.
- ❖ The extent and conditions of the ecosystems determine their capacity to produce ecosystem services.
- ❖ For the purposes of characterizing the ecosystems of a country, in the absence of an internationally agreed ecosystem classification, national classifications may be used and fully described for statistical purposes. Alternatively, the country may follow and adapt other ecosystem categories used internationally, such as the Millennium Ecosystem Assessment reporting categories.



Sub-Component 1.2: Land Cover, Ecosystems and Biodiversity

Topic 1.2.2: Ecosystems and biodiversity (cont.)

Biodiversity

- ❖ Statistics on biodiversity include the diversity of flora and fauna species, protected areas and protected species. To be specific for each category:
 - Flora & fauna species: typical themes include the number and population trends of known species of flora and fauna (terrestrial, freshwater and marine) and their vulnerability status category.
 - Protected areas: physical and descriptive information and statistics on protected terrestrial and marine areas within the country.
 - Protected species: includes the number of protected species and their vulnerability status category.

- ❖ Sources of data:
 - Data on species populations are often obtained from expert and ad-hoc scientific studies and assessments, as well as research conducted by NGOs and civil society.
 - Data on protected areas and species are provided mainly by administrative records. Data may also be found in secondary databases and reports on the status of ecosystems or the state of the environment. They usually fall under the responsibility of environmental authorities and are frequently produced for the national and sub-national levels.



Sub-Component 1.2: Land Cover, Ecosystems and Biodiversity

Topic 1.2.3: Forests

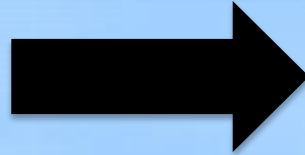
- ❖ Relevant statistics in this topic include:
 - forest area, which can be disaggregated by different forest types (e.g., primary forest, other naturally generated forest and planted forest).
 - forest biomass and its carbon storage, and a characterization of forest ecosystems that exist in the country, including types, location, area and main species of flora and fauna living in the forest.
 - forest area affected by fire.
- ❖ Sources of data:
 - Data on forest area and its biophysical characteristics may be obtained from remote sensing, field surveys, forest inventories and forestry statistics from forest management agencies (e.g., agricultural and forestry authorities).
- ❖ *Timber and other forest resources and their use are covered under Component 2.*





Sub-Component 1.3: Environmental Quality

Sub-Component 1.3
Environmental Quality



Topic 1.3.1
Air Quality

Topic 1.3.2
Freshwater Quality

Topic 1.3.3
Marine Water Quality

Topic 1.3.4
Soil Pollution

Topic 1.3.5
Noise



Sub-Component 1.3: Environmental Quality

- ❖ This sub-component organizes statistics on the concentration of pollutants in the air, freshwater and marine water, and on soil pollution and noise levels.
- ❖ This pollution impacts both the human sub-system and ecosystems.
- ❖ Policy makers, analysts and civil society require statistics on environmental quality to monitor and make evidence-based policies to maintain and improve environmental quality globally and in each country.
- ❖ The spatial implications of pollutant concentration statistics are particularly important because of the fluidity of the environmental media (e.g., fresh and marine water and air). This underscores the need for collaboration between statistical offices and environmental agencies on the design (sampling pattern) of monitoring networks.

Exclusions

It should be noted that the emissions of these pollutants are not included here but, rather, in Component 3: Residuals.



Sub-Component 1.3: Environmental Quality

Topic 1.3.1: Air Quality

- ❖ This topic includes statistics on the ambient concentration of the most important air pollutants, including suspended solid particles, gases and other relevant pollutants that can have a negative effect on human and ecosystem health.
- ❖ Air quality is usually measured at monitoring stations. Based on their location and purpose, monitoring stations may be impact, regional or background stations.
- ❖ National monitoring of air quality is usually limited to urban settlements where polluting activities and the affected population are concentrated. Air quality monitoring is also conducted frequently in ecosystems or habitats of outstanding value or of high vulnerability.
- ❖ Statistics based on these measurements may be used to describe certain aspects of ecosystem health.





Sub-Component 1.3: Environmental Quality

Topic 1.3.2: Freshwater Quality

- ❖ Without sufficient quantities of good quality freshwater, ecosystems and humans cannot survive. Precipitation, aquifers, lakes, rivers, coastal zones and oceans are all interconnected in the water cycle, so the choice of where to measure or monitor pollutants and which pollutants to monitor will depend on local and national priorities, ecosystem characteristics and available resources.
- ❖ The quality of freshwater can be described based on concentrations of nutrients and chlorophyll, organic matter, pathogens, metals and organic contaminants, and by physical and chemical characteristics in surface water and groundwater.
- ❖ Data for water quality statistics are produced primarily by monitoring stations.





Sub-Component 1.3: Environmental Quality

Topic 1.3.3: Marine Water Quality

- ❖ Relevant statistics about marine and coastal water quality and pollutant concentrations may include, but are not limited to, nutrients and chlorophyll, organic matter, pathogens, metals, organic contaminants, physical and chemical characteristics, and coral bleaching.
- ❖ The most commonly monitored marine pollutants and associated phenomena, such as eutrophication and red tide, can be analysed as relevant in local, national or supranational terms, based on the type of pollution and effect.
- ❖ Data sources for marine water quality statistics are typically either national or international monitoring stations, associated with scientific research or compliance with policy objectives and targets.
- ❖ Spatial and temporal considerations are very important when constructing statistics on this topic.





Sub-Component 1.3: Environmental Quality

Topic 1.3.4: Soil Pollution



- ❖ Soil pollution is typically caused by chemicals and other residuals disposed of by humans. Some of the most commonly measured soil pollutants include petroleum hydrocarbons (e.g., oil residuals and solvents), pesticides and heavy metals.
- ❖ Soil pollution directly affects human and environmental health and land productivity based on factors including pollutant concentration, depth of contact with biota and density of humans in polluted areas.
- ❖ Data for soil pollution are produced primarily by monitoring stations and will be related to those specific locations. The data from these monitoring stations require further processing to produce environment statistics on the soil quality of specific locations.
- ❖ The data available for statistical purposes are usually limited and not systematic.
- ❖ Relevant statistics include the number and area of contaminated, potentially contaminated, remediated and other sites.



Sub-Component 1.3: Environmental Quality

Topic 1.3.5: Noise

- ❖ Noise pollution exists not only in the most populated or busiest cities, but also wherever human activities are conducted, such as adjacent to highways, near airports and marine ports and around manufacturing, metal processing and mining establishments and construction sites.
- ❖ Noise pollution negatively affects the welfare and health of humans and also affects ecosystems.
- ❖ Noise pollution is typically measured using calibrated instruments in specific spatially located stations. These monitoring stations, operated by the relevant national or local environmental authority, typically produce data that require further processing to be converted into statistics on noise levels from specific sources and in specific locations.
- ❖ The resulting statistics on, for example, noise levels and intensity, are produced for and are relevant to the specific local areas where the most problematic noise pollution conditions exist.





Questions, comments for Component 1?





Thank you for your attention!

For more information please contact the Environment Statistics Section
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