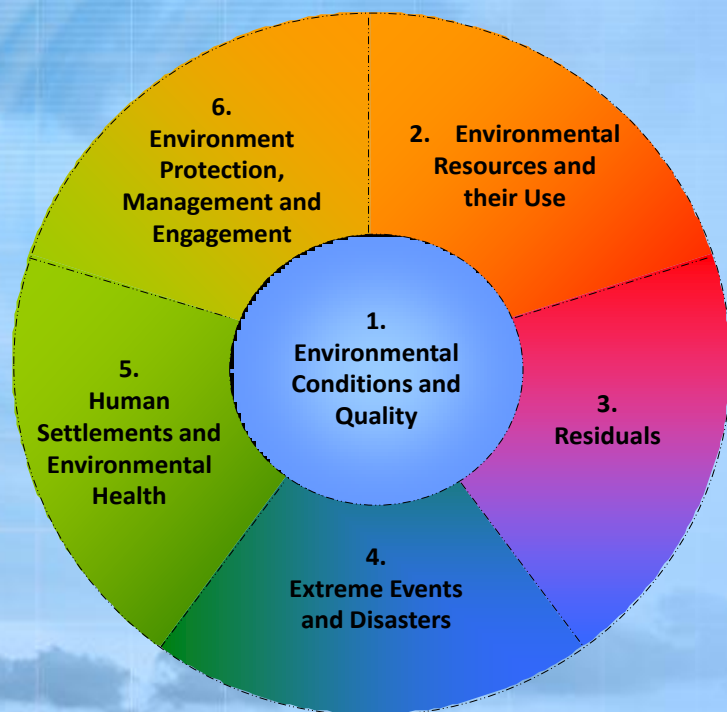# Components, sub-components and statistical topics of the FDES 2013

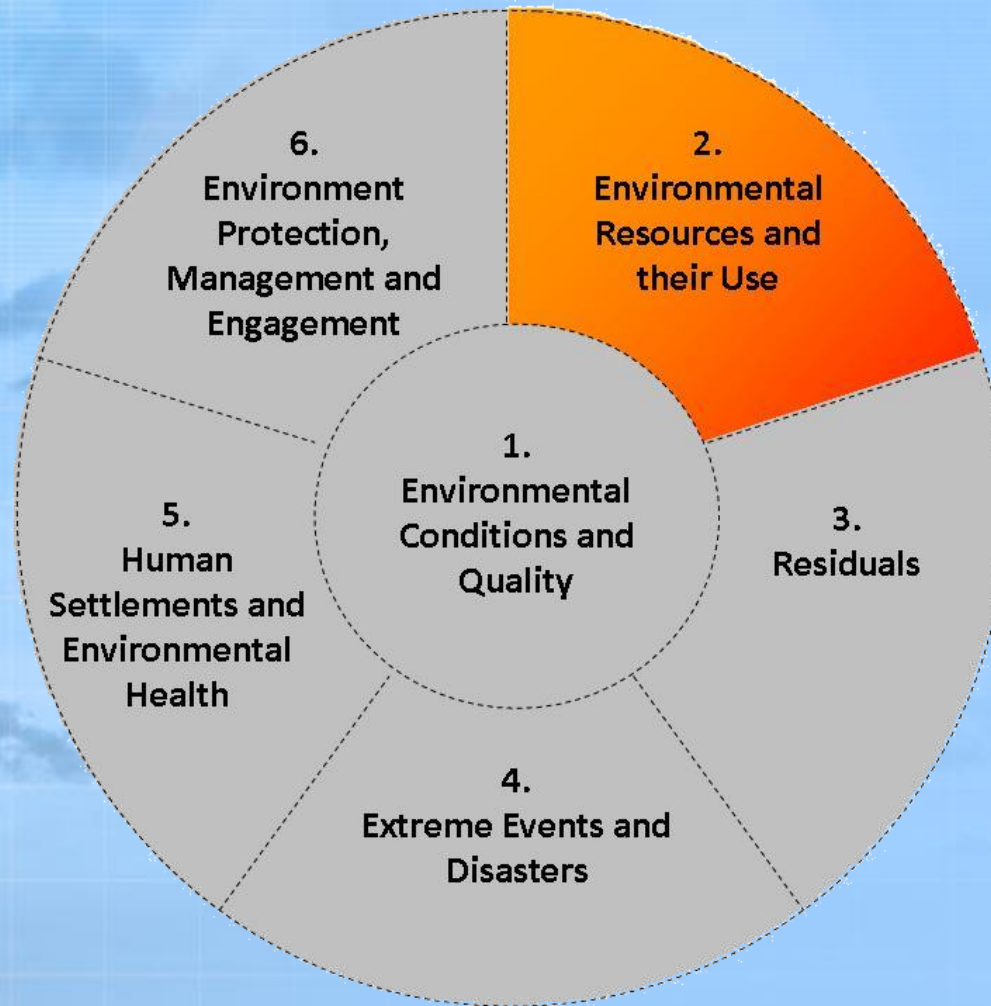## Component 2: Environmental resources and their use

Workshop on Environment Statistics in support of the implementation of the Framework for the Development of Environment Statistics (FDES 2013) (Arusha, Tanzania, 6-10 July 2015)

Environment Statistics Section, United Nations Statistics Division
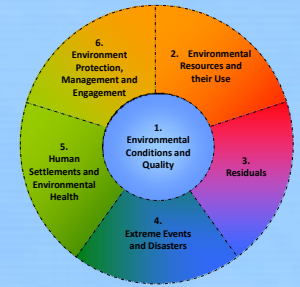
- This presentation has been elaborated by the Environment Statistics Section of the United Nations Statistics Division.

- It is based on Chapter 3 of the Framework for the Development of Environment Statistics (FDES) 2013.

Component 2: Environmental Resources and their Use

Contents of Component 2

❖ Environmental resources are the living and non-living constituents of the earth together comprising the biophysical environment that may provide benefits to humanity. Environmental resources include: subsoil resources (mineral and energy), soil resources, biological resources, water resources and land. They can be naturally renewable (timber, water) or non-renewable (minerals).

❖ In Component 2, statistics on environmental resources and their use are focused on measuring stocks and changes in stocks of these resources, as well as on activities that directly extract, abstract, harvest or restructure environmental resources.

❖ Closely related to the asset and physical flow accounts of the SEEA Central Framework on which, where relevant, FDES terms and definitions are based.

Component 2: Environmental Resources and their Use

Relevance: Necessary for policy makers to make informed decisions on the sustainable use of environmental resources.

Types of Data: Physical and Geospatial, Monetary data can be used as well.

Main Sources and Institutional Partners

❖ Geological surveys and inventories, national energy authorities, NSOs (economics, mining and quarrying statistics), agricultural authorities, environmental, natural resources and wildlife authorities.

❖ System of national accounts (SNA), supply and use tables

❖ Sectoral statistics

❖ System of Environmental-Economic Accounting (SEEA)

Component 2: Overview

Component 2 Environmental Resources and Their Use	Sub-Component 2.1 Mineral Resources (two topics, 13 statistics)	Topic 2.1.1: Stocks and changes of mineral resources Topic 2.1.2: Production and trade of minerals
	Sub-Component 2.2 Energy Resources (two topics, 19 statistics)	Topic 2.2.1: Stocks and changes of energy resources Topic 2.2.2: Production, trade and consumption of energy
	Sub-Component 2.3 Land (two topics, 11 statistics)	Topic 2.3.1: Land use Topic 2.3.2: Use of forest land
	Sub-Component 2.4 Soil Resources	Topic 2.4.1: Soil Resources
	Sub-Component 2.5 Biological Resources (five topics,53 statistics)	Topic 2.5.1: Timber resources Topic 2.5.2: Aquatic resources Topic 2.5.3: Crops Topic 2.5.4: Livestock Topic 2.5.5: Other non-cultivated biological resources
	Sub-Component 2.6: Water Resources (two topics, 28 statistics)	Topic 2.6.1: Water resources Topic 2.6.2: Abstraction, use and returns of water

Sub-Component 2.1: Mineral Resources

Sub-Component 2.1
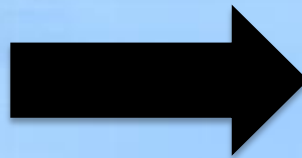
Mineral Resources

Topic 2.1.1:
Stocks and changes of mineral resources

Topic 2.1.2:
Production and trade of minerals

Sub-Component 2.1: Mineral Resources

Topic 2.1.1: Stocks and changes of mineral resources

- ❖ Stocks of mineral resources are the amount of known deposits of non-metallic and metallic mineral resources. Classes of known mineral deposits include commercially recoverable deposits, potentially commercially recoverable deposits, non-commercial and other known deposits.

- ❖ Mineral resources are not renewable and subject to depletion. The scale of extraction can determine the amount of stress placed on the environment.

- ❖ Extraction can be achieved by underground or surface mining.

- ❖ Statistics on their stocks are required to assist in the sustainable management of these resources.

- ❖ Main sources are geological surveys and inventories and economic statistics on mining and quarrying.

- ❖ Institutional Partners include mining authorities at the national and sub-national levels, governing commercial bodies (e.g. gemstone and metallic mineral bourses and manufacturers' associations).

- ❖ **In the FDES those minerals that are energy sources are discussed separately under sub-component 2.2.**

Sub-Component 2.1: Mineral Resources

Topic 2.1.2: Production and trade of minerals

❖ Contribution of mining and quarrying of minerals to the value of goods and services produced by many countries is substantial.

❖ Statistics on the amounts of non-energy minerals produced, their imports and exports are important in order to measure the pressure on these resources and to understand the significance of these resources in the national economy.

❖ Institutional Partners for primary activity data include the ministries responsible for mining and NSOs.

Sub-Component 2.2: Energy Resources

Sub-Component 2.2
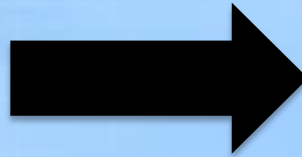
Energy Resources

Topic 2.2.1
Stocks and changes of energy resources

Topic 2.2.2 Production, trade and consumption of energy

Sub-Component 2.2: Energy Resources

Topic 2.2.1: Stocks and Changes of Energy Resources

❖ Stocks of non-renewable energy resources are defined as the amount of known deposits of mineral energy resources, including fossil fuels, peat, uranium, thorium ores, etc. They cannot be renewed on a human timescale, therefore depletion limits their availability for future generations.

❖ Classes of known mineral energy deposits include commercially recoverable deposits, potential commercially recoverable deposits, and non-commercial deposits.

❖ Sources are geological surveys and inventories, and national economic and energy statistics departments.

❖ Institutional partners in data collection are mining and energy authorities at the national and sub-national levels.

Topic 2.2.2: Production, trade and consumption of energy

❖ Energy production refers to the capture, extraction or manufacture of fuels or energy in forms which are ready for general consumption.

❖ Includes energy production from non-renewable and renewable sources, exports, imports and final consumption of energy.

❖ Provides environment statistics that can assist when analyzing the sustainability of the energy mix at the national level.

❖ Sources are energy statistics and energy balances from national energy authorities or NSOs.

❖ Energy production, transformation, distribution and consumption are done with different efficiency rates therefore statistics describing these activities are key to environmental sustainability policy.

Sub-Component 2.3: Land

Sub-Component 2.3

Land

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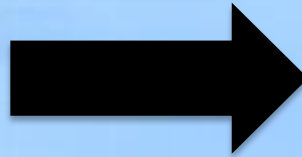
Topic 2.3.1:

Land use

Topic 2.3.2: Use of forest land

Sub-Component 2.3: Land

❖ Land is a unique environmental resource that delineates the space in which economic activities and environmental processes take place and within which environmental resources and economic assets are located.

❖ The total area of a country is the area enclosed by its inland borders and, if applicable, the sea. Marine water areas can be included only in a broader concept of land use.

❖ The two primary aspects of land are land cover and land use. Land cover (the observed biophysical cover on the earth's surface) is discussed under Component 1.

Sub-Component 2.3: Land

Topic 2.3.1: Land Use

- ❖ Reflects both the activities undertaken and the institutional arrangements put in place for a given area for the purposes of economic production, or the maintenance and restoration of environmental functions. Land being "used" means the existence of some kind of human activity or management.
- ❖ There are areas of land that are "not in use" by human activities which are important from an ecological point of view. Land use statistics cover both land in use and land not in use.
- ❖ Reference framework for the interim classification of land use is provided in the SEEA Central Framework.
- ❖ Sources are field surveys and remote sensing, mostly satellite images, and administrative land registers.
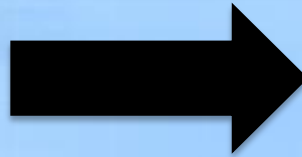
Sub-Component 2.3: Land

Topic 2.3.2: Use of forest land

❖ Forest use is a land use category that, due to its significance, is discussed in the FDES as a separate sub-component.

❖ Changes in the area under forest use are the result of economic activities (afforestation, deforestation), reclassifications among the categories, or natural processes (expansion or regression).

• *Afforestation: the establishment of forest through planting and/or deliberate seeding on land.*

• *Deforestation: the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10 per cent threshold.*

• *Reforestation: the re-establishment of forest through planting and/or deliberate seeding on forest land (no change in land use).*

❖ The main designated functions of forests are: production; protection of soil and water; conservation of biodiversity; or social services.

❖ To better understand the uses of forest land, statistics on forest land should be broken down according to its main designated function.

Sub-Component 2.4: Soil Resources

Sub-Component 2.4
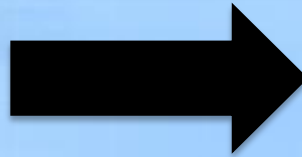
Soil Resources

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Topic 2.4.1:

Soil Resources

Sub-Component 2.4: Soil Resources

❖ Statistics on soil resources provide information on area and volume of soil resources available, lost due to erosion, degradation, or made unavailable by changes in land use.

❖ Statistics on soil resources in terms of their types, nutrient content, carbon content and other characteristics are relevant for more detailed examination of the health of soil systems, and their connections between soil resources and production in agriculture and forestry.

❖ Statistics related to the area, and changes in the area under different soil types are covered under Topic 1.1.4: Soil characteristics.

❖ Changes in the volume of soil resources and other aspects of accounting for soil resources are conceptually included in the FDES but the development of the necessary statistics is subject to further research.

Sub-Component 2.5: Biological Resources

Sub-Component 2.5

Biological Resources

→

Topic 2.5.1

Timber resources

Topic 2.5.2

Aquatic resources

Topic 2.5.3:

Crops

Topic 2.5.4:

Livestock

Topic 2.5.5:

Other non-cultivated biological resources

Sub-Component 2.5: Biological Resources

❖ Biological resources are renewable resources that are capable of regeneration through natural (non-managed or managed) processes. Biological resources form an important part of biodiversity and ecosystems.

❖ Biological resources can be natural (non-cultivated) or cultivated.

❖ Biological resources include timber and aquatic resources and a range of other animal and plant resources (such as livestock, orchards, crops and wild animals), fungi and bacteria.

❖ Collection of statistics related to both natural and cultivated biological resources are required in order to provide policy makers with the data needed to monitor the sustainable usage of these resources.

❖ Cultivated biological resources can impact the environment differently than natural ones. For example: Mono-cultivated, intensive crops that utilize irrigation, and increasing amounts of fertilizers and pesticides.

Topic 2.5.1: Timber resources

❖ Timber resources are natural or cultivated and are important environmental resources.

❖ They are defined by the volume of trees, living and dead, which can still be used for timber or fuel. This includes all trees regardless of diameter or tops of stems. The general proxy that should be considered for determining the volume of timber resources is the volume that is commercially usable.

❖ Sources include forestry, manufacturing, energy and trade statistics as well as physical and monetary supply and use tables from national accounts.

❖ Timber serves as a source of fuel and an important sink for carbon. Timber resources provide inputs for construction and the production of furniture, cardboard, cellulose, paper and other products.

Sub-Component 2.5: Biological Resources

Topic 2.5.2: Aquatic resources

❖ Include fish, crustaceans, mollusks, shellfish and other aquatic organisms such as sponges and seaweed, as well as aquatic mammals.

❖ The FAO International Standard Statistical Classification for Aquatic Animals and Plants (ISSCAAP) identifies the categories used in statistics.

❖ Aquatic resources may be either cultivated or natural biological resources. Those produced within aquaculture facilities (for breeding or for harvest) are considered cultivated. All other aquatic resources harvested as part of capture production processes are considered natural.

❖ Changes in the stocks of aquatic resources are the result of growth in stocks, total removals, natural and catastrophic losses.

❖ Sources include fishery statistics and supply and use tables in the national accounts.

❖ Statistics on aquaculture are very important to assess their impact on the environment.

Sub-Component 2.5: Biological Resources

Topic 2.5.3: Crops

❖ Include plants or agricultural produce grown at a large scale for food or other economic purposes (clothes or livestock fodder).

❖ Both the area used for cultivated crops as well as yields are important. Methods of production used in crops, which can have different environmental consequences, are highly relevant.

❖ Covers statistics on the area used for, and the production of main crop types, annual and perennial crops, different planting methods, monoculture and resource-intensive crops, the application of genetically modified organisms and organic farming.

❖ Statistics on the use of pesticides (e.g. fungicides, herbicides, insecticides, rodenticides, etc.) are also considered essential to environment statistics.

❖ Because of their effect on biodiversity, invasive pests and pollution and pesticides are essential.

❖ Sources include national statistical offices and agricultural authorities.

Topic 2.5.4: Livestock

- Environmentally relevant statistics on livestock include the number and characteristics of live animals, as well as antibiotics and hormones used for them.

- Livestock are animal species raised by humans for commercial purposes, consumption, or labour. Typical livestock species include among others cows, poultry, pigs and sheep.

- Statistics on the use of antibiotics, hormones, etc. in livestock production inform an important environmental and health concern related to agriculture.

- Sources include agricultural authorities and National Statistics Offices.
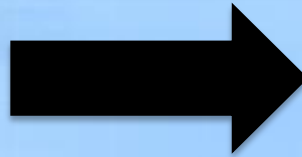
Topic 2.5.5: Other non-cultivated biological resources

- Include plants and animals in the wild, such as berries, fungi, bacteria, fruits, sap and other plant resources that are harvested as well as wild animals that are trapped or killed for production, consumption and trade.

- Excludes timber and aquatic resources (discussed under topics 2.5.1 and 2.5.2).

- Environmentally relevant statistics on this topic focus on the use of these resources as this can affect biological diversity.

- Sources and institutional partners include environmental, natural resources and wildlife authorities as well as the government agency responsible for hunting.

Sub-Component 2.6: Water Resources

Sub-Component 2.6

Water Resources

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Topic 2.6.1
Water resources

Topic 2.6.2
Abstraction, use and returns of water

Sub-Component 2.6: Water Resources

❖ Statistics on water resources, their abstraction, use and returns are needed by policy makers for use in:

- Estimating the amount of available freshwater resources;
- Monitoring abstraction from key water bodies to prevent overutilization;
- Ensuring equitable usage of water; and
- Tracking the volume of water returned to the environment.

❖ International Recommendations for Water Statistics (IRWS) provides definitions and groupings for the purposes of statistics on water resources and their use.

Topic 2.6.1: Water Resources

❖ Include volume of renewable freshwater generated within a country or territory as result of precipitation, evapotranspiration, inflow of water from other territories, and outflow of water to other territories or the sea.

❖ Water resources consist of fresh and brackish water, regardless of their quality, in inland water bodies including surface water, groundwater and soil water.

❖ <u>Inland water stocks</u> are the volume of water contained in surface and groundwater bodies and in the soil at a point in time.

❖ <u>Surface water</u> includes water in artificial reservoirs, lakes, rivers and streams, snow, ice and glaciers.

❖ <u>Groundwater</u> comprises water that collects in porous layers of underground formations known as aquifers.

❖ Sources include hydrometeorological and hydrological monitoring.

❖ *Hydrograpic information as well as freshwater and marine water quality are covered by Component 1.*

Topic 2.6.2: Abstraction, use and returns of water

❖ Abstraction, use and returns of water are the flows of water between the environment and the human sub-system and within the human sub-system.

❖ Water abstraction is the amount of water that is removed from any source, either permanently or temporarily, in a given period of time. Water can be abstracted by the abstractor for own use or for distribution to other users.

❖ Depending on climatic conditions and water use and transportation technologies, water abstracted (minus losses and incorporation into products) is returned to the environment after use. Statistics related to wastewater are covered under Component 3.

❖ Sources are administrative records of the water supply industry; statistical surveys of the economic units using water or household surveys.

❖ The most important activities, in terms of the volume of water abstracted, are agriculture (irrigation and livestock), the generation of electricity (hydropower and cooling) and the water collection, treatment and supply industry.

Questions, comments for Component 2?