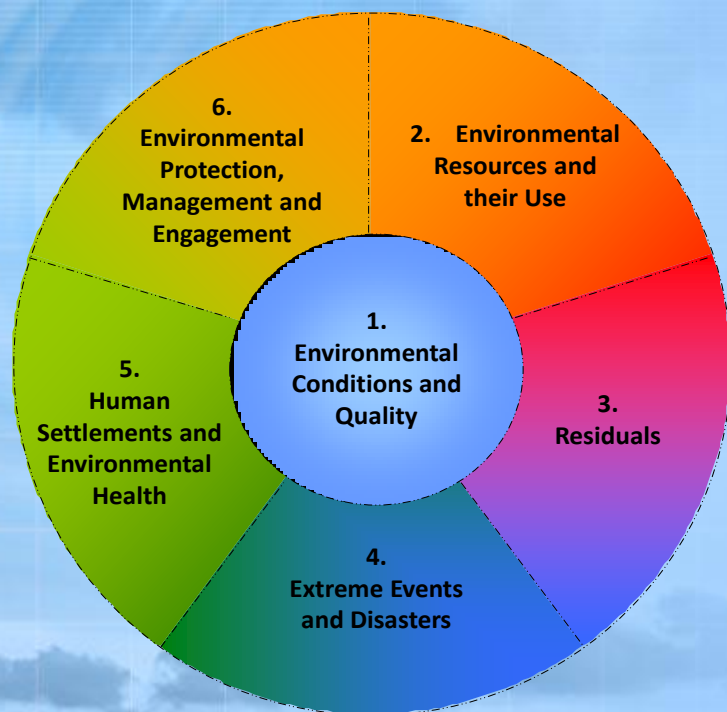
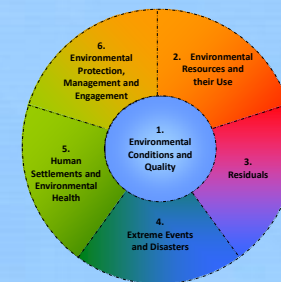


Components, sub-components and statistical topics of the FDES 2013

Component 2: Environmental resources and their use



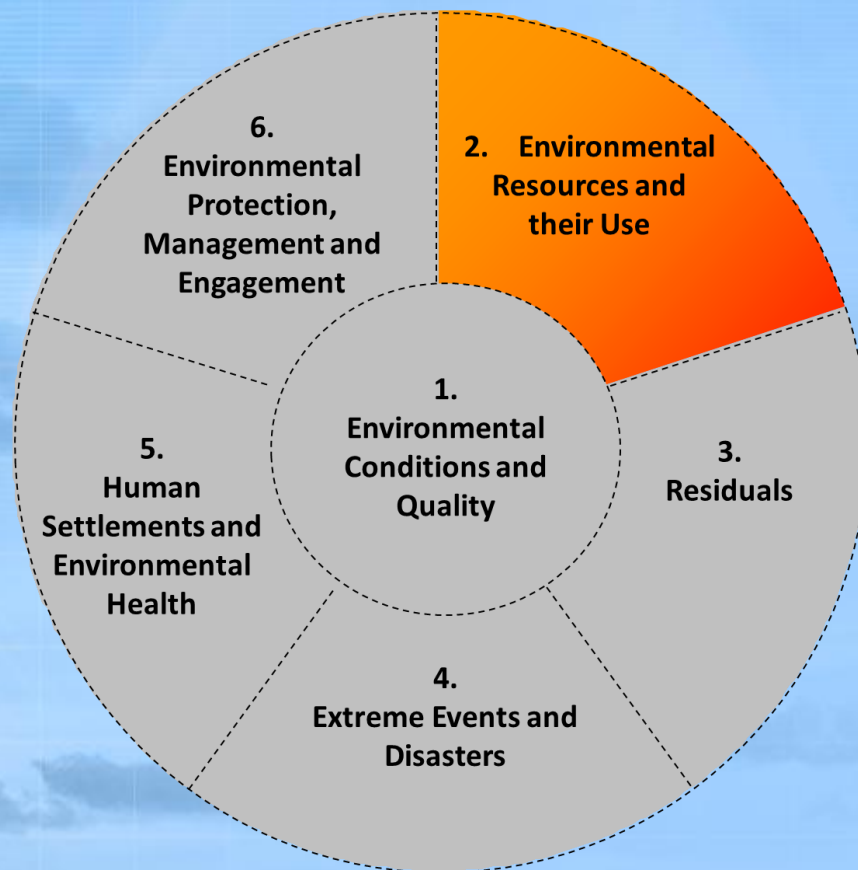
Workshop on Environment Statistics in support of the implementation of the Framework for the Development of Environment Statistics (FDES 2013) (Lomé, Togo, 19-23 October 2015)



- 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 and their Use



- ❖ Component 2 is closely related to the asset and physical flow accounts of the SEEA-CF on which the text, terms and definitions are based, where relevant.
- ❖ Environmental resources (or assets, as they are referred to in the SEEA-CF)
 - are the naturally occurring living and non-living components of the earth, together comprising the biophysical environment, which may provide benefits to humanity.
 - include natural resources (such as sub-soil resources (mineral and energy), soil resources, biological resources and water resources) and land. They may be naturally renewable (e.g., fish, timber or water) or non-renewable (e.g., minerals).
- ❖ Environmental resources are important inputs in production and consumption.
 - Consequently, policy makers need statistics documenting their availability and quality over time to make informed decisions.
 - Data on the availability of environmental resources and their use are important to ensure sustainable management of current and future use by the human sub-system.





Component 2: Environmental Resources and their Use

- ❖ In Component 2, statistics on environmental resources and their use focus on measuring stocks and changes in stocks of these resources, and their use for production and consumption.
- ❖ Statistics regarding the most important human activities related to the use of environmental resources help identify the possibilities for policy intervention. The activities that directly extract, abstract, harvest or restructure individual environmental resources are included under Component 2.
- ❖ The use of products originating from environmental resources in the economy and by households can be captured in physical and monetary supply and use tables originating from national accounts and also from sectoral statistics. The SEEA-CF links environmental resources after their extraction from the environment to their use as products in the economy and to the SNA.



Component 2: Overview

Component 2 Environmental Resources and Their Use	Sub-Component 2.1 Mineral Resources (2 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 (2 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 (2 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 (5 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 (2 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 defined as the amount of known deposits of non-metallic and metallic mineral resources. Classes of known mineral deposits include: commercially recoverable deposits; potential commercially recoverable deposits; and non-commercial and other known deposits.
- ❖ Mineral resources are not renewable so their depletion reduces their availability in the environment over time. The scale of their extraction can determine the amount of stress placed on the environment.
- ❖ Statistics on their stocks are required to assist in the sustainable management of these resources.
- ❖ Main sources of statistics about stocks of mineral resources are geological surveys and inventories, as well as economic statistics on mining and quarrying.
- ❖ The institutional data collection partners will be the mining authorities at the national and sub-national levels. Data are also available from governing commercial bodies such as gemstone and metallic mineral bourses and manufacturers' associations.
- ❖ *Mineral resources used for the production of energy are discussed in the FDES separately under Sub-Component 2.2.*



Sub-Component 2.1: Mineral Resources

Topic 2.1.2: Production and trade of minerals

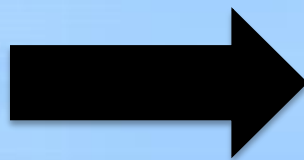
- ❖ Mining and quarrying contribute substantially to the value of goods and services produced by many countries.
- ❖ Statistics on the amounts of minerals extracted or produced, and their imports and exports are important to measure the pressure on these resources. They may be linked to economic statistics to understand their significance in the national economy.
- ❖ Industrial commodity statistics, sectoral statistics on mining and quarrying, and trade statistics constitute the main sources of statistics about the production and trade of minerals.





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

- ❖ Energy can be produced from non-renewable or renewable sources. Non-renewable energy resources cannot be renewed in any human timescale, so their extraction and use in the economy depletes the resource, limiting its availability for future generations.
- ❖ Stocks of non-renewable energy resources are defined as the amount of known deposits of mineral energy resources. They include fossil fuels (e.g., natural gas, crude oil and natural gas liquids, oil shale, natural bitumen and extra heavy oil, coal and lignite), peat, uranium and thorium ores.
- ❖ Classes of known mineral energy deposits include commercially recoverable deposits, potential commercially recoverable deposits, and non-commercial and other known deposits.
- ❖ Main sources of statistics about:
 - stocks of non-renewable energy resources are geological surveys and inventories, while the institutional data collection partners will be the mining and energy authorities at the national and sub-national levels.
 - extraction of non-renewable energy resources are economic statistics on mining, as well as energy statistics.



Sub-Component 2.2: Energy Resources

Topic 2.2.2: Production, trade and consumption of energy

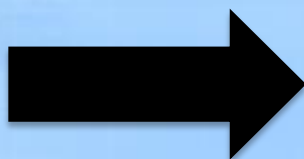
- ❖ Energy production refers to the capture, extraction or manufacture of fuels or other energy products in forms which are ready for general consumption.
- ❖ Energy production, transformation, distribution and consumption are processes characterized by different efficiency rates and which cause distinct environmental impacts. Therefore, producing statistics to describe these activities is key to informing environmental sustainability policy.
- ❖ Statistics include production of energy, total energy supply and final consumption of energy.
- ❖ The main sources of statistics on the production, trade and consumption of energy are energy statistics, foreign trade statistics and energy balances that are available from national energy authorities or NSOs in most countries.





Sub-Component 2.3: Land

Sub-Component 2.3
Land



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 two primary aspects of land are land cover and land use. They are closely related: while land cover describes the biophysical aspects of land, land use refers to the functional aspects of land. Land cover is discussed under Component 1.
- ❖ The total area of a country is the area enclosed by its inland borders and, if applicable, the sea. While inland waters (e.g., rivers, lakes and ponds) are included in land use, marine water areas may be included only in a broader concept of land use.





Sub-Component 2.3: Land

Topic 2.3.1: Land Use

- ❖ 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.
- ❖ Consequently, there are areas of land that are “not in use” by human activities. These areas are important from an ecological point of view.
- ❖ Land use statistics cover both land in use and land not in use.
- ❖ Sources of statistics are a combination of field surveys and remote sensing (mostly satellite images), and administrative land registers.
- ❖ A reference framework for the interim classification of land use is provided in the SEEA-CF as agreed after a comprehensive global consultation process.





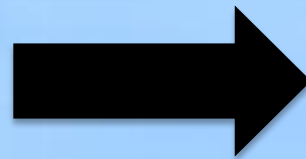
Sub-Component 2.3: Land

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 forest area in the different categories result from economic activities (afforestation or deforestation), reclassifications among the categories, or natural processes (expansion or regression). FAO defines:
 - afforestation as the establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest.
 - deforestation as 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 as the re-establishment of forest through planting and/or deliberate seeding on land classified as forest.
- ❖ The primary designated functions of forests are production, protection of soil and water, conservation of biodiversity, social services, multiple use and other.
- ❖ To better understand the uses of forest land, statistics on forest land should be broken down according to its primary designated function.

Sub-Component 2.4: Soil Resources

Sub-Component 2.4
Soil Resources



Topic 2.4.1:
Soil Resources



Sub-Component 2.4: Soil Resources

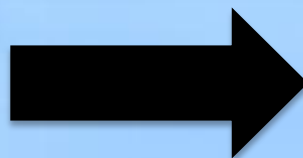
Topic 2.4.1: Soil resources

- ❖ Accounting for soil resources can provide information on the area and volume of soil resources lost due to erosion or degradation, or made unavailable by changes in land cover and other sources.
- ❖ Accounting for soil resources in terms of their types, nutrient content, carbon content and other characteristics is relevant for a more detailed examination of the health of soil systems and of the connections between soil resources and production in agriculture and forestry.
- ❖ The relevant statistics cover the stocks of soil resources and their changes (additions and reductions) in terms of area and volume, by soil type.
- ❖ Statistics related to the area and changes in the area under 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 included conceptually 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.
 - form an important part of biodiversity and ecosystems.
 - 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.
 - can be natural (non-cultivated) or cultivated.

- ❖ Cultivated biological resources may impact the environment differently than natural ones. This is quite evident in the case of mono-cultivated, intensive crops that use irrigation and increasing amounts of fertilizers and pesticides.





Sub-Component 2.5: Biological Resources

Topic 2.5.1: Timber resources

- ❖ Timber resources:
 - can be natural or cultivated and are important environmental resources in many countries.
 - provide inputs for construction and the production of furniture, cardboard, cellulose, paper and other products, and are also a fuel source.
 - 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.
- ❖ The use of timber products in the economy and by households can be captured in physical and monetary supply and use tables originating from national accounts and from forestry, manufacturing, energy and trade statistics.





Sub-Component 2.5: Biological Resources

Topic 2.5.2: Aquatic resources

- ❖ Aquatic resources:
 - ❖ comprise fish, crustaceans, molluscs, shellfish, aquatic mammals and other aquatic organisms.
 - ❖ may be either cultivated or natural biological resources. Aquatic resources produced within aquaculture facilities (for breeding or for harvest) are considered cultivated biological resources. All other aquatic resources harvested as part of capture production processes are considered natural biological resources.
- ❖ Changes in the stocks of aquatic resources are the result of growth in stocks, total removals and, natural and catastrophic losses.
- ❖ Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Aquaculture activities may also include the application of colorants, pellets, antibiotics, fungicides, hormones and other substances. Statistics on these aspects of aquaculture are very important to assess their impact on the environment.
- ❖ The FAO International Standard Statistical Classification for Aquatic Animals and Plants (ISSCAAP) is commonly used for statistics on aquatic resources.
- ❖ The use of aquatic products in the economy and by households can be captured in physical and monetary supply and use tables originating from national accounts.





Sub-Component 2.5: Biological Resources

Topic 2.5.3: Crops

- ❖ Crops refer to plants or agricultural produce grown for food or other economic purposes, such as clothes or livestock fodder.
- ❖ In terms of environment statistics, both the area used for cultivated crops and yields are important. Furthermore, crop production methods, which can have different environmental consequences, are highly relevant.
- ❖ Statistics:
 - The topic covers statistics about the area used for and the production of main crop types, annual and perennial crops, different planting methods, monoculture and resource-intensive farming systems, the use of genetically modified organisms, and organic farming.
 - Because of their effect on biodiversity, invasive pests and pollution, statistics on the use of pesticides (e.g., fungicides, herbicides, insecticides and rodenticides) are also considered essential to environment statistics.
 - Finally, imports and exports of crops can also be an important measure of total production, apparent national consumption and, possibly, the associated pressure on the environment.
- ❖ The main source of data, besides the NSO and the key institutional partner, is usually the agricultural authority.





Sub-Component 2.5: Biological Resources

Topic 2.5.4: Livestock

- ❖ Livestock are animal species that are raised by humans for commercial purposes, consumption, or labour. Usually raised in agricultural settings, typical livestock species include cows, poultry, pigs, goats and sheep.
- ❖ Environmentally relevant statistics on livestock include the number and characteristics of live animals, as well as antibiotics and hormones used for them. Furthermore, imports and exports of livestock are also a good measure of national livestock quantity and, possibly, of pressure on the environment.
- ❖ The main source of data for livestock statistics is usually the agricultural authority or the NSO.





Sub-Component 2.5: Biological Resources

Topic 2.5.5: Other non-cultivated biological resources

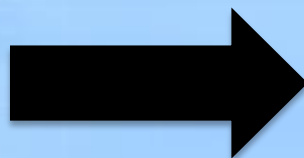
- ❖ A range of naturally occurring biological resources provides inputs to the economy and forms an important part of biodiversity.
- ❖ They may include wild berries, fungi, bacteria, fruits, sap and other plant resources that are harvested, as well as wild animals that are trapped or killed for production, consumption and trade.
- ❖ Environmentally relevant statistics on this topic focus on the use and management of these resources as this can affect biological diversity.
- ❖ The main source of data and the institutional partners for these statistics include the environmental, natural resources and wildlife authorities, and the government agency responsible for hunting.
- ❖ *Excludes timber and aquatic resources (discussed under topics 2.5.1 and 2.5.2, respectively).*





Sub-Component 2.6: Water Resources

Sub-Component 2.6
Water Resources



Topic 2.6.1
Water resources

Topic 2.6.2
Abstraction, use and
returns of water



Sub-Component 2.6: Water Resources

- ❖ Policy makers need statistics on water resources, their abstraction, use and returns for many reasons, including to:
 - estimate the amount of available water resources;
 - monitor abstraction from key water bodies to prevent overutilization;
 - ensure equitable usage of abstracted water; and
 - track the volume of water returned to the environment.
- ❖ International Recommendations for Water Statistics (IRWS) provides the definitions and groupings for the purposes of statistics on water resources and their use.





Sub-Component 2.6: Water Resources

Topic 2.6.1: Water Resources

- ❖ Water resources consist of fresh and brackish water, regardless of their quality, in inland water bodies, including surface water, groundwater and soil water.
- ❖ Inland water stocks are the volume of water contained in surface and groundwater bodies and in the soil at a point in time.
 - Surface water comprises all water that flows over or is stored on the ground's surface, regardless of its salinity levels.
 - Groundwater comprises water that collects in porous layers of underground formations known as aquifers.
- ❖ Statistics on water resources include the volume of water generated within the country or territory as the result of precipitation, the volume of water lost to evapotranspiration, the inflow of water from neighbouring territories, and the outflow of water to neighbouring territories or the sea.
- ❖ The statistics are sourced from hydrometeorological and hydrological monitoring, measurements and models.
- ❖ *Statistics on the quality of water in water bodies are discussed under Topic 1.3.2: Freshwater quality and Topic 1.3.3: Marine water quality.*



Sub-Component 2.6: Water resources

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 is abstracted from surface and groundwater resources by economic activities and households. It can be abstracted for own use or for distribution to other users.
- ❖ After abstraction and distribution, water is used in the economy in production and consumption activities. Water can be recycled and reused several times before it is returned to the environment. Statistics on water use can be obtained from statistical surveys of primary users, household surveys and administrative records of the water supply industry.
- ❖ A large part of the water used in economic activities and by households is returned to the environment after or without treatment.
- ❖ *Statistics on the generation, treatment and pollutant content of wastewater are discussed under Sub-component 3.2: Generation and Management of Wastewater.*





Questions, comments for Component 2?





Thank you for your attention!

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