



# **Analysis of explicit and implicit frameworks relevant to environment statistics**

**Expert Group Meeting on the Framework for the Development of  
Environment Statistics  
(New York, 4-6 May 2011)**

**United Nations Statistics Division**

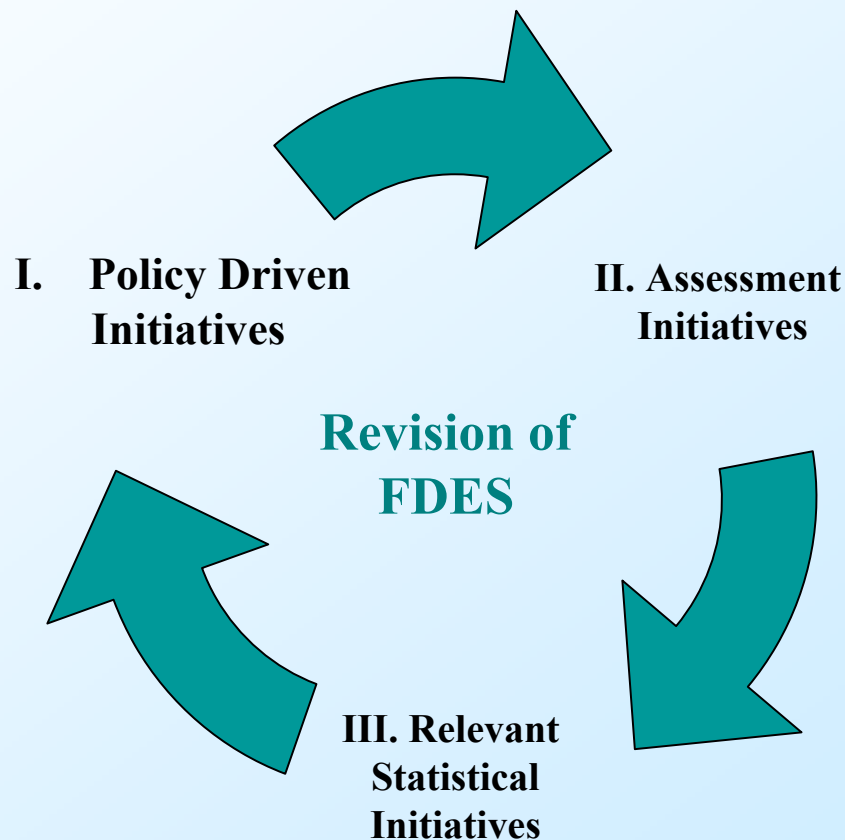


## Objective – Identify potential inputs for the revision process of the FDES

1. Review important components of initiatives relevant to environmental statistics, assessing their usefulness
2. Analyze their implicit and explicit FWs emphasizing scope, structural components, dimension and topics
3. Consider their underlying conceptual approaches



Various global and regional initiatives were analyzed:  
Policy driven initiatives, environmental and related  
assessment initiatives and statistical initiatives related to  
environment statistics





# I. Global Policy Initiatives and their monitoring FWs

Analysed initiatives:

1.1 The Earth Summit – Rio, 1992

1.2 The Commission of Sustainable Development Indicators (1997 – present)

1.3 Rio+10. The World Summit on Sustainable Development in Johannesburg.

1.4 The 2000 MDG framework and its environmental targets and indicators

1.5 Green Economy and Green Growth 2010 ->

1.6 The road for the 2012 UNCSD (Rio+20)

- Policy driven initiatives propose implicit and explicit FWs for monitoring progress towards agreed objectives (in some cases targets). Most of these initiatives propose sets of tailor-made indicators.
- The indicators of these policy driven initiatives reflect global consensus and statistical feasibility





# MDG monitoring FW: Goal 7



## MDG Goal 7: Ensure environmental sustainability

Target	Indicators
<p>Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources</p> <p>Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss</p>	<p>7.1 Proportion of land area covered by forest</p> <p>7.2 CO2 emissions, total, per capita and per \$1 GDP (PPP)</p> <p>7.3 Consumption of ozone-depleting substances</p> <p>7.4 Proportion of fish stocks within safe biological limits</p> <p>7.5 Proportion of total water resources used</p> <p>7.6 Proportion of terrestrial and marine areas protected</p> <p>7.7 Proportion of species threatened with extinction</p>
<p>Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation</p>	<p>7.8 Proportion of population using an improved drinking water source</p> <p>7.9 Proportion of population using an improved sanitation facility</p>
<p>Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers</p>	<p>7.10 Proportion of urban population living in slums</p>





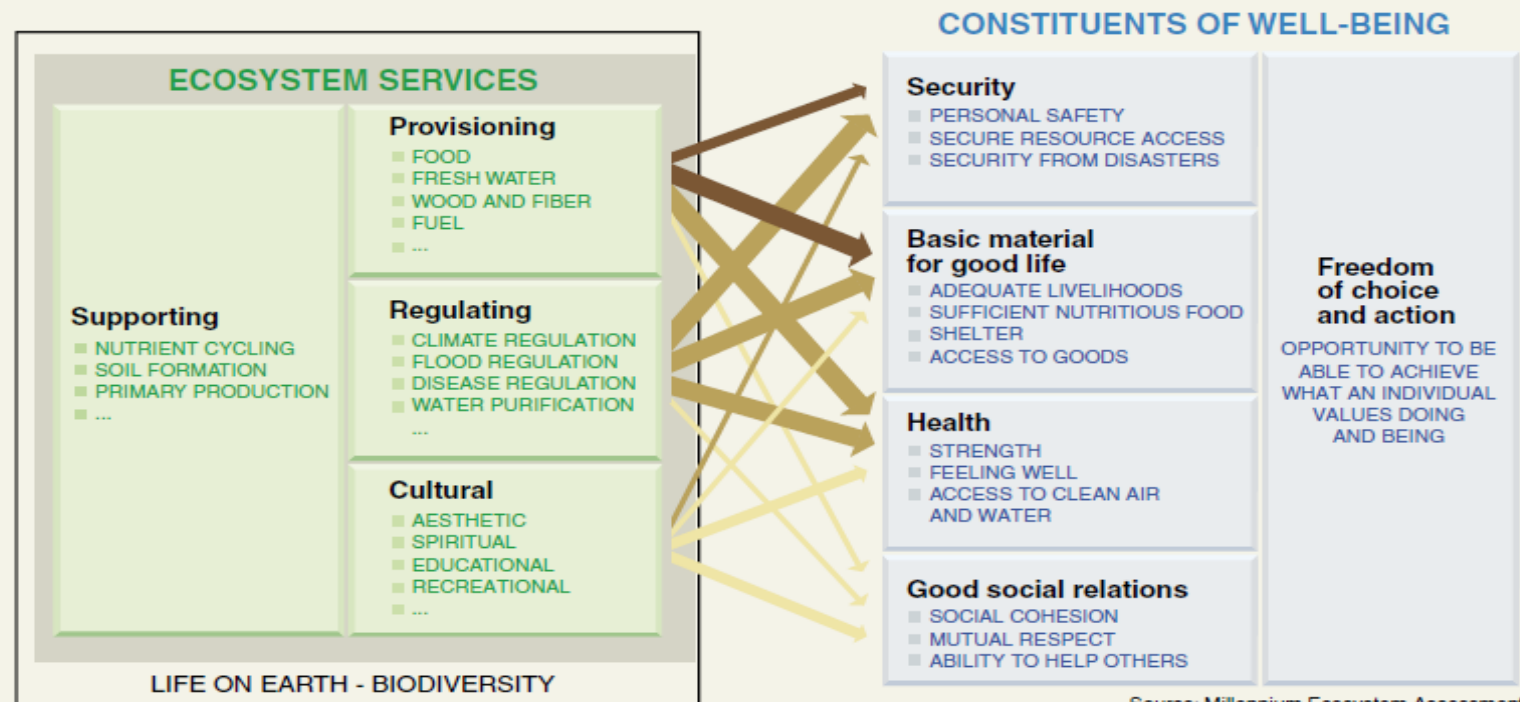
## II. Global and regional environmental assessments and their Frameworks

Global/regional environmental assessments	
<b>Millennium Ecosystem Assessment (MEA, 2005)</b>	Created ecosystems reporting categories (rows) that may overlap Ecosystem-specific assessment within each category Global scale
<b>Global Environment Outlooks (GEOs)</b>	Assessment based on DPSIR to structure information Multi-scale (Global-Regional-National-Subnational)
<b>State and Outlook (SOER) of the European Environment, 2010</b>	Used policy priority areas, reporting advancements related to European targets and trends
<b>USA's State of the Nations' Ecosystems Report (2008)</b>	Assessment FW w/synthesis matrix of indicators: Ecosystem types in columns), key ecosystem characteristics (extent and pattern, chemical and physical characteristics, biological components and goods and services) in rows

# MEA: linkages between ecosystem services and human wellbeing

**Figure A. LINKAGES BETWEEN ECOSYSTEM SERVICES AND HUMAN WELL-BEING**

This Figure depicts the strength of linkages between categories of ecosystem services and components of human well-being that are commonly encountered, and includes indications of the extent to which it is possible for socioeconomic factors to mediate the linkage. (For example, if it is possible to purchase a substitute for a degraded ecosystem service, then there is a high potential for mediation.) The strength of the linkages and the potential for mediation differ in different ecosystems and regions. In addition to the influence of ecosystem services on human well-being depicted here, other factors—including other environmental factors as well as economic, social, technological, and cultural factors—influence human well-being, and ecosystems are in turn affected by changes in human well-being. (See Figure B.)



**ARROW'S COLOR**  
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

**ARROW'S WIDTH**  
Intensity of linkages between ecosystem services and human well-being

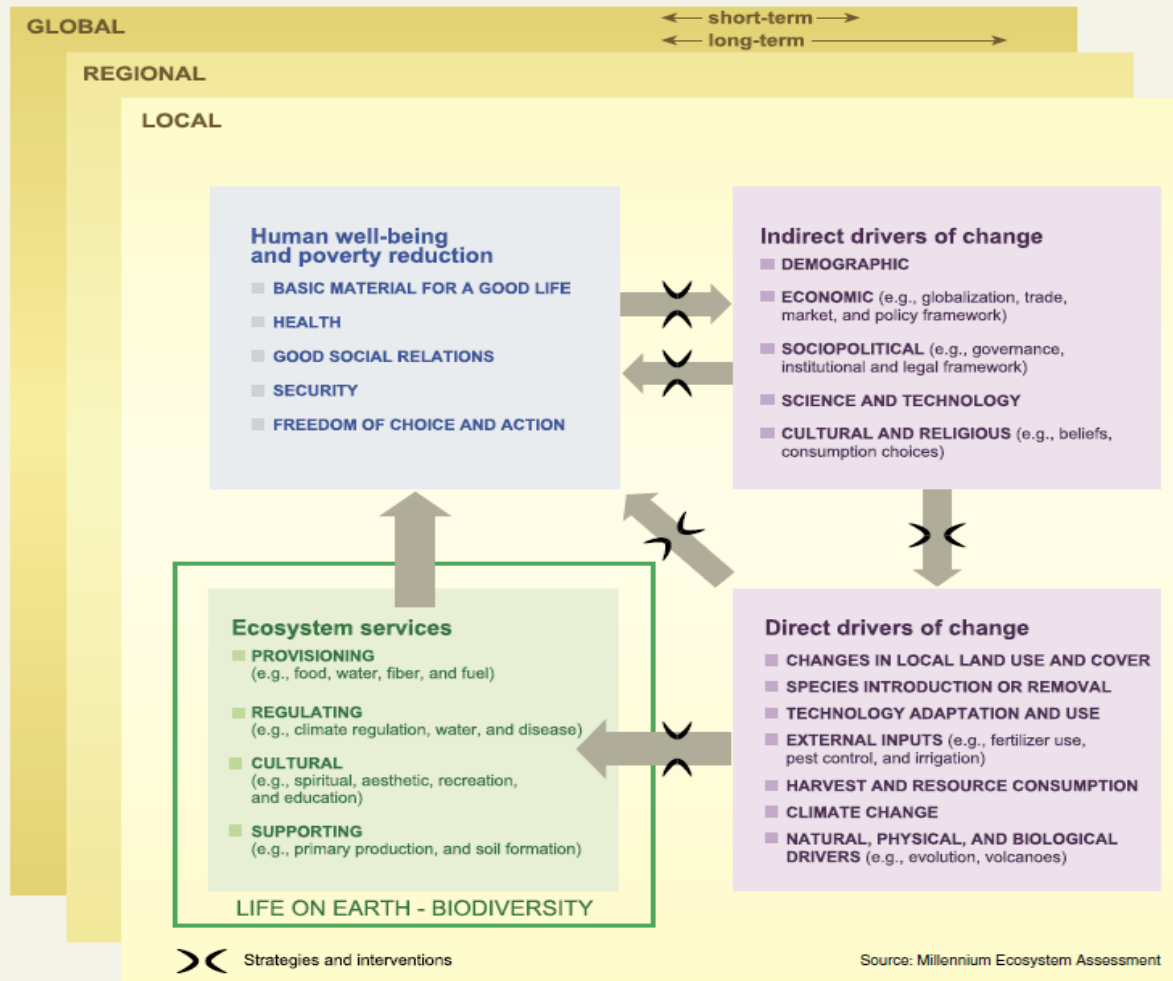
- Weak
- Medium
- Strong



# MEA: conceptual framework

**Figure B. MILLENNIUM ECOSYSTEM ASSESSMENT CONCEPTUAL FRAMEWORK OF INTERACTIONS BETWEEN BIODIVERSITY, ECOSYSTEM SERVICES, HUMAN WELL-BEING, AND DRIVERS OF CHANGE**

Changes in drivers that indirectly affect biodiversity, such as population, technology, and lifestyle (upper right corner of Figure), can lead to changes in drivers directly affecting biodiversity, such as the catch of fish or the application of fertilizers (lower right corner). These result in changes to ecosystems and the services they provide (lower left corner), thereby affecting human well-being. These interactions can take place at more than one scale and can cross scales. For example, an international demand for timber may lead to a regional loss of forest cover, which increases flood magnitude along a local stretch of a river. Similarly, the interactions can take place across different time scales. Different strategies and interventions can be applied at many points in this framework to enhance human well-being and conserve ecosystems.

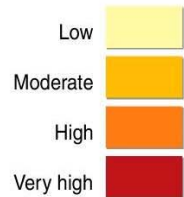


# MEA's reporting categories

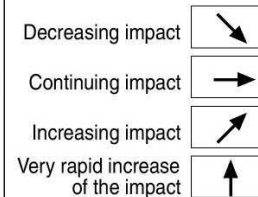


		Habitat change	Climate change	Invasive species	Over-exploitation	Pollution (nitrogen, phosphorus)
Forest	Boreal	↗	↑	↗	→	↑
	Temperate	↘	↑	↑	→	↑
	Tropical	↑	↑	↑	↗	↑
Dryland	Temperate grassland	↗	↑	→	→	↑
	Mediterranean	↗	↑	↑	→	↑
	Tropical grassland and savanna	↗	↑	↑	↘	↑
	Desert	→	↑	→	→	↑
Inland water	↑	↑	↑	→	↑	
Coastal	↗	↑	↗	↗	↑	
Marine	↑	↑	→	↗	↑	
Island	→	↑	↘	→	↑	
Mountain	→	↑	→	→	↑	
Polar	↗	↑	→	↗	↑	

Driver's impact on biodiversity over the last century



Driver's current trends

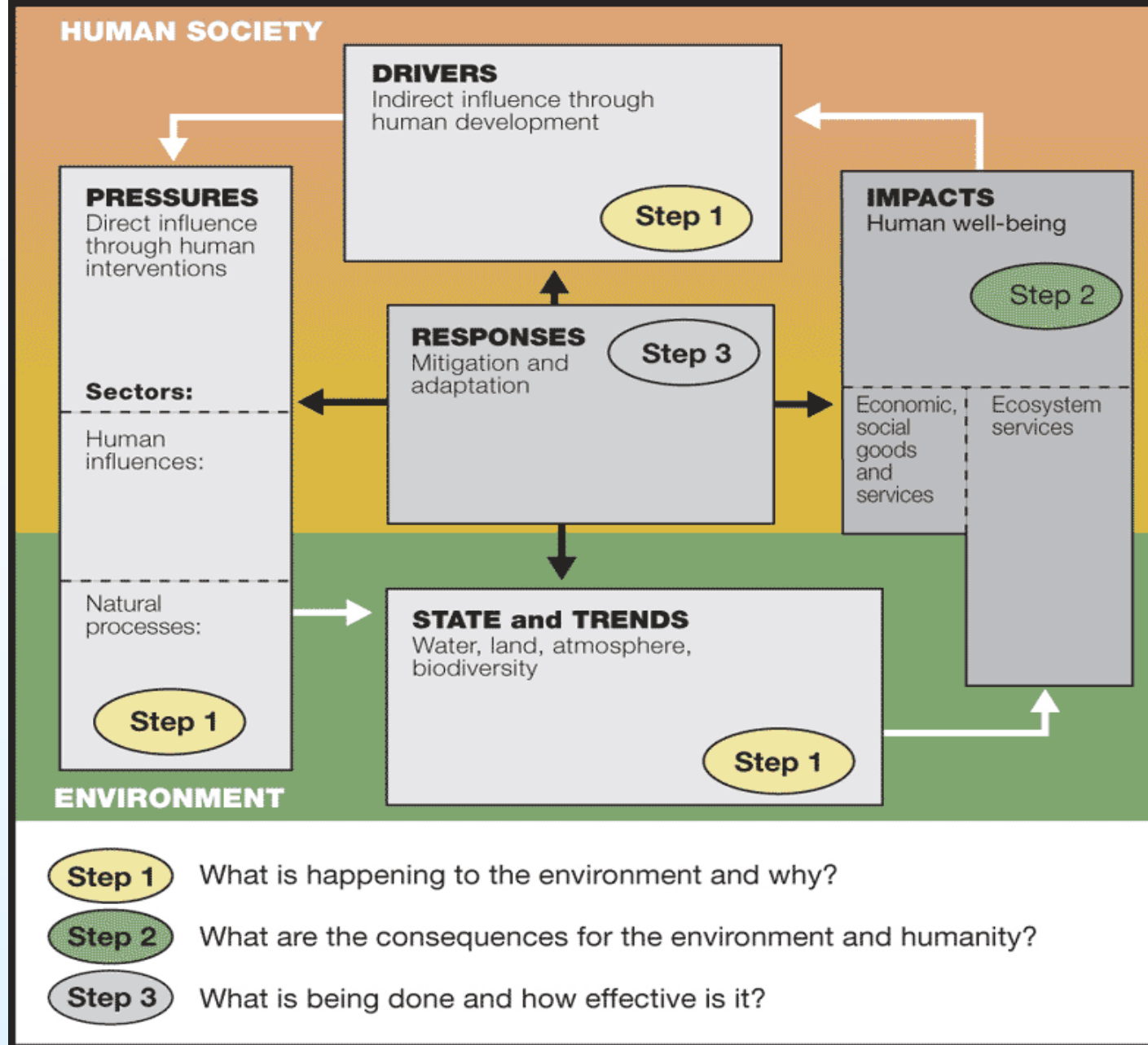


Main direct drivers of change in biodiversity and ecosystems (CWG). (2005). In *UNEP/GRID-Arendal Maps and Graphics Library*. Retrieved 23:06, April 28, 2011 from <http://maps.grida.no/go/graphic/main-direct-drivers-of-change-in-biodiversity-and-ecosystems-cwg>.

Source: Millennium Ecosystem Assessment



# DPSIR FW (GEO4)



Source: DEWA,  
UNEP, 2006

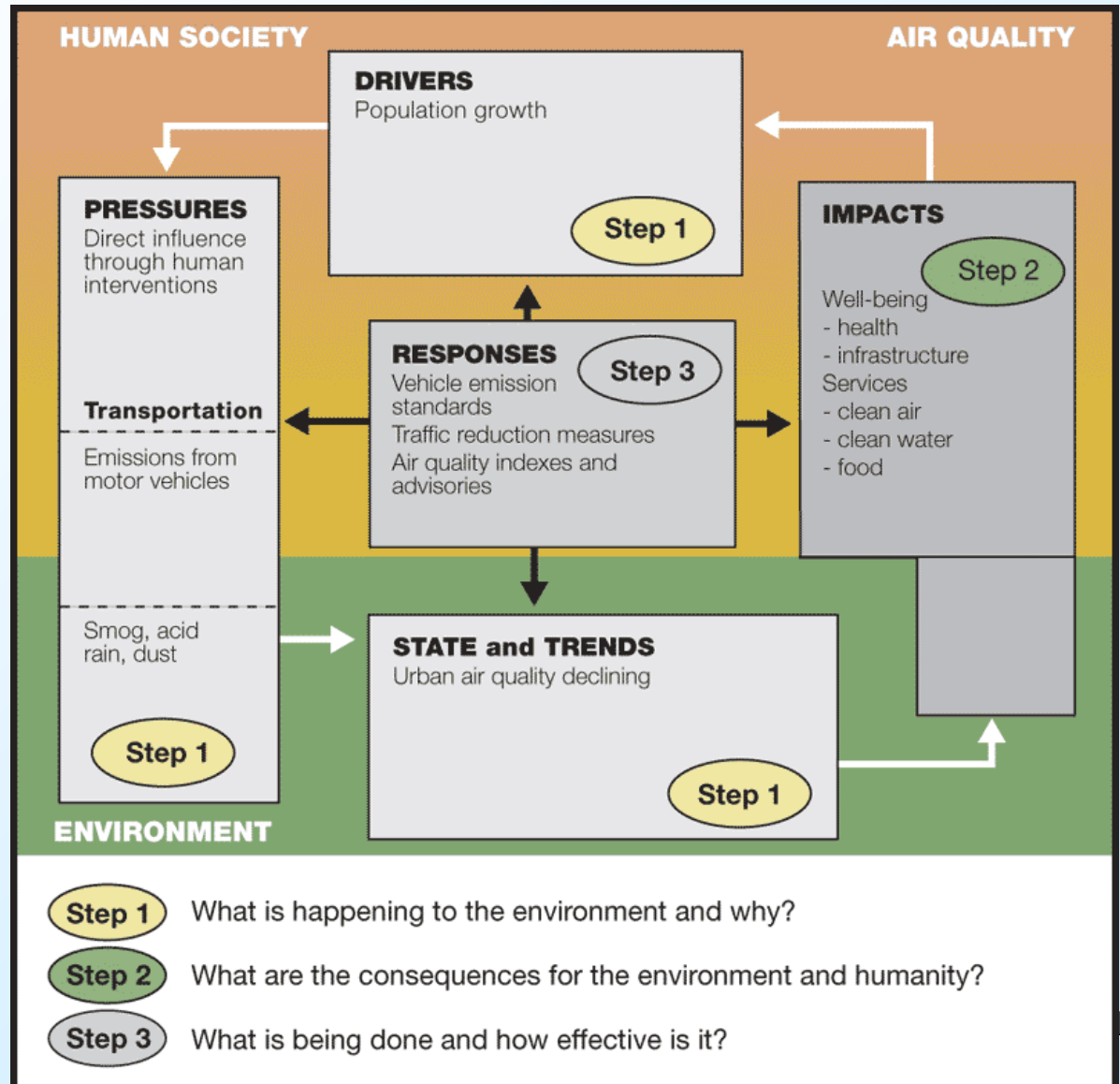
The UNEP Human - Environment Interaction analytical approach: - built on the Drivers, Pressures, State and trends, Impacts and Responses (DPSIR) framework. It is multi-scalable and indicates generic cause and effect relations within and among:

- **DRIVERS:** The drivers are sometimes referred to as indirect or underlying drivers or driving forces and refer to





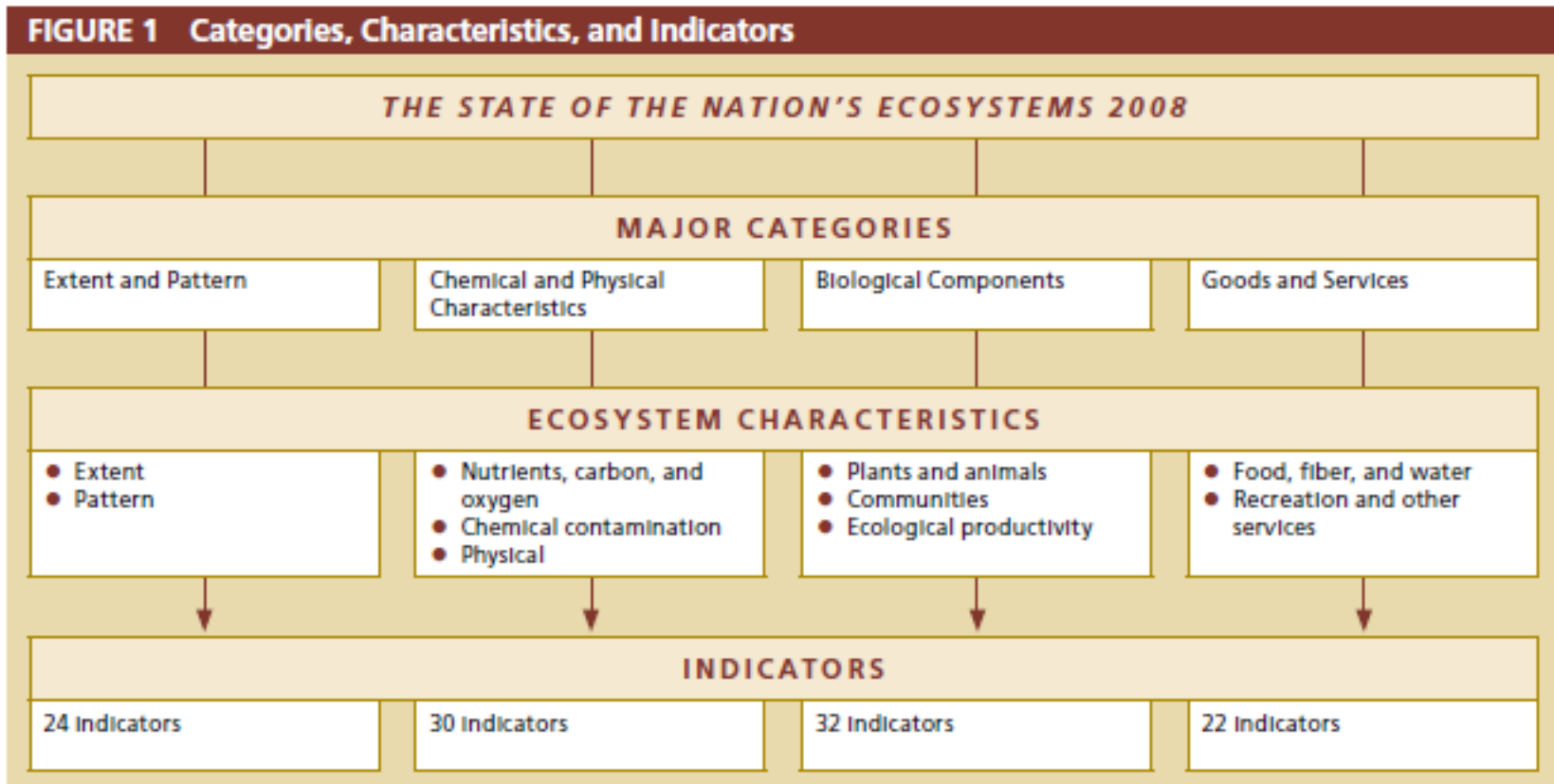
# Application DPSIR to Urban Air Quality assesment





# USA State of the Nation's Ecosystems, 2008

**FIGURE 1** Categories, Characteristics, and Indicators





# USA State of the Nation's Ecosystems, 2008: Indicators at a glance

The Indicators at a Glance				The Indicators at a Glance									
Core National Indicators		Coasts and Oceans		Farmlands		Forests		Fresh Waters		Grasslands and Shrublands		Urban and Suburban Landscapes	
<b>EXTENT AND PATTERN</b>													
<b>Extent</b>	<ul style="list-style-type: none"> <li>Ecosystem Extent*</li> </ul>	<ul style="list-style-type: none"> <li>Coastal Living Habitats</li> <li>Shoreline Types</li> </ul>	<ul style="list-style-type: none"> <li>Total Cropland*</li> <li>The Farmland Landscape*</li> </ul>	<ul style="list-style-type: none"> <li>Forest Area and Ownership*</li> <li>Forest Types*</li> <li>Forest Management Categories*</li> </ul>	<ul style="list-style-type: none"> <li>Extent of Freshwater Ecosystems*</li> <li>Altered Freshwater Ecosystems*</li> </ul>	<ul style="list-style-type: none"> <li>Area of Grasslands and Shrublands*</li> <li>Land Use in Grasslands and Shrublands</li> </ul>	<ul style="list-style-type: none"> <li>Area and Composition of the Urban and Suburban Landscape*</li> <li>Total Impervious Area</li> </ul>						
<b>Pattern</b>	<ul style="list-style-type: none"> <li>Pattern of "Natural" Landscapes†</li> </ul>	<ul style="list-style-type: none"> <li>Pattern in Coastal Areas‡</li> </ul>	<ul style="list-style-type: none"> <li>Proximity of Cropland to Residences‡</li> <li>Patches of "Natural" Land in the Farmland Landscape†</li> </ul>	<ul style="list-style-type: none"> <li>Pattern of Forest Landscapes†</li> </ul>	<ul style="list-style-type: none"> <li>In-Stream Connectivity‡</li> </ul>	<ul style="list-style-type: none"> <li>Pattern of Grassland and Shrubland Landscapes†</li> </ul>	<ul style="list-style-type: none"> <li>Streambank Vegetation</li> <li>Housing Density Changes in Low-Density Suburban and Rural Areas‡</li> <li>"Natural" Lands in the Urban and Suburban Landscape†</li> </ul>						
<b>CHEMICAL AND PHYSICAL CHARACTERISTICS</b>													
<b>Nutrients, Carbon, and Oxygen</b>	<ul style="list-style-type: none"> <li>Movement of Nitrogen*</li> <li>Carbon Storage‡</li> </ul>	<ul style="list-style-type: none"> <li>Areas with Depleted Oxygen*</li> </ul>	<ul style="list-style-type: none"> <li>Nitrate in Farmland Streams and Groundwater*</li> <li>Phosphorus in Farmland Streams*</li> <li>Soil Organic Matter*</li> </ul>	<ul style="list-style-type: none"> <li>Nitrate in Forest Streams*</li> <li>Carbon Storage*</li> </ul>	<ul style="list-style-type: none"> <li>Phosphorus in Lakes, Reservoirs and Large Rivers*</li> </ul>	<ul style="list-style-type: none"> <li>Nitrate in Grassland and Shrubland Groundwater</li> <li>Carbon Storage</li> </ul>	<ul style="list-style-type: none"> <li>Nitrate in Urban and Suburban Streams*</li> <li>Phosphorus in Urban and Suburban Streams*</li> </ul>						
<b>Chemical Contamination</b>	<ul style="list-style-type: none"> <li>Chemical Contamination*</li> </ul>	<ul style="list-style-type: none"> <li>Contamination in Bottom Sediments*</li> </ul>	<ul style="list-style-type: none"> <li>Pesticides in Farmland Streams and Groundwater*</li> </ul>		<ul style="list-style-type: none"> <li>Freshwater Acidity‡</li> </ul>		<ul style="list-style-type: none"> <li>Urban and Suburban Air Quality†</li> <li>Chemical Contamination*</li> </ul>						
<b>Physical</b>	<ul style="list-style-type: none"> <li>Change in Stream Flows‡</li> </ul>	<ul style="list-style-type: none"> <li>Coastal Erosion</li> <li>Sea Surface Temperature*</li> </ul>	<ul style="list-style-type: none"> <li>Potential Soil Erosion</li> <li>Soil Salinity</li> <li>Stream Habitat Quality†</li> </ul>		<ul style="list-style-type: none"> <li>Water Clarity</li> <li>Stream Habitat Quality†</li> </ul>	<ul style="list-style-type: none"> <li>Number and Duration of Dry Periods in Grassland and Shrubland Streams and Rivers*</li> <li>Depth to Shallow Groundwater</li> </ul>	<ul style="list-style-type: none"> <li>Urban Heat Island</li> </ul>						
<b>BIOLOGICAL COMPONENTS</b>													
<b>Plants and Animals</b>	<ul style="list-style-type: none"> <li>At-Risk Native Species*</li> <li>Established Non-native Species‡</li> </ul>	<ul style="list-style-type: none"> <li>At-Risk Native Marine Species</li> <li>Established Non-native Species in Major Estuaries*</li> <li>Unusual Marine Mortalities</li> </ul>	<ul style="list-style-type: none"> <li>Status of Animal Species in Farmland Areas</li> <li>Established Non-native Plant Cover in the Farmland Landscape†</li> </ul>	<ul style="list-style-type: none"> <li>At-Risk Native Forest Species*</li> <li>Established Non-native Plant Cover in Forests</li> </ul>	<ul style="list-style-type: none"> <li>At-Risk Native Freshwater Species*</li> <li>Established Non-native Freshwater Species*</li> <li>Animal Deaths and Deformities</li> </ul>	<ul style="list-style-type: none"> <li>At-Risk Native Grassland and Shrubland Species*</li> <li>Established Non-native Grassland and Shrubland Plant Cover*</li> <li>Population Trends in Invasive and Non-Invasive Birds</li> </ul>	<ul style="list-style-type: none"> <li>Species Status</li> <li>Disruptive Species</li> </ul>						
<b>Communities</b>	<ul style="list-style-type: none"> <li>Native Species Composition*</li> </ul>	<ul style="list-style-type: none"> <li>Harmful Algal Events*</li> <li>Condition of Bottom-Dwelling Animals</li> </ul>	<ul style="list-style-type: none"> <li>Soil Biological Condition</li> </ul>	<ul style="list-style-type: none"> <li>Forest Age*</li> <li>Forest Disturbance: Fire, Insects, and Disease*</li> <li>Fire Frequency</li> <li>Forest Community Types with Significantly Reduced Area</li> </ul>	<ul style="list-style-type: none"> <li>Status of Freshwater Animal Communities*</li> <li>At-Risk Freshwater Plant Communities*</li> </ul>	<ul style="list-style-type: none"> <li>Fire Frequency</li> <li>Riparian Condition</li> </ul>	<ul style="list-style-type: none"> <li>Status of Animal Communities in Urban and Suburban Streams</li> </ul>						
<b>Ecological Productivity</b>	<ul style="list-style-type: none"> <li>Plant Growth Index*</li> </ul>	<ul style="list-style-type: none"> <li>Chlorophyll Concentrations*</li> </ul>											
<b>GOODS AND SERVICES</b>													
<b>Food, Fiber, and Water</b>	<ul style="list-style-type: none"> <li>Production of Food and Fiber and Water Withdrawals</li> </ul>	<ul style="list-style-type: none"> <li>Commercial Fish and Shellfish Landings</li> <li>Status of Commercially Important Fish Stocks*</li> <li>Selected Contaminants in Fish and Shellfish</li> </ul>	<ul style="list-style-type: none"> <li>Major Crop Yields</li> <li>Agricultural Inputs and Outputs*</li> <li>Monetary Value of Agricultural Production</li> </ul>	<ul style="list-style-type: none"> <li>Timber Harvest*</li> <li>Timber Growth and Harvest*</li> </ul>	<ul style="list-style-type: none"> <li>Water Withdrawals</li> <li>Groundwater Levels</li> <li>Waterborne Human Disease Outbreaks</li> </ul>	<ul style="list-style-type: none"> <li>Cattle Grazing</li> </ul>							
<b>Recreation and Other Services</b>	<ul style="list-style-type: none"> <li>Outdoor Recreation</li> <li>Natural Ecosystem Services*</li> </ul>	<ul style="list-style-type: none"> <li>Recreational Water Quality</li> </ul>	<ul style="list-style-type: none"> <li>Recreation in Farmland Areas</li> </ul>	<ul style="list-style-type: none"> <li>Recreation in Forests</li> </ul>	<ul style="list-style-type: none"> <li>Freshwater Recreational Activities</li> </ul>	<ul style="list-style-type: none"> <li>Recreation on Grasslands and Shrublands</li> </ul>	<ul style="list-style-type: none"> <li>Publicly Accessible Open Space per Resident</li> <li>Natural Ecosystem Services*</li> </ul>						

\* Indicator refined since the 2002 State of the Nation's Ecosystems Report (original metric or metrics retained)

† Indicator redesigned since the 2002 State of the Nation's Ecosystems Report

‡ New indicator since the 2002 State of the Nation's Ecosystems Report



### III. Global and regional statistical initiatives relevant to environment statistics

#### A. Frameworks traditionally used for the organization of environment statistics and indicators

- FDES used by many countries. Asian Development Bank work on Environmental statistics and indicators – 1995-2002
- DPSIR – most agencies and many countries
- Theme-subtheme organization by LAC`s environment statistics and indicators. ILAC uses FW Goals- Indicative Purposes -Indicators

#### B. Beyond GDP and metrics of sustainable development

- Commission of the European Communities: “GDP and beyond: Measuring progress in a changing world”, 2009.
- The ECE/OCDE/EUROSTAT work on a sustainable development framework and indicators 2005- 2012
- The Stiglitz Commission, 2010
- The OECD “indicators for the green growth strategy”, 2010
- The SEEA 2003 and SEEA 2012 Volume 1 revision

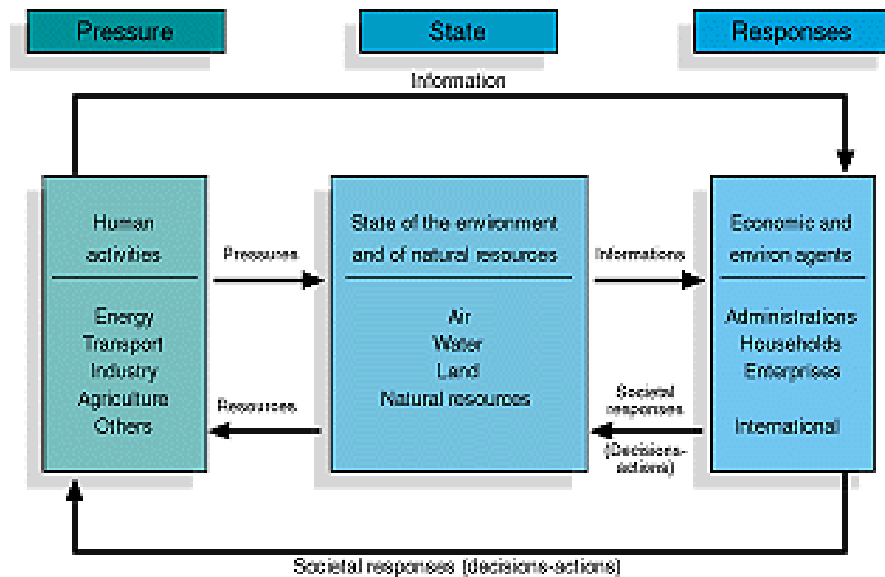
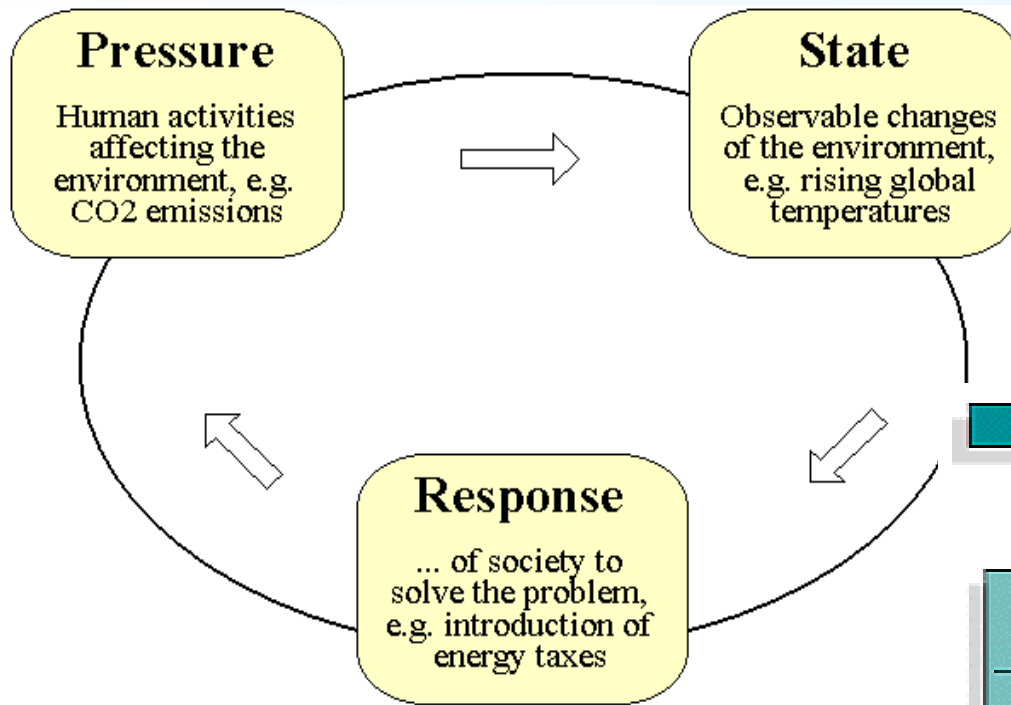


### III. Global and regional statistical initiatives relevant to environment statistics (2)

- **FDES framework** containing a (implicit) **Pressure – State - Response** sequence has been used mostly by countries to organize indicators and statistics. Useful at the regional level, for example in an Asian Pacific project conducted by the Asian Development Bank (ADB)
- FDES has been used extensively and **adapted** to national and regional priorities
- The LAC region uses a **thematic** organizing structure for the regional environmental statistics and an **objective, targets and indicator monitoring FW** for the regionally agreed indicators of sustainable development ILAC initiative
- Most international and multilateral agencies are currently using some form of the **DPSIR framework** to organize environmental compendia and indicator sets (OECD, EEA, etc)



# PSR Commonly used FW to organize environmental information





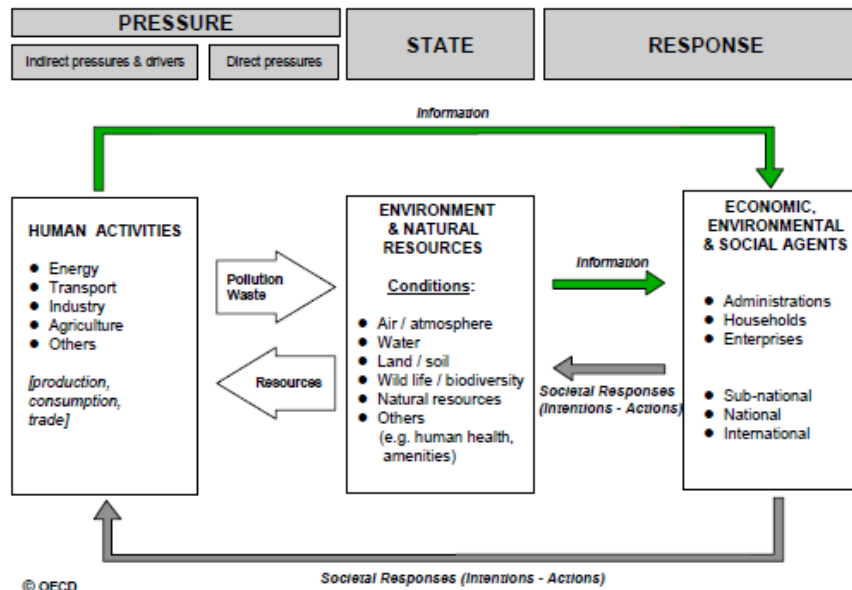
# OECD Environmental Data

## COMPENDIUM STRUCTURE

The conceptual framework within which the OECD core set of environmental data is organised builds on the pressure-state-response model (see below).

The first part of this Compendium relates to environmental issues, including direct pressures on the environment (emissions of pollutants, use of water resources, natural disasters) and related environmental conditions. The second part relates to economic activities generating pressures on the environment: energy, transport, industry, agriculture. The third part relates to instruments used to manage the environment, such as environmentally related expenditure and taxes, and international conventions. A section with general data (GDP, population) is added to help seeing the Compendium data in a broader context.

### Conceptual framework and structure of the OECD Core Set of environmental data





Driving forces	Pressure Anthropogenic Stress	State	Impacts	Responses
<p>Agriculture</p> <p>Urban development</p> <p>Transport</p> <p>Industrial/ storage and landfilling of toxics</p> <p>Tourism</p> <p>Trade</p> <p>Consumption</p>	<p><u>Physical restructuring</u>: soil sealing, development of transport infrastructure, cultivation of marginal land, drainage of wetlands, damming of rivers...</p> <p><u>Overharvesting/overuse</u>: intensive agriculture and forestry, management of dams/seasonal overuse of water, over-fishing, hunting</p> <p><u>Introduction of plant and animal species</u>: intentional and non-intentional</p> <p><u>Discharge of waste &amp; residual to air, water and soil</u>: polluting emissions from river basins, use of pesticides, air depositions...</p>	<p><b>Basic accounts</b></p> <p><u>Stocks and flows</u>: surface, volume, joules, length, number of units,</p> <p><u>Distribution</u>: by grid, region, river basins</p> <p><b>Health/ distress diagnosis</b></p> <p><u>Vitality</u>: change in primary/secondary productivity, loss/exceedance of nutrient loads, eutrophication, populations dynamics...</p> <p><u>Organisation</u>: interactions, connectivity-fragmentation, accumulation of toxic substances, (in)stability of substrate, of water systems...</p> <p><u>Resilience</u>: change in species community structure, decline in long-lived native species, vulnerability to stress and natural disturbance...</p> <p><u>Dependency from external artificial inputs</u>: work, energy, fertilisers, irrigation, subsidies...</p> <p><u>Disease prevalence</u>: for plants, animals and humans, epidemics, malnutrition...</p>	<p><u>Loss of ecosystem services/ commodities</u></p> <p><u>Loss of ecosystem services/ regulation</u></p> <p><u>Loss of ecosystem services/ socio-cultural amenities</u></p> <p><u>Impacts of biodiversity</u></p>	<p>Protection of biotopes &amp; species</p> <p>Ecosystem management</p> <p>Pollution abatement</p> <p>Agri-environmental measures</p> <p>Land planning</p> <p>Fiscal policies, subsidies</p> <p>Valuation of ecosystem depreciation &amp; payment for ecological liabilities</p> <p>Payment for ecosystem services</p>
<b>Natural disturbance</b>				
Climate change	<p><u>Erosion/ sedimentation</u></p> <p><u>Droughts</u></p> <p><u>Floods</u></p>			
		<p><b>Change in total ecosystem potential (composite index)</b></p> <p>quantities weighted by health indexes, multicriteria analysis</p>		

Merging the ecosystem approach with the conventional PSR/DPSIR framework. Source: JLWeber, 2010

### III. Global and regional statistical initiatives relevant to environment statistics (3)

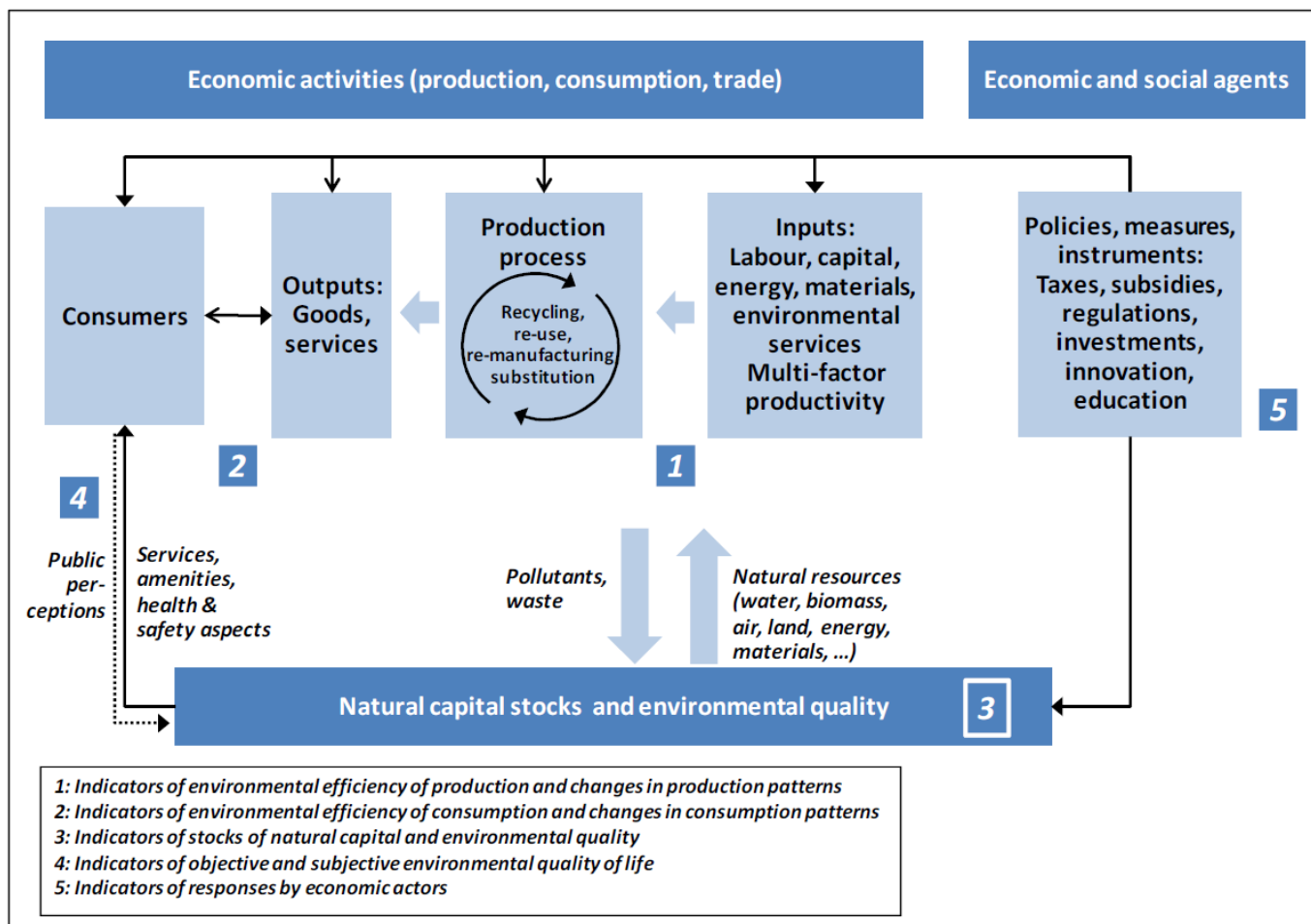


**Beyond traditional metrics** for wellbeing, development and SD:

- **Stiglitz Commission** critical of current capacity to provide adequate statistics on State of environment, and vital links to socio-economic data. Support natural capital (within a general K approach), acknowledging methodological difficulties (commensurability, valuation methods, and data insufficiency). A set of carefully developed indicators could be second best.
- **UNECE/Eurostat/OECD** task force on measuring SD pursuing K approach to identify indicators of SD (long term), also indicators of quality of life and distributional aspects. A SDI is proposed, but when assessing data availability, “in many cases no ideal indicators can be found, in most cases good proxies are available” SDI presented 2 ways: A conceptual dashboard that stresses the main trade-offs of human wellbeing ‘here and now’, ‘elsewhere’ and ‘later’; while a policy dashboard organizes data classifying them along classic policy domains.
- **SEEA** is expected to be international statistical standard in 2012 (volume 1), at same level as the SNA. Physical accounts have gained more importance in the development of the SEEA. SEEA 2012 has expanded boundary of natural assets to include some, but not all of the elements that are not captured by the market, and it is developing natural assets and physical flow classifications that are important to the revision of the FDES. Volume 2 is expected to cover the ecosystem accounting.

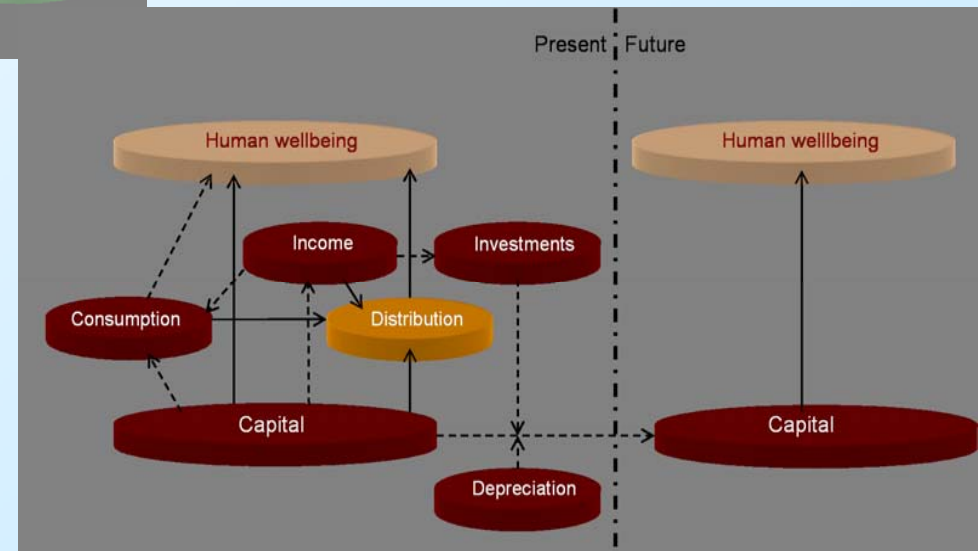
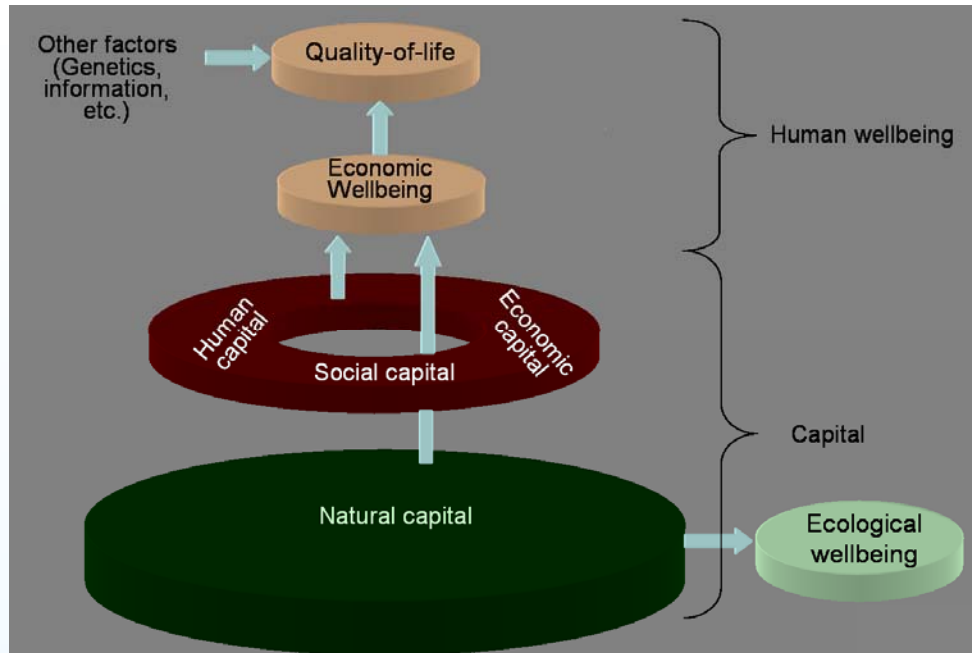


Figure 10. Framework for Green Growth Indicators





# Joint UNECE/Eurostat/OECD Task force on measuring sustainable development (TFSD)



## SD themes: conceptual classification (draft)

Joint UNECE/Eurostat/OECD task force on measuring sustainable development

Classification	Sub-classification	Themes
Current human wellbeing ('here and now')	Overarching indicators	HWB-A-Wellbeing
		HWB-B-Consumption
		HWB-C- Income
		HWB1. Nutrition
		HWB2. Health
		HWB3. Housing
		HWB4. Air quality
		HWB5. Education
		HWB6. Leisure
		HWB7. Labour
		HWB8. Economic security
		HWB9. Inequality
		HWB10. Physical safety
	HWB11. Trust	
	HWB12. Shared norms and values	
	HWB13. Institutions	

Capital (pre-condition of future human well-being, 'later')	Economic capital	EC1. Physical Capital	
		EC2. Knowledge Capital	
	Financial capital	FC1. Financial capital	
		Natural capital	NC1. Land
			NC2. Energy reserves
			NC3. Metal and non-metal reserves
			NC4. Ecosystems
			NC5. Soil quality
			NC6. Water quality
			NC7. Water quantity
			NC8. Air quality
	NC9. Climate		
		HC1. Labour	
HC2. Education			
HC3. Health			
	SC1. Trust		
	SC2. Shared norms and values		
	SC3. Institutions		
	<i>EC-M Economic and financial capital</i>		
	<i>HC-M. Human capital</i>		
	<i>NC-M. Natural capital</i>		
	<i>SC-M. Social capital</i>		
	<i>EW-M Economic wealth</i>		
	INT-C-Income		
		INT-NC1. Land	
		INT-NC2. Energy reserves	
		INT-NC3. Metal and non-metal reserves	
		INT-NC7. Water quantity	
		INT-NC9. Climate	



## About reviewed conceptual approaches

- Most frameworks are supported by a mixture of different concepts about the environment and the human activities and welfare
- Most relevant to FDES revision: ecosystems and natural capital approaches



# Ecosystems Approach

A comprehensive science to the conservation and management of ecosystems and its subsystems (interrelations)





# Natural capital approach

Maintaining the natural assets through time, and quantifying and valuing ecosystem services for managing, preserving and restoring the natural environment



Consequently, the system is capturing the ecosystem services provided by forests and the ways in which the forest provides benefits to the economy and the environment. The system also captures the ways in which the forest provides benefits to the economy and the environment. The system also captures the ways in which the forest provides benefits to the economy and the environment.





## Contributing conceptual approaches

- Both approaches provide valuable conceptual inputs and structural elements to construct components of the environment, and measurements of its dynamics over time and space.
- From the **ecosystem approach**, the potential of the MEA and State of Ecosystems and other relevant ecosystem-based frameworks and their reporting categories and topics are being considered for the structure, dimensions and topics of the revised FDES.
- From the **natural capital approach**, relevant analytical categories comprising the stocks and flows, are being considered. Also SEEA 2012 and its classifications (being developed) of assets and physical flows, are to be considered as potential inputs for the corresponding environmental components of the revised FDES.



# Some final thoughts for the revision of FDES

- The revision of the original 1984 FDES should take into account the current state of the art in **knowledge**. It should also reflect the common characteristics of the **statistical systems** in the different countries (statistical feasibility).
- Scientific knowledge, concepts, frameworks and data are **interdependent** in the environmental field. Worldwide development is heterogeneous, and slower than needed
- **Limited availability of scientific knowledge and insufficient data** on key components and relations within ecosystems restrict advancement of definitions (and ideal overarching theories), classifications, designation of strict boundaries and the corresponding derivation of required data sets.
- Policy driven FWs used in monitoring and assessment of the environment and sustainable development are tailor-made to **respond to specific purposes**



## Some final thoughts (2)

- Implicit and explicit **FWs are tailor-made** to accommodate the country- or agency-specific relevant interests and themes, and/or to respond to specific national or institutional environmental goals.
- Approaches underlying reviewed FWs aimed at new understanding and measuring of well being and sustainability. **Heterogeneous**, extend over a wide spectrum from the narrowest to the most complex conceptualizations.
- When matching **complex thinking** and monitoring necessities with the available **statistical** data sets and current institutional and resource difficulties of most countries in the world, an evident **gap** is observed.
- **Statistical capabilities** created by the functioning and development of the national statistical systems and national statistical offices, the allocated human and other **resources** and the availability of current **datasets** are key in determining what is feasible for the resulting revised FDES and corresponding datasets.





Thank you  
Danke  
Xie  
Khawp khun  
Yum  
Eotio  
Salamat  
Juspa  
Mahalo  
Gracia  
Obrigada  
Spacibo  
Arigato  
Gracias