"Capacity Building and Strengthening Institutional Arrangement / Data Yearbook"

Workshop: "Environmental Indicators and their use for indicator-based reporting activities"

The Most Advanced Core Sets of Indicators

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APAT

Agency for Environmental Protection and Technical Services

The main institutional organizations involved into the environmental indicators construction activity have been: OECD, UN, EEA/Eurostat

DEFINITE AIMS

Aims are changed in time, owing to informative needs.

The main aims

To monitor the state of the environment;

To monitor the integration between the environmental and the economic information;

To understand and describe sustainability;

To communicate environmental information in clear and intuitive way.

To monitor the environmental policy;

SEVERAL INDICATORS TYPOLOGIES

1. To monitor the state of the environment

STATE INDICATORS

Knowledge of environmental conditions

Quality of the environmental matrix

OECD and EU (EEA – DG Env.)

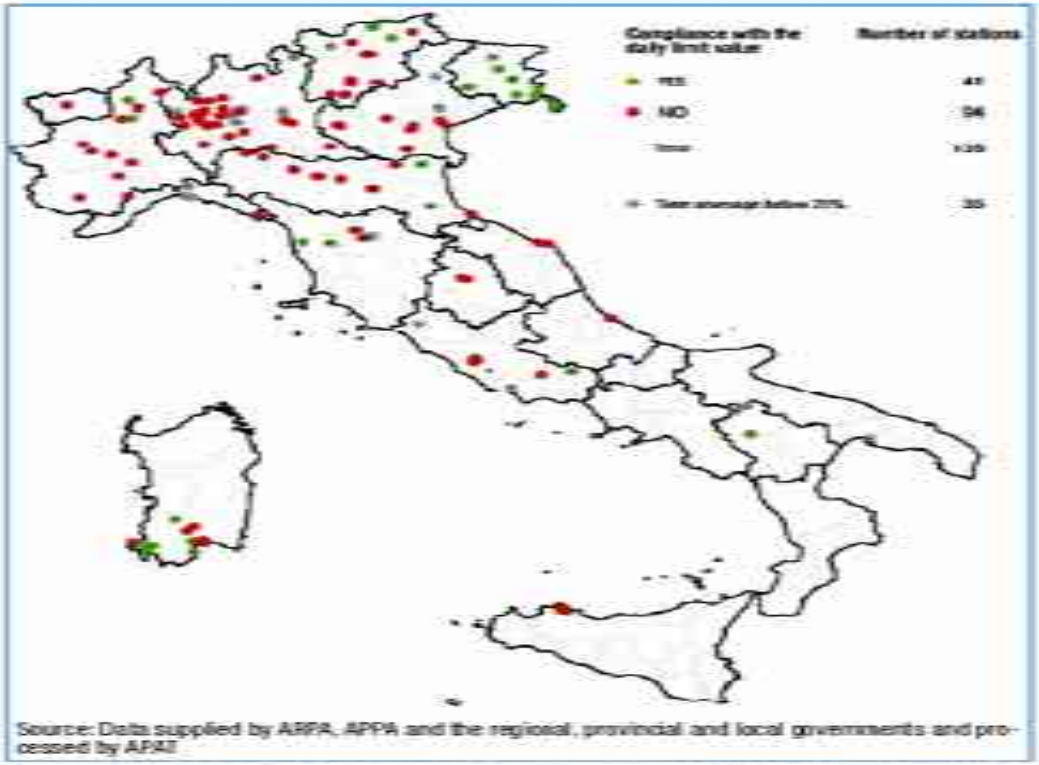
AMBIENT AIR QUALITY: PM_{10} PARTICULATE MATTER

INDICATOR – AD1.011

Particulate Matter (PM) consists of airborne particles in solid or liquid form with an aerodynamic equivalent diameter of between 0.1 and about 100µm. The acronym PM_{10} identifies the airborne particles having an aerodynamic equivalent diameter of up to 10 µm. They tend to remain in the air for long periods of time and, therefore, can be transported very far from the point of emission; these particles have a very complex and variable chemical composition, and are capable of penetrating into the human respiratory system beings with negative effects on health.

PM_{10} particulate matter is a pollutant with an important secondary fraction.

The sources of airborne particles may be either natural (wind erosion, volcanic eruptions, forest fires) or anthropogenic (road vehicle traffic and combustion of various kinds). Road vehicles, in particular, contribute to airborne particle pollution through exhaust emissions, road surface wear and tire wear. Anthropogenic sources of PM_{10} also generate the many gases causing secondary pollution and which determine the formation of very fine particles, such as, for example, sulphur and nitrogen oxides, VOCs (Volatile Organic Compounds) and ammonia.



Source: Data supplied by ARPA, APPA and the regional, provincial and local governments and processed by APAT

Figure 6.9: PM_{10} particulate matter: overview of monitoring stations based on compliance with the daily limit value (50 µg/m³ that is not to be exceeded more than 35 days per calendar year) 2004

In 2004, 135 monitoring stations (out of a total of 170) supplied a set of valid data with a time coverage of at least 75%.

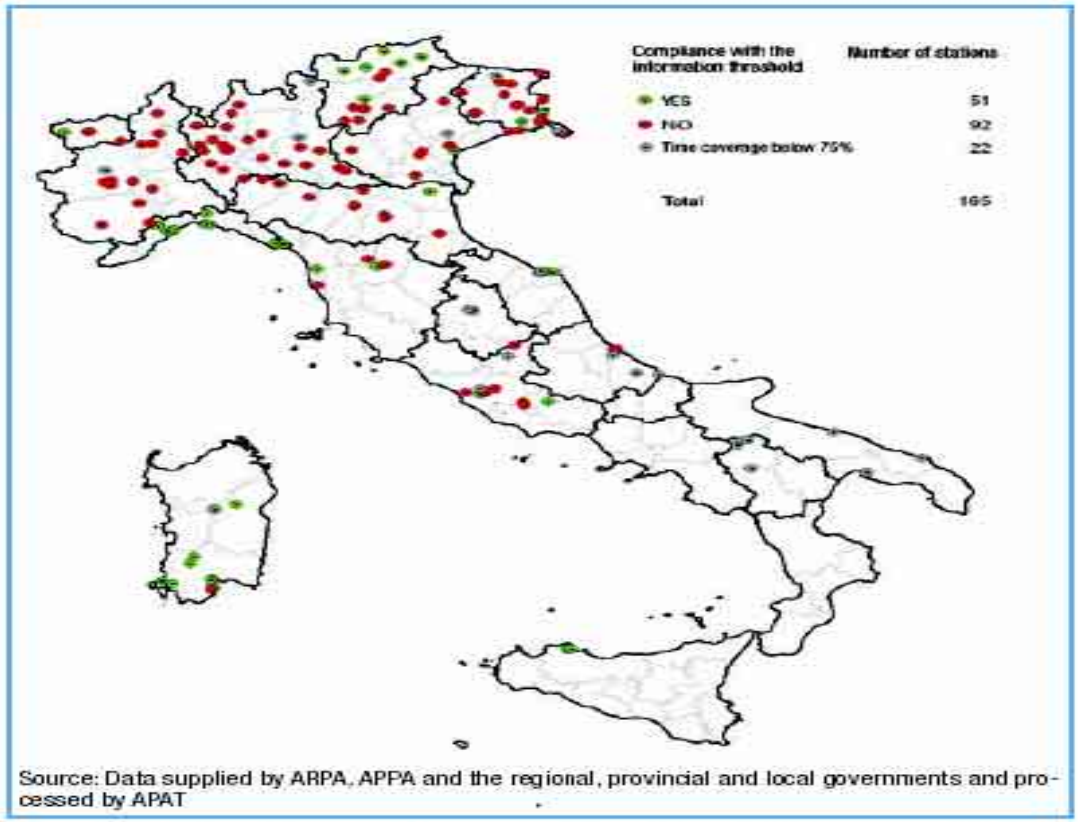
The daily limit value for PM_{10} is 50 µg/m³; this limit value is not to be exceeded more than 35 days per calendar year. This limit was introduced in 2005.

Figure 6.9 shows, with respect to 2004, the monitoring stations nationwide that exceeded or did not exceed the daily limit value. It can be observed that 94 stations (69.6% of the total) record exceedances of the daily limit value for between 36 and 188 days in the year, while the remaining 41 stations (30.4%) respect it.

AMBIENT AIR QUALITY: TROPOSPHERIC OZONE (O_3)

INDICATORE - A01.012

Tropospheric ozone is a secondary pollutant formed by photochemical reactions in the presence of primary pollutants such as nitrogen oxides (NO_X) and volatile organic compounds (VOCs). Tropospheric ozone can seriously harm both human health and the ecosystems, as well as agriculture and materials. Photochemical pollution is a cross-border phenomenon that can concern huge geographical areas (the Po River basin, for example). Consequently, the excess values recorded in a certain area are not always the result of emissions from sources located in that area; it is often the case, for example, that the largest contribution comes from adjacent areas. The highest concentrations of ozone are recorded in the hottest months of the year at the hottest time of the day. In urban areas ozone tends to form and to transform itself very rapidly, according to a behaviour that differs greatly from other pollutants. The principal emission sources of ozone precursors are road vehicles, household heating systems and power plants.



Source: Data supplied by ARPA, APPA and the regional, provincial and local governments and processed by APAT

Figure 6.10: Ozone: overview of monitoring stations based on compliance with the information threshold, hourly-average concentration value of 180 µg/m³ (2004)

One of the principal threshold values according to the current legislation (Commission Directive 2002/3/EC, translated into Italian law by Legislative Decree 183/2004) for the protection of human health is the information threshold of 180 µg/m³ as the hourly-average concentration value, which is the limit value beyond which there is a hazard for human health in the case of short-term exposure of several sensitive population groups.

Question n. 16

"To monitor the state of the environment", has been the first aim which inspired the core set development. True or false?

True

2.To succeed the integration between the environmental and the economic information

INTEGRATION INDICATORS

"Bridges" between environmental worries and economic needs.

EEA, Eurostat, OECD

Projects

TERM (Transport and Environment Reporting Mechanism);

EERM (Energy and Environment Reporting Mechanism);

IRENA (Indicator Reporting on the Integration of Environmental concerns into Agriculture Policy).

Term Indicators (2005)

Indicator		2000	2001	2002	2003	2004	2005
TERM 01	Transport final energy consumption by mode	+	+	+	+	+	+
TERM 02	Transport emissions of greenhouse gases		+	+	+	+	+
TERM 03	Transport emissions of air pollutants	+	+	+	+	+	+
TERM 04	Exceedances of air quality objectives due to traffic	+	+	+	+	+	+
TERM 05	Exposure to and annoyance by traffic noise	+	+				
TERM 06	Fragmentation of ecosystems and habitats by transport infrastructure	+	+	+			
TERM 07	Proximity of transport infrastructure to designated areas		+	+			
TERM 08	Land take by transport infrastructure	+	+	+			
TERM 09	Transport accident fatalities	+	+	+	+	+	+
TERM 10	Accidental and illegal discharges of oil at sea		+	+			
TERM 11	Waste oil and tires from vehicles			+			
TERM 11a	Waste from road vehicles (ELV)	+	+	+			
TERM 12a	Passenger transport	+	+	+	+	+	+
TERM 12b	Passenger transport modal split by purpose				+	+	+
TERM 13a	Freight transport	+	+	+	+	+	+
TERM 13b	Freight transport modal split by group of goods				+	+	+
TERM 14	Access to basic services	+	+		+		
TERM 15	Regional accessibility of markets and cohesion		+		+		
TERM 16	Access to transport services	+	+				
TERM 18	Capacity of infrastructure networks	+	+	+	+	+	+
TERM 19	Infrastructure investments	+	+	+			

TERM 20	Real change in transport prices by mode	+	+	+		+	+
TERM 21	Fuel prices and taxes	+	+	+	+	+	+
TERM 22	Transport taxes and charges				+	+	+
TERM 23	Subsidies						
TERM 24	Expenditure on personal mobility by income group					+	+
TERM 25	External costs of transport		+	+	+	+	+
TERM 26	Internalisation of external costs	+	+	+	+	+	+
TERM 27	Energy efficiency and specific CO2 emissions	+	+	+	+		+
TERM 28	Specific emissions	+	+		+		+
TERM 29	Occupancy rates of passenger vehicles	+	+	+		+	+
TERM 30	Load factors for freight transport		+	+		+	+
TERM 31	Uptake of cleaner and alternative fuels	+	+	+	+	+	+
TERM 32	Size of the vehicle fleet	+	+	+	+	+	
TERM 33	Average age of the vehicle fleet		+	+	+		+
TERM 34	Proportion of vehicle fleet meeting certain emission standards	+	+	+	+	+	
TERM 35	Implementation of integrated strategies	+	+	+		+	
TERM 36	Institutional cooperation		+	+		+	
TERM 37	National monitoring systemS	+	+	+		+	
TERM 38	Implementation of SEA	+	+	+		+	
TERM 39	Uptake of environmental management systems by transport companies	+					
TERM 40	Public awareness	+	+			+	

PROPORTION OF VEHICLE FLEET MEETING CERTAIN EMISSION STANDARDS

INDICATOR - D03.014

This indicator measures the proportion of vehicle fleet meeting the more recent (and stringent) emission standards for new vehicles. The emissions of harmful substances in this sector are mostly related to the energy combustion methods; therefore, the use of appropriate technologies can considerably reduce the amount of emissions.
Upgrading the vehicle fleet to the environmental standards for new vehicles proceeds at a natural fleet replacement pace, although there are still large amounts of vehicles that do not meet these standards (about half the heavy commercial vehicles and over half the motorcycles). This trend, however, is not viewed negatively, because an acceleration in the upgrading of the fleet would inevitably produce an expansion of the fleet itself, the side effect of which would be to further increase the share of road transport.

Table 3.3: Vehicles meeting certain emissions standards in Italy by fuel type (2004)

	Pre-euro/ Euro 0	Euro 1, since 1.1.1993	Euro 2, since 1.1.1997	Euro 3, since 1.1.2001	Euro 4, since 1.1.2005	
Motor cars			%			
Petrol	30.8	20.1	28.0	18.5	2.4	
Diesel	12.8	5.3	29.1	48.4	4.4	
LPG	55.9	26.2	15.2	2.5	0.1	
Methane	37.6	23.4	24.4	13.3	1.2	
Motorcycles and delivery tricars	Pre-euro / Euro 0	Euro 1, since 1.1.2003	Euro 2, since 1.7.2004	Euro 3, since 1.1.2008		
All fuels	54.2	45.8	-	-		
Light commercial vehicles	Pre-euro / Euro 0	Euro 1, since 1.1.1995	Euro 2, since 1.1.1999	Euro 3, since 1.1.2001	Euro 4, since 1.1.2006	
All fuels	40	16	16.6	27.5	-	
Heavy commercial vehicles	Pre-euro / Euro 0	Euro 1/stage I, since 1.1.1994	Euro 2/stage II, since 1.1.1997	Euro 3, since 1.1.2001	Euro 4, since 1.1.2006	Euro 5, since 1.1.2009
Lorries	57.2	7.6	20.9	14.2	-	-
Buses	49.5	7.9	27.1	15.5	-	-

Source: ACI data processed by APAT

LEGEND:

The percentage figures are related to the vehicle fleet circulating at the end of the year.
Note: The dates refer to registration or, in the case of motorcycles, to sales. State-of-the-art vehicles are often marketed in advance of the deadlines shown.

Question n.17

"Integration indicators" give a knowledge of environmental conditions. True or false?

False

Question n. 18

What does "TERM" mean?

Transport and Environment Reporting Mechanism

…and which kind of indicators it includes?

Integration Indicators

3. To understand and describe sustainability

SUSTAINABLE DEVELOPMENT INDICATORS

UNCSD

Useful to:

- increase focus on sustainable development;
- assist decision-makers at all levels to adopt sound national sustainable development policies.

Social, economic and environmental aspects

Question n. 19

"Sustainable development indicators" assist decision-makers at all levels to adopt sound national policies. True or False?

True

UNCSD environmental indicators examples

Water: Groundwater reserves, discharges of oil into coastal waters.

Land: Land use change, Land affected by desertification, Use of agricultural pesticides/fertilizer.

Other natural resources: Forest area change, Threatened species, Existence of national bio-safety regulations or guidelines.

Atmosphere: Emissions of greenhouse gasses; Ambient concentrations of pollutants in urban areas, Expenditure on air pollution abatement.

Waste: Generation of industrial and municipal solid waste, Waste recycling and reuse, Generation of hazardous waste.

4. To monitor the environmental policy

EFFECTIVENESS/EFFICIENCY INDICATORS

Lisbon European Council (2000) invited the European Commission to present an annual report on progress achieved in several areas (employment, innovation, economic reform, social cohesion, environment).

Environmental indicators included: *Greenhouse gasses emissions* and *Energy intensity of the economy*.

More indicators to be developed.

Indicators to be developed

- Consumption of toxic chemicals
- Health expectancies
- Biodiversity index
- Resource productivity
- Recycling rate of selected materials
- Generation of hazardous waste.

5. To communicate environmental information in clear and intuitive way

HEADLINE INDICATORS (EEA)

KEY INDICATORS (OECD)

Enlarge the audience

Selection Activity

Question n. 20

"Headline indicators" and "key indicators" are used in order to enlarge the audience. True or false?

True

Core Sets of Indicators

Indicators are scheduled into **core sets**.

- **Conceptual Framework**
- **Environmental Issues or Themes**

MOST ADVANCED CORE SETS

OECD Indicators Core Set

UNCSD Indicators Core Set

EEA/EUROSTAT Indicators Core Set

MCSD Indicators Core Set

APAT Indicators Core Set

OECD Core Set of Indicators

1989 The Group of Seven (G7) entrusts OECD to define shared criteria for the environment analysis and evaluation among the member states.

1991 “Environmental Indicators: a preliminary set” is published.

Main aims achieved :

- To provide a conceptual framework;
- To fix up selection criteria for the indicators;
- To measure environmental condition by shared methodologies;
- To encourage the regular use of the indicators.

1993 First OECD **core set of indicators**.

- 14 environmental issues (93 indicators)
- Background indicators (11 indicators)

1993-2001 Elaboration of a thematic **short list of key indicators**.

OECD KEY INDICATORS

Purpose:

to give “a broad overview of environmental issues of common concern in OECD countries, and inform policy makers and public about progress made and to be made”. *OECD definition*.

Selection criteria:

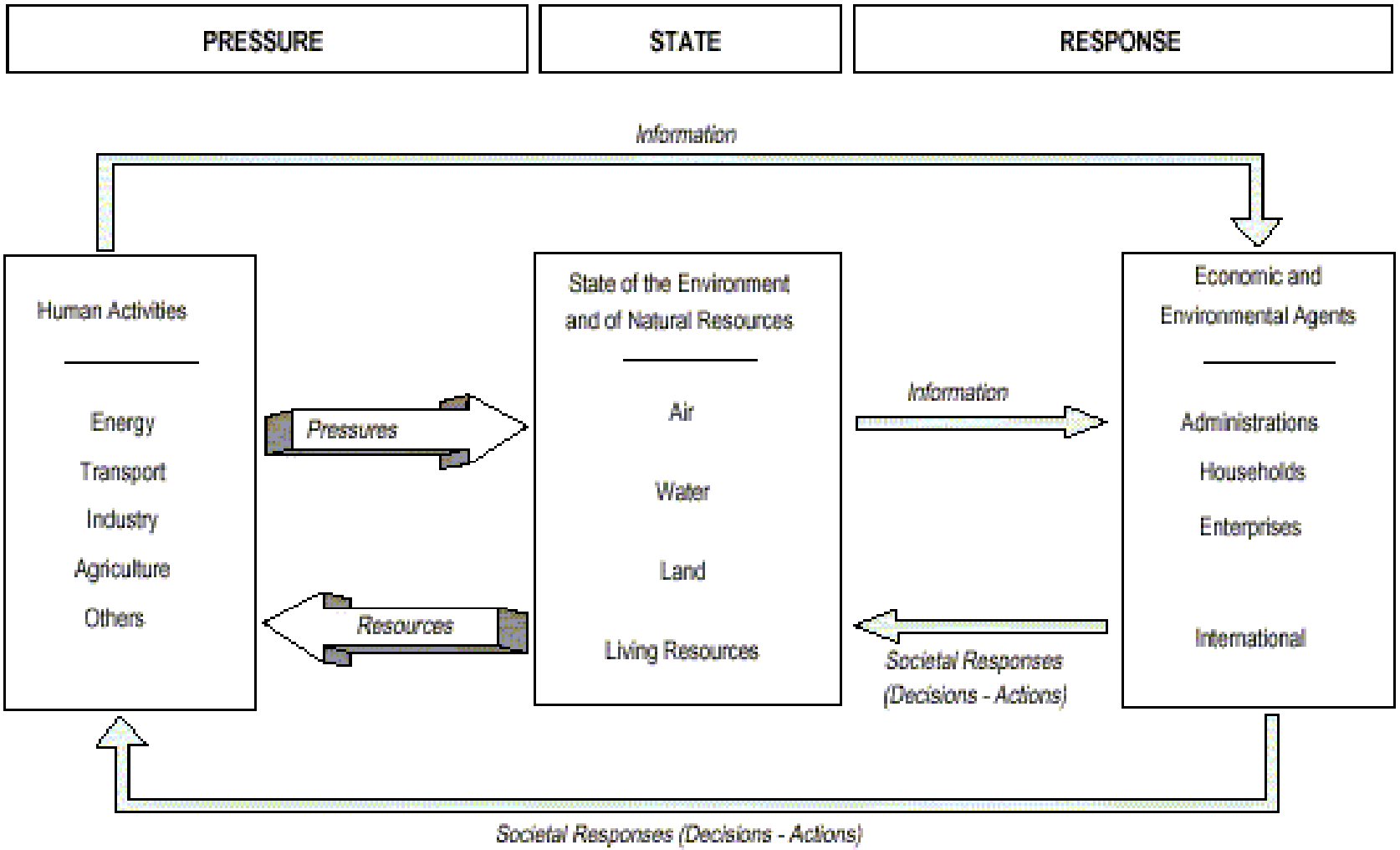
- Policy relevance;
- Analytical soundness;
- Measurability.

2001 “Toward sustainable development – Environmental indicators” is published.

2005 OECD publishes “OECD Environmental Indicators”

- 9 environmental issues (19 indicators)
- 10 environmental issues (10 key indicators short list)

The Framework



The OECD Core Set of Indicators (2005)

ISSUE	INDICATOR
Climate change	*CO_2 emission intensities*
	Greenhouse gas emissions
	Greenhouse gas concentration
Ozone layer depletion	*Ozone depleting substances*
	Stratospheric ozone
Air quality	*Air emission intensities*
	Urban air quality
Waste	*Waste generation*
	Waste recycling
Water quality	*River quality*
	Waste water treatment
Water resources	*Intensity of use of water resources*
	Public water supply and price
Forest resources	*Intensity of use of forest resources*
	Forest and wooded land
Fish resources	*Fish catches and consumption – national*
	Fish catches and consumption – global and regional
Biodiversity	*Threatened species*
	Protected areas

OECD set of key environmental indicators

Pollution issues		Available indicators*	Medium term indicators **
Climate change	1.	CO2 emission intensities Index of greenhouse gas emissions	Index of greenhouse gas emissions
Ozone layer	2.	Indices of apparent consumption of ozone depleting substances (ODS)	Same, plus aggregation into one index of apparent consumption of ODS
Air quality	3.	SOx and NOx emission intensities	Population exposure to air pollution
Waste generation	4.	Municipal waste generation intensities	Total waste generation intensities, Indicators derived from material flow accounting
Freshwater quality	5.	Waste water treatment connection rates	Pollution loads to water bodies
Natural resources & assets			
Freshwater resources	6.	Intensity of use of water resources	Same plus sub-national breakdown
Forest resources	7.	Intensity of use of forest resources	Same
Fish resources	8.	Intensity of use of fish resources	Same plus closer link to available resources
Energy resources	9.	Intensity of energy use	Energy efficiency index
Biodiversity	10.	Threatened species	Species and habitat or ecosystem diversity Area of key ecosystems

* *Indicators for which data are available for a majority of OECD countries and that are presented in this report*

** *Indicators that require further specification and development (availability of basic data sets, underlying concepts and definitions).*

This selection is the result of an arrangement among the member states

OECD Methodological Sheet

Biodiversity: Land Area Protected

DEFINITION

Goal addressed: *sustainable environment*

This indicator addresses the goal of the reversal of the current trends in the loss of environmental resources at both global and national levels by 2015.

Quantitative goal:
There is no quantitative goals for this indicator. However, an informal target of protection of 10% for each major *ecological region* was put forward in the 1991 *Caring for the Earth: A Strategy for Sustainable Living*. This target reflects recognition that representation of ecosystem diversity is more meaningful than a flat percentage of the country's area.

Dimension captured: *protected areas*

Protected areas are an essential tool for ecosystem conservation, with functions going well beyond the conservation of biological diversity. As such they are one of the building blocks of sustainable development.

Definition

This indicator represents the extent to which areas important for conserving biodiversity, cultural heritage, recreation, natural resource maintenance, and other values, are protected from incompatible uses.

Numerator: Surface of totally protected or protected areas expressed in km².
Denominator: Total surface of the country in km²

Totally protected areas are areas maintained in a natural state and are closed to extractive uses. They comprise National Nature Reserves, National Parks, National Monuments.

Partially protected areas are managed for specific uses such as recreation, or to provide optimum conditions for certain species or ecological communities. They are also necessary to protect valued expressions of human relationships with nature in terms of landscape.

Unit of measurement: percentage of land area

BASELINE & GOAL

Protected Area as a Percent of Total Area

	Baseline (1990)	Goal (2015)
East Asia and the Pacific	7%	
Europe & Central Asia	4%	
Latin America & Caribbean	8%	
Mideast, N. Africa & Europe	2%	
South Asia	4%	
Sub-Saharan Africa	6%	
World	5.6%	n.a.

Source: WRI

COVERAGE

Protected Area as a Percent of Total Area, 1990

	Countries with data	Population represented
East Asia and the Pacific	27	100%
Europe & Central Asia	12	100%
Latin America & Caribbean	23	99%
Mideast, N. Africa & Europe	13	100%
South Asia	5	98%
Sub-Saharan Africa	39	98%
World	146	100%

Source: WRI

SOURCES

Lead agency :	IUCN (World Conservation Union)
National data provider:	Relevant agencies
Availability time lag:	to be advised
Gender disaggregated:	Not applicable
Data set used:	WRI, WDI

METHODS

Internationally agreed methodology:	Yes
Method of collection:	to be advised
Indicator limitations:	No internationally agreed target See comments

COMMENTS

Indicator limitations

The effectiveness of this indicator is limited by two problems. First, it represents *de jure* not *de facto* protection. It does not indicate quality of management or whether the areas are in fact protected from incompatible uses. Second, the indicator does not show how representative the protected areas are of the country's ecological diversity. This is a significant deficiency, since a large proportion of the same ecosystems may be protected to the neglect of others.

Biodiversity is a global issue. It is intended to improve the indicator to score the importance of the areas protected and level of protection in force.

UNCSD Core Set of Indicators

1995 A free entrance database is achieved.

1995-1996 Reconnaissance through a proper technical sheet describing: policy relevance, calculating methodology, data availability and sources.

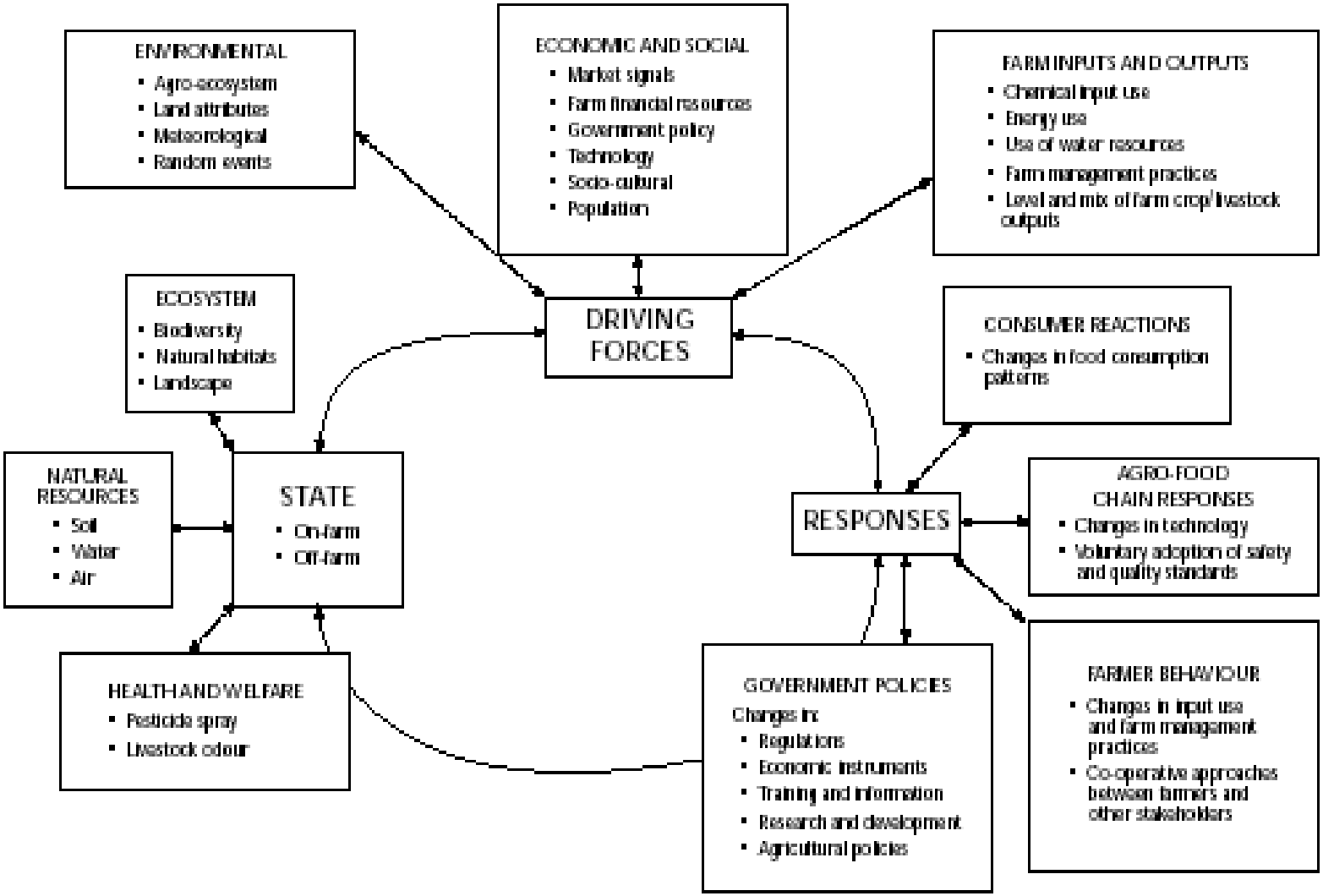
1995-2000 Development of indicator fact-sheets, training courses, indicators evaluation, data validation activities.

2000 Development of aggregated indicators and indexes.

2001 First version of the core set.

2006 Last core set updating.

The Framework



The UNCSD Core Set Of Indicators (1996)

The social indicators

Theme	Sub-theme	Indicator
Equity	Poverty	Percent of Population Living below Poverty Line
		Gini Index of Income Inequality
		Unemployment Rate
	Gender Equality	Ratio of Average Female Wage to Male Wage
Health	Nutritional Status	Nutritional Status of Children
	Mortality	Mortality Rate Under 5 Years Old
		Life Expectancy at Birth
	Sanitation	Percent of Population with Adequate Sewage Disposal Facilities
	Drinking Water	Population with Access to Safe Drinking Water
	Healthcare Delivery	Percent of Population with Access to Primary Health Care Facilities
		Immunization Against Infectious Childhood Diseases
		Contraceptive Prevalence Rate
Education	Education Level	Children Reaching Grade 5 of Primary Education
		Adult Secondary Education Achievement Level
	Literacy	Adult Literacy Rate
Housing	Living Conditions	Floor Area per Person
Security	Crime	Number of Recorded Crimes per 100,000 Population
Population	Population Change	Population Growth Rate
		Population of Urban Formal and Informal Settlements

The Environmental Indicators

Theme	Sub-theme	Indicator
Atmosphere	Climate Change	Emissions of Greenhouse Gases
	Ozone Layer Depletion	Consumption of Ozone Depleting Substances
	Air Quality	Ambient Concentration of Air Pollutants in Urban Areas
Land	Agriculture	Arable and Permanent Crop Land Area
		Use of Fertilizers
		Use of Agricultural Pesticides
	Forests	Forest Area as a Percent of Land Area
		Wood Harvesting Intensity
	Desertification	Land Affected by Desertification
	Urbanization	Area of Urban Formal and Informal Settlements
Oceans, Seas and Coasts	Coastal Zone	Algae Concentration in Coastal Waters
		Percent of Total Population Living in Coastal Areas
	Fisheries	Annual Catch by Major Species
Fresh Water	Water Quantity	Annual Withdrawal of Ground and Surface Water as a Percent of Total Available Water
	Water Quality	BOD in Water Bodies
		Concentration of Faecal Coliform in Freshwater
Biodiversity	Ecosystem	Area of Selected Key Ecosystems
		Protected Area as a % of Total Area
	Species	Abundance of Selected Key Species

The Economic Indicators

Theme	Sub-theme	Indicator
Economic structure	Economic Performance	GDP per Capita
		Investment Share in GDP
	Trade	Balance of Trade in Goods and Services
	Financial Status	Debt to GNP Ratio
		Total ODA Given or Received as a Percent of GNP
Consumption and production patterns	Material Consumption	Intensity of Material Use
	Energy Use	Annual Energy Consumption per Capita
		Share of Consumption of Renewable Energy Resources
		Intensity of Energy Use
	Waste Generation and Management	Generation of Industrial and Municipal Solid Waste
		Generation of Hazardous Waste
		Management of Radioactive Waste
		Waste Recycling and Reuse
	Transportation	Distance Traveled per Capita by Mode of Transport

The Institutional Indicators

Theme	Sub-theme	Indicator
Institutional Framework	Strategic Implementation of SD	National Sustainable Development Strategy
	International Cooperation	Implementation of Ratified Global Agreements
	Information Access	Number of Internet Subscribers per 1000 Inhabitants
	Communication Infrastructure	Main Telephone Lines per 1000 Inhabitants
Institutional Capacity	Science and Technology	Expenditure on Research and Development as a Percent of GDP
	Disaster Preparedness and Response	Economic and Human Loss Due to Natural Disasters

The Methodological Sheet

1. INDICATOR

(a) **Name:** Land Affected by Desertification.

(b) **Brief Definition:** This is a measure of the amount of land affected by desertification and its proportion of national territory.

(c) **Unit of Measurement:** Area (Km2) and % of land area affected.

(d) **Placement in the CSD Indicator Set:** Environmental/Land/Desertification.

2. POLICY RELEVANCE

(a) **Purpose:** The indicator describes the extent and severity of desertification at the national level.

(b) **Relevance to Sustainable/Unsustainable Development (theme/sub-theme):** The indicator should be a mechanism for determining the importance of this issue at the national level.

(c) **International Conventions and Agreements:** The two most significant agreements are: Agenda 21 of the 1992 UN Conference on Environment and Development; and the UN Convention to Combat Desertification, 1994…

(d) **International Targets/Recommended Standards:** No specific targets have been defined, however, the goal should be to reduce the area and percentage of land affected…

(e) **Linkages to Other Indicators:** This state and trends indicator needs to be considered in conjunction with related driving force and response indicators…

3. METHODOLOGICAL DESCRIPTION

(a) **Underlying Definitions and Concepts:** Desertification is defined as land degradation in arid, semi-arid, and dry sub-humid areas…

(c) **Limitations of the Indicator:** There are a number of issues to be resolved before this indicator can be entirely satisfactory…

(d) **Status of the Methodology:** The methodology for the compilation of the above statistics has not yet been agreed…

(e) **Alternative Definitions/Indicators:** Not available.

4. ASSESSMENT OF DATA

(a) **Data Needed to Complete the Indicator:** The data needed to compile the indicator are the extent and severity of dryland degradation in the country concerned…

(b) **National and International Data Availability and Sources:** Dryland and national areas can be obtained from national statistical institutions and publications, publications…

5. AGENCIES INVOLVED IN THE DEVELOPMENT OF THE INDICATOR

(a) **Lead Agency:** The lead agency is the Office to Combat Desertification and Drought (UNSO) of UNDP. The contact point is…

(b) **Other Contributing Organizations:** Other contributing organizations include: UNEP, FAO…

6. REFERENCES

(a) **Readings:**

Bie, Stein W. 1990. *Dryland Degradation Measurement Techniques*, World Bank, Environment Work Paper No. 26, 42 p.

(b) **Internet:**

United Nations Convention to Combat Desertification. http://www.unccd.ch

EU (EEA/EUROSTAT/DG Env.) Core Set of Indicators

1992 European Commission elaborates a framework for the construction of pressure indicators. DPSIR has been developed.

1994 EEA and EIOnet begin their activities.

1995 European Parliament ratifies the first list of pressure indicators. The attention has been focused on 10 themes of environmental policy: climate change, stratospheric ozone depletion, loss of biodiversity, natural resources withdrawals, chemicals, waste, air pollution, marine and coastal environment, water, urban environment.

1995-1998 Selection activity of the existing pressure indicators, development of new indicators, settlement of calculation
methodology, improvement of data filing techniques.

1999 Eurostat publishes “Towards Environmental Pressure Indices”.

"Towards Environmental Pressure Indices"

Purposes:

· to fill in gaps of knowledge;

· to provide comparisons between Member States that up to now were not possible;

· to provide the basis for further discussion and methodological developments;

· to provide added value to the results of many research projects.

Eurostat Pressure Indicators (1999)

List of Environmental Pressure Indicators developed by Eurostat in the TEPI project

Air Pollution	Emissions of nitrogen oxides (NOx)	Emissions of volatile organic compounds (VOCs)	Emissions of sulphur dioxide (SO2)	Emissions of particles	Consumption of gasoline & diesel oil by road vehicles	Primary energy consumption
Climate Change	Emissions of carbon dioxide (CO2)	Emissions of methane (CH4)	Emissions of nitrous oxide (N2O)	Emissions of hydrofluoro-carbons (HFCs) (replacing Emissions of CFCs)	Emissions of perfluorocarbons (PFCs) (replacing Emissions of NOx)	Emissions of sulphurhexa-fluoride (SF6) (replacing Emissions of SOx
Loss of Biodiversity	Protected area loss, damage and fragmentation	Wetland loss (changed from Wetland loss through drainage)	Agriculture intensity: area used for intensive arable agriculture	Fragmentation of forests & landscapes by roads/ intersections	Forest damage (changed from Clearance of nat./semi-nat. forested areas)	Change in traditional land-use practice
Marine Environment & Coastal Zones	Eutrophication	Fishing pressure	Development along shore	Discharges of heavy metals	Oil pollution at coast & at sea	Tourism intensity (replacing Discharges of halogenated organic compounds)
Ozone Layer Depletion	Emissions of bromofluoro-carbons (halons)	Emissions of chlorofluorocarbons (CFCs)	Emissions of hydrochlorofluoro-carbons (HCFCs)	Emissions of nitrogen oxides (NOx) by aircraft	Emissions of chlorinated carbons	Emissions of industrially produced methyl bromide (CH3Br) (changed from Emissions of CH3Br)

Resource Depletion	Water consumption per capita (incl. ground water abstraction)	Use of energy per capita	Increase in territory permanently occupied by urbanisation; infrastructure...	Nutrient-balance of the soil (nutrient input/nutrient output)	Electricity production from fossil fuels (mineral oil, natural gas & coal)	Timber balance (new growth/ harvest)
Dispersion of Toxic Substances	Consumption of pesticides by agriculture	Emissions of persistent organic pollutants (POPs)	Consumption of toxic chemicals	Index of heavy metal emissions to water	Index of heavy metal emissions to air	Emissions of radioactive material
Urban Environmental Problems	Urban energy consumption (changed from Energy cons.)	Non-recycled municipal waste	Non-treated urban wastewater (changed from Non-treated wastewater)	Car share of urban passenger transport (changed from Share of private car transport)	People endangered by noise emissions from urban traffic (changed from People endangered by noise emissions)	Urban land use (changed from Land-use)
Waste	Waste landfilled	Waste incinerated	Hazardous waste	Municipal waste	Industrial waste (replacing Waste per product during a n° of products entire lifetime)	Waste recycled/material recovered
Water Pollution & Water Resources	Emissions of nutrients (changed from Nutrient (N + P) use (eutrophication equivalents))	Ground water abstraction	Pesticides used per hectare of utilised agriculture area	Nitrogen used per hectare of utilised agriculture area	Waste water treatment (changed from Water treated/water collected)	Emissions of organic matter as biochemical oxygen demand (BOD)

EEA works at a **wider** core set including indicators related to the all DPSIR categories.

- to prioritise improvements in the quality and coverage of data flows, which will enhance comparability and certainty of information and assessments;

- to streamline contributions to other indicator initiatives in Europe and beyond;

- to provide a manageable and stable basis for indicator-based assessments of progress against environmental policy priorities.

2001 The European Council gathered in Goteborg, ratifies an interest towards a small set of indicators (**Environment Headline Indicators**).

EEA Headline Indicators

Themes: Climate change, Nature & Biodiversity, Environment & Human health, Waste & Resources.

Purpose:

"to provide simple and clear information to decision-makers and the general public about progress in environmental policies and the key factors determining the state of the environment and whether we are moving towards environmental sustainability". *EEA definition*

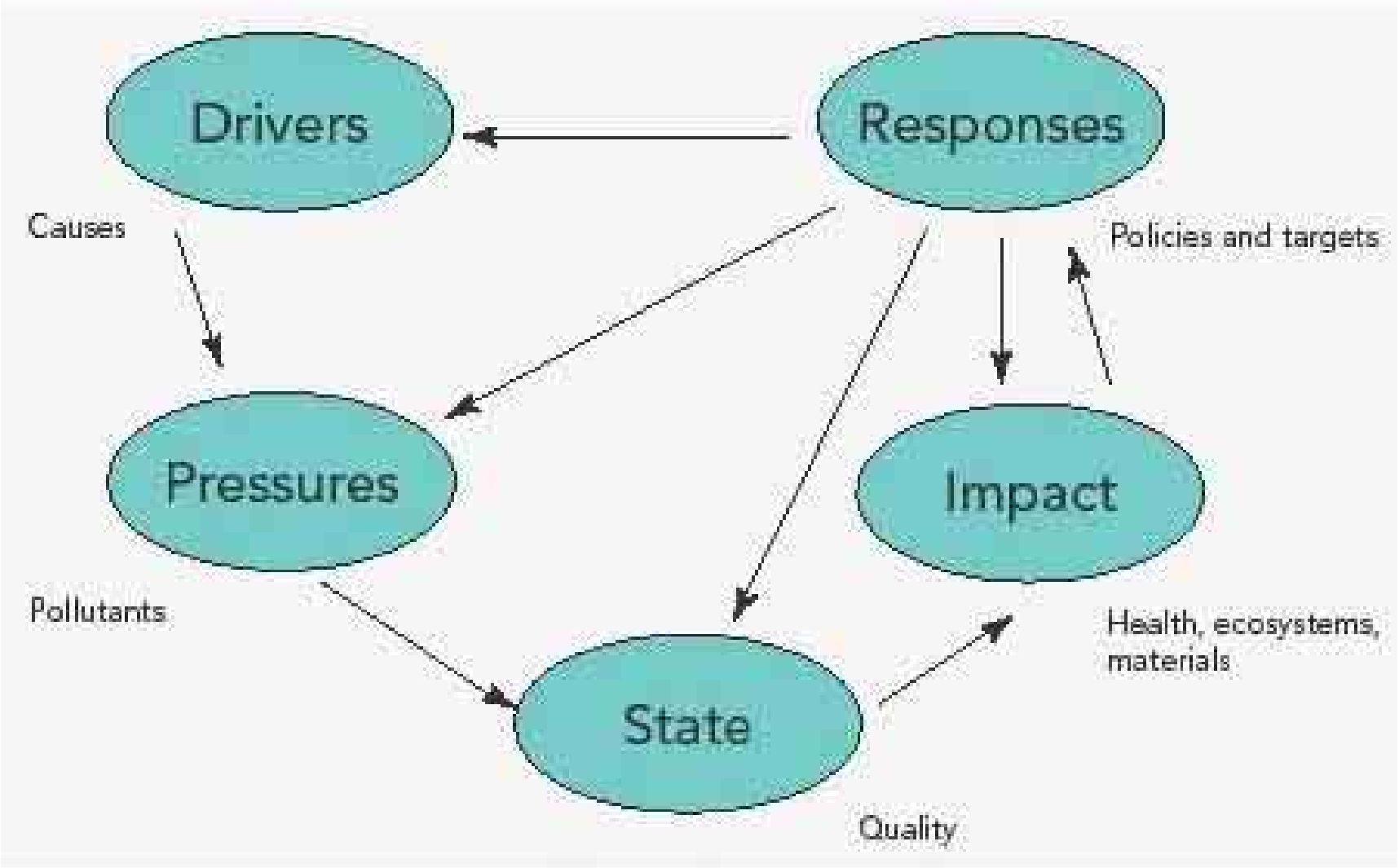
Selection criteria:

Policy relevance.

EEA HEADLINE INDICATORS	
Climate Change	
Climate Change	Emissions of greenhouse gasses
Nature &Biodiversity	
Nature &Biodiversity	Designated "Special Protection Areas"
Air Quality	Air pollution – acidifying pollutants
Environment & human health	
Air Quality	Air pollution – ground level ozone precursos
Urban Air Quality	Emissions of air pollutants in urban areas
Water Quality	Water pollution – concentrations of nitrate-nitrogen and phosphorus in large rivers
Chemicals	No indicator due to lack of existing, comparable data
Waste & resources	
Waste	Municipal and hazardous waste
Resource Use	Energy consumption
Water Quantity	European water abstraction
Land Use	Arable land, permanent grassland, permanent crops, forest land, built up areas, length of road network

(2001)

THE FRAMEWORK



Three Phases

1st phase → July 2002:	400 indicators relevant to policy objectives and distributed across DPSIR
2nd phase. → May 2003:	350 indicators relevant to policy objectives and distributed across DPSIR
3rd phase. → February 2004:	37 indicators relevant to policy targets and data availability

Getting from 350 to 37
The Criteria

• Be ***policy relevant*** - support EU policies' priority issues of increasing policy relevance (on the basic of available EU policy documentation, DG environment work programme..)

• Monitor ***progress toward the quantified targets*** (if there is no targets, then use thresholds)

• Be based on ***ready available and routinely collected data*** for EEA countries within specified timescale (to be determined country by country) at reasonable cost-benefit ratio

• Be consistent in **space coverage** and cover all or most of EEA countries

•**Time coverage** – sufficient/insufficient time trends (exemptions of general nature to be verified – e.g. situation of candidate countries)

•Primarily be **national** in scale and **representative for countries** (countries benchmarking)

•Be **understandable** and simple

•Be conceptually and **methodologically well founded** and representative (to be used by at least one community or international organization) and on the bases of well established consultation with countries

- Be of **priority** in EEA management plan

- Be **timely** (be produced in reasonable and “useful” time)

- Be **well documented** and of known quality

EEA Core Set of 37 Indicators (2004)

Theme	CSI	Indicator title	Specification version
Air pollution and ozone depletion	1	Emissions of acidifying substances	2004
	2	Emissions of ozone precursors	2004
	3	Emissions of primary particulates and secondary particulate precursors	2004
	4	Exceedance of air quality limit values in urban areas	2004
	5	Exposure of ecosystems to acidification, eutrophication and ozone	2004
	6	Consumption of ozone-depleting substances	2004
Biodiversity	7	Threatened and protected species	2004
	8	Designated areas	2004
	9	Species diversity	2004
Climate change	10	Greenhouse gas emissions and removals	2004
	11	Projections of greenhouse gas emissions and removals and policies and measures	2004
	12	Global and European temperature	2004
	13	Atmospheric greenhouse gas concentrations	2004
Terrestrial	14	Land take	2004
	15	Progress in management of contaminated sites	2004
Waste	16	Municipal waste generation	2004
	17	Generation and recycling of packaging waste	2004

Water	18	Use of freshwater resources	2004
	19	Oxygen-consuming substances in rivers	2004
	20	Nutrients in freshwater	2004
	21	Nutrients in transitional, coastal and marine waters	2004
	22	Bathing water quality	2004
	23	Chlorophyll in transitional, coastal and marine waters	2004
	24	Urban wastewater treatment	2004
Agriculture	25	Gross nutrient balance	2004
	26	Area under organic farming	2004
Energy	27	Final energy consumption	2004
	28	Total energy intensity	2004
	29	Total energy consumption	2004
	30	Renewable energy consumption	2004
	31	Renewable electricity	2004
Fisheries	32	Status of marine fish stocks	2004
	33	Aquaculture production	2004
	34	Fishing fleet capacity	2004
Transport	35	Passenger transport demand	2004
	36	Freight transport demand	2004
	37	Use of cleaner and alternative fuels	2004

EEA Methodological-Sheet

Code & title of indicator

Key message

Graph

Results and assessment

Subindicators (key message, graph, assessment)

References

Data

Metadata

Further work required

MCSD – Core Set Of Indicators

1975 Mediterranean countries and European Commission adopt a convention supplemented by a MAP (Mediterranean action plan).

1977 Setting up of the Regional Activity Centres.

1980 Creation of other specific regional activity centres; development of MAP's activities.

1992 The Rio conference leds to:

- Agenda MED 21 (1994)
- MAP's revision (1995)
- Establishment of the Mediterranean Commission on Sustainable Development (MCSD) (1996)

MCSD – CORE SET

MCSD Priorities

- Sustainable management of the coastal regions;
- Management of water demand;
- Tourism and sustainable development in the Mediterranean;
- Industry and the environment;
- **Indicators for the sustainable development**;
- Awareness raising and information;
- Free trade and the environment in the Euro-Mediterranean context;
- Urban management and sustainable development.

THE BLU PLAN

Observing, evaluating and exploring the relationships between environment and development.

130 *Sustainable development indicators* (SDI) have been defined by the Mediterranean countries.

To promote indicators computation and use in Mediterranean countries and coastal areas, Plan Bleu has prepared:

- a glossary;
- a 4-page set of “Indicator information sheet”.

SDI have been tested by the Blue Plan (and the help of EU), in 3 Mediterranean countries: Croatia, Libya and Syria.

Test results have been published in the “Final report “indicators for sustainable development in the Mediterranean costal region”.

National exercises and tests to develop and apply national sustainable development indicators have been performed by Mediterranean countries (Slovenia, Tunisia, Lebanon and Morocco).

On the basis of the results of these tests, it has been possible to draw up the list of 34 priority indicators

The 34 Priority Indicators

IMPROVING INTEGRATED WATER RESOURCE AND DEMAND MANAGEMENT
1 Water Efficiency Index (total and by sector) WAT_P01
2 Water demand and compared to GDP (total and by sector) WAT_P02
3 Exploitation Index of renewable resources WAT_P03
4 Share of population with access to an improved water sources (total, urban, rural) WAT_P04
5 Share of population with access to an improved sanitation system (total, urban, rural) WAT_P05
MANAGING ENERGY DEMAND AND MITIGATING THE EFFECTS OF CLIMATE CHANGE
6 Energy intensity (total and by sector) ENE_P01
7 Share of renewable energies in energy balance ENE_P02
8 Greenhouse gas emissions ENE_P03
9 Amount financed in the framework of the Kyoto Protocol flexibility mechanisms by the annex 1 countries to the benefit of other Mediterranean countries ENE_P04
ENSURING SUSTAINABLE MOBILITY THROUGH APPROPRIATE TRANSPORT MANAGEMENT
10 Motor transport intensity compared to GDP TRA_P01
11 The proportion of road transport in terms of land freight transport TRA_P02
12 Share of public surface transport (urban and inter-urban) TRA_P03
PROMOTE SUSTAINABLE TOURISM
13 Share of “non-seaside resort beds” vs total number of beds TOU_P01
14 International tourism receipts TOU_P02
PROMOTING SUSTAINABLE AGRICULTURAL AND RURAL DEVELOPMENT
15 Ratio of agricultural population vs rural population AGR_P01
16 Loss of arable land AGR_P02
17 Share of public budget allocated to sustainable rural development programmes AGR_P03
18 Proportion of agriculture quality products and Share of the agricultural land area used byorganic farming AGR_P04

PROMOTING SUSTAINABLE URBAN DEVELOPMENT
19 Number of cities with over 10 000 inhabitants engaged in a process Agenda 21 type or in urban renewal programmes URB_P01
20 Proportion of urban population with access to a decent dwelling URB_P02
21 Household waste produced per capita and number of uncontroled landfills URB_P03 Improve the urban environment:
22 Air quality in the main Mediterranean urban areas URB_P04
PROMOTING SUSTAINABLE MANAGEMENT OF THE SEA AND THE COSTAL AREAS AND TAKE URGENT ACTION TO PUT AN END TO THE DEGRADATION OF COASTAL ZONES
23 Share of artificialised coastline COA_P01
24 Operational pollution from ships COA_P02
25 Proportion of coastal urban population connected to a sanitation network COA_P03
26 Surface of protected coastal and marine areas COA_P04
STRENGTHEN SOLIDARITY, COMMITMENT AND FINANCING FOR A SUSTAINABLE DEVELOPMENT AT REGIONAL, NATIONAL AND LOCAL LEVELS
27 ODA allocated as % of OECD DAC countries donors' GNP; proportion of the ODA allocated to Mediterranean countries and proportion contributing to the strategy objectives COO_P01
28 EU net public financial flows to EU Mediterranean members, candidates, CARDS and MEDA countries (in absolute value and per capita) and proportion contributing to the objectives of the strategy COO_P02
29 Proportion of bank credit allocated to the private sector – Existence of alternative financing systems to bank credit COO_P03
30 Proportion of local government tax receipts as percentage of total tax revenues (government receipts). Proportion of government budget allocated to local authorities COO_P04
31 Public financial mechanisms to support the least favoured regions COO_P05
STRENGTHEN HUMAN CAPITAL AND ACTORS' INVOLVEMENT: RESEARCH, TRAINING, EDUCATION, AWARENESS-RAISING AND PARTICIPATION
32 Youth literacy rate HUM_P01
33 Girl/Boy primary and secondary school registration ratio HUM_P02
34 Public and private expenses for research and development in percentage of GDP HUM_P03

MCSD Methodological Sheet

- Strategic Objective
- Rationale
- Definition
- Unit
- Objective and/or target values
- Methodological indications
- Geographical scope
- References
- International data sources
- Precautions for use
- Methodological Annex

APAT - Core Set Of Indicators

1998 The core set definition process begins.

State indicators have been the first indicator typology to be developed; other kind of indicators afterwards (in accordance with the DPSIR framework).

2000 The “White Book”.
It is the first report about indicators, realized by APAT.
580 indicators have been scheduled in main environmental policy. Only a small part o them has been populated.

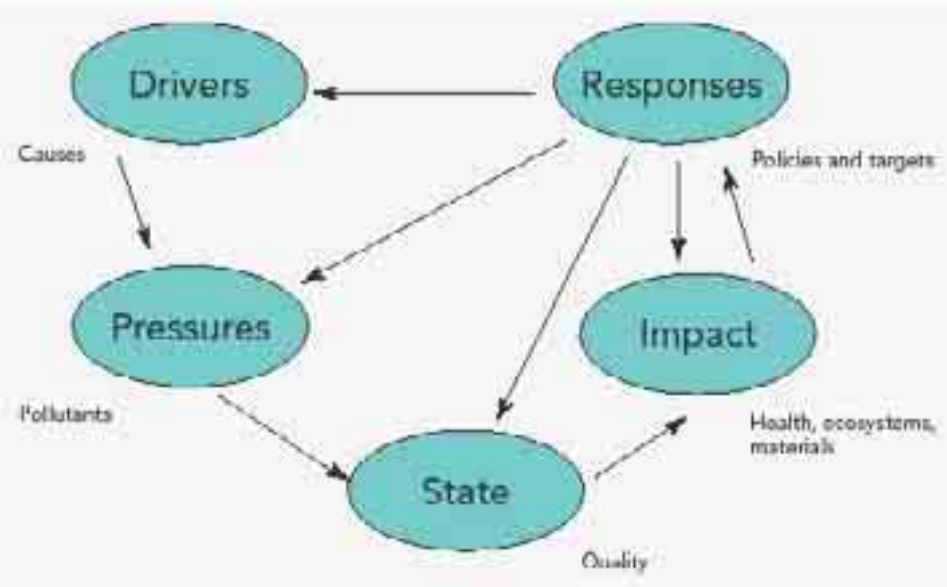
2001 “Toward the Environmental Data Yearbook” is published.

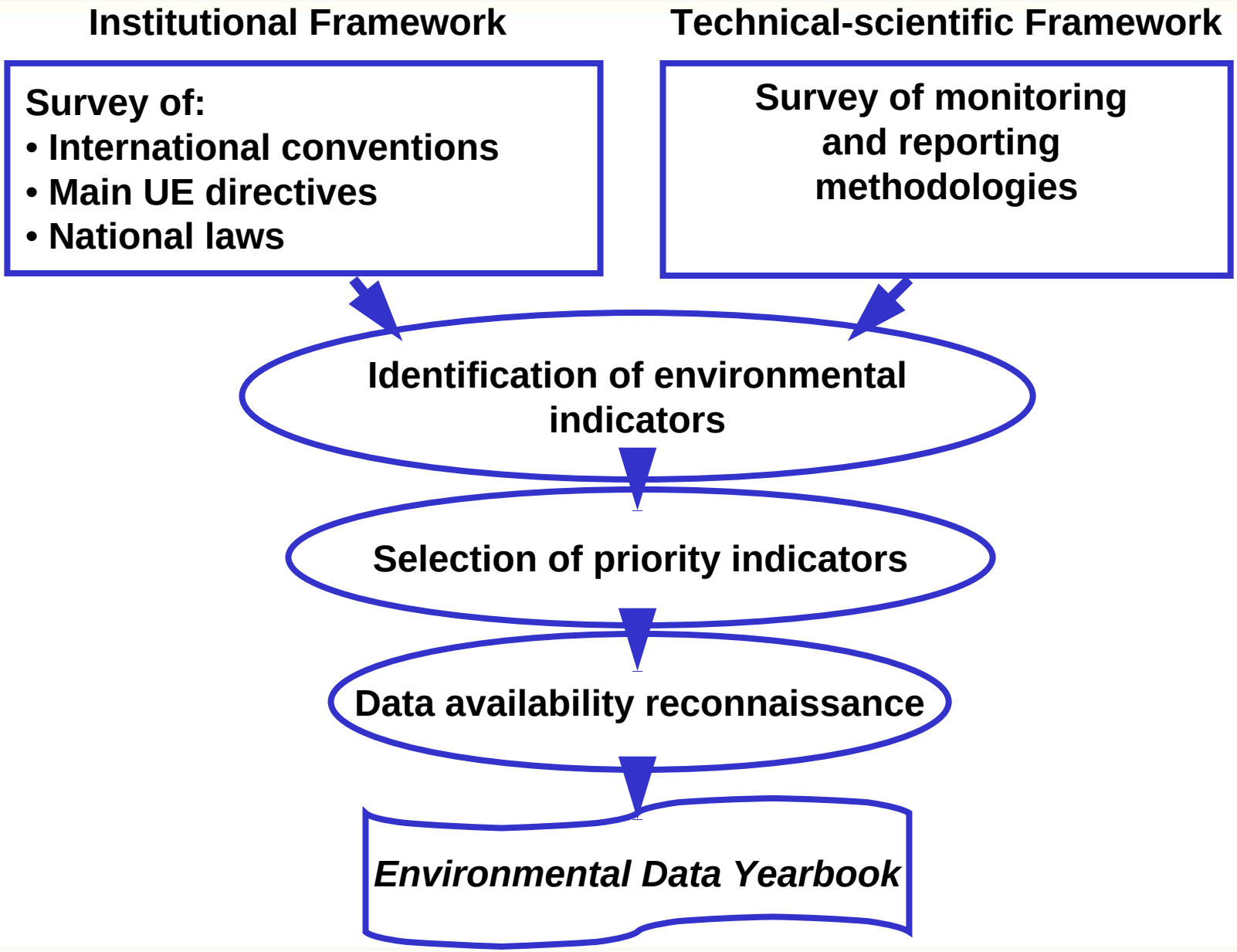
96 indicators have been populated. Information provided by methodological sheet, tables and graphs.

2002 “Environmental Data Yearbook” is published.
158 indicators.
New issues.
Chapters dedicated to productive sectors.

2003-2007 Other editions

Methodological Framework: DPSIR




Institutional Framework
Technical-scientific Framework
Survey of:
• International conventions
• Main UE directives
• National laws
Survey of monitoring and reporting methodologies
Identification of environmental indicators
Selection of priority indicators
Data availability reconnaissance
Environmental Data Yearbook

The Core Set Of Indicators

(Topic areas 2005-2006)

Productive sectors

Agriculture and forestry (12)

Energy (17)

Transport (21)

Tourism (4)

Industry (9)

Environmental matrix

Atmosphere (17)

Biosphere (26)

Hydrosphere (28)

Geosphere (21)
Waste (14)
Ionizing radiation (10)
Non-ionizing radiation (9)
Noise (13)
Natural risk (12)
Anthropogenic risk (5)

Other issues

Environmental quality of organization, firms and products (3)
Monitoring and control (10)
Promoting and spreading environmental culture (10)
Environment and health (7)

The Methodological Sheet

NAME OF INDICATOR

INDICATOR CODE

DESCRIPTION

Detailed description of indicator: methodology of construction, explanation of contents

UNIT OF MEASURE

DATA SOURCES

UPDATING INDICATOR

Necessary lapse of time to update indicator

INFORMATION QUALITY

Relevance	Accuracy	Comparability in time	Comparability in space
2	2	2	1

It supplies information on the data quality

★★

AIM AND LIMITS

It supplies aim and limits of indicator

TARGETS FIXED BY LAW

It describes national and international targets related to indicator

STATE AND TREND

It explains the reason of determination of Chernoff icon

COMMENTS TO TABLES AND FIGURES

It supplies further tools to read tables and figures

Quality of Information

- Relevance
- Accuracy
- Comparability in time
- Comparability in space

RANKING TABLE

Grade	Quality of information	Sum
★★★	HIGH	Between 4 and 6
★★	MEDIUM	Between 7 and 9
★	LOW	Between 10 and 12

State and Trend

	the targets will reasonably be achieved
	the indicator subject-matter is moving in the right direction, but the targets will hardly be achieved within the established timeframe
	all other cases

REFERENCES

OECD *Toward sustainable development – Environmental indicators* 2001
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EEA *Europe's environment: The Dobris Assessment – An overview,* 1995
EEA *Core set of indicators – Guide,* 2005
EEA *TERM 2005 – Transport and environment: facing a dilemma,* 2006
EUROSTAT *Towards Environmental Pressure Indicators for the EU: an Examination of the Sectors,* 1999
MCSD *Indicators for the Sustainable Development in the Mediterranean Region,* 2000
MCSD *Methodological sheets of the 34 priority indicators for the Mediterranean Strategy for Sustainable Development – Follow up,* 2006
UNCSD *Indicators of Sustainable Development: Framework and Methodologies,* 2001
UNCSD *Global Trends and Status of Indicators of Sustainable Development,* 2006