Working Group on Environmental Monitoring and Assessment

Ninth session
Geneva, 4–5 September 2008
Item 6(b) of the provisional agenda

ROUND TABLE ON THE LATEST DEVELOPMENTS IN ENVIRONMENTAL MONITORING AND ASSESSMENT AT THE NATIONAL, SUBNATIONAL AND COMPANY LEVEL

ENVIRONMENTAL INDICATORS IN SLOVENIA

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Environmental indicators are one of the four pillars of environmental reporting (data – indicators, maps, text – comments, photographs). Every map in this publication is complemented with a selection of indicators from the list of Environmental Indicators in Slovenia, which further illustrate the discussed topic, particularly its temporal dimension. The indicators are available at the web portal **Environmental indicators in Slovenia** at the following address:

http://kazalci.arso.gov.si

The web portal Environmental Indicators in Slovenia provides access to over 100 indicators, which use graphs and comments to present the environmental trends in Slovenia. The indicators are organized into thematic groups – chapters covering environmental components (e.g. water, air), environmental issues (e.g. climate change, nature protection, loss of biodiversity, waste management) and the incorporation of environmental content in the formulation of sector policies (e.g. transport, agriculture, tourism, energy, instruments of environmental policy).

WHY ENVIRONMENTAL INDICATORS?

Environmental indicators are some of the most effective tools for reporting on the environment. They are based on numerical data that demonstrate the state, a particular feature and above all the development of the selected phenomenon. Thus the indicators serve as warning signs for certain trends. They help us measure or determine the quantity of numerous and diverse aggregated data. The term 'indicators' therefore denotes data selected and presented in an agreed manner which we attempt to tie to environmental policy objectives. Correctly chosen indicators that are based on a sufficiently long time series of data may point at key development trends of a specific phenomenon. They may assist decision-makers in environmental planning and management as well as help the general public understand the environmental issues.

INTEGRATION OF INDICATORS IN THE ENVIRONMENT MANAGEMENT CYCLE

Environmental indicators must be designed to answer key questions stemming from the environment management cycle (Figure 1). The cycle is comprised of several phases: planning, doing and evaluating the effectiveness of environment management policies. In the planning phase, an interaction is established between the society recognizing certain values and visions on the one hand and policy-makers on the other hand. Key environmental issues are determined in this phase and it is integral that the environmental indicators reflect these issues. In the doing phase, an effective system of data collection and processing is established. This system enables long-term monitoring of a phenomenon, which serves as a basis for examining the effectiveness of policies in the evaluating phase, the final and most important phase of the environment management cycle.

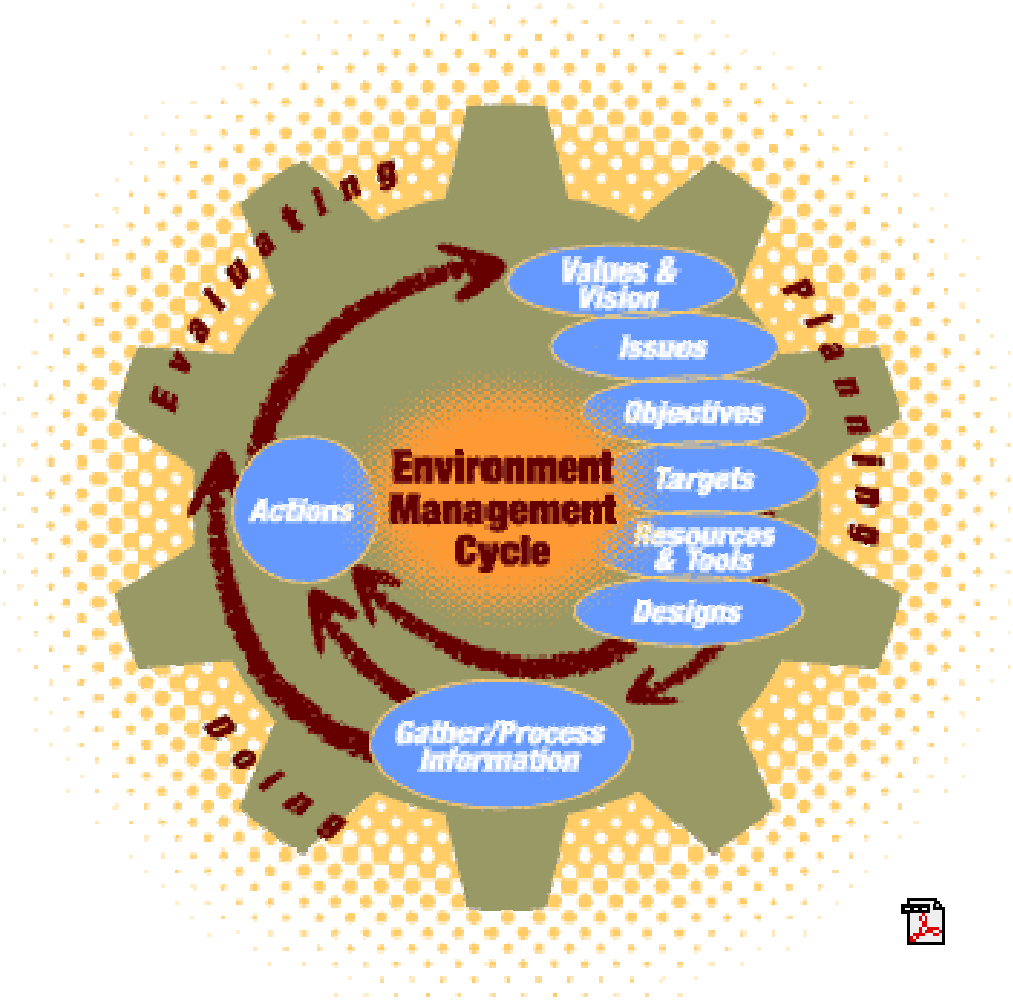

Figure 1: Environment Management Cycle
Source: A Guidebook to Environmental Indicators, CSIRO, 1998

CHOOSING ENVIRONMENTAL INDICATORS

Sets of indicators are formulated using an assessment framework which helps determine the function of each indicator. The United Nations Commission for Sustainable Development first used a tripartite framework (Driving Forces – State – Responses) for sustainable development indicators. The European Environment Agency expanded this model to a five-part framework known as DPSIR (Driving forces – Pressures – State – Impact – Responses). Each of the components reflects a specific purpose of the framework (Figure 2):

• **Driving forces** are socio-economic factors and activities which either increase or mitigate the pressures on the environment, e.g. the extent of economic, transport or tourist activities.

• **Pressures** are direct anthropogenic pressures and impacts on the environment, e.g. pollutant discharges or use of natural resources.

• **State** implies the current condition and trends of a certain environmental phenomenon such as the degree of air, water and soil pollution, biodiversity in a specific geographic area, the availability of natural resources (e.g. wood, freshwater).

• **Impacts** are the effects of the changed environment on the health of humans and other species.

• **Responses** are reactions of the society to environmental issues. Responses may include specific state measures, e.g. taxes on the use of natural resources. Decisions by businesses and individuals, e.g. corporate investments in pollution control or purchases of recycled goods by households, are equally important.

Within the context of the DPSIR Assessment Framework as developed by the European Environment Agency, indicators help us understand the cause-and-effect and particularly interdependence relationships in the environment.

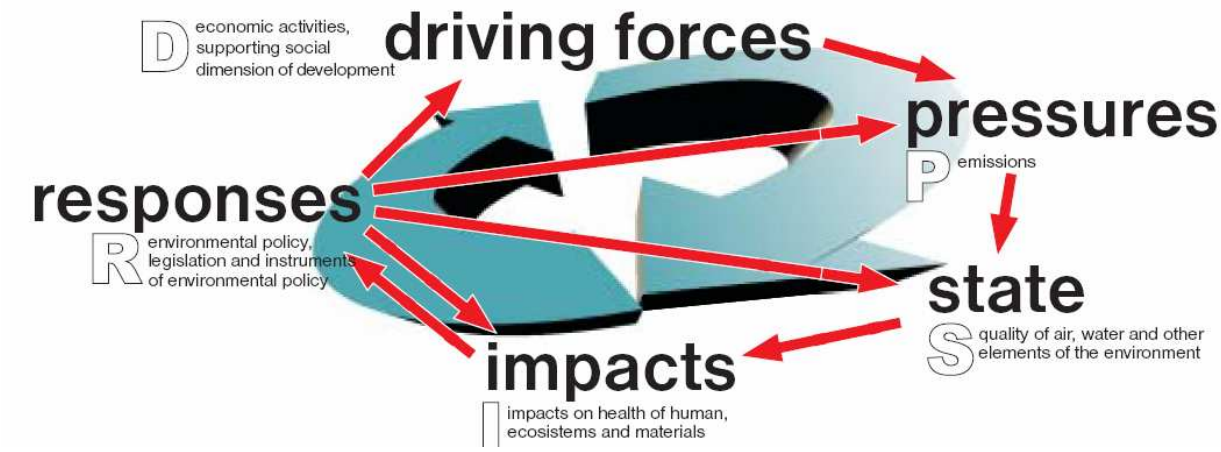

Figure 2: Assessment Framework developed by the European Environment Agency
Source: European Environment Agency, 2002

PRESENTATION OF INDICATORS

All indicators are presented in the same manner; they include specific elements and follow the format shown in Figure 3.

The images next to the **title** of the indicator graphically illustrate the **classification** of the indicator in the DPSIR Assessment Framework and the **assessment of the trend** symbolized by a daisy. The symbol summarizes the expert evaluation of the phenomenon examined by the indicator on the basis of the data presented and the set objectives. The main points of the indicator analysis are given in the **key message**.

In order to effectively evaluate the development of a certain phenomenon, the envisaged trend and intensity of development must be clearly identified. Each indicator is therefore accompanied by a **goal**. The required trends are mostly drawn from the fundamental document laying down an environmental protection programme, i.e. the Resolution on the National Environmental Protection Programme (Official Gazette of the Republic of Slovenia, no. 2/2006), as well as from other sectoral documents and programmes.

Each indicator is given a **definition** providing basic information on the methodology of conducted measurements and on the presentation of the indicator. The indicators employ internationally verified methodologies and are thus generally comparable on the international level. The indicators were prepared using methodological sheets for indicators drafted by the European Environment Agency. We primarily relied on the Core Set of Indicators. Where so required by a certain phenomenon, the manner of monitoring, accessibility of data or by any other technical factor, the methodology has been adapted to conditions specific to Slovenia.

The quantitative values of a given indicator are expressed mainly as annual values from 1992 onwards and are shown in **graphs**. The indicator is further detailed in a **comment,** which interprets the trend, explains possible reasons for it and outlines the implemented and planned measures to improve or preserve the current state of the environment.

Symbols assessing the trends of individual indicators

positive development indicating the achievement of a qualitatively or quantitatively defined goal

undefined course of development, development not sufficient to achieve qualitative or quantitative goals, possibly a variable trend within a given indicator


unfavourable course of development

The section **Data and sources** contributes to the transparency of the monitoring methods employed for the selected indicators. In addition to the data presented in tables, this section further describes the data sources used for the indicator and provides additional notes on the methodology.

The data used for the environmental indicators were collected from databases at the Environmental Agency of the Republic of Slovenia as well as from sources at other institutes (e.g. Statistical office of the Republic of Slovenia, Agency of the Republic of Slovenia for Agricultural Markets and Rural Development, Chamber of Commerce and Industry of Slovenia etc.). The reports obtained through data analysis and integration and accompanied by expert opinions may assist decision-makers in their political deliberations and may also serve to satisfy the public's right to be informed on the state of the environment and the efficiency of environmental policies.

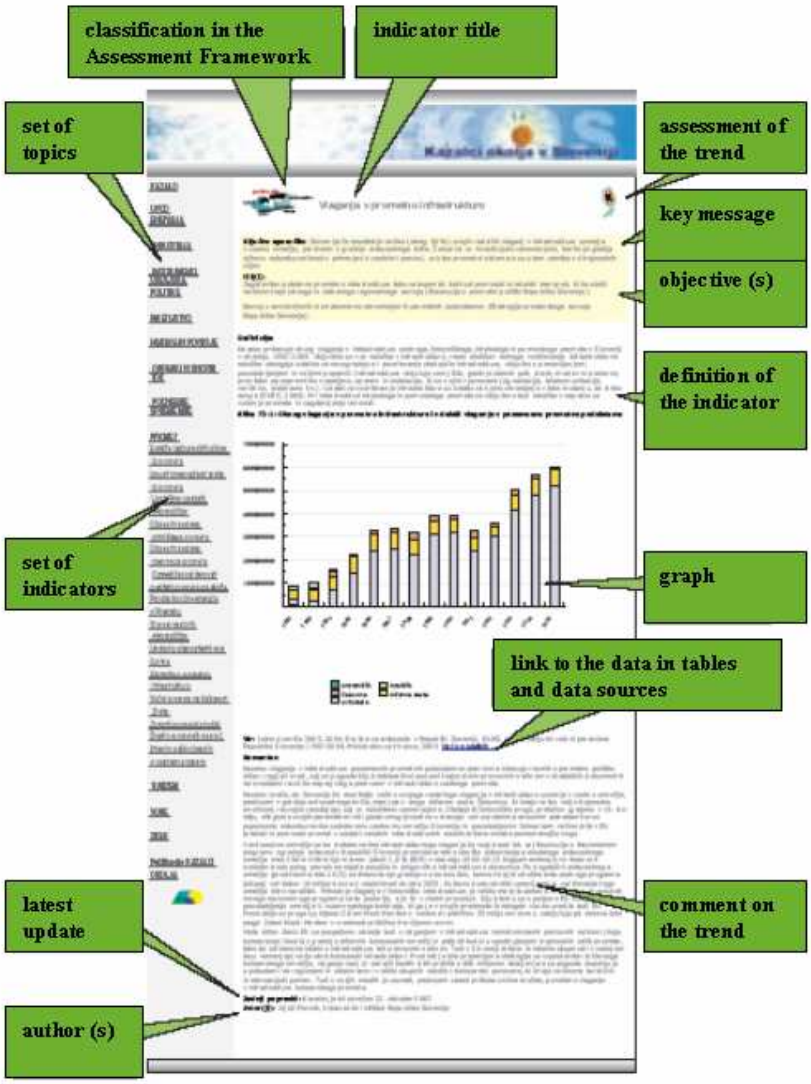

Figure 3: Format of selected indicators presented at the web portal Environmental Indicators in Slovenia (http://kazalci.arso.gov.si)

THE FUTURE DEVELOPMENT OF INDICATORS

Experience by other countries and international institutions shows that indicators are a sufficiently cost-effective and useful tool for monitoring and reporting on the state of the environment and on the progress of environmental policies. In the future, the Environmental Agency of the Republic of Slovenia will strive to enhance the quality of input data and information as well as to achieve comparability of the selected set of indicators with international sets. We will endeavour to bring the indicators in line with the national objectives of environmental protection and to select the indicators which reflect sustainability in the environmental dimension of Slovenia's development.

Korak naprej v ravnanju z okoljem

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