

Comparative Analysis of Indicator Sets for Sustainable Development

VDI Technology Center
Future Technologies Division
Düsseldorf, Germany

Christoph Glauner, Dr. Thomas Wiedmann

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2. Scope and goal of this report

This report is part of the "**ESTO study on national and regional programs and strategies for Sustainable Development**". It is a comparative analysis of seventeen indicator sets for sustainable development. On the one hand informations about the indicator sets were delivered by the partner institutions within this ESTO project, while on the other hand VDI-TZ performed own investigations on several indicator systems. The table on page 6 shows the institutions who made the main investigations on the respective indicator systems.

The **goal** of this report was to provide a quick overview of indicator systems that were designed to measure the progress of sustainable development in countries or regions. The short informations given in this report can be regarded as a preparatory work that may help to classify indicator systems, to put them in categories, and to show the context in which the respective systems have to be seen.

In the sense of a reference book this report will also help to quickly find further informations on indicators for sustainable development. It should serve as a first orientation in the jungle of indicator sets that have been developed in recent times. The single issues used for comparison were chosen to give an impression of the state of art of the indicator set and to give hints on how important the set could be in terms of European policies for a sustainable development.

The selection of indicator schemes for this list was made from the following criteria:

- assumed relevance for European sustainability policies
- prominent indicator schemes of European countries or regions
- outstanding indicator schemes with international comparison (Eurostat, OECD)
- commonly accepted methodological framework (UN-CSD)
- outstanding or new methodological approach (UK, IISD)
- one example of a non-European indicator scheme (USA)
- one example of an international indicator scheme concerning one region (Baltic 21)
- one example of a local indicator scheme (FEST).

It has to be emphasised that this report does **neither** claim to be complete **nor** to follow an exact methodological approach. Many indicator approaches could not be considered in this report, although they are relevant in the SD discussion, too. In this context the approaches for integrating sectoral policies and environmental policy have to be mentioned: the OECD as well as the EU are working on these approaches (e. g.: TERM - Transport-Environment Reporting Mechanism, EEA report "Are we moving in the right direction? Indicators for transport and environment integration in the EU"; Integration indicators for energy 1999; Eurostat & European Commission, Agri-environmental indicators: Indicators for the integration of environmental concerns into the Common Agricultural Policy, COM 2000/20).

The selection of indicator sets was not restricted to a distinct methodology. The IISD approach for example belongs to the category of highly aggregated indicators, to which also other initiatives belong, like ISEW or HDI. Nevertheless it was included as it can be regarded as exemplary for a compact visualisation method for SD.

According to the task description and limited resources this report is rather at the stage of a quick reference book to sustainability indicators than of a scientific comparative analysis. Nevertheless it might be of practical help with the search for information about sustainability issues.

3. Methodology

The comparative analysis of the indicator sets was based on the evaluation grid proposed in the implementation plan of the ESTO project and extended by several other evaluation criteria. All together the following grid was used:

Title

- ➔ Title of the indicator system or the report/plan/strategy including the indicator set.

Author / organisation

- ➔ Name of author or organisation publishing the indicator set.

Year of publication (and publication dates)

- ➔ Dates of the first and the following publications. These dates also show whether there is an evolution of the indicator system.

Hyperlinks and/or additional references

- ➔ WWW links and/or additional references to the indicator set itself or related documents (references others than given in "Title" and "Author / organisation").

Scope / main goal

- ➔ Describes the purpose of the indicator set and the main goal (main objective).

Geographical scope

- ➔ Indicates if the indicator set is related to an international, national or regional scale.

Type of indicator system

- ➔ Classifies the indicator set according to the following questions:
 - Is it an indicator set within a sustainability strategy or plan (A) or is it a "stand-alone" indicator system with its own methodology (B)?
 - Are the indicators associated with data (numbers/figures) (A) or are there no data introduced/available (B)?
 - Is indicator system still in use, i. e. is someone working with or on the indicators (A) or is there no use of the indicator set anymore (B)?

Sustainability dimensions (and the number of indicators)

- ➔ Which dimensions of sustainability are addressed (environment, economy, society, institutions)?

Problem areas (and the number of indicators)

- ➔ Main fields of interest/concern. As there is no clear and uniform definition of the terms "problem/sustainability areas" and "problem/sustainability sectors", we decided not to distinguish between these fields and to summarise them under the term "problem areas".

Methodological framework

- ➔ Most of the indicator systems are based on a distinct methodology, assigning the indicators to categories like "pressure", "state", "response", or others. "State" indicators for example, describe the actual situation (the state) of a system. A prominent framework is the "pressure-state-response" (PSR) model that was developed by the OECD.

Type of targets/objectives

- ➔ Use of qualitative or quantitative targets/objectives.

Expressed linkages between indicators and goals/objectives/targets?

- ➔ Is there a direct linkage between goals/objectives/targets of the sustainability framework and the indicators?

External dimensions

- ➔ Do the indicators also reflect external dimensions of sustainability (e. g. imports / exports)?

Use of aggregated or proxy indicators

- ➔ Sometimes single indicators (i. e. indicators describing one distinct phenomenon) are bundled to aggregated indicators that are used to describe a whole set of phenomena in one number (e. g. the gross national product GNP is a highly aggregated indicator of many economic activities). In other cases one of several single indicators in a problem area are chosen to serve as a "proxy" for the whole problem area. These proxy indicators are called e. g. "headline" or "key" indicators.

Relation to other indicator sets

- ➔ Is there a relation to other existing indicator sets? Is the work based on another indicator set?

Evaluation

- ➔ This section should briefly evaluate the indicator set in terms of strong and weak points (indicated with + and -) and the possible relevance for European sustainability policies. It has to be mentioned that such a limited evaluation is always **incomplete** and **subjective**.

The evaluation takes the following criteria into consideration (if possible/applicable):

- Simplicity / easy to understand
- Providing a clear overview
- Sensitivity of the indicators to changes
- Validity and reliability
- Availability of data and time series
- International compatibility
- Taking into account the interactions between environment, economy and society
- Flexibility/openness of the conceptual frame (PSR etc.)
- Consistency of the various categories
- Applicability within/for Europe

4. Selection of indicator sets

The partner institutions of the ESTO project "**Study on national and regional programs and strategies for Sustainable Development**" delivered a pre-analysis of several indicator sets which was taken as a basis for this work. Additionally, VDI-TZ analysed other indicator systems which can be regarded as representative or important for the international (Baltic 21, IISD, OECD, UN-CSD), European (Eurostat), and regional/local level (FEST). We also added the CSD testing list for Germany.

The following table shows all indicator sets used for the comparative analysis in this report (and the partner institutes of the ESTO network that delivered the main input).

Country / region / institution	Title	Year of publication	ESTO partner ¹
Austria	Nationaler Umwelt Plan - National Environment Plan	1995	ZSI/ITAS
Baltic 21	Development in the Baltic Sea Region towards the Baltic 21 Goals	2000	IPTS/VDI-TZ
Belgium	Federal Report on SD - Towards sustainable development?	1999	TNO-STB
Denmark	Danish Nature and Environment Policy	1999	ZSI
Eurostat	Indicators of Sustainable Development	1997	VDI-TZ
FEST	Indikatoren im Rahmen einer lokalen Agenda 21	1999	VDI-TZ
Finland	Finnish Government Programme for Sustainable Development	1998	ITAS
Germany	Erprobung der CSD-Nachhaltigkeitskriterien in Deutschland	2000	VDI-TZ
IISD	The dashboard of sustainability	2000	VDI-TZ
Luxembourg	National Plan for a Sustainable Development	1997	TNO-STB
Netherlands	National Environmental Program (NEP III)	1998	TNO-STB
OECD	Towards sustainable development – environmental indicators	1998	VDI-TZ
Scotland	Scotland the Sustainable ...	1999	ZSI
Sweden	Communication "Ecological Sustainability"	1997	ITAS
UK	Quality of Life Counts	1999	ZSI/VDI-TZ
UN-CSD	Working List of Indicators of Sustainable Development	1999	VDI-TZ
USA	Sustainable America	1996	ITAS

¹ Whole names of institutions and persons can be found on page 7 (chapter 5).

5. Consulted Experts

This study is partly based on work performed by partner institutes of the ESTO network and on comments and suggestions of experts consulted additionally. All names are listed in alphabetical order.

Contact persons and experts for sustainable development:

- Peter **Bosch**, European Environment Agency (EEA), Copenhagen
- Dietrich **Brune**, Institute for Technology Assessment and System Analysis (ITAS), Karlsruhe
- Barbara **Buchegger** and Uli **Kotzeluh**, Zentrum für soziale Innovation (ZSI), Vienna
- Reinhard **Coenen**, Institute for Technology Assessment and System Analysis (ITAS), Karlsruhe
- Gerald Jan **Ellen**, TNO Institute of Strategy, Technology and Policy (TNO-STB), Delft
- Peter **Hardi**, International Institute for Sustainable Development (IISD), Winnipeg, Canada
- Karima **Isert**, Institute for Prospective Technological Studies (IPTS), Sevilla
- Marco **Morosini**, Center of Technology Assessment (TA-Akademie), Stuttgart
- Gerhard **Sardemann**, Institute for Technology Assessment and System Analysis (ITAS), Karlsruhe
- Lucas **Simons**, TNO Institute of Strategy, Technology and Policy (TNO-STB), Delft
- David **Stanners**, European Environment Agency (EEA), Copenhagen
- Natacha **Zuinen**, Federal Planning Bureau, Brussels

6. Comparative Analysis

Austria - National Environment Plan

Title

Nationaler Umwelt Plan (NUP) - National Environment Plan

Author / Organisation

Austria, Federal Ministry for Environment, Youth and Family (BMU)

Year of publication (and publication dates)

Published 1995. 1996 ratified by the Austrian national assembly.

The program should have been updated every two years, but since 1995 there was no following publication.

Hyperlinks and/or additional references

- http://www.bmu.gv.at/admin_umwelt/admin_u_nup/frmset_nup_i.htm
- <http://www.cedar.at/data/nup>
- <http://www.nachhaltigkeit.at>
- BMU-A – Bundesministerium für Umwelt, Jugend und Familie (1998) Indicators of Sustainable Development, Wien
(http://www.bmu.gv.at/u_nachhalt/nachhaltigkeit/un_nachhaltigkeitsindikatoren.htm)

Scope / main goal

The National Environment Plan is not an indicator system but a start-up paper for implementing sustainable development in Austria. It contains suggestions for possible indicators (e. g. eight indicators in the problem area "energy"). The main focus is on the environmental dimensions of sustainability, although other aspects are included as well. The intention is to give a basic guideline for implementation of SD in Austria, especially on the regional level. Scientific results and prospects serve as a guidance for further development.

Geographical scope

National.

Type of indicator system

"Indicator suggestions within a sustainability strategy" (A) or "Stand-alone indicator system" (B): A
"Associated with data" (A) or "no data" (B): B
"Still in use" (A) or "not in use" (B): B

Sustainability dimensions

- Environment
- (Economy)
- (Society)
- (Institutions)

Focus on environmental topics and to some extent institutional aspects.

Problem areas

- Management of Resources
- Industry
- Energy
- Traffic
- Agriculture

- Forest
- Water
- Tourism
- Consumption (part of the consumers)

Methodological framework

For every sustainability criteria there is a goals for which different approaches are proposed. For these approaches measures, objectives, competence assignment, control, urgency, timetable and foreseeable effects are being defined.

Type of targets/objectives

Implicit use of qualitative targets including an unspecified time horizon (e. g. urgent, medium-term).

Expressed linkages between indicators and goals/objectives/targets

- There is a detailed matrix where measures are directly connected to problem areas.
- Indicators emphasise the need for action in the ecological dimension, whereas goals emphasise the need for action in all four areas of sustainability.

External dimensions

Some topics are considered in an international context (e. g. traffic, energy).

Use of aggregated or proxy indicators

The proposed indicators are not aggregated.

Relation to other indicator sets

The Austrian environmental policy is lead by principles, which stand in agreement with the results of the Rio conference, the work of the CSD (Commission for Sustainable Development) and the fifth environmental actions programme of the EU. However, the indicator system does not refer in detail to an existing indicator system.

Evaluation

- + The methodological framework in the Austria NUP is comprehensive. The problem is diagnosed in advance in order to search for indicators in the second step (whereby the target, the time period, the urgency and the competence assignment is clearly named).
- +/- NUP was one of Europe's first national strategies. It sets standards for others, but the implementation is still lacking.

Baltic 21

Title

Development in the Baltic Sea Region towards the Baltic 21 Goals - an indicator based assessment
(Baltic 21 Series No. 2/2000)

Author / organisation

Council of the Baltic Sea States (CBSS), Baltic 21 Secretariat

Year of publication (and publication dates)

2000, the work on indicators started in 1997.

Hyperlinks and/or additional references

- <http://www.ee/baltic21>
- <http://www.ee/baltic21/indicators/>

Scope / main goal

The first Baltic 21 Biennial Report was presented in the spring of year 2000 (Baltic 21 Series No 1/2000). The report includes the progress in implementing the Baltic 21 action program, and the monitoring of the development in the region towards sustainable development.

The Baltic Sea Region is the first region in the world to adopt common regional goals for sustainable development. In order to monitor the Baltic 21 goals, a set of core indicators has been elaborated for each goal, and statistics have been compiled.

Since the Biennial Report does not contain all the Baltic 21 indicators, this report (Baltic 21 Series No 2/2000) provides a full presentation of the Baltic 21 goals, the selected indicators and the compiled statistics together with the assessment of the current trends in the region. The report also contains a chapter on the mode of work for selecting the indicators and for compiling the needed statistics.

Geographical scope

International

Participating countries: Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland, Russia, and Sweden.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B): A
"Associated with data" (A) or "no data" (B): A
"Still in use" (A) or "not in use" (B): A

Sustainability dimensions (and the number of indicators)

The report is divided into core indicators and sectoral indicators.

The core indicators represent the following sustainability dimensions:

- Economy (3)
- Environment (9)
- Society (6)

The sectoral indicators mainly represent environmental indicators, although a few economic indicators are mentioned as well (a clear division is not useful because of the sectoral approach).

- Economy / Environment (68)

Problem areas (and the number of indicators)

Core indicators:

- Health (3)
- Economy and Society (4)

- Democracy (1)
- Pollution of atmosphere, land and water (8)
- Energy and material efficiency (2)

Sectoral indicators:

- Agriculture (6)
- Energy (17)
- Fisheries (8)
- Forestry (16)
- Industry (8)
- Tourism (3)
- Transport (10)

Methodological framework

The methodological framework is not comparable to other approaches like PSR etc..

Type of targets/objectives

Use of qualitative targets/objectives.

Expressed linkages between indicators and goals/objectives/targets?

There is a direct linkage between goals of the sustainability framework and the indicators. For each goal there are one or more indicators given. On the top of each sector there is a introduction where the linkage between indicators and goals is expressed.

External dimensions

No external dimensions are reflected in this indicator system.

Use of aggregated or proxy indicators

The indicators used are called "core" indicators. In the most cases these are not aggregated indicators.

Relation to other indicator sets

The indicators were based on similar work done by organisations such as the UN Commission for Sustainable Development.

Evaluation

- + The Baltic 21 indicator set is part of a well developed strategy for sustainability.
- + The Baltic Sea Region with eleven countries involved is the first region in the world to adopt common international goals for sustainable development.
- The sectoral indicators mainly represent environmental indicators, thus the indicator system does not cover all dimensions of sustainable development.

Belgium

Title

Federal Report on Sustainable Development - Towards sustainable development?
(The report is available in three languages: english, french, and dutch)

Author / Organisation

Belgium (Federal Planning Bureau, Task Force on Sustainable Development)

Year of publication (and publication dates)

In July 1999 the first Federal Report on sustainable development "Towards sustainable development?" was published.

Hyperlinks and/or additional references

- http://www.plan.be/en/pub/other/detail_other.stm?pub=OPSDREP01
- <http://www.plan.be/en/pub/other/OPSDREP01/OPSDREP01en.pdf> (summary, English)
- http://www.plan.be/en/pub/other/detail_other.stm?pub=OPSDREP02
- <http://www.plan.be/en/pub/other/OPSDREP02/OPSDREP02fr.pdf> (full, French)

Scope / main goal

On the 5th of may 1997 the Belgian Parliament accepted a law concerning the co-ordination of sustainable development. The law requires the biennial publication of a Federal Report on Sustainable Development by the Federal Planning Bureau. This report will in future contain an analysis of the current situation, policy and expectations for the future and an evaluation of the Federal Sustainable Development Plan.

Geographical scope

National.

Type of the indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):	A
"Associated with data" (A) or "no data" (B):	A
"Still in use" (A) or "not in use" (B):	A

Sustainability dimensions

- Environment
- Economy
- Society
- Institutions

Problem areas

- Poverty and social exclusion
- Health
- Atmosphere
- Biodiversity
- Marine environment
- Farming and rural development
- Consumption patterns

Methodological framework

The indicators were chosen from a number of lists (OECD, CSD and the federal planning bureau), and if needed indicators were added from various sources.

The following types of indicators are used in the Belgian indicator system:

- Direction indicators: for example GNP, number of families.
- Pressure indicators: for example CO₂, NO_x emissions
- State indicators: for example quality of air, loss of biodiversity
- Impact indicators: for example health problems
- Response indicators: for example government investments in various subjects.

Type of targets/objectives

(No information about the type of targets (qualitative or quantitative) could be found in the documents.)

Expressed linkages between indicators and goals/objectives/targets

No direct linkage between indicators and goals/objectives/targets could be found.

External dimensions

External dimensions are considered; the topics are systematically reviewed in an international context.

Use of aggregated or proxy indicators

The indicators used are mostly single, not aggregated indicators.

Relation to other indicator sets

Most indicators were chosen from a number of lists (OECD, CSD and domestic; the federal planning bureau).

Evaluation

- The number and the quality of the indicators proposed varies largely from one problem area to the other according to the advancement of the work in the different subjects.
- Many indicators have yet to be elaborated and the quality and availability of data remains a problem for many indicators.

Denmark

Title

Danish Nature and Environment Policy.

Author / Organisation

Danish Ministry of Environment and Energy.

Year of publication (and publication dates)

First paper 1995, updated in 1999.

Hyperlinks and/or additional references

- <http://www.mem.dk/ukindex.htm>
- Holten-Andersen J, Christensen N, Kristiansen L.W, Kristensen P, Emborg L (Eds.) (1998) The State of the Environment in Denmark, 1997. NERI. Technical Report No. 243. National Environmental Research Institute, Roskilde, Denmark

Scope / main goal

- The Danish Nature and Environment Policy 1999 presents a good overview of the Danish nature and environmental initiatives since 1995 when the first complete environment policy report was published. The report is broad and comprises both national and international initiatives. It provides updated and complete information about environmental efforts, main problems and the framework of future initiatives.
- Guidance framework and rules for work in other ministries.
- Basis for diffusion of environmental background into other fields.
- Implementation of diffusion in other fields as an important goal is established in this way.

Geographical scope

National.

Type of indicator system

The Danish Nature and Environment Policy 1999 is a mixture of report and programme which is based on a large number of data. However, the data themselves do not appear in the report. A "stand-alone" indicator system is still under development.

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

A

"Associated with data" (A) or "no data" (B):

A

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions

The "Danish Nature and Environment Policy 1999" concentrates on the environmental dimension. Economic and societal aspects are mentioned but there were no indicators developed for these dimensions.

- Environment
- (Economy)
- (Society)

Problem areas

Main themes:

- Greenhouse gases
- Resource consumption and health
- Nature
- The aquatic environment
- The urban environment

- Contaminated sites

Others:

- Cities
- The landscape
- Agriculture
- Nature management
- Forestry
- Open-air life and tourism
- Utilisation of raw materials
- Fisheries and aquaculture
- Industry
- Public and private service
- Building and construction
- Energy supply
- Water supply
- Transport
- Households
- Wastewater treatment
- Waste management
- Nature and environmental assistance
- Development aid
- The environment and development interrelate
- The environment and economy
- The environment and employment

Methodological framework

The Danish approach follows the pressure-state-response framework.

Type of targets/objectives

As a rule, implicit qualitative targets are used.

Expressed linkages between indicators and goals/objectives/targets

Indicators and targets are considered as part of each other.

External dimensions

External dimensions are considered (there is a chapter "International nature and environmental assistance").

Use of aggregated or proxy indicators

Several indicators are aggregated.

Relation to other indicator sets

A relation to other indicator sets could not be identified.

Evaluation

- +/- The strategic development plan for sustainable development provided by the Danish government is the follow up of several Danish activities in the past that took place in the field of environmental politics, especially energy and waste management.
- "Summary" of a national political situation, which is dedicated to environmental, social and economic questions. The methodological framework for indicators is still under development and not published yet.
- Only the environmental aspect of SD is well developed.

Eurostat

Note: At the European level, following the Cardiff Declaration, the European Commission in collaboration with the European Environment Agency and Eurostat work on the elaboration of a set of indicators on the integration of environment and different economic sectors as well as on the integration of sustainable development in enterprises. These projects fit into the process of sustainable development. There are running projects on the integration of:

- environment/transport
- environment/agriculture
- environment/energy
- sustainable development/enterprises.

Title

Indicators of Sustainable Development.

Author / Organisation

Statistical Office of the European Communities (Eurostat).

Year of publication (and publication dates)

1997. Eurostat is preparing a new report on the CSD list of indicators for the Rio+10 conference in 2002.

Hyperlinks and/or additional references

Commission of the European Communities (1999) Commission Working Document. Report on Environmental and Integration Indicators to Helsinki Summit. Commission of the European Communities, Brussels

European Environment Agency (1997) Towards Guidelines for Response Indicators. European Environment Agency, Copenhagen

European Environment Agency (1998) Europe's Environment: The Second Assessment. Office for Official Publications of the European Communities, Luxembourg. Elsevier Science, Oxford

European Environment Agency (1999) Environment in the European Union at the Turn of the Century. Environmental Assessment Report No. 2. Office for Official Publications of the European Communities, Luxembourg

European Environment Agency (1999) Towards a European Menu of Environmental Headline Indicators. European Environment Agency, Copenhagen

European Environment Agency (1999) A Checklist for State of the Environment Reporting, Technical Report No 15. European Environment Agency, Copenhagen

European Environment Agency (1999) Reporting Frequencies of State-of-the-Environment Reports in Europe, Technical Report No 36. Office for Official Publications of the European Communities, Luxembourg

European Environment Agency (2000) Environmental Signals 2000. European Environment Agency Regular Indicator Report. European Environment Agency, Copenhagen.

<http://themes.eea.eu.int/toc.php/improvement/information?doc=39262&l=en> or

<http://themes.eea.eu.int/showpage.php/?pg=40635>

Eurostat (1997) Environmental Statistics 1996. Office for Official Publications of the European Communities, Luxembourg, Luxembourg

Eurostat, Statistisches Amt der Europäischen Gemeinschaften (1997) Jahrbuch 1997. Europa im Blick der Statistik 1986-1996. Office for Official Publications of the European Communities, Luxembourg

Eurostat (1998) Europe's Environment: Statistical Compendium for the Second Assessment. Office for Official Publications of the European Communities

Eurostat (1999) Towards Environmental Pressure Indicators for the EU. Theme 8 Environment and Energy. Office for Official Publications of the European Communities, Luxembourg, Luxembourg

Eurostat (1999) Towards Environmental Pressure Indicators for the EU: An Examination of the Sectors. Theme 8 Environment and Energy. Office for Official Publications of the European Communities, Luxembourg

Jesinghaus J, Montgomery R (1997) Indicators of Sustainable Development. Eurostat, European Communities. Office for Official Publications of the European Commission, Luxembourg
<http://esl.jrc.it/envind/>

Lammers P.E.M, Gilbert A.J. (1999) Towards Environmental Pressure Indicators for the EU: Indicator Definition. Eurostat, European Commission, Luxembourg

Scope / main goal

The "Indicators of Sustainable Development" study was carried out by Eurostat on the basis of the list of 132 indicators in the "Blue Book". The criteria applied in selecting the indicators presented were availability of data for a sufficient number of European Union Member States and relevance in the European context. It is a pilot study which seeks to apply the indicators of the United Nations' "Blue Book" to the European Union.

Geographical scope

International / National.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):	B
"Associated with data" (A) or "no data" (B):	A
"Still in use" (A) or "not in use" (B):	A

Sustainability dimensions (and the number of indicators)

- Environment (21)
- Economy (9)
- Society (14)
- Institutions (2)

Problem areas (and the number of indicators)

- International co-operation (2)
- Consumer patterns (4)
- Financial resources and mechanisms (3)
- Demographic dynamics and sustainability (4)
- Human health (3)
- Poverty (2)
- Education, public awareness and training (1)
- Sustainable human settlement development (4)
- Atmosphere (5)
- Quality and supply of freshwater resources (3)
- Agricultural and rural development (4)
- Planning and management of land use (1)
- Solid wastes and sewage-related issues (3)
- Deforestation (3)
- Biological diversity (2)
- Science for sustainable development (1)
- Information for decision-making (1)

Methodological framework

For each indicator there is a definition, a qualitative goal and the data of each member state of the EU. The pressure-state-response model of the OECD was not applied.

Type of targets /objectives

Implicit use of qualitative targets.

Expressed linkages between indicators and goals/objectives/targets

Yes.

External dimensions

External dimensions are only considered in the points "foreign direct investments" and "total ODA (official development assistance) given or received as a percentage of GDP".

Use of aggregated or proxy indicators

In most cases the indicators used are not aggregated. There is no use of proxy indicators.

Relation to other indicator sets

Based on the CSD working list.

Evaluation

- + A very good construction of every indicator: a definition of the indicator, the data for most of the EU member states, a reason for the establishment of indicators and an evaluation of the data with qualitative objectives.
- + The indicators are filled with data material from most European countries.
- + For the reason of the comparable presentation of the indicators, the political relevance for Europe is very large.
- +/- As Eurostat is a statistical office the selection of indicators is probably more based on the availability of statistical data than on political issues.

Forschungsstätte der Evangelischen Studiengemeinschaft (FEST)

Title

Indikatoren im Rahmen einer lokalen Agenda 21 (Indicators in the frame of a local agenda 21)

Author / Organisation

Forschungsstätte der Evangelischen Studiengemeinschaft (FEST) - Institut für Interdisziplinäre Forschung. On behalf of the Landesanstalt für Umweltschutz in Baden-Württemberg, Karlsruhe.

Year of publication

1999 (unpublished list)

Hyperlinks and/or additional references

- <http://www.fest-heidelberg.de>
- Diefenbacher H, Karcher H, Stahmer C, Teichert V (1997) Nachhaltige Wirtschaftsentwicklung im regionalen Bereich. Forschungsstätte der Evangelische Studiengemeinschaft – FEST, Heidelberg
- Teichert V, Diefenbacher H, Wilhelmy S (1997) Regionale Indikatoren für nachhaltige Entwicklung. Forschungsstätte der Evangelischen Studiengemeinschaft (FEST), Heidelberg

Scope and goal

Research project "Indicators in the frame of a local agenda 21" on behalf of the Ministries for Environment of Baden-Württemberg, Bayern, Hessen and Thüringen. Altogether nine cities and three districts should be examined for their convertibility to sustainability.

Geographical scope

Regional / local.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

B

"Associated with data" (A) or "no data" (B):

B

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions (and the number of indicators)

- Environment (8)
- Economy (8)
- Society (8)
- Social groups (4)
- Policy (4)

Problem areas

For each problem area there is one "headline" indicator.

- Waste management
- Air quality
- Ecosystem and biological diversity
- Renewable resources
- Non-renewable resources
- Traffic
- Environmental policies and area of land contaminated by hazardous waste
- Environmental consciousness of the people
- Distribution of work

- Private consumption and equipment of households
- Regional self-supply
- Structure of economy
- Investment in the process industry
- Training facilities
- Inflation
- Structure of the public sector
- Distribution of income and property
- Education and culture
- Demographic dynamics and human settlement
- Socially sustainable mobility
- Planning of the traffic system
- Health
- Security
- Women
- Children and Youths
- Seniors
- Foreigners
- Members of the sustainability process
- Honorary engagement
- Democratic engagement
- Efforts for international justice

Methodological framework

There is no description of a methodological framework. Each problem area is represented by one "headline" indicator.

Type of targets/objectives

Implicit use of qualitative targets.

Expressed linkages between indicators and goals/targets/objectives?

Goals/targets/objectives and lead indicators always stand together.

External dimensions

External dimensions are only considered in the point "Efforts for international justice".

Use of aggregated or proxy indicators

Each problem area is represented by a so-called "headline" indicator. These indicators are not aggregated.

Relation to other indicator sets

No relation to other indicator sets.

Evaluation

- + Clear selection of indicators, providing a good overview for the four dimensions of sustainability (ecological, economic, social and institutional).
- + Separate consideration of special groups (women, children, foreigners and seniors).
- Only partially transferable to a national level.

Finland

Title

Finnish Government Program for Sustainable Development.

(Note: the very recently published indicator set "SIGNS OF SUSTAINABILITY - Finland's indicators for sustainable development 2000" could not yet be considered in this report!)

Author / Organisation

Finnish National Commission on Sustainable Development (FNCSD).

Year of publication (and publication dates)

1998. The program mentioned above is Finland's third comprehensive document outlining national measures to be taken to promote sustainable development. In 1990, the Council of State presented to the Finnish Parliament the report "Sustainable Development and Finland". In 1995, the FNCSD prepared a second report "Finnish Action for Sustainable Development". Recently the Finnish Environment Institute published the results of the project "Signs of sustainability - Finland's indicators for sustainable development 2000" (not yet included in this report).

Hyperlinks and/or additional references

- http://www.vyh.fi/eng/environ/sustdev/indicat/ind_work.htm
(work on sustainable development indicators in Finland)
- <http://www.vyh.fi/eng/environ/sustdev/indicat/csd/csdtext.htm>
(results from testing CSD indicators)
- <http://www.vyh.fi/eng/environ/sustdev/indicat/inds2000.htm>
- <http://www.vyh.fi/eng/environ/sustdev/indicat/inditaul.htm>
- Ministry of the Environment (1998) Finnish Government Programme for Sustainable Development. Council of State Decision-in-Principle on the Promotion of Ecological Sustainability. Ministry of the Environment, Helsinki
- Rosenström U, Lehtonen M, Muurman J (1996) Trend in the Finnish Environment. Indicators for the 1997 OECD Environmental Performance Review of Finland. The Finnish Environment 63. Ministry of the Environment, Environmental Policy Department, Helsinki
- Statistics Finland (1999) Index of Environmental Friendliness. Helsinki
http://tilastokeskus.fi/tk/yr/ye22_en.html

Scope / main goal

Citation from the Finnish Government Program for Sustainable Development:

"The program is designed to promote ecological sustainability along with the necessary economic, social and cultural conditions for achieving it. Its basic aim is that all key sectors of administration, trade and industry should pursue the goal of sustainable development in all their activities.

- *The basic condition for ecologically sustainable development is the preservation of biological diversity and the viability of ecosystems as well as the long-term reconciliation of economics and other human activity with the environment's carrying capacity.*
- *Economic sustainability, as viewed in the program, means balanced and steady growth that is not reliant on long-term indebtedness or squandering of reserves. An economic sustainability also means preserving the national assets and safeguarding biodiversity.*
- *Socially sustainable development means to ensure peoples equal opportunities to create their own well-being, to exercise their fundamental rights, to acquire the basis pre-conditions for life, and to assume and equally share responsibility in decision-making in their own country and the world community.*
- *In its cultural dimension sustainable development should ensure free intellectual activity and preservation and development of cultural diversity from one generation to the next."*

Geographical scope

National.

Type of the indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B): A
"Associated with data" (A) or "no data" (B): A
"Still in use" (A) or "not in use" (B): A

Sustainability dimensions (and the number of indicators)

- Environment (21)
- Economy (29)
- Society and culture (33)

Problem areas (and the number of indicators)

- Climate change (3)
- Ozone layer depletion (2)
- Acidification (2)
- Eutrophication (4)
- Biodiversity (5)
- Toxic contamination (5)
- Economic development (4)
- Administrative and economic instruments (4)
- Natural resources (6)
- Urban structure and transport (6)
- Production and consumption (9)
- Factors affecting population (4)
- Health (5)
- Employment (4)
- Social problems and equality (6)
- Education, research and participation (4)
- Access to information (3)
- Cultural heritage (3)
- Ethnic minorities (2)
- Development co-operation (2)

Methodological framework

The OECD's "pressure-state-response" framework was used in the development stages of this indicator set.

Type of targets/objectives

Qualitative targets are used.

Expressed linkages between indicators and goals/targets/objectives

For every indicator there are one or more direct goals given.

Use of aggregated or proxy indicators

Use of non-aggregated indicators.

Relation to other indicator sets

Finland has taken part in the testing of the indicator system of the UN Commission on Sustainable Development.

Evaluation

+/- Cultural aspects are included into the social dimension of sustainability.

Germany

Note: In Germany there is no existing indicator system for sustainable development, but only a list of environmental data which follows the "driving force-pressure-state-response" approach ("Umweltdaten Deutschland 1998", editor: Federal Environmental Agency). A national system of indicators for SD is in preparation. As a substitute the results of the german testing of the CSD list of indicators on SD are presented here.

Title

Erprobung der CSD-Nachhaltigkeitskriterien in Deutschland - Bericht der Bundesregierung

Author / Organisation

Federal Ministry of Environment, Nature Protection and Nuclear Safety.

Year of publication (and publication dates)

The german testing report was submitted to the CSD in december 1999 and was published in 2000.

Hyperlinks and/or additional references

- <http://195.8.231.181/sachthemen/international/g8/csd.htm>
- <http://www.umweltbundesamt.de/uba-info-daten/daten/csd.htm>
- Federal Ministry for the Environment (1997) Towards Sustainable Development in Germany.
- Umweltbundesamt (1997) Nachhaltiges Deutschland. Wege zu einer dauerhaft umweltgerechten Entwicklung. Erich Schmidt Verlag, Berlin
- Umweltbundesamt (1997) Daten zur Umwelt. Der Zustand der Umwelt in Deutschland. Ausgabe 1997. Erich Schmidt Verlag, Berlin
- Umweltbundesamt, Statistisches Bundesamt (1998) Umweltdaten Deutschland 1998. Umweltbundesamt, Statistisches Bundesamt, Berlin

Scope / main goal

The german CSD testing report is an input for the international discussion about national indicator systems. It is an evaluation of the CSD-concept with the background of specific german conditions.

- Improving the structure and the conceptual framework.
- Closing of gaps in the CSD-list
- Searching indicators for the category "institutions"
- Creating a linkage between indicators
- Further condensing of information

Geographical scope

National.

Type of the indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

B

"Associated with data" (A) or "no data" (B):

B

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions (and the number of indicators)

- Environment (95 / 121)
- Economy (31 / 45)
- Society (43 / 47)
- Institutions (33)

Some of the indicators are composed by sub-indicators (specifications of single indicators). Depending on the mode of counting these sub-indicators, different numbers may be the result. The official number of all indicators is 218.

Problem areas (and the number of single indicators)

- Poverty / general social development (12)
- Demography (8)
- Health (13)
- Human settlement development (10)
- General economic development (14)
- Consumption patterns (7)
- Financial resources and mechanisms (3)
- Transfer of environmentally sound technology, co-operation and capacity-building (1)
- Private companies (6)
- Water quality and resources (9)
- Oceans etc. (4)
- Land resources (6)
- Agriculture (9)
- Forest (7)
- Biological diversity (8)
- Environmental sound management of biotechnology (3)
- Atmosphere (Energy/Greenhouse effect; ozone layer; air quality) (14)
- Waste(9)
- Dangerous waste (5)
- Dangerous chemicals (5)
- Radioactive waste (3)
- Traffic (13)
- Integrating environment and development in decision-making (0²)
- Science for sustainable development (5)
- Education (14)
- International co-operation (1)
- International legal instruments and mechanisms (7)
- Information for decision-making (4)
- Major groups (2)

Methodological framework

- Relation to the chapters of the Agenda 21
- Driving force - State - Response (DSR-framework)

Type of targets/objectives

Implicit use of qualitative targets/objectives.

Expressed linkages between indicators and goals/targets/objectives

Indicators are related to the goals/targets/objectives in the relevant chapters of the Agenda 21.

External dimensions?

There are a few external dimensions considered (e.g. import/export of dangerous waste, products with the label "fair trade", international co-operation)

Use of aggregated or proxy indicators

Use of non-aggregated indicators.

² An indicator really representing the trend on this issue is still lacking. Two of the indicators proposed for this problem area were included in other problem areas.

Relation to other indicator sets

Based on the CSD working list.

Evaluation

- + Content-wise and also methodological further development of the CSD working list.
- + Very extensive explanations on each chapter and on the indicators chosen.
- + The testing of the CSD-working list in Germany is of high relevance for Europe because the selection or the new development of indicators approximately corresponds to the requirements of other European states.
- +/- The original goal (to aggregate the indicators as much as possible) was missed. Instead even more indicators (than originally existed in the CSD-list) were developed.
- Data belonging to the indicators have not been published yet.

International Institute for Sustainable Development (IISD)

Title

The dashboard of sustainability.

Author / Organisation

International Institute for Sustainable Development (IISD) -
Consultative Group on Sustainable Development Indicators (CGSDI)

Year of publication (and publication dates)

January 2000 (Version 1.4)
October 1999 (Version 1.1)

Hyperlinks and/or additional references

- <http://iisd.ca/cgsdi/>
- http://iisd.ca/cgsdi/dashboard_dsply.htm
- Hardi P, Zdan T (1997) Assessing Sustainable Development: Principles in Practice. International Institute for Sustainable Development – IISD, Winnipeg, Manitoba
<http://iisd1.iisd.ca/pdf/bellagio.pdf>

Scope / main goal

The goal is to generate a concrete methodology proposal for highly aggregated sustainability reporting at the national level. The "Dashboard of Sustainability" is an instrument panel designed to inform decision-makers, the media, and the general public on the status of a nation's progress toward, or away from, sustainability.

Geographical scope

International / national.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):	B
"Associated with data" (A) or "no data" (B):	B
"Still in use" (A) or "not in use" (B):	A

Sustainability dimensions (and the number of indicators)

- Environment (7)
- Economy (6)
- Society (7)

Problem areas

Problem areas that are included in highly aggregated indicators:

- Greenhouse gas emissions
- Water quality
- Air quality
- Dispersion of toxic substances
- Soil degradation
- Waste disposal
- Urban sprawl
- Total material throughput
- Energy consumption
- Trade
- Debt service and export earnings

- Labour productivity
- Inflation
- Population
- Unemployment
- Poverty
- Crime
- Housing affordability
- Nutritional status of children
- Democratic participation

Methodological framework

Citation from the IISD homepage:

"Each dimension (dial) is structured in the follow way:

- *a needle pointing to a value that reflects the current performance*
- *a graph reflecting the change in that performance over time*
- *a gauge showing the amount remaining of certain critical stocks*

The overall state of the nation is reflected in a composite status indicator, labelled "Overall Sustainability", a colour bar that bridges the three dials.

Beneath each of the dials is a display area for alert lights. Indicators crossing critical thresholds or experiencing rapid change trigger warning lights that call special attention to those indicators."

Type of targets/objectives

Implicit use of qualitative targets/objectives.

Expressed linkages between indicators and goals/objectives/targets

Direct link between indicators and goals.

External dimensions

Only trade (imports / exports) is considered.

Use of aggregated or proxy indicators

Use of indices (highly aggregated indicators).

Relation to other indicator sets

Relation to a lot of indicators sets e.g.:

- Worldbank (Produced Assets)
- WWF (Living Planet Index, LPI)
- UN - CSD blue book (Social Health Index)

Evaluation

- + A quick glance at the Dashboard will give the view of an immediate impression about the overall sustainability of a nation, the current trends, and the urgent issues.
- + The Needle, Graph, and Gauge display makes clear distinctions between stocks and flows, shows change over time, reflects the status of longer term capital stocks, and relates all of these measures together in visual terms.
- + It links together in one presentation several different aggregated measures, and takes a first step toward super-aggregating them into a meaningful index.
- The indicator system has not been tested yet (no operationalisation yet).
- As highly aggregated indices are used, the causes for missing (or achieving) sustainability can not be identified.

Luxembourg

Title

Plan national pour un Développement durable - National Plan for a Sustainable Development
(the plan is published in french and english).

Author / Organisation

Government of Luxembourg.

Year of publication (and publication dates)

Pre-project started in June 1997. In June 1999 the National Government of Luxembourg approved the final National Plan for a Sustainable Development. A task force will be responsible for writing a new sustainability plan every three years.

Hyperlinks and/or additional references

- <http://www.mev.etat.lu/home.html>

Scope / main goal

The purpose of this National Plan for a Sustainable Development is to specify the priority fields of action in Luxembourg from the point of view of sustainable development, to formulate concrete objectives and to propose the actions and instruments necessary for their implementation.

Geographical scope

National.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

A

"Associated with data" (A) or "no data" (B):

A

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions (and the number of indicators)

- Environment (19)
- Economy (22)
- Society (18)

Problem areas (and the number of indicators)

- Poverty (2)
- Social equity (6)
- Dynamic demographic and durability (4)
- Education and R&D (4)
- Health (2)
- Economy and standard of living (5)
- Conciliation economy-ecology within the company (4)
- Energy (4)
- Agriculture (4)
- Transport (5)
- Hydrosphere (3)
- Atmosphere (4)
- Geosphere (2)
- Forest (3)
- Biological diversity (4)

- Waste (3)

Methodological framework

There is no use of the "pressure-state-response" or a similar model.

Type of targets/objectives

Both, qualitative and quantitative targets are used.

Expressed linkages between indicators and goals/targets/objectives

A changing number of indicators are related to the goals/targets/objectives.

External dimensions

Within the plan there are a few external dimensions considered like ODA (official development assistance).

Use of aggregated or proxy indicators

In most cases use of non-aggregated indicators.

Relation to other indicator sets

The indicators used are originally based on the indicators suggested by the United Nations CSD.

Evaluation

- + The development of the indicators that are being used is based on the data and method of the UN-CSD. Therefore these indicators are relevant for other countries as well. The same indicators could be used as a monitoring tool for measuring the progress of sustainable development at European level.
- The National Plan and its indicators are used less than one year now. Not much experience has been gained so far. There is no information about the quality of the indicators, the acceptance of them or the influence that they have on the policy. The first evaluation is to be expected next year.

Netherlands

Title

National Environmental Program (NEP III).

Author / Organisation

Ministry of Housing, Environment and Spatial Planning,
Ministry of economical affairs,
Ministry of Nature, Agricultural and Fishery,
Ministry of Traffic, Transportation and Public Works,
Ministry of Finance,
Ministry for International Co-operation and Development.

Year of publication (and publication dates)

1998. The first NEP appeared in 1989. The ultimate goal of this report was to reach sustainability in the time period 1990 to 2010. For several environmental themes and main actor groups in the society, strategic targets were set and specific policies were developed. This approach has been the foundation of NEP II and the NEP III. The NEPs are evaluated and a new NEP appears every four years. In 2001 NEP IV will appear (one year earlier than expected).

Hyperlinks and/or additional references

- <http://www.milieuloket.nl/9230000/b/nmpp.htm> (Dutch only)
- Ministry of Housing, Spatial Planning and the Environment (1996) Environmental Programme 1996-1999. Ministry of Housing, Spatial Planning and the Environment, The Hague, Netherlands

Scope / main goal

The Netherlands do not have a special sustainability program or strategy. The NEP III presents the current national environment policy - it is not a clear indicator system, although some indicators are mentioned. The ultimate goal is a delinking between environmental pressure and economic growth.

Geographical scope

National.

Type of the indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B): A
"Associated with data" (A) or "no data" (B): A
"Still in use" (A) or "not in use" (B): A

Sustainability dimensions

- Environment

Problem areas

- Climate
- Acidification
- Eutrophication
- Soil Pollution
- Disruption of areas
- Dispersion of pollutants
- Removal of Dangerous substances and waste
- Shortage of water
- Waste of materials

Methodological framework

The set includes "driving force", "pressure", and "state" indicators.

Type of targets/objectives

Use of both qualitative and quantitative targets.

Expressed linkages between indicators and goals/objectives/targets

No information on this issue was provided or could be found.

External dimensions

External dimensions are not considered.

Use of aggregated or proxy indicators

No information on this issue was provided or could be found.

Relation to other indicator sets

The indicators from the environmental themes are based on national emissions data.

Evaluation

- In the Netherlands there is no plan for sustainability, but only an environmental policy plan. Therefore only environmental targets are expressed.
- + The NEP IV (the next one) will try to integrate all three dimensions of sustainability.

OECD "Towards sustainable development"

Title

Towards sustainable development - environmental indicators.

Author / Organisation

OECD

Year of publication (and publication dates)

1998

Hyperlinks and/or additional references

- Organisation for Economic Co-operation and Development (1991) Environmental Indicators. A Preliminary Set. Organisation for Economic Co-operation and Development, Paris
- Organisation for Economic Co-operation and Development (1994) Environmental Indicators. Core Set. Organisation for Economic Co-operation and Development, Paris
- Organisation for Economic Co-operation and Development (1995) OECD Environmental Performance Reviews – Netherlands. Organisation for Economic Co-operation and Development, Paris
- Organisation for Economic Co-operation and Development (1997) OECD Environmental Data – Compendium 1997. Organisation for Economic Co-operation and Development, Paris
- Organisation for Economic Co-operation and Development (1998) Towards Sustainable Development – Environmental Indicators. Organisation for Economic Co-operation and Development, Paris

Scope / main goal

The OECD program on environmental indicators has three major purposes:

- keeping track on environmental progress
- ensuring that environmental concerns are taken into account when policies are formulated and implemented for various sectors, such as transport, energy and agriculture
- ensuring similar integration of environmental concerns into economic policies, mainly through environmental accounting

The work on indicators is carried out in close co-operation with OECD Member countries. It has led to:

- agreement by OECD countries to use the pressure-state-response (PSR) model as a common harmonised framework
- identification and definition of several sets of indicators based on their policy relevance, analytical soundness and measurability
- measurement and publication of these indicators for a number of countries

Geographical scope

International / national.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

B

"Associated with data" (A) or "no data" (B):

A

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions (and the number of indicators)

- Environment (18)
- Economy / Society (15)

Problem areas (and the number of indicators)

- Climate change (2)
- Ozone layer depletion (2)
- Air quality (2)
- Waste (2)
- Water quality (2)
- Water resources (2)
- Forest resources (2)
- Fish resources (2)
- Biodiversity (2)
- GDP and population (2)
- Consumption (2)
- Energy (3)
- Transport (3)
- Agriculture (3)
- Expenditure (2)

Methodological framework

PSR framework (pressure - state - response).

Type of targets/objectives

Use of implicit qualitative indicators.

Expressed linkages between indicators and goals/objectives/targets

The indicators are related to a short description of the "sustainability area" together with a qualitative target.

External dimensions

External dimensions are considered by an indicator called ODA (official development assistance).

Use of aggregated or proxy indicators?

In most cases use of non-aggregated indicators.

Relation to other indicator sets

Several national indicator sets refer to the OECD list or use indicators that are based on it.

Evaluation

- + Enables a comparison between different states (this is not possible with most national indicator systems)
- + The indicators in this publication are those that are regularly used in the OECD's analytical work and for which data are available for a majority of OECD countries.
- Only a few economic and social indicators are considered.

Scotland

Title

"Scotland the Sustainable - 10 Action Points for the Scottish Parliament" and "Scotland the Sustainable? - the Learning Process".

Author / Organisation

Scotland (a report to the Secretary of State for Scotland, from his Advisory Group on Sustainable Development, and his Advisory Group on Education for SD).

Year of publication (and publication dates)

1999

Hyperlinks and/or additional references

- <http://www.sustainable.scotland.gov.uk/>
- Scottish Environment Protection Agency (1996) State of the Environment Report.
<http://www.sepa.org.uk/stateenv/soereport.htm>

Scope / main goal

Scotland's emphasis and driving force are activities on local level with a strong emphasis on educational and motivation aspects. The Scottish way is to process the British way on local level. The Scottish administration therefore uses the help of local and Scottish wide NGOs and their background in mobilising and motivating population.

This action plan is seen as an opportunity to develop policies and structures to promote education for Sustainable Development. The time frame is set 30 years as a realistic horizon.

Geographical scope

Regional / national.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

A

"Associated with data" (A) or "no data" (B):

A

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions

- Environment
- Economy
- Society

Problem areas

- Biodiversity
- Countryside
- Coast
- Wildlife and open space
- Business and environment
- Community and the environment
- Energy
- Environmental education
- Transport
- Urban environment
- Waste resources

Methodological framework

PSR framework (pressure - state - response).

Type of targets/objectives

Use of qualitative targets/objectives.

Expressed linkages between indicators and goals/objectives/targets

There is an expressed linkage between indicators and targets on a local level. Not all indicators are covered on the local level – in every region/city. No criteria for the selection is given.

External dimensions

Within the goals: "the parliament and executive should build effective working links with the UK and internationally...".

Use of aggregated or proxy indicators

In most cases use of non-aggregated indicators.

Relation to other indicator sets

There is no obvious relation to other indicator sets.

Evaluation

+/- main emphasis is put on education ("holistic thinking is seen as a basis for SD")

Sweden

Title

Communication "Ecological Sustainability".

Author / Organisation

Swedish Government

Year of publication (and publication dates)

1997. Since the implementation of the programme in 1997 the Swedish Government has published progress reports annually to inform the parliament and the public on the progress achieved.

Hyperlinks and/or additional references

- <http://www.hallbarasverige.gov.se/eng/> (Sustainable Sweden)
- http://www.miljo.regeringen.se/propositionermm/skrivelser/pdf/s99-2000_13eng.pdf
- http://www.miljo.regeringen.se/pressinfo/pdf/m99_015e.pdf
- Environmental Advisory Council (1999) Green Headline Indicators (Schweden).
http://www.hallbarasverige.gov.se/eng/vagar_till/miljovard/green.htm

Scope / main goal

The Swedish programme has a clear vision: "Ecological sustainability in one generation"

The Swedish government has formulated three basic goals for ecologically sustainable development, which are:

- Environmental protection
- Efficient resource utilisation
- Sustainable supply

Geographical scope

National.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

A

"Associated with data" (A) or "no data" (B):

A

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions

- Environment

Problem areas

Problem areas were only developed for the goal "environmental protection".

- Air
- Groundwater
- Lakes and watercourses
- Wetlands
- Marine environment, coastal areas and archipelagos
- Eutrophication
- Acidification
- Forests
- Agricultural landscape
- Mountain landscape
- Urban environment
- Toxic contamination

- Radiation contamination
- Ozone layer
- Climate

Methodological framework

The Swedish Strategy "Ecological Sustainability" does not contain a list of indicators. In the meantime the Council has developed eleven indicators, so called green ratios (Sweden Green Headline indicators Gröna Nyckeltal, 1999). However, these indicators could not be considered in this report, anymore.

Type of targets/objectives

Implicit use of qualitative targets.

Expressed linkages between indicators and goals/objectives/targets

The green ratios are not explicitly linked to the environmental quality, but linkages can be established.

External dimensions

External dimensions are considered as the programme has an international perspective.

Use of aggregated or proxy indicators

Only headline indicators (called: green ratios) are used.

Relation to other indicator sets

No relation to other indicator sets.

Evaluation

- + The Swedish Government plans to present a detailed catalogue of targets and measures until the end of 2000.
- + The programme is characterised by a well-developed implementation and monitoring approach regarding responsibilities, participation of actors and progress assessment.
- The Swedish government recommends the incorporation of all three dimensions (economy, ecology and society). However, in its own report these three dimensions are not implemented. The indicators are only developed for the ecological dimension.
- The choice of the 15 quality targets is not explained in the text. Furthermore the chosen indicators have no direct reference to the targets.

UK

Title

"Quality of Life Counts" (including the indicators for sustainable development for the UK).
The UK sustainability strategy is called "A Better Quality of Life: A Strategy for Sustainable Development for the United Kingdom".

Author / Organisation

UK - Department of the Environment, Transport and the Regions.

Year of publication (and publication dates)

July 2000 (the first set of indicators was developed in 1996).

Hyperlinks and/or additional references

- <http://www.environment.detr.gov.uk/sustainable/index.htm>
- <http://www.environment.detr.gov.uk/sustainable/quality99/index.htm>
- <http://www.environment.detr.gov.uk/sustainable/quality99/annexa.htm>
- Department of the Environment (1996) Indicators of Sustainable Development for the United Kingdom; Department of the Environment, London
<http://www.environment.detr.gov.uk/epsim/indics/index.htm>
- Department of the Environment, Transport and the Regions (1998) Sustainability Counts. Consultation Paper on a Set of ,Headline‘ Indicators of Sustainable Development. Department of the Environment, Transport and the Regions, London
<http://www.environment.detr.gov.uk/sustainable/consult/index.htm>
- Department of the Environment, Transport and the Regions (1999a) Quality of Life Counts. Indicators for a Strategy for Sustainable Development for the United Kingdom: A Baseline Assessment <http://www.environment.detr.gov.uk/sustainable/quality99/index.htm>
- Department of the Environment, Transport and the Regions (1999b) The Environment in your Pocket 1998. Department of the Environment, Transport and the Regions, London
<http://www.environment.detr.gov.uk/des20/pocket/index.htm>
- Department of the Environment, Transport and the Regions (1999c) Monitoring Progress. Indicators for the Strategy for Sustainable Development in the United Kingdom. Department of the Environment, Transport and the Regions, London
<http://www.environment.detr.gov.uk/sustainable/quality/monitor/index.htm>
- Department of the Environment, Transport and the Regions (1999d) A Better Quality of Life. A Strategy for Sustainable Development for the United Kingdom. The Stationery Office, Norwich
<http://www.environment.detr.gov.uk/sustainable/quality/life/index.htm>

Scope / main goal

Sustainable development is about ensuring a better quality of life for everyone, now and for generations to come. It means a more inclusive society in which the benefits of increased economic prosperity are widely shared, with less pollution and less wasteful use of natural resources. The report provides a baseline assessment, looking in more detail at those indicators and the messages they send, and providing a benchmark against which future progress can be measured.

Sustainable development objectives are:

- social progress which recognises the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources;
- maintenance of high and stable levels of economic growth and employment;

Geographical scope

National.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

A

"Associated with data" (A) or "no data" (B):

A

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions (and the number of indicators)

- Environment (44)
- Economy (49)
- Society (38)
- Institutions (16)

Problem areas (and the number of indicators)

A sustainable economy:

- Resource efficiency (8)
- Economic stability and competitiveness (7)
- Developing skills and rewarding work (13)
- Production and consumption (21)

Building sustainable communities:

- Economic vitality and employment (6)
- Health (5)
- Travel (6)
- Access (7)
- Shaping our surroundings (11)
- Involvement and stronger institutions (3)

Managing the environment and resources:

- An integrated approach (4)
- Climate change and energy supply (6)
- Air and atmosphere (6)
- Freshwater (7)
- Seas, oceans and coasts (5)
- Landscape and wildlife (16)

Sending the right signals:

- Sending the right signals (9)

International co-operation and development:

- International co-operation and development (7)

Methodological framework

- The sustainable development strategy includes 15 "headline" indicators to give a broad overview of trends; and outlined a national set of about 147 indicators, to focus on specific issues and identify areas for action.
- PSR framework (pressure - state - response).

Type of targets/objectives

Use of explicit qualitative targets/objectives.

Expressed linkages between indicators and goals/objectives/targets

Yes, every indicator is linked to a qualitative target (objective), every objective is operationalised with an indicator.

External dimensions

A lot of external dimensions are considered within this indicator set (e.g. import/export, ODA (official development assistance), world and UK materials consumption levels per person).

Use of aggregated or proxy indicators

The level of aggregation within the 147 single indicators is low. The 15 headline indicators do not represent an aggregation of several single indicators but stand as proxy indicators for a whole problem area.

Relation to other indicator sets

There is a relation to the UN-CSD indicator set (served as a basis for the UK set).

Evaluation

- + Very clear structure: short explanation of the targets in every chapter, overview of the indicators with a qualitative evaluation (positive, negative, no change, no data) as well as links with other indicators, at last an effective description of every individual indicator.
- + For a large number of the selected indicators, data are available. For a small part, data will still have to be gathered (esp. for aggregated indicators [e. g. chemical releases to the environment] and a few very specialised indicators).
- + Use of highly aggregated headline indicators and very specialised indicators, so that on the one hand an overview of the state of sustainability is given and on the other hand it is possible to go into detail if desired.
- + Excellent Internet presentation with a lot of information.

UN-CSD

Title

Working List of Indicators of Sustainable Development.

Author / organisation

UN Commission on Sustainable Development (CSD).

Year of publication (and publication dates)

1999 (first publication in April 1995).

Hyperlinks and/or additional references

- <http://www.un.org/esa/sustdev/isd.htm>
- United Nations (1996) Indicators of Sustainable Development (UN-CSD). United Nations, New York <http://www.un.org/esa/susdev/isd.htm>
- UNDP – United Nations Development Programme (1997) Human Development Report 1997. Oxford University Press, London
- UNEP – United Nations Environment Programme (1997) Climate Change Information Kit, UNEP, Genf <http://www.unep.ch>
- UNEP – United Nations Environment Programme (1999) Global Environment Outlook 2000. United Nations Environment Programme, Earthscan Publications Ltd., London

Scope and goal

As part of the implementation of the Work Programme on Indicators of Sustainable Development (ISDs) adopted by the Commission on Sustainable Development (CSD) at its Third Session in April 1995, a working list of 134 indicators and related methodology sheets were developed. Several nations are currently testing or have been testing the indicator set at the national level. The goal of the CSD with respect to ISDs is to have an agreed set of indicators available for all countries to use by the year 2001.

Test countries are: Barbados, Belgium, Bolivia, Brazil, China, Costa Rica, Germany, Finland, France, Ghana, Great Britain, Kenya, Maldives, Morocco, Mexico, Austria, Pakistan Philippines, South Africa, Czech Republic, Tunisia, and Venezuela (state: January 1999). The study of Eurostat represents a first contribution to the indicator testing phase recommended by the United Nations Commission on Sustainable Development (CSD).

Geographical scope

International (but intended for national use).

Type of indicator system

The CSD working list represents a methodological study on indicator systems (see above).

Sustainability dimensions (and the number of indicators)

- Environment (55)
- Economy (23)
- Society (39)
- Institutions (15)

Problem areas (and the number of indicators)

- Poverty (6)
- Demography (4)
- Education (9)
- Health (12)
- Human settlement development (8)
- International co-operation (5)

- Consumption (8)
- Financial resources and mechanisms (6)
- Transfer of environmentally sound technology, co-operation and capacity-building (4)
- Water quality and resources (7)
- Oceans etc. (5)
- Land resources (3)
- Fragile ecosystems (desertification) (4)
- Fragile ecosystems (mountains) (3)
- Agriculture (7)
- Forest (4)
- Biological diversity (2)
- Environmental sound management of biotechnology (2)
- Atmosphere (6)
- Waste (5)
- Toxic chemicals (2)
- Hazardous waste (4)
- Radioactive waste (1)
- Integrating environment and development in decision-making (4)
- Science for sustainable development (3)
- National mechanisms and international co-operation for capacity-building in developing countries (0)
- International institutional arrangements (0)
- International legal instruments and mechanisms (2)
- Information for decision-making (3)
- Strengthening the role of major groups (3)

Methodological framework

- DSR framework (driving force – state – response).
- The indicators are related to chapters of Agenda 21.

Type of targets/objectives

Implicit use of qualitative targets/objectives.

Expressed linkages between indicators and goals/objectives/targets?

Indicators are related to the goals/objectives/targets in the chapters of the Agenda 21.

External dimensions

A few external issues are considered (e. g. imports/exports and ODA (official development assistance)).

Use of aggregated or proxy indicators

In most cases use of non-aggregated indicators (over 130 specific indicators).

Relation to other indicator sets

Examples:

- Germany's participation in the testing phase (<http://www.umweltbundesamt.de/uba-info-daten/daten/csd.htm>)
- Results from testing CSD indicators of sustainable development in Finland, 1997 (<http://www.vyh.fi/eng/environ/sustdev/indicat/csd/csdtext.htm>)
- Eurostat (Indicators of Sustainable Development, 1997)
- Austria's participation in the testing phase Test (since 1996, still in work)
- UK (Indicators of Sustainable Development for the UK, 1997)

- and many others (see above).

Evaluation

- + The CSD working list provides indicators following the internationally accepted chapters of Agenda 21. The coverage of the four aspects of sustainable development and of all the chapters of Agenda 21 ensures that most significant aspects of sustainable development are monitored by the indicators. All in all this list is very wide and offers - through its orientation on the chapter of Agenda 21 - a comprehensive collection of indicators.
- + As many countries have already worked with the list, there is a good availability of data and the relevance for industrialised countries has been proved already. It should be possible to create a special European list out of the national findings.
- The work on the list is still in progress and accordingly it is often being rearranged, i. e. indicators are being complemented or deleted. There will be a major work to combine all indicators proposed by the national testings.
- There is no information about appraisal techniques.

USA

Title

Sustainable America - A New Consensus for the Prosperity, Opportunity and a Healthy Environment for the Future.

Author / Organisation

USA, President's Council on Sustainable Development.

Year of publication (and publication dates)

1996. In May 1999 the Council presented another report titled "Towards a Sustainable America - Advancing Prosperity, Opportunity and a Healthy Environment for the 21st century", which at the President's request focussed on four specific policy areas: climate change, improving environmental management, metropolitan and rural strategies and international leadership. For these four areas the state-of-art is analysed, recommendations are given and actions proposed.

Hyperlinks and/or additional references

- <http://www.whitehouse.gov/PCSD/Publications/index.html>
- Board of Sustainable Development, "Our Common Journey - A Transition toward Sustainability", Washington, D.C., National Academy Press, 2000, XVI
<http://www.nap.edu/books/0309067839/html/>
- U.S. Interagency Working Group on Industrial Ecology, Material and Energy Flows in the United States (2000) Industrial Ecology. Material and Energy Flows in the United States. Washington D.C. <http://www.sdi.gov/reports.htm>
- U.S. Interagency Working Group on Sustainable Development Indicators (1998) Sustainable Development in the United States: An Experimental Set of Indicators. December 1998. Final Report. Washington D.C. <http://www.sdi.gov/reports.htm>

Scope and goal

The Report of 1996 adopts the Brundtland definition of SD. The Council's interpretation of SD is further elaborated by a vision statement and 16 belief statements.

The vision statement is the following: "Our vision is of a life sustaining Earth. We are committed to achievement of a dignified, peaceful, and equitable existence. A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends".

The belief statements formulate conditions and requirements for meeting the challenge of sustainable development. They refer to environmental, economic, social and international issues.

Geographical scope

National.

Type of indicator system

"Indicators within a sustainability strategy" (A) or "Stand-alone indicator system" (B):

A

"Associated with data" (A) or "no data" (B):

B

"Still in use" (A) or "not in use" (B):

A

Sustainability dimensions (and the number of indicators)

- Environment (14)
- Economy (13)
- Society (20)
- Institutions (9)

An exact counting of the number of indicators is difficult, as there is no strict division in the four dimensions of sustainability.

Sustainable areas (and the number of indicators)

- Health and the Environment (4)
- Economic prosperity (6)
- Equity (3)
- Nature (10)
- Stewardship (4)
- Sustainable communities (9)
- Civic engagement (4)
- Population (5)
- International responsibility (5)
- Education (6)

Methodological framework

The indicators are formulated as progress indicators.

Type of targets/objectives

Use of qualitative targets.

Expressed linkages between indicators and goals/objectives/targets

A clear linkage between the goals/objectives/targets and the indicators exists.

External dimensions

External dimensions are considered in the area "International responsibility".

Use of aggregated or proxy indicators

In most cases use of non-aggregated indicators.

Relation to other indicator sets

There is no obvious relation to other indicator sets.

Evaluation

- + One of the few indicator systems, which handles the societal aspects in detail.
- + The indicators are not only suitable for the USA but can also be used in every other industrialised country.
- +/- Sustainability targets and indicators are embedded in a larger frame about America's and the world's future.
- Only a few remarks on the methodology are included.
- Without doubt the report of the Council has an appealing and ambitious character, but it does not replace an official strategy of the US Government as it is only a report of an advisory body.

7. Literature

This list includes citations of the analysed indicator sets and other important documents referring to indicators of sustainable development.

- **Board of Sustainable Development**, "Our Common Journey - A Transition toward Sustainability", Washington, D.C., National Academy Press, 2000, XVI <http://www.nap.edu/books/0309067839/html/>
- **Bossel H (1999)** Indicators for Sustainable Development: Theory, Method, Applications. A Report to the Balaton Group. International Institute for Sustainable Development – IISD, Winnipeg
- **Brunvoll F, Dávila E H, Palm V, Ribacke S, Rypdal K, Tängdén L (1999)** Inventory of Climate Change Indicators for the Nordic Countries. Statistics Norway, Department of Economics Statistics, Oslo
- **Bundesministerium für Umwelt, Jugend und Familie (1998)** Indicators of Sustainable Development, Wien http://www.bmu.gv.at/u_nachhalt/nachhaltigkeit/un_nachhaltigkeitsindikatoren.htm
- **Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (2000)** Erprobung der CSD-Nachhaltigkeitsindikatoren in Deutschland. Bericht der Bundesregierung, Berlin
- **Commission of the European Communities (1999)** Commission Working Document. Report on Environmental and Integration Indicators to Helsinki Summit. Commission of the European Communities, Brussels
- **Department of the Environment (1996)** Indicators of Sustainable Development for the United Kingdom; Department of the Environment, London <http://www.environment.detr.gov.uk/epsim/indics/index.htm>
- **Department of the Environment, Transport and the Regions (1998)** Sustainability Counts. Consultation Paper on a Set of 'Headline' Indicators of Sustainable Development. Department of the Environment, Transport and the Regions, London <http://www.environment.detr.gov.uk/sustainable/consult/index.htm>
- **Department of the Environment, Transport and the Regions (1999a)** Quality of Life Counts. Indicators for a Strategy for Sustainable Development for the United Kingdom: A Baseline Assessment <http://www.environment.detr.gov.uk/sustainable/quality99/index.htm>
- **Department of the Environment, Transport and the Regions (1999b)** The Environment in your Pocket 1998. Department of the Environment, Transport and the Regions, London <http://www.environment.detr.gov.uk/des20/pocket/index.htm>
- **Department of the Environment, Transport and the Regions (1999c)** Monitoring Progress. Indicators for the Strategy for Sustainable Development in the United Kingdom. Department of the Environment, Transport and the Regions, London <http://www.environment.detr.gov.uk/sustainable/quality/monitor/index.htm>
- **Department of the Environment, Transport and the Regions (1999d)** A Better Quality of Life. A Strategy for Sustainable Development for the United Kingdom. The Stationery Office, Norwich <http://www.environment.detr.gov.uk/sustainable/quality/life/index.htm>
- **Diefenbacher H, Karcher H, Stahmer C, Teichert V (1997)** Nachhaltige Wirtschaftsentwicklung im regionalen Bereich. Forschungsstätte der Evangelische Studiengemeinschaft – FEST, Heidelberg
- **Endres A, Radke V, Hübler K-H, Böttcher-Tiedemann Chr, Diller Chr (1996)** Indikatoren einer nachhaltigen Entwicklung. Endbericht. Institut für Stadtforschung und Strukturpolitik GmbH – IfS, Berlin
- **Enquete-Kommission "Schutz der Erdatmosphäre" (1995)** Mehr Zukunft für die Erde. Nachhaltige Energiepolitik für dauerhaften Klimaschutz. Bonn
- **Environmental Advisory Council (1999)** Green Headline Indicators (Schweden). http://www.hallbarasverige.gov.se/eng/vagar_till/miljovard/green.htm

- **Erdmenger Chr, Burzacchini A, Levett R (Eds.) (1996)** Local Loops. How Environmental Management Cycles Contribute to Local Sustainability. Office for Official Publications of the European Communities, Luxembourg.
- **European Environment Agency (1997b)** Towards Guidelines for Response Indicators. European Environment Agency, Copenhagen
- **European Environment Agency (1998)** Europe's Environment: The Second Assessment. Office for Official Publications of the European Communities, Luxembourg, Elsevier Science, Oxford
- **European Environment Agency (1999a)** Environment in the European Union at the Turn of the Century. Environmental Assessment Report No. 2. Office for Official Publications of the European Communities, Luxembourg
- **European Environment Agency (1999b)** Towards a European Menu of Environmental Headline Indicators. European Environment Agency, Copenhagen
- **European Environment Agency (1999c)** A Checklist for State of the Environment Reporting, Technical Report No 15. European Environment Agency, Copenhagen
- **European Environment Agency (1999d)** Reporting Frequencies of State-of-the-Environment Reports in Europe, Technical Report No 36. Office for Official Publications of the European Communities, Luxembourg
- **European Environment Agency (2000)** Environmental Signals 2000. European Environment Agency Regular Indicator Report. European Environment Agency, Copenhagen.
<http://themes.eea.eu.int/toc.php/improvement/information?doc=39262&l=en> or
<http://themes.eea.eu.int/showpage.php/?pg=40635>
- **Eurostat (1997)** Environmental Statistics 1996. Office for Official Publications of the European Communities, Luxembourg, Luxembourg
- **Eurostat (1998)** Europe's Environment: Statistical Compendium for the Second Assessment. Office for Official Publications of the European Communities **ES – Eurostat (1999a)** Towards Environmental Pressure Indicators for the EU. Theme 8 Environment and Energy. Office for Official Publications of the European Communities, Luxembourg, Luxembourg
- **Eurostat (1999b)** Towards Environmental Pressure Indicators for the EU: An Examination of the Sectors. Theme 8 Environment and Energy. Office for Official Publications of the European Communities, Luxembourg
- **Eurostat, Statistisches Amt der Europäischen Gemeinschaften (1997)** Jahrbuch 1997. Europa im Blick der Statistik 1986-1996. Office for Official Publications of the European Communities, Luxembourg
- **Faucheux S, O'Connor M (1998)** Valuation for Sustainable Development: Methods and Policy Indicators. Edward Elgar Publishing, Cheltenham/UK, Northampton/MA/USA
- **Funtowicz S.O (1999)** Information Tools for Environmental Policy under Conditions of Complexity. Environmental Issues Series No 9. European Environment Agency – EEA, Copenhagen
- **Global Resource Information Database – GRID-Arendal (1997)** State of the Environment in Norway 1997. Arendal <http://www.grida.no/prog/norway/soeno97/index.htm>
- **Hardi P, Zdan T (1997)** Assessing Sustainable Development: Principles in Practice. International Institute for Sustainable Development – IISD, Winnipeg, Manitoba <http://iisd1.iisd.ca/pdf/bellagio.pdf>
- **Hille J (1998)** The Concept of Environmental Space. Implications for Policies, Environmental Reporting and Assessments. European Environment Agency – EEA, Office for Official Publications of the European Communities, Luxembourg
- **Holten-Andersen J, Christensen N, Kristiansen L.W, Kristensen P, Emborg L (Eds.) (1998)** The State of the Environment in Denmark, 1997. NERI. Technical Report No. 243. National Environmental Research Institute, Roskilde, Denmark

- **IFEN, Institut français de l'environnement (2000)** Aménagement du territoire et environnement. Politiques et indicateurs. Spatial Planning and Environment. Policies and Indicators. Institut français de l'environnement, Orléans, (engl. and french)
- **Jesinghaus J, Montgomery R (1997)** Indicators of Sustainable Development. Eurostat, European Communities. Office for Official Publications of the European Commission, Luxembourg
<http://esl.jrc.it/envind/>
- **Jörissen J, Kopfmüller V, Brandl V, Paetau M (1999)** Ein integratives Konzept nachhaltiger Entwicklung. Forschungszentrum, Karlsruhe
- **Kristensen, P (1997)** Feasibility Study on the Production of an Yearly EEA Indicator Report. National Environmental Research Institute. European Environment Agency – EEA, Copenhagen
- **Lammers P.E.M, Gilbert A.J. (1999)** Towards Environmental Pressure Indicators for the EU: Indicator Definition. Eurostat, European Commission, Luxembourg
- **Meadows, D. (1998):** Indicators and Information Systems for Sustainable Development - a Report to the Balaton Group. Published by The Sustainability Institute • PO Box 174 • Hartland Four Corners VT 05049
http://iisd1.iisd.ca/pdf/s_ind_2.pdf
- **Ministry of Housing, Spatial Planning and the Environment (1996)** Environmental Programme 1996-1999. Ministry of Housing, Spatial Planning and the Environment, The Hague, Netherlands
- **Ministry of the Environment (1998)** Finnish Government Programme for Sustainable Development. Council of State Decision-in-Principle on the Promotion of Ecological Sustainability. Ministry of the Environment, Helsinki
- **Moldan B, Billharz S (1997)** Sustainability Indicators. Report of the Project on Indicators of Sustainable Development. Scientific Committee on Problems of the Environment – SCOPE. John Wiley&Sons. Chichester, New York, Weinheim, Brisbane, Toronto, Singapore
- **Noll, H.-H. / Kramer, C. (1996):** Umweltberichterstattung und Umweltindikatoren. In: Kölner Zeitschrift für Soziologie und Sozialpsychologie 36 (196), p.516-547
- **Nordic Council of Ministers (1997)** Indicators of the State of the Environment in the Nordic Countries. Nordic Council of Ministers, Copenhagen
- **OECD – Organisation for Economic Co-operation and Development (1991)** Environmental Indicators. A Preliminary Set. Organisation for Economic Co-operation and Development, Paris
- **OECD – Organisation for Economic Co-operation and Development (1994)** Environmental Indicators. Core Set. Organisation for Economic Co-operation and Development, Paris
- **OECD – Organisation for Economic Co-operation and Development (1995)** OECD Environmental Performance Reviews – Netherlands. Organisation for Economic Co-operation and Development, Paris
- **OECD – Organisation for Economic Co-operation and Development (1997)** OECD Environmental Data – Compendium 1997. Organisation for Economic Co-operation and Development, Paris
- **OECD – Organisation for Economic Co-operation and Development (1998)** Towards Sustainable Development – Environmental Indicators. Organisation for Economic Co-operation and Development, Paris
- **Öko-Institut (1999):** Soziale und ökonomische Nachhaltigkeitsindikatoren. Freiburg
- **Pearce D (1993)** Blueprint 3. Measuring Sustainable Development. Earthscan Publications Ltd, London.
- **Pfister G, Knaus A, Renn O (1997)** Nachhaltige Entwicklung in Baden-Württemberg – Statusbericht. Akademie für Technikfolgenabschätzung in Baden-Württemberg, Stuttgart
- **Radermacher W, Zieschank R, Hoffmann-Kroll R, van Nouhuys J, Schäfer D, Seibel S (1998)** Entwicklung eines Indikatorensystems für den Zustand der Umwelt in der Bundesrepublik Deutschland mit Praxistest für ausgewählte Indikatoren und Bezugsräume. Hrsg.: Statistisches Bundesamt Wiesbaden. Metzler-Poeschel, Stuttgart

- **Ratke, V. (1999):** Nachhaltige Entwicklung - Konzept und Indikatoren aus wirtschaftstheoretischer Sicht. Heidelberg
- **Rosenström U, Lehtonen M, Muurman J (1996)** Trend in the Finnish Environment. Indicators for the 1997 OECD Environmental Performance Review of Finland. The Finnish Environment 63. Ministry of the Environment, Environmental Policy Department, Helsinki
- **Scottish Environment Protection Agency (1996)** State of the Environment Report.
<http://www.sepa.org.uk/stateenv/soereport.htm>
- **Smeets E, Weterings R (1999)** Environmental Indicators: Typology and Overviews. Technical Report No 25. European Environmental Agency – EEA, Copenhagen http://binary.eea.eu.int:80/t/tech_25_text.pdf
- **Spangenberg J, (1995)** Ein zukunftsfähiges Europa. Towards Sustainable Europe. Wuppertal Institut für Klima, Umwelt und Energie, Wuppertal
- **Spangenberg, J.H. / Bonniot, O. (1998):** Sustainable Indicators - A compass on the road towards sustainability. Wuppertal Paper No. 81, February 1998
- **Statistics Finland (1999)** Index of Environmental Friendliness. Helsinki
http://tilastokeskus.fi/tk/yr/ye22_en.html
- **Statistisches Landesamt Baden-Württemberg (1999)** Statistik von Baden-Württemberg. Daten zur Umwelt 1998. Statistisches Landesamt Baden-Württemberg, Stuttgart
- **Teichert V, Diefenbacher H, Wilhelmy S (1997)** Regionale Indikatoren für nachhaltige Entwicklung. Forschungsstätte der Evangelischen Studiengemeinschaft (FEST), Heidelberg
- **U.S. Interagency Working Group on Industrial Ecology, Material and Energy Flows in the United States (2000)** Industrial Ecology. Material and Energy Flows in the United States. Washington D.C.
<http://www.sdi.gov/reports.htm>
- **U.S. Interagency Working Group on Sustainable Development Indicators (1998)** Sustainable Development in the United States: An Experimental Set of Indicators. December 1998. Final Report. Washington D.C. <http://www.sdi.gov/reports.htm>
- **Umweltbundesamt (1997)** Daten zur Umwelt. Der Zustand der Umwelt in Deutschland. Ausgabe 1997. Erich Schmidt Verlag, Berlin
- **Umweltbundesamt (1997)** Nachhaltiges Deutschland. Wege zu einer dauerhaft umweltgerechten Entwicklung. Erich Schmidt Verlag, Berlin
- **Umweltbundesamt (2000)** DUX – Der deutsche Umweltindex. Umweltbundesamt, Berlin
<http://www.umweltbundesamt.de/dux/dux.htm>
- **Umweltbundesamt, Statistisches Bundesamt (1998)** Umweltdaten Deutschland 1998. Umweltbundesamt, Statistisches Bundesamt, Berlin
- **UNDP – United Nations Development Programme (1997)** Human Development Report 1997. Oxford University Press, London
- **UNEP – United Nations Environment Programme (1997)** Climate Change Information Kit, UNEP, Genf
<http://www.unep.ch>
- **UNEP – United Nations Environment Programme (1999)** Global Environment Outlook 2000. United Nations Environment Programme, Earthscan Publications Ltd., London
- **United Nations (1996)** Indicators of Sustainable Development (UN-CSD). United Nations, New York
<http://www.un.org/esa/susdev/isd.htm>
- **Walz R, Block N, Eichhammer W, Hiessl H, Nathani C, Ostertag K (1996)** Weiterentwicklung von Indikatorensystemen für die Umweltberichterstattung. Abschlussbericht. Forschungsvorhaben 101 05 016 des Umweltbundesamtes. Fraunhofer Institut für Systemtechnik und Innovationsforschung – Fh-ISI, Karlsruhe

- **World Bank (1997)** Expanding the Measure of Wealth. Indicators of Environmentally Sustainable Development. Environmentally Sustainable Development Studies and Monographs Series No. 17. The World Bank, Washington
- **Worldbank (2000):** World development indicators 2000 <http://www.worldbank.org/data/wdi2000/index.htm>
- **Wuppertal Institut für Klima, Umwelt, Energie GmbH (1996)** Zukunftsfähiges Deutschland. Ein Beitrag zu einer global nachhaltigen Entwicklung. Hrsg.: Bund für Umwelt und Naturschutz Deutschland - BUND/MISERIOR, Birkhäuser Verlag, Basel
- **WWF – World Wide Fund For Nature – International (1999)** Living Planet Report 1999. Gland, Schweiz <http://www.panda.org/livingplanet/lpr99/>