

Working Paper No. 20
31 March 2006

ENGLISH ONLY

ECONOMIC COMMISSION FOR EUROPE

CONFERENCE OF EUROPEAN STATISTICIANS

Joint UNECE/OECD/Eurostat Working Group on Statistics for Sustainable Development
First meeting
Luxembourg, 3-4 April 2006
Item 10 of the Provisional Agenda

**CONCEPTUAL FRAMEWORK OF THE SWISS SUSTAINABLE
DEVELOPMENT INDICATOR SYSTEM**
Submitted by the Swiss Federal Statistical Office¹

This meeting is organised jointly with Eurostat and OECD
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CONCEPTUAL FRAMEWORK OF THE SWISS SUSTAINABLE DEVELOPMENT INDICATOR SYSTEM

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INTRODUCTION

This paper presents the basics of the Swiss indicator system MONET:

- i) the normative frame of reference, which states the goals and definitions; and
- ii) the conceptions to implement these in the set up of the indicator system.

A CONCEPTUAL FRAMEWORK

1. The project to develop the Swiss indicator system MONET (a German acronym for Monitoring der Nachhaltigen Entwicklung) followed a systematic procedure in order to guarantee transparency and comprehensiveness and to minimize the risk of arbitrariness or one-sided influence of any one interest group. As experience gained in other countries has shown, a precise description of the conceptual framework is essential if the indicator system is to be specific and widely accepted. A conceptual framework typically includes: a statement of objectives; a set of definitions; a specification of what to measure; and set of rules concerning how to measure.

OBJECTIVES AND DEFINITIONS

2. Our first step was to take the Brundtland definition of “sustainable development” and to draw up an interpretation of the definition, which allowed us to subsequently set it down in practical terms.

3. By signing the Rio Declaration and “Agenda 21”, Switzerland and many other countries committed themselves to sustainable development in the Brundtland Report's sense: “Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs”. The Brundtland definition as well as the other “Rio documents” places humans and the maintenance of options for meeting human needs at the focus of attention and are based on the ethically founded value of solidarity within and between generations. It is key to understand that the concept “sustainable development” cannot be divided into its constituent terms.¹ It is development that must be made sustainable – and development is internationally defined as a process, which increases people's opportunity of choice. This anthropocentric and option-oriented definition of intra- and intergenerational justice is a guiding principle for the MONET project too. However, the definition must be operationalised to be of practical use.

Intra- and intergenerational justice

4. The entitlement to having needs met is taken to extend over space and time. It applies to all human beings currently alive and to the future population of the earth. Justice is a culturally determined concept. The postulate of intra- and intergenerational justice thus leaves considerable latitude for interpretation. However, the most consensual possible concept of

justice is required for a global issue such as sustainable development. The observation of human rights has proved to be the globally most widely accepted concept of justice. Human rights provide an ethically founded framework for the right to dignified life and free development of personality and the obligation to guarantee the same right to others. The concept is pared down to the essential in terms of the "ethically right" and excludes the discretionary in terms of the "morally good" (such as the Christian precept, "Love your neighbour as yourself"). For the purposes of sustainable development, observation of human rights is defined as follows: Sustainable development entails the indivisibility of human rights over time and space in terms of guaranteeing human dignity and maintenance and long-term preservation of environmental, material and cultural living conditions, which are essential for the free development of personality.

Maintenance of options

5. If "development" is understood as a process, which should not limit but instead expand the opportunity of choice and action of all humans, this has an implication for both use of capital and fairness of distribution. Capital stocks should not in principle be substituted, but should instead be preserved whenever possible. The aim is accordingly to obtain a representation of the distribution of economic, social and environmental resources between the individual generations in which opportunity of choice and action is at least maintained along the time axis. Legal philosophy provides one practical response in the form of Rawls' fairness criterion, which seeks to determine the concept of justice people would select if they did not know their actual position in society in advance. When this question is asked, a distribution is deemed just if the benefit to the most disadvantaged individual is maximised. This principle was developed for intragenerational distribution, but it can also be applied to intergenerational distribution, where it means that any current use of capital must bring about at least equally large advantages for future generations. Capital may accordingly only be used if, as a consequence, the options of the most disadvantaged generation are not compromised.

Meeting of needs

6. In a global context, meeting of needs may be understood as fulfilling basic biological, psychological and social needs in such a manner as to ensure subsistence. This interpretation is sufficient until this goal has been achieved, but not once the basic needs of a large majority have been more than adequately met. In this case too, human rights could again be of assistance with the concept of "guaranteeing human dignity". Human dignity is here seen in not an absolute but instead a relative sense; in other words, human dignity may, for example, be measured relative to average quality of life or the living conditions of a majority. However, the level to which needs are to be met differs from country to country and is subject to negotiation.

Finite natural resources

7. In addition to meeting needs and intra- and intergenerational justice, there is a further significant core concept of sustainable development: preservation of the utility and qualities of natural resources over the course of time. In order to guarantee that needs are met over time and space, it is necessary to husband resources, primarily natural resources, whose availability is finite.

8. The argument that maintaining the largest possible number of options entails comprehensive protection of the full diversity of the natural foundations of life, is expressed in numerous documents relating to sustainable development. Introducing the demand for the protection of biodiversity into the definition of sustainable development brings the sustainability of the earth's ecosystem into the equation, because maintaining biodiversity entails substantially maintaining further renewable and non-renewable resources and sinks.

9. The purpose of mentioning biodiversity is not to assign particular significance to the environmental component, but instead to point out that loss of biodiversity will restrict future generations' options for meeting needs and that such a process would moreover be irreversible. The reason for mentioning biodiversity and not the natural environment as a whole is that this anthropocentric concept of biodiversity does not focus on maintaining natural resources for their own sake, but instead in terms of their utility to humans. Moreover, maintaining biodiversity in any case entails careful management of natural resources.

10. The Brundtland definition thus reads as follows:

1. Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs.
2. Sustainable development means ensuring dignified living conditions with regard to human rights by creating and maintaining the widest possible range of options for freely defining life plans. The principle of fairness among and between present and future generations should be taken into account in the use of environmental, economic and social resources.
3. Putting these needs into practice entails comprehensive protection of biodiversity in terms of ecosystem, species and genetic diversity, all of which are the vital foundations of life.

Qualitative objectives

11. The next step is to define objectives for the issues, which will be observed using an indicator system for sustainable development. Following the above outlined normative frame of reference we didn't opt for the three pillar approach of a sustainable society, a sustainable economy and a sustainable environment, but formulated qualitative objectives, which are key for sustainable *development* and all apply in an overarching manner to society, the economy and the environment: "social solidarity", "economic efficiency" and "environmental responsibility".

12. The three qualitative objectives are of equal importance. Equal weight must be attached to them. This means e.g. that environmental protection measures have to be economically efficient and economic-political decisions have to be socially acceptable and ecological. Equal importance means in our case also that, in the long term, environmental, economic and social objectives cannot be achieved at the expense of the other objectives.

Postulates concerning sustainable development

13. So as to put the definition and qualitative objectives in practical terms, the next step entails the formulation of postulates of sustainable development. These ultimately constitute the frame of reference that is used to access the sustainability of the observed developments.

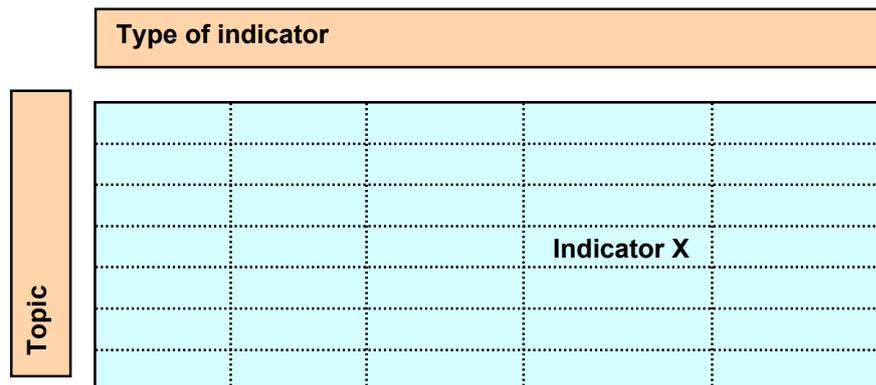
At the same time, the indicators allow the indicators to be chosen on a consistent and transparent basis.

14. The postulates are assigned by topic to the qualitative objectives and divided into 20 areas. Since the three areas of society, economy and environment are recorded as qualitative objectives and not as capital stocks, the postulates allow statements to be made not only in relation to stock sizes but also to the meeting of needs and to the efficiency and fairness with which needs are met and resources are used. The postulates have a clear and direct relation to the definition and the qualitative objectives, and they are relevant over time and space. Given that they are geared to long-term validity, they do not include any current political measures or paths towards solutions.²

WHAT TO MEASURE AND HOW TO MEASURE

15. A conceptual framework also includes specifications of what to measure and of how to measure. In our case this meant the choice of topics of relevance to sustainable development in Switzerland and the development of an indicator typology that was apt for social, economic and environmental indicators. These two dimensions correspond with the two axes of a grid into which the individual indicators must be inserted.

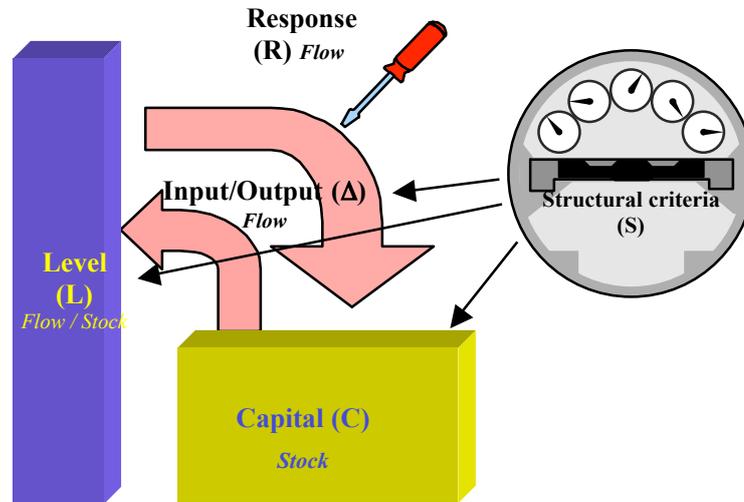
Figure: Indicator-system grid



Type-of-indicator axis

16. The indicator classification developed for the MONET project describes the dynamics of the operations of relevance to sustainable development as identified in the definition. The model has similarities with the “driving force-pressure-state-impact-response” model used in some indicator systems. Unlike the latter, however, it is not tailored to the requirements of environmental applications, but is also applicable to social and economic topics. This is particularly due to the following type of indicator, the structural criteria. They answer the question: “To what extent is the capital used in an equitable and efficient manner?” These indicators relate to the distribution of met needs and capital (and thus options) between various population groups and describe what environmental and economic and social resources have to be used to meet particular needs. The model reflects the above outlined normative frame of reference, which stresses the maintenance of options to meet the needs (level indicators) of the today living generation (structural criteria) and the generations to come (capital indicators).

Figure: Indicator typology



17. The following figure contains a summary of the characteristics of the five types of indicators.

Figure: Types of indicators and their characteristics

Type of indicator Features	Level (L)	Capital (C)	Input/Output (Δ)	Structural criteria (S)	Response (R)
Principal question/s	Meeting needs – how well do we live?	Preservation of resources – what are we leaving behind for our children?	Flows – to what extent does the capital appreciate or increase or depreciate or diminish?	Fairness – how well are resources distributed; decoupling – how efficiently are we using our resources?	Measures – how have the socio-political systems reacted in their efforts to influence development?
Description of meaning	Extent to which needs are met	Status of and changes to resources	Use and influencing of capital	Efficiency, disparities	Social and political measures
Value measured	"Level" variables are generally flow variables, which are often stated in relationship to other variables (e.g. GDP per capita, living space per capita, distance travelled per capita, unemployment rate).	"Capital" is measured using stock variables. These may be represented as absolute values (drinking water supply, newspaper circulation figures) or relative values (proportion of threatened species, hospital beds per capita).	These are always measured by flow variables. They may be represented as absolute values (e.g. greenhouse gas emissions in tonnes) or relative values (e.g. proportion of GDP spent on education, phosphorus input per hectare).	"Efficiency" is always expressed as a relative variable (e.g. nitrogen oxide emissions per km) or defined as a proportion (e.g. proportion of journeys made using public transport). The description of "disparities" is broken down by e.g. population group (e.g. proportion of women completing tertiary education) or region (e.g. regional economic output). ³	"Responses" are recorded using flow variables (e.g. transfer payments to the poor) or descriptive absolute or relative values (e.g. number or proportion of local communities charging a refuse collection fee).
Breakdown by group or region	no	no	no	yes	no

Counterpart in DPSIR	Driving force	State	Pressure/ Impact	None	Response
Delimitation vis-à-vis other types of indicators	≠ continuous consumption of resources (→ Δ)	≠ variable for measuring consumption (→ Δ)	≠ variable for measuring accumulation or decline of stock (→ C)	≠ absolute variable (→ Δ) ≠ ∅ average of the total population (→ L)	

18. The model embraces various aspects which are relevant to sustainable development: the degree to which social needs are met (L), expenditure for that purpose (Δ), the current situation with regard to resources (C) and the level of efficiency and appropriateness of their use (S). Combining different types of indicators allows complex statements to be made on particular topics and prevents arbitrary assessment of developments. In practice, the indicators from one topic, unlike in the above (ideal) model, frequently and especially do not display any clear causal associations. A causal relationship between the individual indicators of a topic area is therefore desirable, but not essential.

Topic axis

19. Sustainable development is an anthropocentric concept, thus it is obvious to choose individual and social fields of action and specify them as a list of topics. The political sphere, which after all addresses such issues, provides a useful starting point. For pragmatic reasons, we thus brought our list of topics as far as possible into line with a classification (25 policy areas) used before with regard to Switzerland's sustainability strategy. However, it must be remembered that politics does not necessarily encompass all topics that are of relevance to sustainable development. The list of topics thus not simply reflects current reality but also includes topics, which are not (yet) on the political agenda. Furthermore, the MONET system is structured so that certain aspects of sustainable development, such as "equality of opportunity" and "regional disparities", are integrated across all topics. These topics are modelled by the "structural criteria" (columns of the grid) and thus no longer need to appear in the list of topics.

Figure: List of the current 26 topics of the MONET indicator system

List of topics	
1 Social security and prosperity	14 Research, development and technology
2 Health	15 Production
3 Subjective living conditions	16 Consumption
4 Housing	17 Mobility
5 Culture and leisure	18 Materials, wastes and immissions
6 Social cohesion and participation	19 Soil
7 Development cooperation	20 Water
8 Education and science	21 Air
9 Information	22 Climate
10 Physical security	23 Land use
11 International trade and competitiveness	24 Biodiversity
12 Domestic markets	25 Energy
13 Employment	26 Forests

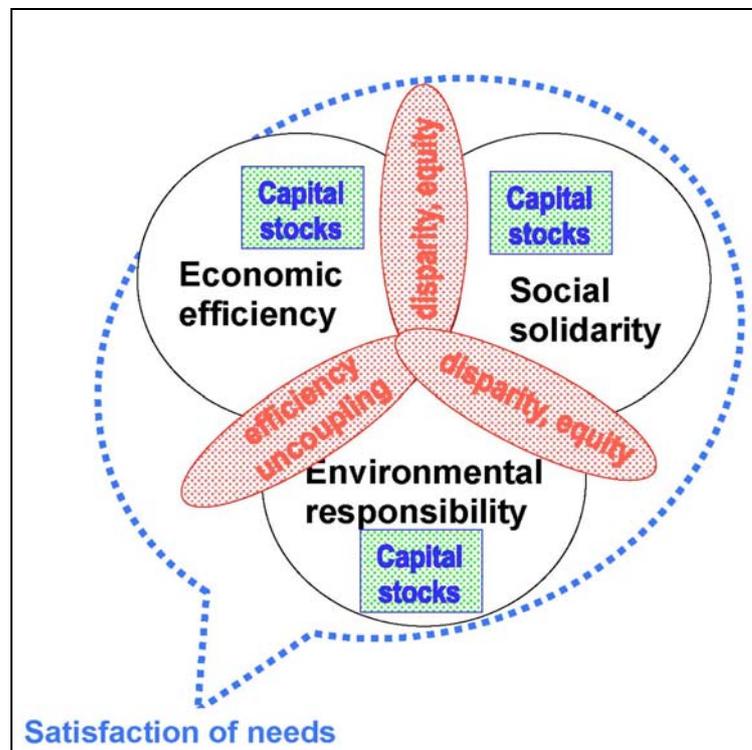
FURTHER DEVELOPMENT

20. Much could be said also with regard to the participative selection process and the resulting set of over 100 indicators, but this would be beyond this paper's scope and can be found elsewhere. Also, as with every framework, there are strengths and flaws in the approach, but this will be subject of discussion. Here we would like to use the remaining pages to put a focus on the usefulness of the conceptual framework for further applications like the development of a set of key indicators.

Key indicators

21. Although the large number of indicators, which was a result of the system's structure, could be seen as a problem there is the advantage that it represents a pool of sub-groups for specific applications. It includes flagship indicators, indicators that can be used for comparisons with other countries, or selections for specific questions. For example, our key indicators could be drawn from the set. In this case, the frame of reference helped to organise the selection of the key indicators: the indicators for capital concern fairness vis-à-vis future generations and the structural criteria fairness within the present generation as well as the efficiency of the use of resources, while level indicators give an overview over the development of the standard of living. For this reason these three types are of special importance in relation to assessing sustainable development and come first, when a reduction on a few indicators is asked for.

Figure: Condensed model for key indicators



22. The resulting set of 17 indicators reflects the issues identified as critical for sustainable development and provides clear and concise information on their progress:

Figure: Sustainable development – a brief guide

Are we headed in the right direction?

1 Meeting needs – how well do we live?	Trend since 1990
Mental wellbeing is improving.	
People are earning more.	
Violence is on the rise.	
The unemployment situation is getting worse.	
2 Fairness – how well are resources distributed?	Trend since 1990
Poverty is spreading.	
Official Development Assistance spending is about the same.	
The wage gap between men and women is gradually narrowing.	
3 Preservation of resources – what are we leaving behind for our children?	Trend since 1990
Teenage reading skills have not changed much.	
Public debt is rising.	
The investment to GDP ratio is about the same.	
More people are working in science and technology.	
Habitat diversity has not changed much.	
Developed land is encroaching upon the landscape.	
4 Decoupling – how efficiently are we using our natural resources?	Trend since 1990
Freight transport is growing faster than the economy.	
The private to public transport ratio has not changed much.	
Per capita consumption of fossil fuels has remained about the same.	
The Domestic Material Consumption to GDP ratio is improving.	

Legend: Sustainable development trends since 1990:
 : Positive (towards greater sustainability)
 : Negative (towards lesser sustainability)
 : Neutral

CONCLUSION

23. To sum up: The endeavours undertaken to develop a firm and stringent conceptual framework for setting up the Swiss indicator system MONET have been crowned with success. Firstly, they resulted in a well-balanced, transparent and comprehensible indicator system and secondly, they proved useful not only for the selection of the first set of indicators, but also for further developments of the system.

24. This particular framework takes into account the primary concerns of sustainable development, which is to combine conservation of resources and fairness in development; and it offers a tool to represent these characteristics in a measurement system.

25. It is in our view absolutely necessary to start out with a framework, which on the one hand communicates underlying assumptions, objectives and definitions and which on the other hand sets rules for the selection of indicators to prevent excessive arbitrariness and horse-trading. Transparency and comprehensiveness provide confidence in a concept, whose success is partly attributable to its wide range of possible interpretations. A precise description of the conceptual framework is thus essential if the set of indicators is to be reliable and widely accepted.

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For all information and documents on MONET see: <http://www.monet.admin.ch>

INFORMATION

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¹ The word "sustainable" with its positive connotations is used in combination with various nouns for many different purposes, which have little to do with sustainability as it was defined originally.

² Wherever possible, we adopted existing postulates, mostly based on sustainable development documents used by the federal administration. According to the relative lack of the social dimension in the sustainability discourse, we consulted in-house experts of living conditions statistics and made use of social reports.

³ The "structural criteria" often use the same measurement variables as are used for the L, C or Δ indicators, but always in relation to the use of resources or broken down by population group or region.