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Sustainability assessment

Conceptual framework and basic methodology

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OVERVIEW

Task

Switzerland has anchored sustainable development in the object article of the new Federal Constitution. It plans to align its policies with the goals of sustainable development. In order to strengthen the influence of sustainable development on the political planning and decision-making process, the Federal Council's 2002 Sustainable Development Strategy (Federal Council 2002) mandates the Federal Office for Spatial Planning (ARE) to look into the feasibility of sustainability assessment – this is Measure 22 of the Strategy.

Status of the present report

This report is the product of a broad-based internal drafting process within the federal administration (see details of the accompanying working group under "Publication details"). It is a federal administration-level working paper. In passing its resolution on the interim report on the status of follow-up work to the Sustainable Development Strategy 2002 (IDARio 2004), the Federal Council acknowledged the status of work on sustainability assessment and charged the administration with testing the methodology in practice and addressing unresolved issues (see Part III Outlook).

The present conceptual framework provides information on how sustainability assessment might be carried out at federal level. It concentrates primarily on methodological issues. Aspects of the process itself and any legal and institutional foundation are to be determined at a later date after the test phase has been completed.

What is sustainability assessment?

Sustainability assessment is an evaluation and optimization instrument that is aimed at strengthening the integration of sustainable development in political planning and decision-making processes across all areas. It assesses the social, economic and environmental impacts of political projects and undertakings on the part of the Confederation, reveals conflicting goals and promotes optimization at the earliest possible stage.

Sustainability assessment generally assesses projects prior to their realization in the sense of an *ex ante* evaluation. The earlier sustainability assessment is included in the political planning process, the greater the policy design freedom and optimization scope, and the more effective the use of sustainability assessment.

Sustainability assessment focuses on the strategic, planning and programmatic levels and can be applied to the evaluation of projects and undertakings from the broadest range of

policy sectors. For example, a sustainability assessment might look at sectoral transport plans, new regional policy, the new fiscal regime, the 2004 relief programme or the revision of telecommunications legislation and the federal law on radio and television. Sustainability assessment should be integrated as far as is possible into the regular political planning process and build on domain-specific analyses and evaluations that already exist or are planned as part of that process – e.g. in connection with the drafting of a Federal Council Opinion. A sustainability assessment is lead-managed by the agency responsible for the domain in question. Sustainability assessment is not intended to be another form of analysis alongside existing evaluation instruments. Rather, it offers a specific assessment of impacts from the sustainable development perspective. In practice, then, a strategic environmental analysis or regulatory impact analysis could form an integral part of a sustainability assessment by offering a sector-specific evaluation from the environmental or economic viewpoint.

How is the sustainability of projects assessed?

Sustainable development is a normative concept which sets clear target trends. It is almost impossible, however, to evaluate political projects in a precise and mechanistic manner. Sustainability assessment offers a qualitative evaluation process that presents the impacts of a project transparently in three dimensions, illuminates them from the perspective of key sustainable development factors, highlights conflicts and trade-offs and facilitates the search for better solutions.

At the normative level, the conceptual sustainability assessment framework follows the principles laid down by the Federal Council in its Sustainable Development Strategy 2002. It is based on the capital stock model and on "weak sustainability plus". The capital stock model fleshes out the general principle of sustainability with an expanded definition of capital, i.e. that it may not be exhausted but must be renewed and increased. This means that trade-offs are permitted between the three dimensions, provided basic minimum social, economic and environmental requirements are upheld (e.g. human rights, pollutant levels).

A project should be subject to sustainability assessment and optimization if there are serious conflicts between at least two sustainability dimensions. A sustainability assessment or optimization process is especially desirable if the project displays the following characteristics:

› The problem is already critical in one area of impact, or there is a worsening trend.
› The burdens (negative effects) will be borne primarily by subsequent generations, and these negative impacts are irreversible or reversible only with difficulty.

› The project is associated with risks that are difficult to assess and any evaluation is fraught with uncertainty.
› Minimum requirements, i.e. non-negotiable limits or threshold values, are contravened.
› The spatial impact of the project is considerable.
› The scope for optimizing the project is broad.

Sustainability assessment evaluates the impacts of a project according to a standard set of predefined criteria. This set of criteria is based on the 15 criteria laid down by the Federal Council in its Sustainable Development Strategy.

The sustainability assessment process is broken down into three parts: relevance analysis, impact analysis and assessment and optimization. Relevance analysis establishes the relevance of a project in terms of sustainability and whether or not it should undergo a sustainability assessment. Impact analysis is used to determine the impacts of the project on sustainability criteria. In the assessment and optimization phase, the results of the impact analysis are evaluated from a number of different perspectives, conflicts are revealed and trade-offs weighed up. The focus of this work is on optimizing the project by formulating and comparing different variants.

The greater the negative effects and conflicts and the more that specific assessment aspects are affected, the more vitally important it is to optimize a project, paying particular attention to areas in which minimum requirements are contravened.

PART I INTRODUCTION

BACKGROUND

The Federal Council adopted its Sustainable Development Strategy[1] on 27 March 2002. Its aim is to align Confederation policy more closely with sustainable development using 22 Measures. In the last Measure 22, the strategy makes provision for an investigation of the feasibility of sustainability assessment. Sustainability assessment is intended to evaluate the projects and undertakings of the federal government from the sustainable development perspective, to highlight shortcomings and to optimize the projects in question. Sustainable development as a political goal is thus to become an integral part of the policies, strategies, programmes, concepts and plans of the Confederation, and a factor that is taken into account in a systematic way in the formulation of sectoral policies. In Measure 22, the Federal Council entrusts the Federal Office for Spatial Development with conducting a feasibility study on sustainability assessment and developing a suitable methodological toolkit. The ARE is to examine the following questions individually: What activities could be subject to a sustainability assessment and what level of impact should such an assessment address?

› At what stage of a project would such an assessment have to be initiated?
› Should new instruments be developed, or can existing assessment tools be expanded by incorporating additional criteria?
› How is a specific sustainability assessment to be differentiated from existing or planned assessment instruments?
› Are the results of a sustainability assessment binding, and who has decision-making authority?
› Into what processes can sustainability assessment be embedded?

An interdepartmental working group, led by the ARE, is supporting the implementation of Measure 22. The ARE submitted an initial proposal for a sustainability assessment procedure in an interim report in August 2003. The report affirms the basic feasibility of sustainability assessment.

At the end of 2003, the Interdepartmental Rio Committee (IDARio) informed the Federal Council of the state of implementation of the Sustainable Development Strategy in an interim report (IDARio 2004), generally presenting a positive appraisal of sustainability

1 The Federal Council's Sustainable Development Strategy 2002, as well as background information on sustainable development in general and the commitment of the Confederation can be found at www.are.admin.ch.

assessment as a tool. The Federal Council took cognizance of this interim report and commissioned the federal administration to test sustainability assessment in practice.

The present report incorporates the results of the ARE interim report of August 2003 and further develops the methodology of sustainability assessment. The ultimate objective is a general conceptual framework for sustainability assessments at federal level. The present report provides a foundation for how sustainability assessments could be carried out within the federal administration. The report concentrates on the methodological questions surrounding sustainability analysis. It offers a general outline of how sustainability assessment might be carried out in methodological terms at the federal level, and puts the process in the context of other evaluation processes that already exist or are under discussion, such as regulatory impact analysis or strategic environmental analysis. Rather than competing with these methods, sustainability assessment offers a complementary approach. More work will have to be done on how sustainability analysis can combine these instruments' findings on sector-specific impacts into an overall picture, compare and contrast them and facilitate proper consideration and optimization.

According to the Federal Council resolution of 19 December 2003, sustainability assessment is to be put to the test in a subsequent practical phase using specific case studies, in order to refine sustainability assessment as an instrument and to look further into procedural and institutional issues, including how sustainability assessment interacts with other evaluation processes. This conceptual framework provides the methodological foundation for this work.

Part I of the conceptual framework provides an introduction to the methodology itself. It sets out the normative definition of sustainable development, which provides the benchmark of assessing the sustainability of projects. It also specifies the aims, principles and subjects of sustainability assessment.

Part II contains a step-by-step guide to conducting a sustainability assessment.

Part III looks ahead to the work that needs to be done to refine the conceptual framework.

A separate Annex, which is available only on the Internet (www.are.ch) and in German (referred to below as the Sustainability Assessment Annex) illustrates the individual stages of the process using three working examples:

› the EU Structural Funds (EU regional policy)

› the health insurance law (*Krankenversicherungsgesetz, KVG*) and

› EnergieSchweiz's voluntary measures.

The examples are presented solely for the purposes of illustrating this approach and are based largely on existing impact analyses.

UNDERSTANDING OF SUSTAINABLE DEVELOPMENT

The normative framework of the present report consists of the target dimensions and guidelines formulated in the Federal Council's 2002 Sustainable Development Strategy (Federal Council 2002). Five criteria are set forth for each of the three target dimensions.

*As regards the target dimension of **environmental responsibility**, development is sustainable if habitats for humans, animals and plants are preserved and consideration is given to future generations in the use of natural resources. This means that:*

- *Areas of natural importance and biodiversity are to be preserved;*
- *The consumption of renewable resources (e.g. raw materials that can be recultivated, water) is to be kept below the rate of regeneration or natural replenishment;*
- *The consumption of non-renewable resources (e.g. fossil fuels, raw materials) is to be kept below the rate of potential increase in renewable resources;*
- *Any impact of emissions and toxic substances on the natural environment (water, soil, air, climate) and human health is to be reduced to a safe level;*
- *The impact of environmental disasters is to be reduced and environmental risks are only to be accepted to the extent that, even in a worst-case scenario, no permanent damage outlasting one generation would be caused.*

*As regards the target dimension of **economic efficiency**, development is sustainable if prosperity and the capacity for economic development are preserved. This means that:*

- *Levels of income and employment are to be maintained and increased as required, with due consideration being given to socially and geographically acceptable distribution;*
- *It should be possible for productive capital, based on social and human capital, to be at least maintained and to show qualitative improvement;*
- *Economic competitiveness and the capacity for innovation are to be improved;*
- *Market mechanisms (pricing) should be the primary economic determinants, with due consideration being given to scarcity factors and external costs;*
- *The public sector is not to be managed at the expense of future generations (e.g. debt, failure to preserve assets).*

*As regards the target dimension of **social solidarity**, development is sustainable if it promotes solidarity and well-being in human life and development. This means that:*

- *Human health and safety are to be comprehensively protected and promoted;*
- *Education is to be provided, ensuring individual development and identity;*
- *Culture is to be promoted, together with the preservation and development of the social values and resources that constitute social capital;*
- *Equal rights and legal security are to be guaranteed for all, with particular attention to equal rights for women and men, equal rights and protection for minorities, and respect for human rights;*
- *Solidarity is to be promoted within and between generations and also at the global level.*

The Federal Council's Sustainable Development Strategy and the fifteen criteria, referred to below as the **Federal Council criteria** for clarity of definition, form the basis for the normative understanding underlying the sustainability assessment methodology outlined here. To ensure that sustainability assessments do not become arbitrary, they must by definition be based on the same normative understanding and on a consistent basic set of governing sustainability criteria, regardless of the type of project to be assessed and the policy areas under scrutiny. Nevertheless, it is conceivable and in many cases expedient for the common set of sustainability criteria to be further differentiated and specified in domain and sector-specific terms according to the project in question.

Depending on the stage and level of detail of a sustainability assessment, it is appropriate to use a smaller or larger set of criteria. For example, a greater number of criteria is more suitable for an in-depth impact analysis. Thus, in addition to the set of 15 Federal Council criteria a slightly modified set of 27 criteria from IDARio (**IDARio criteria**[2]**)** are also used. Figure 1 illustrates the distinctions between the terms "dimensions", "criteria" and "indicators" and where these two definitive sets of criteria fit into the sustainability assessment framework. The two criteria sets are mutually consistent.

2 See IDARio 2001.

DIMENSIONS, CRITERIA AND INDICATORS OF SUSTAINABLE DEVELOPMENT

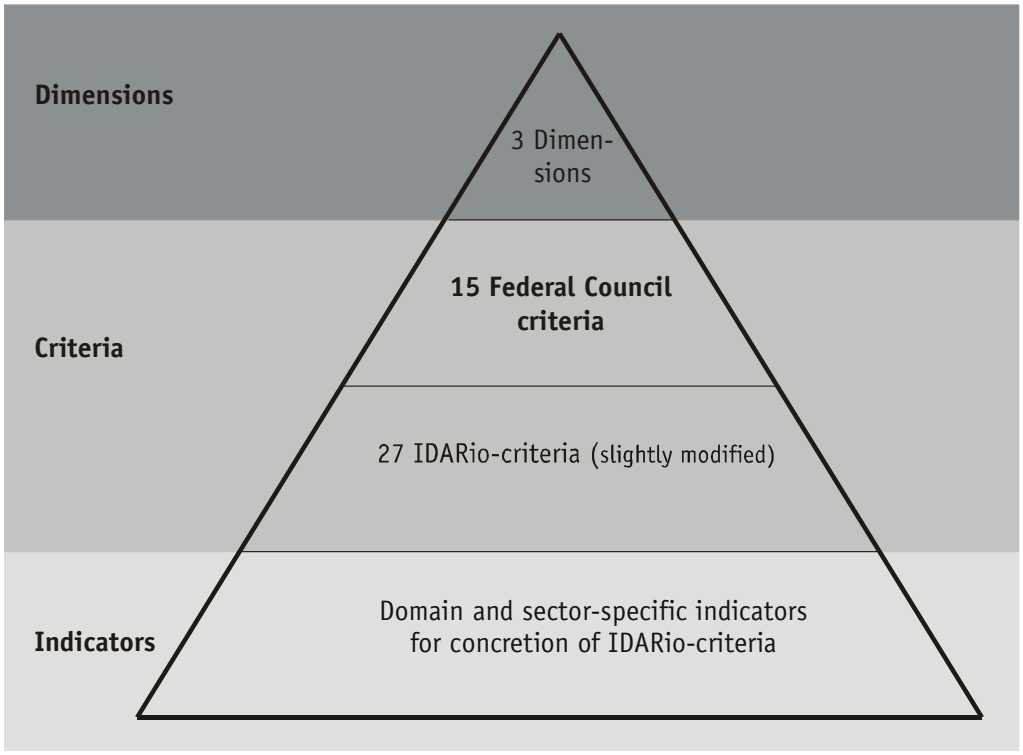

Figure 1

At the centre of the illustration are the **15 Federal Council criteria.** For reasons of practicality and representation, the individual procedural stages will be reduced to the three sustainability dimensions (see Section 4.3).

However, the 15 Federal Council criteria can also be further broken down into the 27 (slightly modified) IDARio criteria (see Table 1). These criteria are applied at various procedural stages (Sections 3.2 and 4.1). For reasons of practicability, minor changes have been made to the original IDARio criteria matrix, consisting of 28 criteria. A description of the criteria and explanation of the modifications can be found in the separate Sustainability Assessment Annex.

IDARIO CRITERIA MATRIX		
Environment	**Economy**	**Society**
› **Env1** Biodiversity	› **Eco1** Per-capita GDP	› **Soc1** Education, learning ability
› **Env2** Climate	› **Eco2** Efficient infrastructure and services	› **Soc2** Health, welfare, security
› **Env3** Emissions	› **Eco3** Value-adding investment rate	› **Soc3** Liberty, independence, individuality
› **Env4** Landscape / cultural & natural heritage	› **Eco4** Long-term sustainable national debt	› **Soc4** Identity, culture
› **Env5** Water	› **Eco5** Resource efficiency	› **Soc5** Values
› **Env6** Materials, organisms, waste	› **Eco6** Competitiveness	› **Soc6** Solidarity, community,
› **Env7** Energy	› **Eco7** Workforce potential	› **Soc7** Openness, tolerance
› **Env8** Soil, area, fertility	› **Eco8** Innovation, high-performance research	› **Soc8** Social security, poverty rate
› **Env9** Environmental risks	› **Eco9** Regulatory framework	› **Soc9** Equal opportunities, equality, participation

Table 2 IDARio criteria, slightly modified. Source: IDARio 2001:73. For explanations of the IDARio criteria, see separate Sustainability Assessment Annex.

Figure 2 shows how the various criteria sets are applied in sustainability assessment.

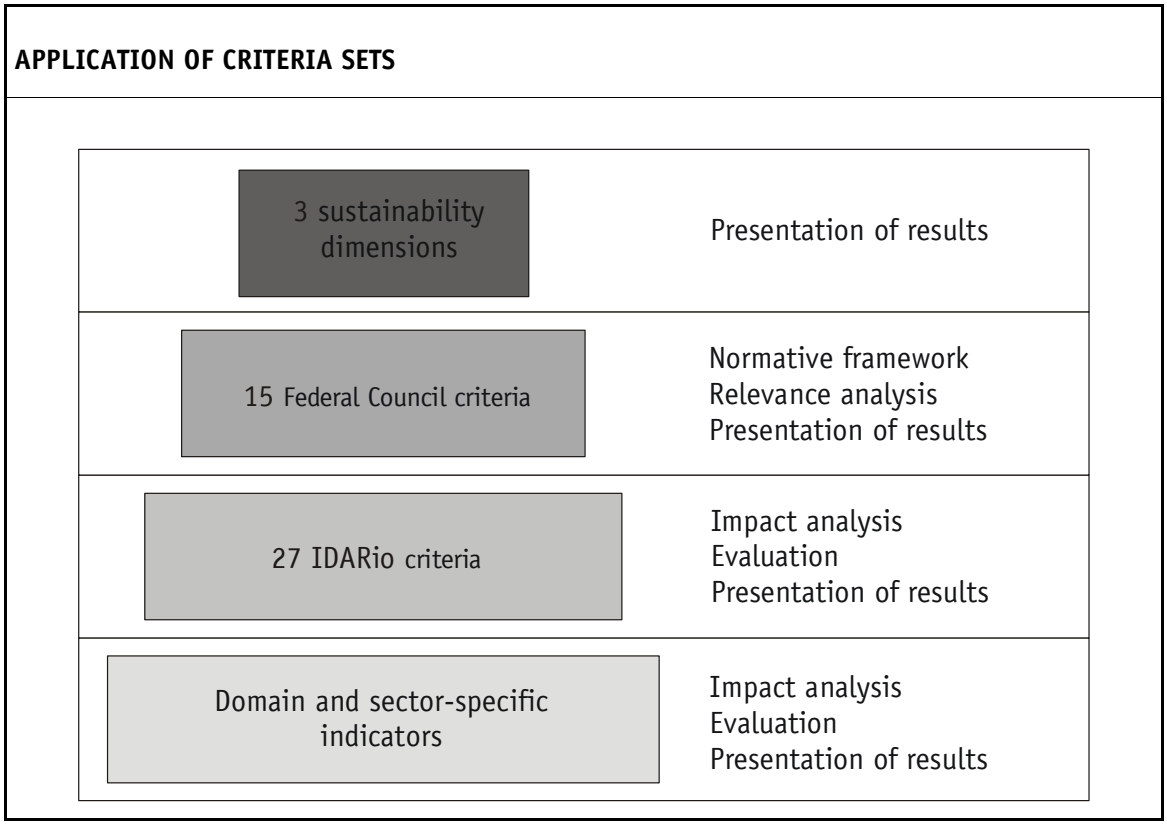

Figure 2

Substitution between target dimensions?

In its strategy, the Federal Council advocates a position halfway between those that the scientific community refers to as "weak" and "strong" sustainability. Strong sustainability demands that the status quo ("capital") of each of the three dimensions of sustainability must be at least maintained, whereas under the weak sustainability principle reductions in one dimension are allowed, provided that they are offset by growth in the other dimensions. According to the Federal Council, offsets between target dimensions are permissible only where they do not *systematically* occur to the detriment of a given key factor and provided that they take biosphere capacity into account (Federal Council 2002). Consequently, "minimum requirements" may be formulated at the level of individual sustainability criteria (see Section 4.1), below which the given factor may not fall.

PURPOSE AND PRINCIPLES OF SUSTAINABILITY ASSESSMENT

Purpose

The purpose of sustainability assessment is to evaluate and optimize federal projects[3] in relation to the goals of sustainable development. The assessment should make it possible to identify imbalances and deficiencies between the dimensions of environment, society and economy, to highlight opportunities for optimization, and to attain a long-term equilibrium between the three dimensions.

Sustainability assessment focuses on strategic, programmatic and conceptual projects instigated by the Confederation. These include legislative objectives and draft legislation (the strategic level), concepts, programmes and plans. This sustainability assessment model does not address assessments at the project level or at the cantonal and municipal levels, although elements of the model may also be applied to assessments of this nature.

The conceptual framework is intended to form a common instrumental basis for addressing the various expectations and requirements arising from the different subjects to be assessed, such as draft legislation, programmes, strategies, concepts and plans.

Sustainability assessment is intended to provide support for the political process to ensure that all three dimensions of sustainability are taken into account. The focus is less on the question of whether or not a given project is sustainable than on designing projects in the most sustainable manner.

Principles of sustainability assessment

The present sustainability assessment model is based on the following principles:

- Sustainability assessment is based on a systematic and comprehensible approach and a coherent system of objectives.
- Sustainability assessment is, by nature, a process (iterative procedure, involvement of parties affected).
- Sustainability assessment is carried out in three stages:
  - A relevance analysis establishes whether a full sustainability assessment (broad or detailed analysis) is worthwhile in a particular instance.
  - A broad or detailed analysis examines the impact of the project on the three dimensions of sustainability.

3 The term "projects" below is understood to comprise all strategic, programmatic and conceptual undertakings and projects.

  - › Finally, the impacts are assessed in terms of sustainable development and the project is optimized.
- › The methodology is not based on mechanistic approaches. Each and every stage of the work incorporates qualitative aspects, based ideally on consultative and discursive processes.
- › Sustainability assessment is intended to provide a methodological framework which can be applied to projects falling under all sectoral policies. The target dimensions and the associated sustainable development criteria are applicable to projects in all domains. The indicators used and the detailed methodological steps of the impact analysis, on the other hand, may differ from one domain or policy area to another.
- › Sustainability assessment is not a new assessment process to be conducted alongside or to replace other existing or planned assessment and testing processes. Instead, it should be applicable in combination with other instruments (such as the strategic environmental analysis or health impact analysis) as part of an established process – and it should be able to build on their results.
- › The earlier sustainability assessment is integrated into the project management process so that sustainability is actively addressed, the more effectively potential sustainability optimization opportunities can be exploited, starting in the development stage.
- › Sustainability assessment seeks optimization, i.e. it helps develop alternatives or ancillary measures early in the process.
- › Transparency is regarded as a fundamental element of each stage or step of sustainability assessment. Each assessment and evaluation is given a logical foundation, the goals and purposes of a project are declared and the interests of the parties involved are clear. Comprehensiveness and comprehensibility are guaranteed.

PROCESS

The procedural stages of sustainability assessment are depicted in Figure 3. The full procedure consists of three phases:

- › Relevance analysis,
- › Impact analysis and
- › Assessment/optimization.

The model is described more concretely in Section 1, where each stage is explained and described. The results generated by each of the three process stages are summarized in a box at the end of each sub-section.

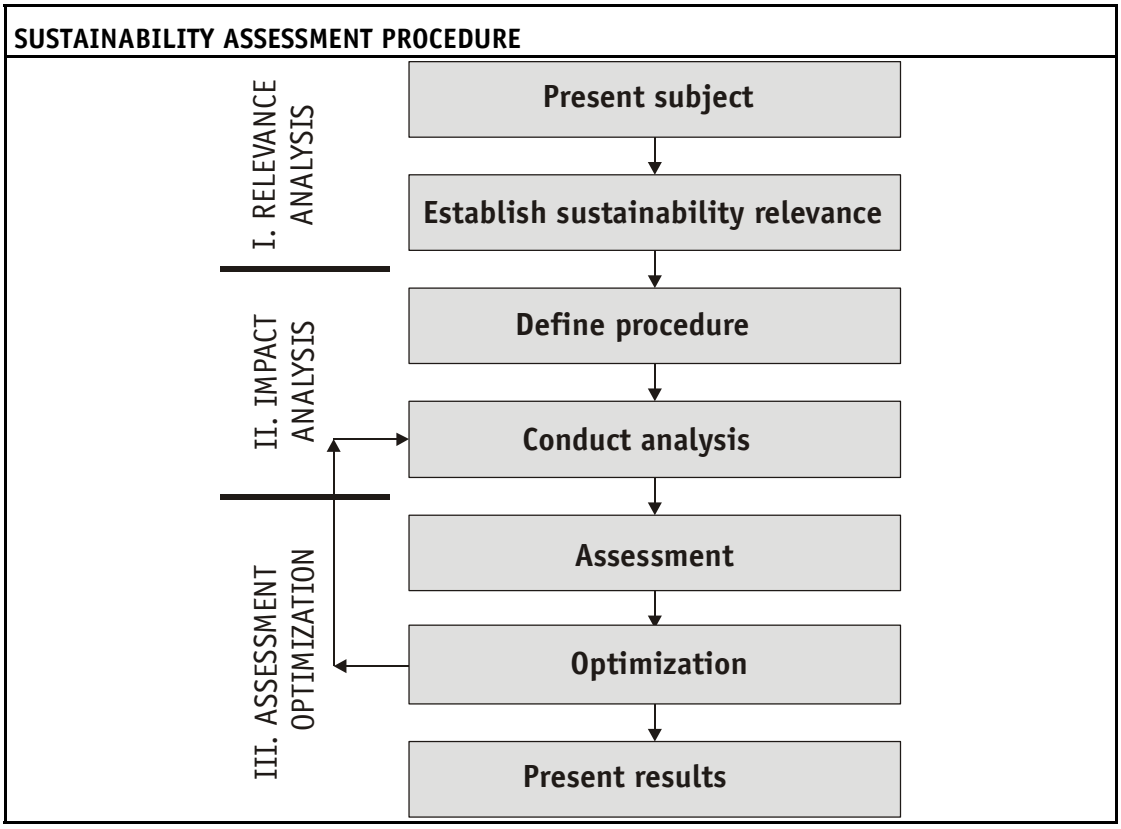

Figure 3 Overview of the sustainability assessment procedure.

PROCEDURE

Each examination of a project is carried out according to a specific procedure. Important procedural issues must therefore be kept in mind at each moment of the sustainability assessment. In particular, accountability for each step, involvement of additional participants within and outside the federal administration and the timing of the sustainability assessment within procedures and administrative processes must be established.

Figure 4 gives an overview of the participants in the overall sustainability assessment process and their responsibilities.

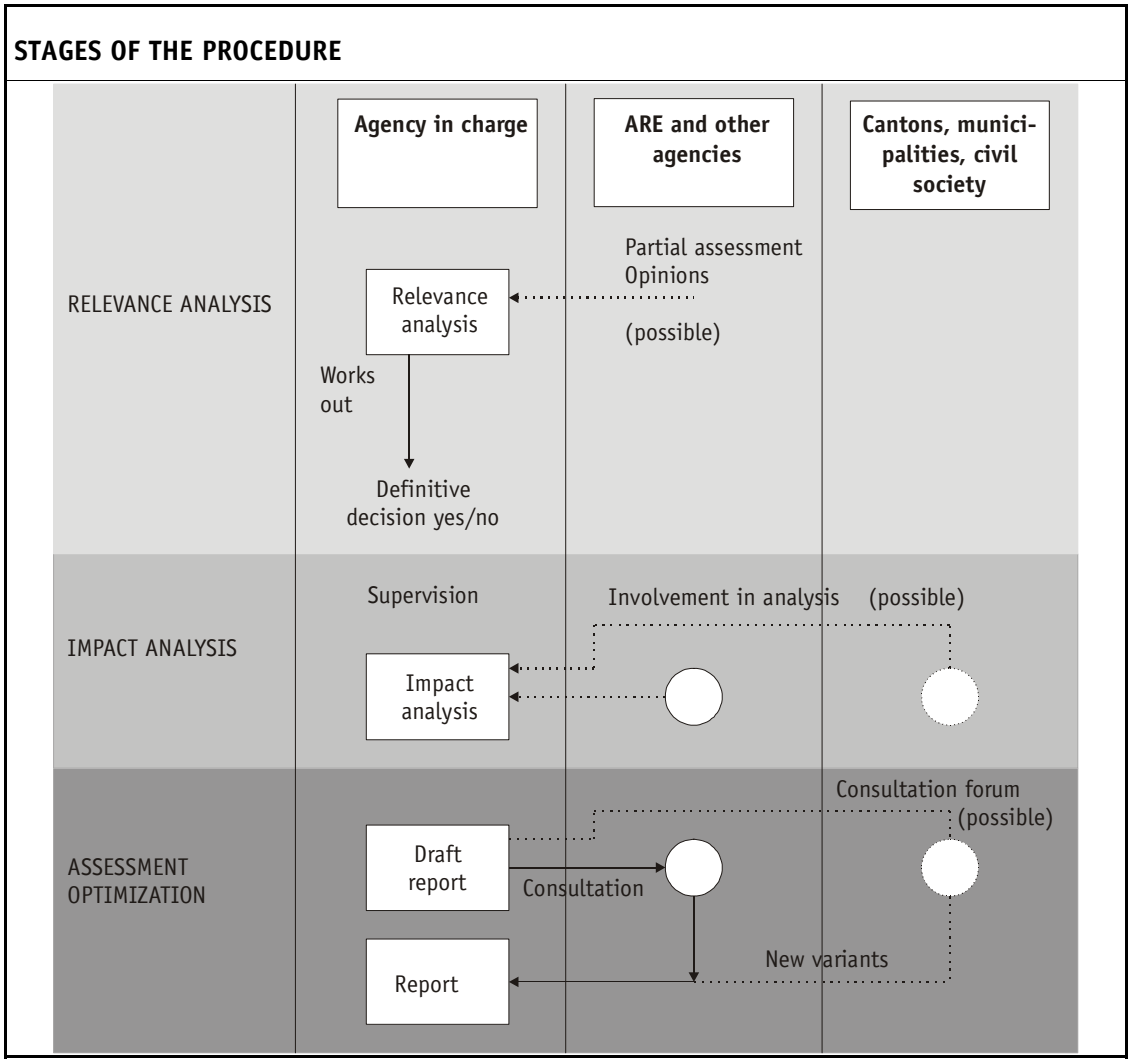

Figure 4 Depiction of process issues, broken down into the procedural stages of relevance analysis, impact analysis and assessment/optimization.

The federal agency in charge is responsible for carrying out the sustainability assessment. This allows use of domain-specific expertise and helps keep administrative costs in check. The federal agency arranges for the appropriate level of involvement of affected stakeholders (especially within the federal administration) and for proper project organization and sets the schedule for the analysis. The ARE may take part in sustainability assessments in an advisory capacity as centre of expertise for sustainable development, ensuring consistent application of the toolkit throughout the federal administration.

The agency in charge may seek partial assessments or opinions from other offices for the **relevance analysis**. The decision whether or not to proceed with the analysis is taken by the agency in charge.

The agency responsible for the particular domain likewise supervises the **impact analysis**. Again, the involvement of other federal agencies and, where appropriate, also of representatives of the cantons, the municipalities, or of non-governmental bodies is conceivable here.

Consultative and participatory processes are of importance in the **assessment**. The assessment may be undertaken by the agency in charge in consultation with other federal offices, or it may be carried out from the very beginning on a broader stage, for example in forums of different participants or expert groups. Cantons, municipalities and non-governmental stakeholders may take part in assessments.

Assessment of sustainable development is an area where **participation** is of key importance. Projects where sustainability is at issue generally affect federal offices and stakeholders having different interests. Moreover, participation by affected stakeholders constitutes a central, integral element of the very concept of sustainable development. For optimum participation, the supervising agency may undertake the following steps:

› Identify the relevant offices and affected stakeholders
› Define the community of participants and the framework and scope of participation as appropriate to the individual project phases
› Establish and give appropriate notice of schedules for participation
› Invite the affected agencies and experts to take part as early as possible.

Scheduling of sustainability assessment within processes and administrative procedures

A project's stage of completion influences the form of sustainability assessment. Generally, sustainability assessments can be carried out at different stages of policy development. The following stages may be distinguished (for more detail see the Sustainability Assessment Interim Report of August 2003 [ARE 2003]):

› Policy origination
› Policy formulation
› Policy decision-making
› Policy implementation
› Policy impact.

Sustainability assessment is intended primarily for *ex-ante* evaluation. A sustainability assessment is particularly useful if different options are under consideration and the project is to be optimized with reference to sustainable development. Consequently, we recommend carrying out a sustainability assessment as early as possible in the policy formulation stage,

when the greatest flexibility remains for optimization and development of variants, alternatives and ancillary measures.

THE RELATIONSHIP OF SUSTAINABILITY ASSESSMENT TO OTHER EVALUATION INSTRUMENTS

A variety of different evaluation instruments are already in use – or are themselves at the evaluation stage – at diverse political levels in Switzerland and abroad. These individual assessment processes and instruments are deployed in different contexts, as illustrated in Figure 5.

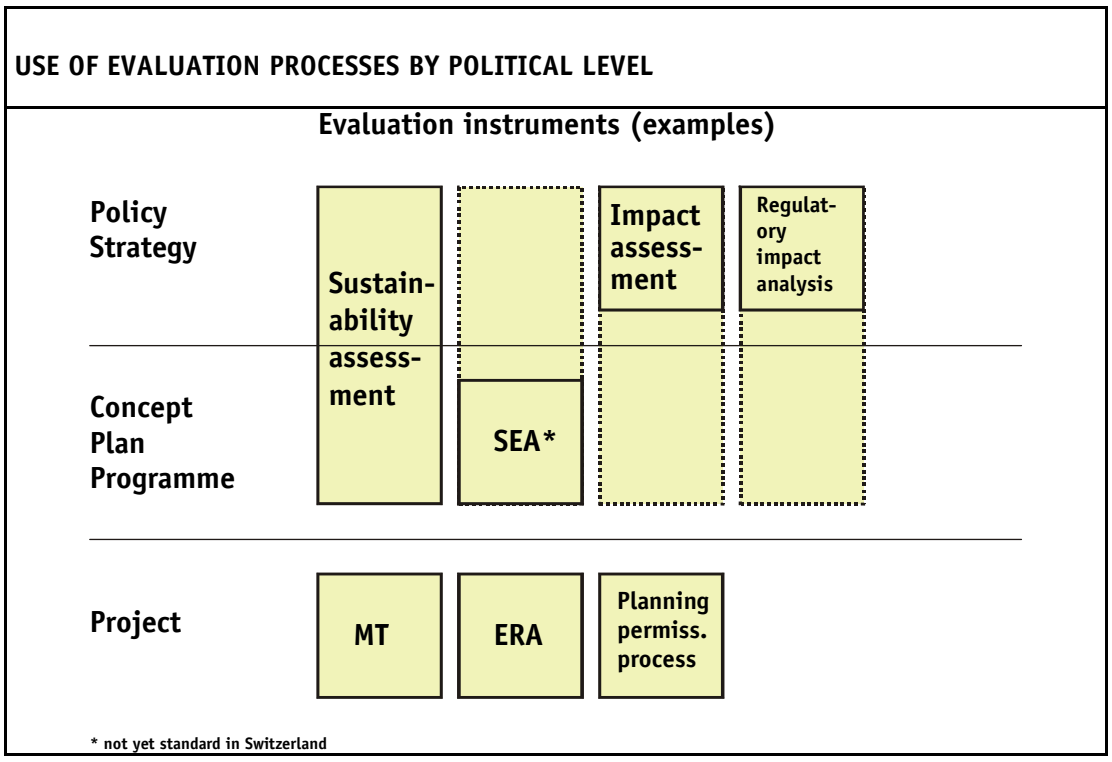

Figure 5 Potential areas of use of the various evaluation processes. SEA: Strategic Environmental Analysis, ERA: Environmental Risk Assessment, MT: Motive Test.

While some evaluation processes are used only at policy or project level, for example, sustainability analysis and strategic environmental analysis are applicable at several levels.

The relationship between sustainability assessment and other evaluation instruments at the policy-strategy and concept-programme levels requires further investigation. The integration of several evaluation instruments is fundamentally both conceivable and desirable (see Section 3.1 and Part III Outlook). There is no question, however, that sustainability

assessment might in any way be able to replace evaluation processes at project level. These processes address a lower level and fulfill other purposes.

SUSTAINABILITY ASSESSMENT AT CANTONAL LEVEL AND ABROAD

A number of **cantons** have made similar efforts to develop instruments and to assess the sustainability of political undertakings. The canton of Bern, for example, has published a test version of guidelines on sustainability assessment for the canton (Directorate of Construction, Transport and Energy of the Canton of Bern, 2004). The cantons of Aargau and Basel-Landschaft are pursuing similar directions: the canton of Aargau is aiming to incorporate sustainable development into its strategic planning and align projects and undertakings with sustainable development at an early stage by means of a "sustainability factors checklist" (www.naturama.ch/projekte/nachhaltigkeit) (German). In the canton of Basel-Landschaft all laws, programmes, concepts and projects are to consider sustainable development aspects (Canton of Basel-Landschaft 2003).

Methods to assess the impact of policies or interventions are also under development at the European level. Although assessment tools at the project level are widespread (e.g. economic viability or environmental impact assessments), assessment methods at the strategic level (programmes, strategies) are less fully developed. The European Commission has progressed farthest in developing sustainability assessment methods (Sustainability Impact Assessment, SIA) (Kirkpatrick/Lee/Morrissey 1999). A preliminary SIA method was developed in 1999 with the goal of application to all major new negotiations on trade issues in which the EU is involved. A set of criteria – with nine overarching factors – has been developed for this purpose[4]. The method is under continual development and has been applied in several cases, notably the WTO negotiations and EU-Chile, EU-Mercosur and EU-Africa/Caribbean negotiations (www.europa.eu.intcomm/trade/issues/global/sia/studies.htm). The EU has not yet considered extending the method to fields other than trade issues.

Efforts toward the methodological development of sustainability assessment are also under way at the individual country level, for example in Austria (Arbter 2003) and the Netherlands (Verheem 2002). The central issue for sustainability assessment in the Netherlands is whether plans or projects will have undesired consequences in the future, in other regions or on other aspects of sustainability, and how this transference can be prevented.

4 Three criteria are listed for each sustainability dimension. Environment: environmental quality, biodiversity and other natural resources. Economy: average real income, net capital investment, employment. Society: equality and poverty, health and education, and gender inequality (Kirkpatrick/Lee 1998:8).

II SUSTAINABILITY ASSESSMENT GUIDELINES

1. PROCEDURE

Figure 6 illustrates the procedural steps of a sustainability assessment:

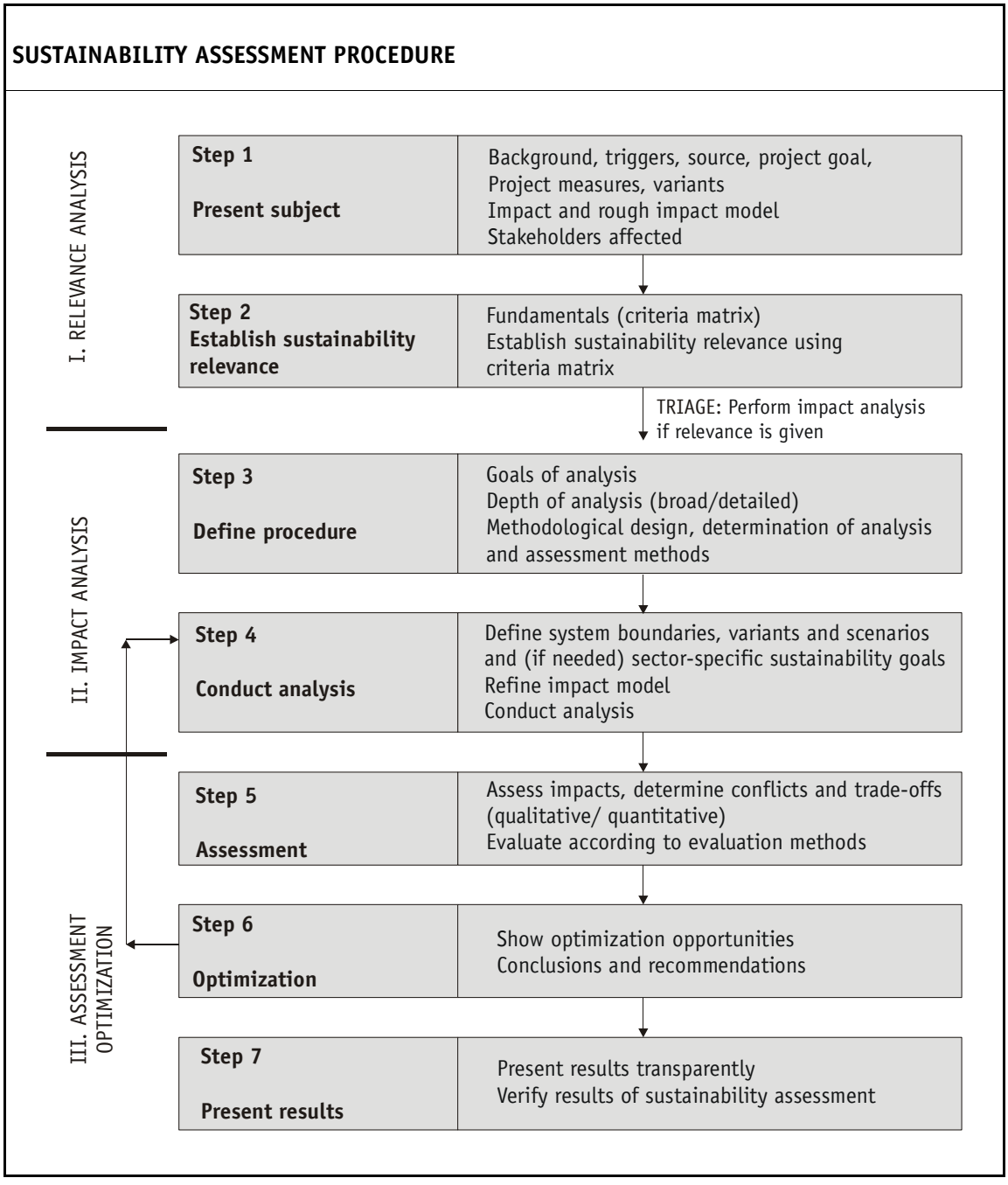

Figure 6 Sustainability assessment procedure.

The idea of the proposed approach consists of the step-by-step specification and assessment of each component of the project under scrutiny. From the first step (presenting the subject), important components of the relevance analysis (step 2) and of the actual impact analysis (step 4) are sketched out. It should be possible to draw on the results of preceding steps at any point in the assessment.

A further characteristic of the proposed concept is the great significance of optimization opportunities, alternatives and variants. If possible, these should be incorporated into the assessment from the very beginning. If no alternatives are available at first, they should be developed as early as possible in the process and subsequently fleshed out. Optimization opportunities may also arise only as a result of the assessment. In this case, it would be advisable to carry out a new analysis and assessment, taking account of such alternatives.

The individual procedural stages will be specified in greater detail below, with notes on practical implementation.

2. RELEVANCE ANALYSIS

The main purpose of the relevance analysis is to determine to what extent a project is relevant to the goals of sustainable development. Based on the results of this step, a determination is made whether or not to assess the project further. The analysis thus provides an initial triage to eliminate projects which are irrelevant or only slightly relevant from a sustainability perspective. The analysis centres on identifying serious potential conflicts between the sustainability dimensions, for example between the environment and the economy. Thus the focus is placed on those aspects which are most important from the sustainable development perspective. Relevance should be determined primarily on the basis of qualitative and, if possible, quantitative aspects. The analysis is undertaken at a high level and on the basis of readily accessible information or expertise (cf. Kirkpatrick/Lee 1999:12). It should be possible to complete it within a reasonable time (roughly one day).
The relevance analysis may be broken down into the following procedural steps:

1. Presenting the subject
2. Establishing sustainability relevance.

The individual procedural steps are examined in detail below.

2.1. PRESENTING THE SUBJECT

A) BACKGROUND, GOAL, MEASURES AND IMPACTS

The goal of describing the subject is to arrive at a clear schematic and to model goals, measures, stakeholders and impacts and the relationships among them. Based on this schematic, simple causality chains can be modelled. All important available information on the project should be included:

Background and goal of the project

Questions to answer:

› What main and subordinate objectives does the project pursue?
› What overall impacts are targeted?
› How is the project embedded in policies and/or what points of contact exist?

List of individual project measures

A project generally consists of an entire bundle of measures, each one in pursuit of various (sub)goals. Accordingly, it is useful to list each measure separately. The health insurance law case study (see separate Sustainability Assessment Annex) includes the following measures: compulsory insurance, full portability, uniform premium, risk balancing, premium discounting and hospital financing.

Questions to answer:

› Can the project be broken down into different individual measures or groups of measures?
› How can the individual measures be briefly characterized?
› Which measures are intended to achieve which of the declared goals (clear causal relationship)?

Stakeholders affected

Here the concern is to identify the stakeholders affected by a project. In the health insurance law case study these are the cantons, the insurers, the insured individuals and the care providers.

The following questions must be answered:

› What stakeholders does the project address (target group)?
› What changes in the target group's behaviour are desired?
› What stakeholders are not directly addressed but are nevertheless affected by the project?
› How can stakeholder groups be differentiated (e.g. within/outside the impact perimeter of the undertaking, by social status, sex, etc.)?

Unintended side-effects

Questions to answer:

› Might the project have any unintended side-effects?

An initial estimate of these unintended consequences is very important, since it provides a first point of orientation for any conflicting goals between the three dimensions of sustainability.

B) CHAINS OF CAUSALITY

Optionally, we may derive simple cause-and-effect chains based on the components specified above. These chains show the relationships between individual measures, the intended changes in target group behaviour and the desired goals. Examples of a simple causal chain are shown in Figure 7 and for the EU Structural Funds in the case study in the separate Sustainability Assessment Annex.

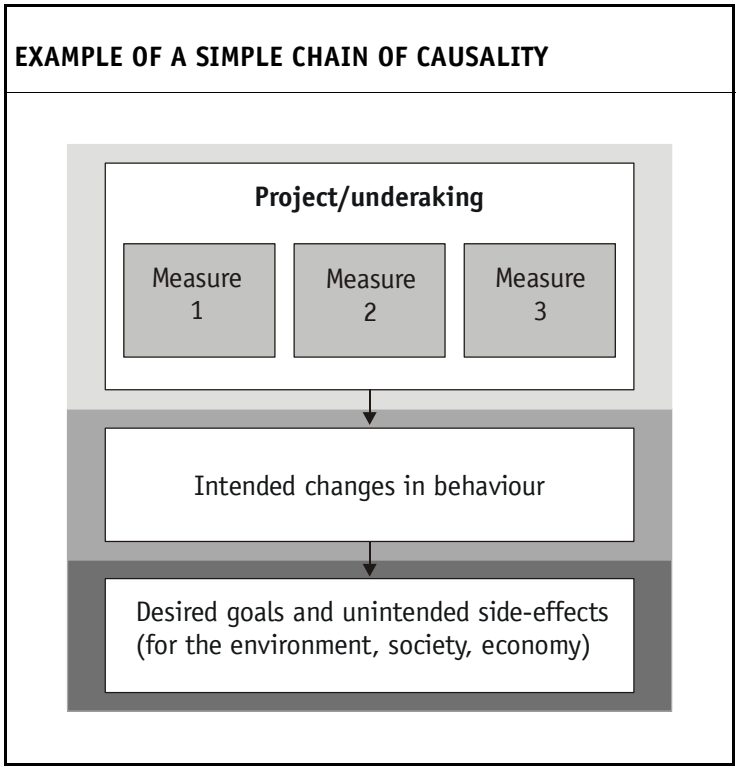

Figure 7

The results of this step serve as the foundation for the actual determination of sustainability relevance, which is described in the following section.

2.2. ESTABLISHING RELEVANCE

Establishing relevance may be broken down into the following steps:

A) Determining the causal relationship between a project and overarching sustainability criteria,

B) Qualitative assessment of relevance to sustainability.

A) ESTABLISHING THE CAUSAL RELATIONSHIP BETWEEN A PROJECT AND OVERARCHING SUSTAINABILITY CRITERIA

This step involves estimating potential impacts on high-level sustainability criteria. This determination of causal relationships should be made on the basis of the 15 Federal Council Criteria (see Part I Understanding of Sustainable Development). The method calls for a uniform criteria matrix to be used regardless of the domain. Adaptation to the particular domain should take place not at the level of the criteria, but at that of the individual indicators (see Section 3.2).

Depending on relevance, we assign a score of 0 to 3 points (no relevance: –, low relevance: 1 point, medium relevance: 2 points, high relevance: 3 points, no estimate possible: ?). Table 2 shows a sample relevance evaluation (without comments) for the EU Structural Funds.

ESTABLISHING RELEVANCE USING THE FEDERAL COUNCIL CRITERIA – EXAMPLE OF THE EU STRUCTURAL FUND					
Environment		**Economy**		**Society**	
Areas of natural importance, biodiversity	••	Income, employment	••	Health, security	••
Renewable resources	••	Productive capital	••	Education, identity	••
Non-renewable resources	••	Competition, innovation	•••	Culture, values	•
Water, soil, air, climate	••	Market mechanisms	•	Legal security, equality	••
Environmental disasters, risks	•	Public-sector enterprises	•	Solidarity	•••

Table 2 Establishing relevance using the 15 Federal Council criteria. See also Sustainability Assessment Annex 1.

The first priority is to show potential causal relationships. Whether the impact is positive or negative is not addressed at this stage. This has the advantage with respect to optimization of allowing unrealized potential positive sustainability effects to be captured.

B) QUALITATIVE ASSESSMENT OF RELEVANCE TO SUSTAINABILITY

The relevance of a project to sustainability is influenced not only by potential causalities, but also by additional factors. We may identify relevance to sustainable development according to the following question checklist:

1. Are there significant conflicting goals among the three dimensions (i.e. improvements in one dimension linked to deterioration in another)?
2. Are negative effects expected in areas where the situation has already deteriorated?
3. Will the project shift burdens onto future generations or lead to consequences which are difficult or impossible to reverse?
4. Are there risks or great uncertainty associated with the project?
5. Is there scope for optimization in designing the project to minimize any conflicting goals? If so, is the potential great or small?
6. Are spatial effects expected beyond the project's desired impact perimeter (e.g. global effects)?

These questions should be answered in broad summary form at this stage of the process. They will be examined more systematically during the assessment (Section 4).

By means of the two subordinate steps of relevance analysis, that is estimation of causal relationships and evaluation using additional questions, we now qualitatively assess the relevance of the project to sustainability. We must ask what circumstances define a project as relevant to sustainability.

When is a project relevant to sustainability?

The two components of the relevance analysis do not allow a stringent objective determination of the threshold above which a project is considered relevant to sustainability. For example, a generally moderate causal relationship with one of the dimensions cannot necessarily be weighted more heavily than a stronger impact on only one of the criteria examined for another dimension. Likewise, setting a required minimum number of points when estimating causalities is of little purpose, since such a points score is incapable of portraying the main lines of conflict and central issues. Thus there is always a certain latitude. Although no precise instructions can be given for determining relevance to sustainability, we may formulate general principles:

- **A project is relevant to sustainability if at least moderate causal relationships exist with two sustainability dimensions and significant conflicts exist between at least two sustainability dimensions.**
- **The degree of relevance is greater if, additionally, the answer to one (or more) of the above checklist questions is yes.**

2.3. PROCEDURAL ISSUES IN RELEVANCE ANALYSIS

As noted, the relevance analysis is based on a methodology capable of furnishing certain guidelines, but not fixed instructions. Thus a certain amount of latitude remains, particularly as the views of different stakeholders may diverge. We must determine who will take the decision for or against carrying out a sustainability assessment with broad or detailed analysis, on what material basis and, in some cases, which organizations are to be involved (see Figure 4).Ultimately we must determine and substantiate whether certain federal agencies should be notified or invited to issue an opinion, and if so which ones. Where transparency is concerned, it is advisable to communicate the results of the relevance test. Format and recipients must also be determined.

2.4. RESULTS OF RELEVANCE ANALYSIS

The following results constitute the outcome of the relevance analysis:

PRESENTING THE SUBJECT

1. The goal, elements and expected impacts of the project are listed in summary.
2. Chains of causality are depicted schematically (optional).

ESTABLISHING RELEVANCE

1. Causal relationships are roughly outlined based on overarching criteria.
2. Conflicting goals are sketched out.
3. Relevance is determined based on additional impact factors.
4. Arguments for/against proceeding with the sustainability assessment are substantiated clearly and logically.

3. IMPACT ANALYSIS

The purpose of the impact analysis is to examine the effects of a project relevant to sustainability in consideration of the sustainable development criteria. The causalities already identified in the relevance analysis are examined in greater detail. Impacts are identified using a detailed criteria matrix (the 27 IDARio criteria). The depth of analysis and resources employed should be commensurate with the significance of the project, taking account of available information and time, staff and financial resources. The time spent on an impact analysis depends largely on the existing documentation and desired depth of field. For a broad analysis based on existing documentation, the process may be expected to take two to four days of work. If a detailed analysis is required or the effects of multiple variants are to be studied, the time required will likely be considerably greater.
The impact analysis may be broken down into the following procedural steps:

› Defining the procedure
› Conducting the analysis.

3.1. DEFINING THE PROCEDURE

In addition to procedural issues such as specifying participation, we must address additional issues related to content and methodology before the actual impact analysis can be carried out. The following are the key steps at this stage:

A) Determining the objective of the analysis
B) Determining the depth of the analysis
C) Determining methods.

A) DETERMINING THE OBJECTIVE

We can only select suitable methods and an appropriate scope of analysis when the desired objectives are clearly specified. The following questions arise:

› What is the purpose of the analysis? Is the focus on developing optimization opportunities, or do we merely wish to examine how closely a project reflects the goals of sustainable development?

› In what form will the analysis be used (e.g. considered in further political discussion etc.)?

B) DETERMINING THE DEPTH OF THE ANALYSIS

Federal projects which could undergo sustainability assessment are diverse. They differ not only in substance and stakeholders, but also in regard to phasing and room for manoeuvre in the political process and to their political implications. The depth of field must be adjusted according to the relevant level of decision. The following questions must be answered:

› What depth of field should we aim for in view of the objective of the analysis, the significance of the project and the available resources (as appropriate to the project phase)? Within what time frame? Involving what stakeholders and for what final recipients?
› Do we wish to carry out a broad or detailed analysis? Could an in-depth analysis be carried out afterwards, depending on the result of the broad analysis?
› Should the prescribed sustainability criteria (see table 1, page 13) be applied in this form, or should they be set out more concretely depending on the domain or sector in question?

C) DETERMINING METHODS

Appropriate methods should be chosen for both the analysis itself (impact analysis) and the subsequent assessment. These may vary according to the subject of the assessment (i.e. strategy, concepts/programmes, plans), and they may also depend largely on whether a broad or detailed analysis is to be carried out (see depth of field). Figure 8 gives an overview of the most important differences between a detailed and a broad analysis.

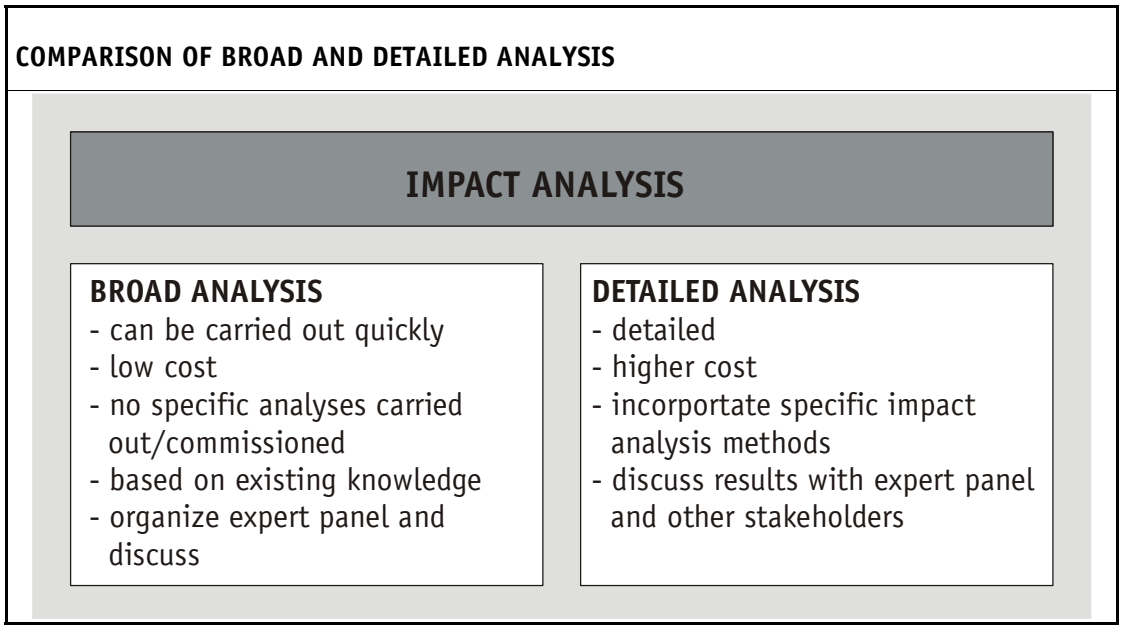

Figure 8

Regardless of the depth of analysis, the following questions must be answered:

› What methods (for impact analysis and assessment) will serve the purpose of the analysis?
› What data do we have? What methods are suitable given the existing data?
› What methods are suitable in light of the main potential impacts we have identified (e.g. natural science, economic, social science methods, according to the type of impacts)?
› Might a combination of several methods be helpful?
› How are qualitative and quantitative parameters to be handled? How can they be compared or related to each other?
› Are partial analyses already available, or are any in progress or planned? How can these be incorporated into the process as a whole?
› What assumptions must be made?

Below we indicate examples of selected methods for impact analysis and assessment.

Impact analysis methods

As a rule, several methods are applied as part of a detailed impact analysis according to the various different impacts of a project. Since a project affects numerous dimensions and social systems, the different methods may be more or less appropriate. Figure 9 indicates several examples of impact analysis methods, allocating each to one of the three dimensions or systems.

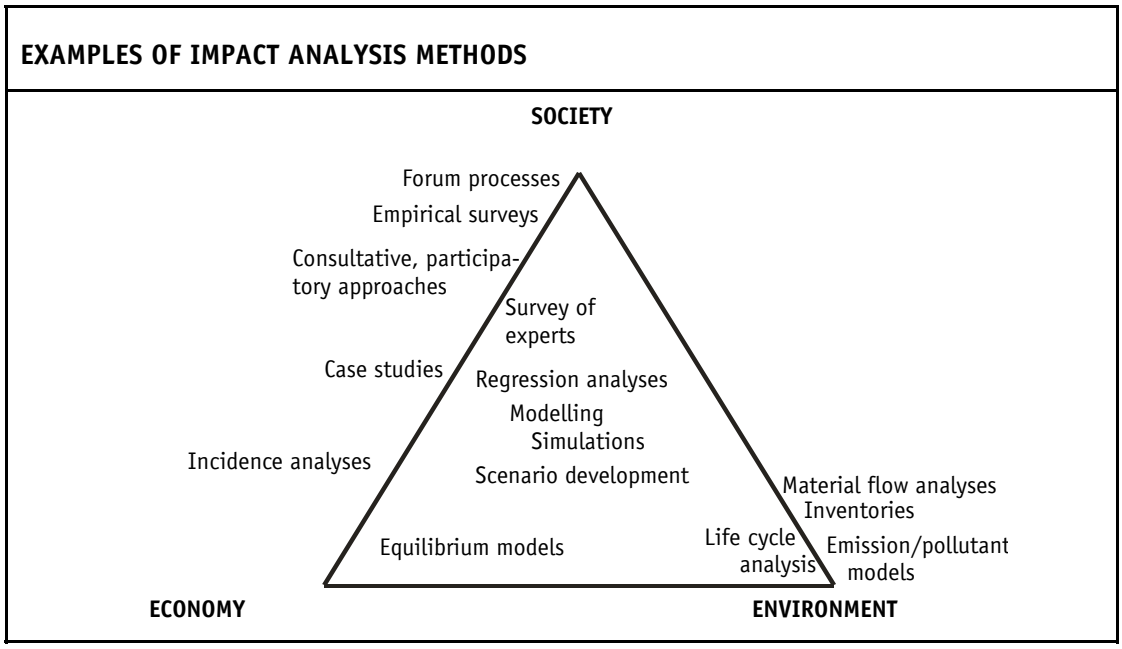

Figure 9 Examples of possible impact analysis methods by subject of investigation.

Any given impact analysis method can only be one component of this procedural step and should be supplemented by other methods. The choice of methods to be applied depends on the impacts examined and the desired depth of scrutiny. For example, if, based on the stated problem and relevance analysis, impacts in the environmental sphere are to be analysed in depth, then detailed scientific analytical methods such as materials flow analyses, experiments or inventories are recommended. The suitability of these domain-specific analysis methods is known to the specialists in the various federal agencies and does not require further elaboration at this point. Our purpose here is merely to indicate that impacts are determined according to the customary domain-specific analysis methods, which thus furnish the scientific basis for the sustainability assessment.

Assessment methods

Depending on the questions at issue, proven scientific methods may also be applied to determining and subsequently assessing impacts on all dimensions. The suitability of these methods depends on the subject of the assessment and the nature of the impacts. Table 3 lists several assessment methods and their fields of application.

No single assessment method will be capable of investigating all the effects of a project in relation to sustainable development criteria. Such partial assessments cannot replace a comprehensive qualitative assessment as undertaken at the conclusion of the sustainability assessment (see Section 4.1).

There is no general answer to the question of which assessment methods are appropriate for which issues. Nevertheless, certain characteristics and fields of application may be roughly summarized for the various methods.

APPLICABILITY OF THE MAJOR ASSESSMENT METHODS

Assessment method	Description	Application
Comparative value analysis (CVA)	Impacts are scored (e.g. from –3 to +3). Indicators are expressed in terms of common denominators, but not weighted and aggregated between themselves.	Comparability of partial impacts is possible. Especially in complex cases where unquantifiable or difficult to quantify values are of importance.
Utility analysis (UA)	Indicator values (impacts) are rated on a uniform scale (e.g. 0–100), impacts are weighted, point totals and weightings are combined into a single utility value.	In complex decision-making situations where unquantifiable or difficult to quantify values are of importance and weighting is useful.
Cost-impact analysis (CIA)	Impacts are related to costs (how much "impact" per monetary unit). No aggregation, weighting or monetarization.	All impacts can be measured. No indication of efficiency. Applied where monetarization of utility components is not possible/ desirable.
Cost-benefit analysis (CBA)	Monetary values for target measures fulfil the weighting function (no weighting and determination of utility values), different impacts can be compared directly (macro/microeconomic).	Not suitable as sole method for complex multidimensional assessment processes such as sustainability assessments (rather as a supplement). Information value of monetarized values may be limited.

Table 3 The major assessment methods. Sources: Federal Office of Road Construction 1991 and FEDRO (Federal Roads Authority) 2003.

How is sustainability assessment related to sectoral testing tools?

Various sectoral testing tools such as regulatory impact analysis, strategic environmental analysis and health impact assessment either already exist or are being investigated (see

Table 4). Similarly, in the formulation of a Federal Council Opinion, the impacts of a project on various social domains must be explicitly indicated.

OTHER ANALYTICAL TOOLS AT THE STRATEGIC-POLITICAL LEVEL	
Tool	**Application**
Regulatory impact assessment	Evaluation of impacts of new regulations on and economic development.
Strategic environmental analysis (under review)	Assessment of environmental concerns above the project level. Recognition of total impacts and potential conflicts of a project, thus relieving/accelerating the environmental impact assessment at the project level.
Health impact assessment (under review)	Testing the potential impact of political decisions on health, welfare and prevention of illness and disability.
Effectiveness testing	Assessment of the effectiveness of all forms of state action (regardless of their legal status) and all Confederation agencies, including the appropriateness/relevance and cost-effectiveness of measures (interdepartmental effectiveness testing contact group 2003 (*Interdepartmentale Kontaktgruppe Wirkungsprüfungen 2003*))

Table 4

The question thus arises of how these tools relate to sustainability assessment, i.e. where these tools are complementary and how they differ.

The integration of multiple assessment tools is both conceivable and desirable. For example, if a project is to be subject to a regulatory impact assessment because regulation may affect economic growth, it is expedient to integrate the results into the sustainability assessment. In such cases the sustainability assessment will be highly detailed where economic growth is concerned. The role of sustainability assessment becomes an holistic one in that it compares the other impacts of the project with its impact on the economy. Sustainability assessment and other domain-specific assessment processes are not competitors but rather complementary. Sustainability assessments may be expected to build frequently on domain-specific assessment processes and incorporate their results for the given impact area. For the remaining impact areas, sustainability assessment can involve a broad or detailed analysis depending on the intensity of the impact and state of knowledge in each area. Ultimately, sustainability assessment will integrate all results into a comprehensive picture.

The interaction between sustainability assessment and strategic environmental analysis requires further study. Nevertheless, here too the goal is not additive concurrency but rather coordination and harmonization.

Issues and requirements during the assessment

› The results of the impact assessment typically incorporate different kinds of information expressed in different units: quantitative figures such as monetary values, traffic quantities or pollutant emissions must be compared with information that is more qualitative and difficult to measure, such as education, identity and culture. Although such a comparison fundamentally can and should be undertaken in this form, there are limits to human intellectual processing capacity in the case of multidimensional impacts. Standardization could be effective in such situations, with various impacts carried over onto a uniform cardinal scale. Such transpositions should be carried out carefully and systematically. They are generally more appropriate when assessing multiple competing options. Weightings of the various impacts and assessment criteria are automatically incorporated. It is important that these weightings and scalings are presented in a comprehensible manner. In certain cases monetarization may also be helpful, with effects expressed in monetary values, for example on the basis of observed or surveyed human preferences or opportunity costs. Again, monetarization is more appropriate if multiple options are to be examined and especially if two separate criteria are to be balanced against each other.

› The concept of sustainable development is based on the balanced development of the three dimensions of sustainability. Consequently, we may generally assume that the three dimensions and their assessment criteria — in equal numbers or in sum — should have the same weight. Problems arise when a project has only a very weak impact on one of the three dimensions but sharply divergent impacts on the other two. This leads to a balancing primarily of the two main dimensions affected. In this case the weighting of the criteria or dimensions should not be changed, but rather the weak vs. strong impacts should be reflected in the scores they are given (-1, -2 etc.).

› In addition to impacts on the sustainability dimensions, impacts on stakeholder groups should also be presented (e.g. social distribution effects).

3.2. CONDUCTING THE ANALYSIS

In the actual impact analysis (broad or detailed analysis), the impacts of a project on various aspects of sustainable development are determined or estimated. It is conceivable that a detailed analysis may be undertaken based on the results of a broad analysis. The procedure for these two kinds of analysis is not fundamentally different; only the depth is adapted to the given purpose. The following steps are carried out:

A) Define system boundaries

B) Specify concrete sustainability criteria

C) Formulate scenarios and variants

D) Analyse causal relationships and determine a concrete impact model

E) Impact analysis.

Possible areas of greater depth for detailed analysis are mentioned under each step.

A) DEFINING SYSTEM BOUNDARIES

A project assessment demands the clear delineation or definition of the subject of investigation. Where the system boundaries are laid is thus of central importance to the result of a sustainability assessment. Clearly declared system boundaries are essential for cogent sustainability assessment.

Drawing system boundaries is more or less difficult depending on the project. Effort expended on this procedural step should therefore be determined by the scope and significance of an undertaking or project in accordance with the phase of the process at which the assessment is carried out. The following principles should be considered in defining system boundaries:

› Substantive, spatial and temporal system boundaries should be declared. Delineation criteria should be clearly laid out and substantiated.

› Generally, we should not draw system boundaries too narrowly, but rather in such a way that the relevant impacts of a transaction or project can be measured. A distinction should be made between strong local impacts and weak large-area impacts. The correct choice of system boundaries should make it possible to consider both levels of impact.

› Ideally, the system boundaries should incorporate a spatial perimeter allowing a description of the direct and indirect long-term implications. In particular and insofar as they are relevant, the international impacts of an undertaking (e.g. North-South relations, impact on the countries of the South, etc.) should be taken into account in choosing system boundaries. With reference to time, we should be able to measure long-term impacts, since pure momentary snapshots exclude a process perspective.

› With regard to both space and time, the analysis should address how results change if the system boundaries are drawn differently (sensitivities).

Figure 10 illustrates the principle that system boundaries must not be drawn too narrowly in substantive, spatial or temporal terms.

DEFINING SYSTEM BOUNDARIES

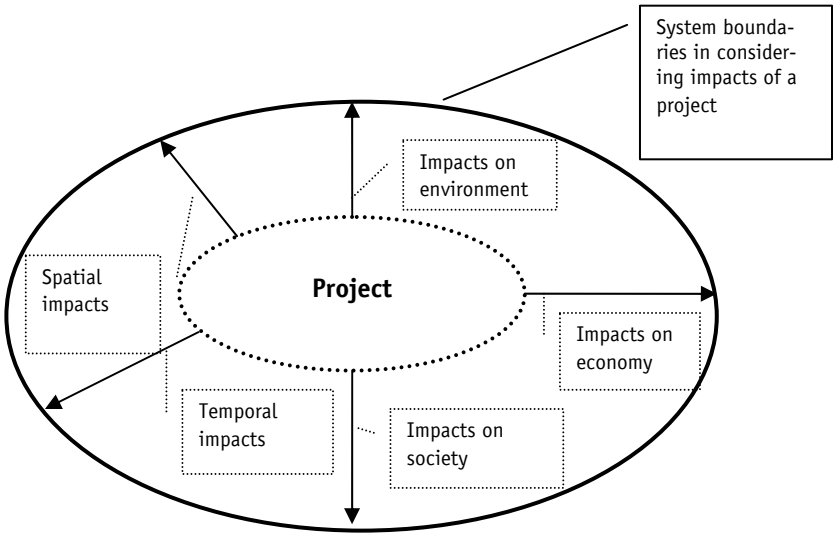

Figure 10 System boundaries in considering impacts on all three sustainability dimensions as well as spatial and temporal impacts.

In the example of the EU Structural Funds, the system boundaries are set as follows in accordance with the above principle: spatially, the analysis should cover the entire EU territory while taking regional aspects into consideration. Temporally, it should cover at least the full term of the current regional policy (to 2006) and potentially further.

B) SPECIFYING CONCRETE SUSTAINABILITY CRITERIA

The purpose of this step is to specify or adapt concrete criteria based on general criteria sets such as the 27 IDARio criteria[5] for application in the impact analysis (see "D: Analysing causal relationships and determining a concrete impact model") at the level of individual sectors using indicators. Sector-specific adaptation is not essential, but it is important that sector-specific indicators, if desired, are embedded in the Federal Council criteria and the IDARio criteria. The target dimensions and sustainability criteria must be the same for all sectors. More extensive sector-specific concrete specification and differentiation can take place only at the level of indicators and their operational use.

5 See Table 2.

Various differentiated indicators are already available which can be used according to the topic or scope of the analysis. These include the following indicator systems:

› Sustainable development monitoring in Switzerland (MONET): a total of 163 individual indicators in 26 subject areas have been developed to serve as building blocks for sector-specific indicators (SFSO/ARE/SAEFL 2003).
› Indicator systems as a management instrument (Federal Chancellery/SFSO 2004).
› Core indicators for sustainability of cities and cantons (ETH novatlantis, various cities and cantons, 2003).
› System of objectives and indicators for sustainable mobility (ZINV DETEC) (ARE 2001).

If no domain- or sector-specific indicators are available, they may be developed during this step. The selected indicators should meet the following requirements (SFSO/ARE/SAEFL 2003:31):

› Scope:
  › The indicator is relevant in the national context.
  › The indicator is relevant in relation to the defined sustainability goals.
› User-friendliness:
  › The indicator is comprehensible (readily interpreted, transparently derived).
  › The indicator provides adequate information content (minimum amount of information, no yes/no criteria). Leading indicators may be chosen, if available.
› Validity:
  › The indicator is scientifically grounded (scientific consensus with regard to validity and reliability).
› Availability of data:
  › The indicator is available at little cost and effort.
  › The indicator is based on periodically and homogeneously measured data.
  › The indicator is based on quantifiable data (although subjective, qualitative data are not excluded).[6]

There are also requirements regarding the composition of indicators (SFOA 2002):

› The relationship of indicators from the various fields of action/sustainability dimensions is roughly balanced (approximately the same number), provided that the project will have a similarly great impact on all dimensions.
› There is as little overlap as possible among the selected indicators.

6 This requirement is not essential for qualitative criteria matrices or individual criteria (unlike quantitative indicators).

› The number of indicators should not be overwhelming (maximum 30 per dimension).

These requirements as to the choice and composition of indicators should be observed when fleshing out sector-specific sustainability criteria.

C) FORMULATING SCENARIOS AND VARIANTS

Scenarios and variants should be integrated into sustainability assessment at the earliest stage possible. This will make it possible to run through multiple cases and compare them directly during the actual impact analysis. Note that incorporating multiple scenarios and variants will increase the cost and time of both the impact analysis and the assessment. Divergent scenarios, in particular, should therefore preferably be considered as part of a detailed analysis.

Scenarios

Scenarios are a tool for handling the uncertainties of future developments and estimating risks. First, we can distinguish between exploratory and normative scenarios. Exploratory scenarios describe probable future development paths, for example on the basis of trends to date. Normative scenarios, conversely, show potential paths for reaching an objective (Brüggemann et al. 2001). In sustainability assessment, the focus is on exploratory scenarios. Scenarios are generally created based on the current state of affairs and attempt to identify the central driving and inhibiting factors of future developments. Divergent scenarios can be described through differing assumptions as to the directions in which these factors might take, along with combinations of such assumptions for various driving factors. Frequently used parameters include GDP growth, technology, population numbers and structure, household structures, communication and consumer habits, values and fundamental political trends (such as EU integration).

For practical reasons, the number of scenarios is best kept small (two or three). If a sector-specific study with corresponding scenarios already exists, these should be adopted here. The following questions arise:

› What **kind of scenarios** do we wish to create? Primarily exploratory scenarios should be created to cover the range of future developments with high probability. When there are three scenarios, a midrange and a low-end and high-end bracketing scenario (with respect to a parameter) are the obvious choice. One of the scenarios is typically based on a dynamic continuation of the current situation ("business as usual").

› What are the **scenario creation parameters**, i.e. the fundamental assumptions on which a scenario is based (e.g. a weakening or strengthening trend, adoption or rejection of legislation, etc.)? Only the most important parameters – those that most strongly influence the impact and assessment of the project – should be changed. The number of variable parameters should be kept small, and generally combined with those constellations which influence the impact of the project in the same direction. The effects of other parameters should be measured during sensitivity analysis rather than here. Parameters related directly to the design of the project are the subject of the assessment and should not be considered in the scenarios, but rather modelled by means of "variants" (see below).

› What other factors are relevant but not considered in the scenarios? (See paragraph on sensitivities.)

› What additional **assumptions** must we make? A defined scenario generally implies changes at other levels which cannot be precisely estimated and must therefore be based on assumptions. The assumptions and influence of altered assumptions should be presented transparently (Kirkpatrick/Lee 1999:6).

Variants

The starting point for comparing variants is the two base variants with a "policy on" (project carried out) and "policy off" (project not carried out) projection. Since a sustainability assessment should also show how a project can be optimized with regard to sustainable development, potential variants of a project should be incorporated into the impact analysis and assessment as early as possible. Nevertheless, it is conceivable that new variants may arise only during the course of the assessment. In these cases, optimization may be carried out in an iterative process involving the definition of a variant, impact analysis and assessment (see also Section 4.2).

D) ANALYSING CAUSAL RELATIONSHIPS AND DETERMINING A CONCRETE IMPACT MODEL

Causal relationships are analysed using the 27 IDARio criteria in similar fashion to the relevance analysis (see Table 1, page 13). The following table shows possible results of the determination of causalities, based on the example of the EU Structural Funds.

DETERMINATION OF CAUSALITIES BASED ON THE EXAMPLE OF THE EU STRUCTURAL FUNDS					
Environment		**Economy**		**Society**	
Env1 Biodiversity	••	Eco1 Per-capita GDP	•••	Soc1 Education, learning ability	••
Env2 Climate	•	Eco2 Efficient infrastructure and services	••	Soc2 Health, welfare, security	••
Env3 Emissions	••	Eco3 Value-adding investment rate	••	Soc3 Liberty, independence, individuality	•
Env4 Landscape/ cultural & natural heritage	•••	Eco4 Long-term sustainable national debt	••	Soc4 Identity, culture	••
Env5 Water	•••	Eco5 Resource efficiency	•	Soc5 Values	•
Env6 Materials, organisms, waste	••	Eco6 Competitiveness	•••	Soc6 Solidarity, community	•••
Env7 Energy	••	Eco7 Workforce potential	••	Soc7 Openness, tolerance	••
Env8 Soil, area, fertility	••	Eco8 Innovation, high-performance research	••	Soc8 Social security, poverty rate	•••
Env9 Environmental risks	•	Eco9 Regulatory framework	••	Soc9 Equal opportunities, equality, participation	••

Table 5 See case study with comments in the Sustainability Assessment Annex.

Impact model

With the knowledge we have gained thus far, we can refine the causal chains we outlined roughly in the first step (presenting the subject). In particular, it will be useful to specify in greater detail the causal relationships (intentional or not) identified in the model (see Figure 11).

EXAMPLE OF A REFINED IMPACT MODEL WITH INTENDED IMPACTS IN THE ENVIRONMENTAL DOMAIN

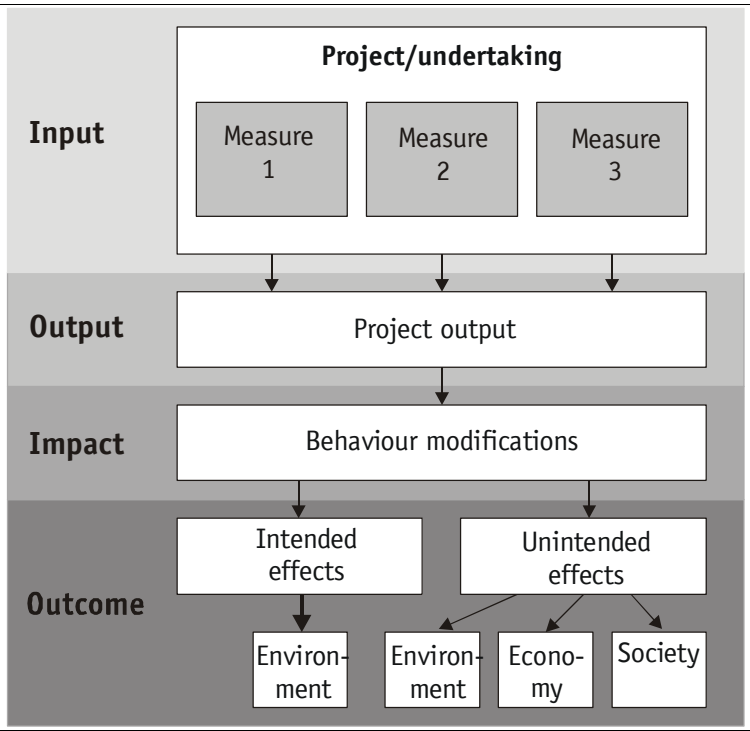

Figure 11 Potential refined causal model in procedural step 4: Impact analysis. The example shows a project aimed at achieving impacts in the environmental domain which displays unintended consequences in all three dimensions of sustainability.

E) IMPACT ANALYSIS

In step D we identified causal relationships between the project and selected sustainable development criteria. The aim here is to identify the direction of the impacts, i.e. to establish the path they take and how intense they are. The impact analysis will again be carried out using the IDARio criteria (see Table 1). The results of this step might be depicted as follows (see Table 6):

RESULTS TABLE OF AN IMPACT ANALYSIS USING INDIVIDUAL CRITERIA				
	Criteria	**Remarks**	**Impact**	
			Direct	**Indirect**
Env1	Biodiversity		0	-
Econ1	Per-capita GDP		-/++	?
Soc1	Education, learning ability		?	0
	…			

Table 6 Illustration of the effects on the capital stock criteria of the sustainable development policy. The analysis is carried out using all criteria. The impact may range from very positive (+++) to very negative (---) or be neutral (0). A measure may also have an ambivalent impact (+-): see also the example of the EU Structural Funds in the Sustainability Assessment Annex.

This step can be shortened or refined depending on the depth of the analysis. In a broad analysis, however, this step might be taken only for those criteria regarded as relevant. In a detailed analysis, the impact analysis is performed for all individual criteria and may be further refined, for example by examining the impacts in relation to different territories, stakeholder groups, etc.

The following checklist questions are helpful and may be considered either for only the relevant criteria, or for all criteria:

› How does the project as a whole and/or the individual measures it comprises affect criterion x?
› What direct intentional and unintentional impacts may we expect the project to have on criterion x?
› What indirect impacts are to be expected?[7]
› Which of the identified impacts are known and which are potential impacts?
› Are the expected impacts very negative, negative, somewhat negative, very positive, positive, somewhat positive or neutral?

The checklist questions applied during the relevance analysis as the first step in sustainability assessment are taken up again here and answered with reference to the individual criteria.

During a **broad analysis** impacts are measured and substantiated on the basis of a rough estimate. Various methods may be used, including determining impacts through a

7 Example of an indirect impact: a project may contribute to enhancing economic development, which in turn affects environmental conditions. Thus the project has an indirect impact on environmental conditions.

panel of experts and/or by examining existing studies and partial analyses. In any case, we should assume that the broad analysis cannot always be supported by scientific, empirical analyses. As a rule, we will use both our own estimates and outside expertise. The source of the information should be clearly shown in the presentation of the impact analysis. That is, it should be evident on what assumptions, sources or estimates the results of the analysis are based.

For a **detailed analysis** numerous impact analysis methods are available, examples of which are described in section 3.1. These impact analysis methods may be applied here. They permit a refinement of the impact analysis and a well-founded response to the above checklist questions.

Sensitivities, uncertainties and risks

Sensitivities, uncertainties and risks merit special attention during an impact analysis. They should be discussed explicitly under a separate point. Information should be provided as to the degree of uncertainty attached to the results and to what extent these results change when key assumptions are changed. We should likewise present risks, i.e. negative impacts which, though normally not expected, we cannot rule out completely. Additionally, we may again draw attention to those influences which are of key importance to the results of the impact analysis. Finally, we may present the assumptions under which the desired impacts are only just attained (so-called threshold values; see also European Commission 2002:38ff.).

3.3. PROCEDURAL ISSUES IN IMPACT ANALYSIS

Whenever possible, the impact analysis is based not on judgements but rather on maximally value-neutral analytical steps. Nevertheless some of the identified impacts will be based on judgements, since limited financial resources and time scarcely permit a comprehensive systematic analysis. Special attention should be devoted to the following aspects:

› The origins of information should be clearly apparent.
› Participation by other agencies (or by representatives of civil society) should be clearly managed and specified.
› The results should serve as a basis for a discussion of the impact analysis and be presented accordingly.

3.4. RESULTS OF IMPACT ANALYSIS

DEFINING THE PROCEDURE

1. Objectives of the analysis are established.
2. Depth of field of the analysis is established.
3. Analysis and assessment methods are determined.

CONDUCTING THE ANALYSIS

1. System boundaries are established.
2. Concrete sustainability criteria are specified.
3. Scenarios and variants are formulated (if possible before the impact analysis).
4. Causal relationships are presented based on a detailed criteria matrix.
5. The impact model is refined.
6. Direction and magnitude of impacts on individual criteria are determined.
7. The results and the assumptions and information from which they are derived are presented in a cogent manner.

4. ASSESSMENT AND OPTIMIZATION

In this stage the results of the impact analysis are assessed in the context of sustainable development and corresponding opportunities for project optimization are developed. The results of the impact analysis, especially the identification of positive and negative impacts, already provide a foundation. Now the aim is to compare the positive and negative impacts as a whole and to tease out conflicts, trade-offs and the pros and cons of the different variants. We perform the assessment using assessment aspects and principles as already applied in summary form during the relevance analysis. For a broad analysis, we estimate 2–4 days of work for assessment and optimization. Where multiple variants are to be assessed, we may expect this to take longer.

This stage may be broken down as follows:

› Assessment

› Optimization

› Present results.

4.1. ASSESSMENT

Before the actual assessment can be carried out, certain aspects of the assessment and assessment principles must be established. Sustainable development is a political concept which is made concrete and operational on the basis of normative values. It is therefore important to ensure that the assessment is as transparent and comprehensible as possible. In order for assessments to be made on a common normative basis and not be arbitrary, they should take account of the following aspects and principles in addition to the common normative criteria matrix.

A) ASPECTS OF THE ASSESSMENT

The following aspects should be taken into account in assessing the results of the impact analysis:

› The existing problem situation

› Trend lines

› Irreversibility of the (negative) impact

› Burden-shifting onto future generations

› Risks and uncertainties

› Absolute minimum requirements for sustainable development

› Spatial impacts

› Scope for optimization.

Thus here we find a link to relevance analysis, which already considered these aspects in summary form. Figure 12 illustrates the significance of these additional aspects for the assessment of impacts.

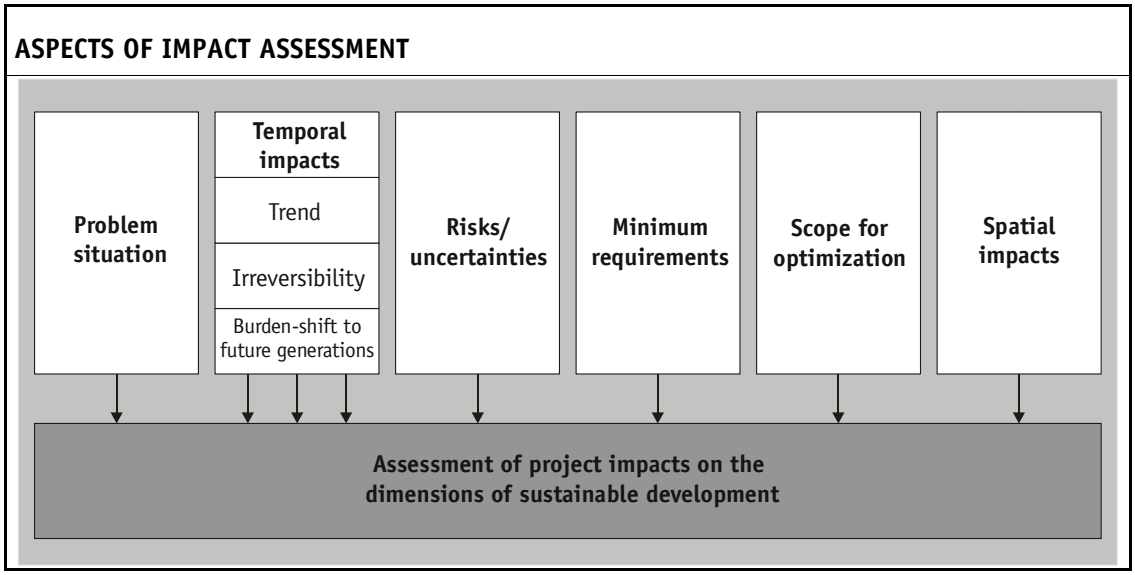

Figure 12 Additional aspects to be considered for assessment of impacts from a sustainable development perspective.

These aspects may be stated concretely as follows:

› Existing **problem situation**: regardless of the impact of the project, the situation is already critical (e.g. high level of pollution).

› **Trend lines:** regardless of the project under scrutiny, the trend with respect to a criterion is positive, negative or roughly constant. Negative trends require particular attention.

› **Irreversibility** of a (negative) impact: the project will have negative effects that can be reversed only with difficulty if at all.

› **Burden-shifting onto future generations:** negative impacts of a project will not be borne by the present generation but shifted to future generations.

› **Risks and uncertainties:** the project is fraught with great uncertainties or risks. Risk is understood on the one hand as uncertainty attached to an assessment owing to an insufficient degree of knowledge (e.g. the effects of non-ionizing radiation) or developments in the future that are difficult to calculate, and on the other as events which, although the probability of their occurrence is low, they have great potential to cause damage (e.g. accidents in nuclear power stations).

› **Minimum requirements:** minimum requirements establish floor or ceiling values as absolute lower and upper limits respectively that must or may not be exceeded. Such minimum or maximum conditions may be structured as follows (European Commission, DG Regio 2002b:25ff. and IDARio 2001:68):
  › Statutory thresholds (e.g. emission values, health-related environmental standards under environmental law and corresponding regulations).
  › Scientific thresholds which are not (yet) reflected in statutory thresholds (e.g. the level of greenhouse gas emissions at which additional global warming can be stopped).
  › Socio-political standards such as equal opportunities, minimum income, living conditions adequate for human dignity, subsistence protection.
  › Human rights safeguards.
  › Other thresholds based on estimates of various interest groups. These may include thresholds above which impacts (e.g. noise levels) are regarded as unacceptable.
› **Spatial impacts:** the impact perimeter of a project may vary in space. A distinction is made between weak large-area impacts (beyond the desired impact perimeter) and strong small-area impacts.
› **Scope for optimization:** there is scope for optimization of the project. This may include project modifications (optimization within the project) and project extensions (optimization through supplementary measures); see also Section 4.2.

Stated simply, the more significant these additional criteria, the more closely the impacts of a project must be considered or the greater weight assigned to them. The shifting of burdens onto future generations is of particular significance.

B) ASSESSMENT PRINCIPLES

The assessment should be capable of incorporating differing perspectives. Specifically, this means:

› Conflicting goals should be clearly delineated in the assessment.
› The assessment should, on the one hand, enable a comprehensive overview, possibly based on median values (e.g. a comparison between the three dimensions of sustainability).
› On the other hand, it should also enable a view focused on strong positive or negative impacts (e.g. EU Structural Funds: positive assessment of competitiveness combined with negative assessment of emissions).

The overview should be presented in terms of overarching criteria or even of the three sustainability dimensions themselves. These aggregates should be based on clear rules and should constitute only one element of the assessment among several.

Conversely, the strong positive or negative impacts are presented at the level of the 27 individual IDARio criteria. These are important because they allow the most important conflicting goals and optimization potentials to be identified more easily. Furthermore, these extreme negative and positive values are particularly important in comparing variants.

Principles of impact assessment

The impacts identified in the impact analysis should be assessed on the basis of the following principles:

› When comparing multiple variants, we give preference to the variant in which none of the three sustainability dimensions is too strongly impaired. Balance between the three dimensions is the aim.

› A project must meet minimum requirements such as environmental standards established to protect human and environmental health, living standards in keeping with human dignity, or those to safeguard human rights (see paragraph on minimum requirements). Minimum requirements are not negotiable. This means that a failure to attain these requirements cannot be offset by positive impacts in other domains. Optimization options must be developed.

› Areas displaying a continuous downward trend and which would be further negatively affected by the project should receive special attention and possibly a greater weighting (see paragraph on weightings). Optimization options should be developed in these cases (see Section 4.2).

› If the project could have an irreversible negative impact on a criterion or shift burdens onto future generations, the criterion in question should receive a heavier weighting. Corresponding optimization options should be developed.

› If a project entails major potential risks or it is not possible to estimate how it may affect certain aspects of sustainable development, alternatives must be offered. The precautionary principle, i.e. implementation of precautionary protection against potentially hazardous impacts, must be respected.

› Large-area impacts should receive particular attention. The intensity of the impact should be considered in the assessment (weak large-area impacts vs. strong small-area impacts).

Small-area impacts generally carry less weight because the burden is, by nature, limited to a small area.

› Where scope for optimization (both for ameliorating negative impacts and reinforcing positive ones) is especially plentiful, we should give special attention to potential alternatives.

Weighting

The assessment principles mention the possibility of assigning a greater weighting to certain criteria in several places. The question arises as to whether procedural rules should be established for weighting or choosing criteria.

A quantitative rule for weighting of a criterion (e.g. giving double weight where there is a negative trend) hardly seems expedient in a primarily qualitative assessment process. For example, we cannot establish whether strongly negative impacts on a criterion (---) where the overall trend is constant should be assessed more or less favourably than weakly negative impacts (-) on a criterion whose overall trend is also negative. Likewise, weak but large-area impacts cannot be compared with strong but small-area impacts. We therefore recommend a qualitative assessment of the project with clear verbal substantiation. It is precisely for this reason that assessment principles are helpful and necessary.

C) ASSESSMENT BASED ON THE RESULTS OF THE IMPACT ANALYSIS AND ADDITIONAL ASSESSMENT CRITERIA

In the actual assessment of project sustainability, we interpret the results of the impact analysis using the above additional assessment principles and aspects and present conflicting goals.

The initial assessment is performed at the level of the 27 IDARio criteria. The following checklist of questions should be answered for all of these criteria or at least (in a broad analysis) for the relevant criteria:

› Is the situation already critical in individual criteria, regardless of the impact of the project under scrutiny (P=existing problem)?
› Is there a downward trend in individual criteria, regardless of the project under scrutiny (T = trend)?
› Are the negative impacts on individual criteria irreversible or reversible only with difficulty (Irr = irreversible)?

› Will the burden be borne not by the present generation but shifted to future generations (Gen. = burden on future generations)?
› Is the project associated with risks/uncertainties in regard to individual criteria (Ri = risk/uncertainty)?
› Are there minimum requirements which are crucial to sustainable development in respect of individual criteria (Min = minimum requirements)?
› How great is the spatial impact perimeter of the project under scrutiny (local and/or wide-area impacts) (Space = spatial impacts)?
› Is there scope to optimize the project under scrutiny with respect to individual criteria? Is it possible to modify parts of the project or to lessen negative impacts through ancillary measures (Opt = optimization potential)? Or are negative impacts attributable primarily to external processes and thus not strongly affected by the project?

Table 7 shows how the assessment of an individual criterion might look.

POSSIBLE REPRESENTATION OF AN ASSESSMENT BASED ON A SINGLE CRITERION

Crit.	I	T	P	Irr.	Gen.	Ri	Min	Opt	Space	Assess-ment	Interpretation
Water	--	↘	No	No	Yes	No	No	Yes, ancillary meas-ures	Mostly local	-3	Negative impacts reinforced by negative trend, risk of burden-ing future generations, hence –3 (instead of -2).

Table 7 Example of a result table for assessment based on a single criterion. Abbreviations: Crit.: IDARio criterion; I: Impact; T: Trend; P: existing problem Irr.: Irreversible; Gen.: Burden on future generations; Ri: Risks/uncertainties; Min.: Minimum requirements; Opt.: Optimization potential; Space.: Spatial impact perimeter.

The identified impacts are evaluated with reference to the assessment criteria, so that the outcome can be intensified or eased accordingly. The assessment is represented on a scale of –3 to +3.

Just as broad and detailed analyses go to different depths, the assessment stage can also be carried out at different levels of detail. The same steps are carried out regardless of depth, but additional refined assessment methods are applied in a detailed assessment, such as those listed in Section 3.1.

Conflicting goals

Based on the assessment of individual criteria, in the second step we depict the most important conflicting goals and trade-offs and summarize the most important results in a comprehensive form. Conflicting goals arise when a project leads to both positive and negative impacts. The need for optimization or the potential conflict between target and interest groups for the various dimensions is greater according to the magnitude of the conflict between goals in the different dimensions. Conflicting goals may be assessed on both the level of individual criteria and that of different sustainability dimensions overall. The sharper the contrast between positive and negative impacts, the greater the conflict between goals. These conflicts can be extracted from the assessment table and interpreted (see Table 7). Additionally, we recommend summarizing the most important general goal conflicts in text form.

The following checklist of questions may be used in an in-depth examination of conflicting goals:

- Do developments in the three sustainability dimensions collide (conflicting goals exist) or harmonize (no conflicting goals)?
- Are there conflicting goals within individual measures, i.e. project elements?
- Are there conflicting goals within the package as a whole (i.e. between individual measures)?
- Are there conflicting goals within individual dimensions of sustainability?

Based on the identified conflicting goals and trade-offs and on the assessment of individual criteria, we should now summarize the most important results in a comprehensive form. This comprehensive assessment is best done in a narrative manner, with the emphasis on qualitative aspects. Additional synoptic tabular presentations are also an option (see also Section 4.3).

4.2. OPTIMIZATION

In the assessment principles we have already suggested where we should make efforts to optimize the project and seek opportunities for optimization.

Essentially we may distinguish between two kinds of optimization: different variants of a project which enable better balancing of the three dimensions of sustainable development (project modifications), and ancillary or supplemental measures to ameliorate identified negative impacts or reinforce weak positive impacts (project extensions). The following questions must be answered:

› What optimization opportunities (variants, alternatives) are available in the domains where the assessment demonstrates a need for optimization?
› Can negative impacts of the project be eased, or positive impacts further reinforced, through ancillary measures?

Variants

Project variants should be considered at the earliest possible stage (if possible before the impact analysis). If variants can be developed only during the optimization stage, the impact of these variants should likewise be analyzed and assessed where possible. Since this will increase cost and effort, any comparison of variants should be limited to the relevant criteria and conflicts.

The key is to formulate the necessary requirements for the variants as concretely as possible based on the broader, more detailed design and implementation of the project. Proposals should be formulated for further investigation and for how the results of sustainability assessment may be integrated.

Ancillary measures

The assessment reveals those areas where the need for measures to reduce negative consequences is greatest. The comparison of different variants, if these have been examined, may likewise furnish insight into areas where positive impacts may be further reinforced. We should keep in mind that ancillary measures may have not only the intended effects, but may also have indirect, unintended consequences, both positive and negative. A combination of multiple ancillary measures may also have cumulative effects which are difficult to predict.

The following criteria may be used in selecting ancillary measures (Kirkpatrick/Lee 1999):

› Appropriate: the measures are suitable for removing an identified deficiency.

› Practicable: the measures are practicable in legal, organizational and technical terms.
› Efficient: the measures should achieve the desired improvements at the lowest possible cost.
› Compatible: the measures are compatible with existing constructs.
› Coherent: the ancillary measures should harmonize with the goals of sustainable development and the measures of the project under scrutiny.
› Complementary to other sustainable development initiatives: the measures should not duplicate other, inherently more suitable measures (e.g. in another policy area).

Determining project specification and implementation requirements

Sustainability assessment is to be regarded essentially as an ex-ante evalation and is used mainly during formulation of policy. Nevertheless it may also be applied during other policy stages. The important thing is that sustainability assessment results are always used for future stages, or that guidelines for future stages are derived from sustainability assessment. For example, this means that when a strategy or programme is evaluated ex-post, focus is placed on those conflicting goals identified in the sustainability assessment.

4.3. PRESENTING RESULTS

In the results portion, we present the evaluations of the various dimensions of sustainable development in a coherent fashion.

The aim is to develop a transparent decision-making foundation that incorporates variants and alternatives. The results should be set forth in a simple and clear linguistic and graphical presentation. A complete assessment table for all 27 IDARio criteria, similar to the specimen in Table 7, for example, may provide a detailed foundation but is inappropriate for communication purposes and is very resource-intensive when addressing multiple variants. The presentation of results should meet the following requirements:

› The impacts on the three dimensions of sustainable development must be clearly apparent.
› Indirect impacts must be clearly apparent.
› Uncertainties and risks should be clearly expressed.
› Qualitative information must remain recognizable and receive the same emphasis as quantitative information.
› The most important conflicting goals between individual criteria must be apparent. An aggregate presentation cannot replace a presentation at the level of individual criteria.

› Optimization opportunities should be presented and comparison of variants should be possible.
› The plausibility of the sustainability assessment results must be verified. Discrepancies between expected and actual results should be explained. The appropriateness of the criteria set used in relation to the transaction or project should be critically examined.

Potential forms of presentation for sustainability assessment results

Results may be presented in numerous ways. We should always use multiple representations combined with textual explanations. We should make particular efforts to choose presentations that both furnish an overall view and illustrate major individual effects. Thus we should aim for an appropriate mixture of information condensed into graphics and tables along with qualitative explanations. The following examples should be regarded only as components of the presentation of results. They are classified into the following forms according to their level of detail:

› Presentation forms at the level of the 27 IDARio criteria of sustainable development policy
› Presentation forms at the level of the 15 Federal Council criteria
› Presentation forms at the level of 9 selected IDARio criteria
› Presentation forms at the level of the 3 dimensions of sustainable development.

a) Presentations at the level of the 27 IDARio criteria

Presentations at this level make it possible to display the results of assessing the 27 IDARio criteria without superordinate aggregation. Strong individual effects are best portrayed at this level. We should attempt to reduce the presentation to those individual criteria which are relevant to the given project.[8] Two potential presentation forms are shown in Tables 8 and 9.

8 A reduction is necessary because the assessment of irrelevant or less relevant criteria might be over-emphasized in a presentation and because clarity is impaired.

ASSESSMENT OF ESSENTIAL IDARIO CRITERIA WHILE TAKING ACCOUNT OF ALL ASSESSMENT CRITERIA (EXAMPLE)									
IDARio criterion	**Impact**	**Trend**	**Irrevers.**	**Fut. gen.**	**Risk/ uncer.**	**Minimum req.**	**Optimization pot.**	**Spat. imp.**	**Score**
ECONOMY									
GDP	--/++	↗					X	X	**0**
Infrastructure efficiency	++	↗							**+2**
Competitiveness	+	→							**+1**
SOCIETY									
Solidarity	--	↘					X		**-3**
Social security	--	→↘					X		**-2**
Equal opportunities	-	→				X	X		**-2**

Table 8

The results of the assessment are presented in simplified form in Table 8. The relevant assessment criteria are not described in detail here, but merely marked with a cross to indicate that they must be considered in the assessment. The minimum requirements that must be fulfilled may be specially highlighted. Additional comments must be presented verbally.

Another presentation option in which multiple variants may be considered is shown in Table 9.

COMPARISON OF VARIANTS, REDUCED TO THE ESSENTIAL CRITERIA									
	Criterion	**Variant 1**		**Variant 2**		**Variant 3**	**Remarks**
Eco1	GDP						
Eco2	Infrastructure efficiency						
Eco6	Competitiveness						
Soc6	Solidarity						
Soc8	Social security						
Soc9	Equal opportunity						

Table 9 Comparison of variants considering the IDARio criteria, between which there are relevant conflicting goals. Scaling: dark grey: -3 and –2; medium grey: -1 to +1; light grey: +2 and +3.

The numerical scores are assigned a clearly-defined colour code. Strongly positive scores (+2 and +3) are shown here in light grey; slightly positive, neutral and slightly negative scores (+1, 0, -1) medium grey and strongly negative (-2 and -3) dark grey. Differentiation through colour (e.g. a spectrum from green to red) instead of shades of grey, as used here for printing-related reasons, will make the results easier to communicate. The presentation shows the major conflicting goals and makes the evaluation visible at a glance. Higher-level

conflicting goals (for example between two sustainability dimensions) which cannot be illustrated by means of individual criteria are not visible here and must be described in textual form.

b) Presentation forms at the level of the 15 Federal Council criteria

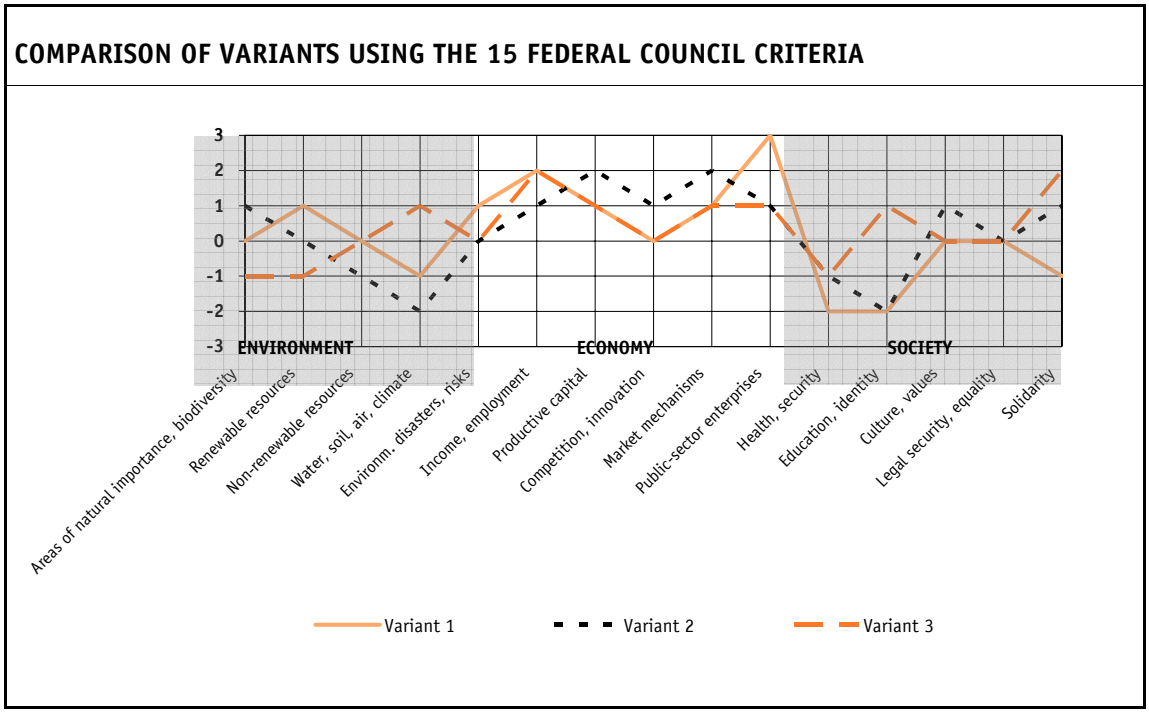

Figure 13 Possible presentation of a comparison of variants using the 15 Federal Council criteria.

The line chart allows a comparison of variants with a reasonable number of criteria. By using colour to set the three dimensions off from one another, strengths and weaknesses of the variants in each dimension are easily recognized. Differences within individual criteria cannot be displayed. The main difficulty, however, is in condensing results from the level of the 27 IDARio criteria down to the 15 Federal Council criteria. This requires the development and implementation of strict aggregation rules. Since there are clear links and the criteria under the sustainability dimensions are equally weighted, aggregation within one dimension is essentially permissible. Such an aggregation will necessarily display shortcomings, however, as important information on the assessment (e.g. the problem situation, trend, irreversibility, risks, etc.) is lost in the aggregation process. The overall assessment ultimately remains a qualitative process of multidimensional balancing and weighting.

c) Presentation forms at the level of 9 selected IDARio criteria

This form of presentation draws on nine (or fewer, depending on the example) selected IDARio criteria. It enables us to focus exclusively on those criteria that are regarded as relevant.

COMPARISON OF VARIANTS USING A NETWORK DIAGRAM BASED ON 9 SELECTED IDARIO CRITERIA

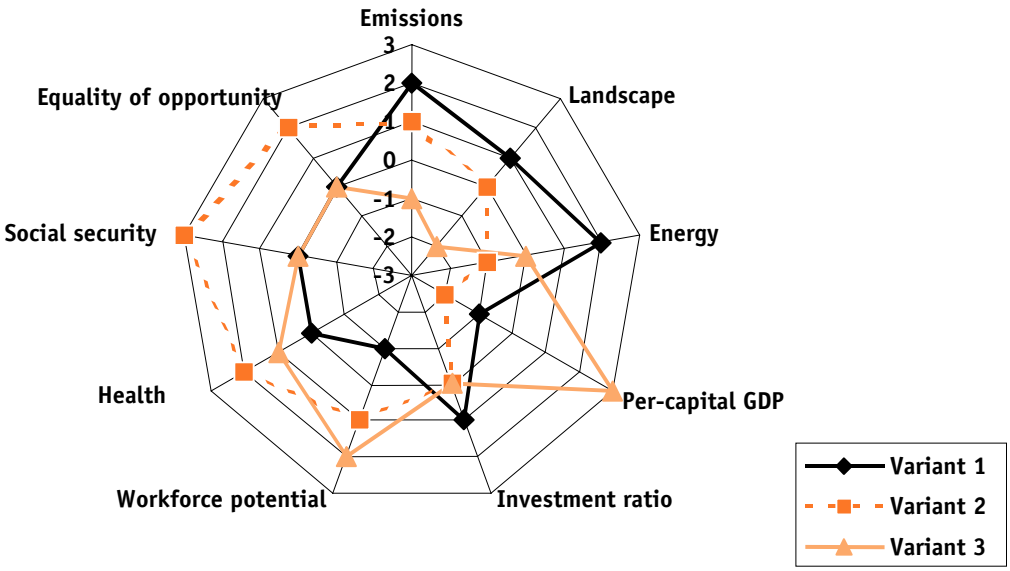

Figure 14

The advantage of this rosette presentation is the direct comparison of multiple variants in the same graphic. The strengths and weaknesses of each variant are clearly visible, and the concentration on nine criteria permits an assessment at the level of relevant factors.

Another presentation which is also capable of displaying range is shown in Table 10.

RANGE PRESENTATION									
Sustainability criteria	**Score**								**Remarks**
	+3	**+2**	**+1**	**0**	**-1**	**-2**	**-3**	**?**	
Emissions	■	■	■						
Landscape								?	
Energy						■			
Per-capita GDP								?	
Investment ratio					■	■	■		
Workforce potential				■					
Health				■					
Social security				■					
Equality of opportunity			■						

Table 10 Sample assessment using selected IDARio criteria + positive impact, - negative impact, 0 neutral impact, ? unknown impact or criterion not applicable.

Trade-offs between individual criteria are clearly visible, and the full range including unknown or inapplicable impacts can be displayed. The reasons for the scores can be included in the same table in text form or presented separately.

d) Presentation forms at the level of the 3 dimensions of sustainable development

COMPARISON OF VARIANTS WITH IMPACTS ON THE THREE SUSTAINABILITY DIMENSIONS

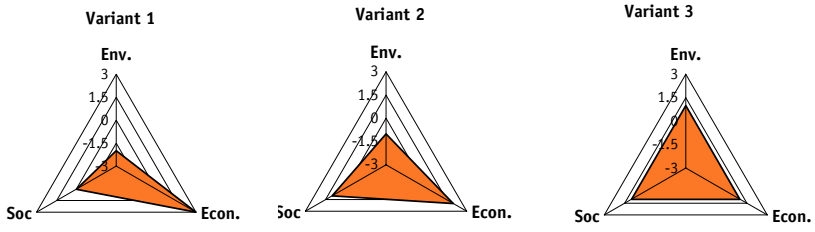

Figure 15 Sample comparison of variants in the form of a simple rosette (network diagram) with three dimensions. Env.: Environment, Econ = Economy, Soc = Society.

The presentation at the level of the three sustainability dimensions clearly shows the main thrust of each variant and illustrates imbalances between the dimensions within each variant. The high level of aggregation places strict demands on the aggregation rules. More-

over, conflicting goals within a given sustainability dimension cannot be shown. A detailed description in textual form and using additional illustrations is vital here.

4.4. PROCEDURAL ISSUES IN ASSESSMENT AND OPTIMIZATION

The assessment may be made in accordance with a single assessment rule. Quantification is likewise possible or useful only within limits. For these reasons, the principles of transparency and comprehensibility are particularly important at this stage of the procedure. Assessments should be substantiated and logical and should be made on the basis of clearly communicated criteria. It is particularly important to reveal divergent assessments, risks and uncertainties and to address areas of conflict.

An effective approach to participation is of equal importance. Depending on the depth and purpose of the assessment, various stakeholders may or should be included in the assessment process. In particular, the form in which other federal agencies and stakeholder groups are to be involved must be determined. Possibilities include consultative processes or forums in which other agencies as well as cantons, municipalities and civil society may be represented.

4.5. RESULTS OF ASSESSMENT AND OPTIMIZATION

ASSESSMENT

1. Information is compiled on criteria affecting the assessment.
2. Assessment principles are taken into account.
3. Individual impacts of the project on criteria in the environmental, economic and social dimensions are assessed qualitatively. Any differential weightings of individual criteria are substantiated.
4. The assessment of impacts on the three dimensions of sustainable development as a whole is summarized and substantiated.
5. Important conflicting goals are presented and discussed.
6. The assessment as a whole is substantiated transparently. Involvement of affected agencies and, depending on the significance of the project, of other interest groups is assured.

OPTIMIZATION

1. Areas where optimization is required are clearly identified.

2. Optimization opportunities (variants and ancillary measures) are indicated. If possible, the variants are also subject to an impact analysis and assessment.
3. Proposals for optimizing the remaining course of the project are developed.

PRESENTING RESULTS

1. Results of assessment and optimization are presented in a transparent fashion. They may serve as decision support materials for decision-makers.
2. The guidelines for the next phase are established.
3. Quantitative and qualitative results are presented with equal emphasis. Graphical forms of presentation are always accompanied by textual explanations.
4. Uncertainties and risks are presented.

PART III OUTLOOK

The present conceptual framework provides a methodological foundation for carrying out a sustainability analysis of political projects and undertakings at strategy, programme, concept and plan levels. There are a number of questions that cannot be answered conclusively by this basic report. Therefore, the conceptual framework should be tested and refined using specific case studies in a subsequent phase of work. In addition to methodological refinements, work is also required on how sustainability assessment might appropriately be embedded in institutional and legislative terms at federal level. The following issues, in particular, must be addressed at this procedural level:

› What is the relationship between sustainability assessment and other existing or planned evaluation instruments at strategy, programme and concept level? In particular, what is the relationship between sustainability assessment and strategic environmental analysis?
› At what stages should other federal agencies and perhaps also cantons, municipalities and non-governmental organizations be consulted or involved? How should the federal agency in charge of the particular domain involve other agencies in the sustainability analysis, especially at the early stages (relevance analysis, impact analysis)? How can such involvement be guaranteed without consultations becoming too unwieldy?
› Should sustainability assessment as an instrument be given a binding foundation in law? Who will conduct relevance analyses, who will be informed of their findings and what opportunities will other federal agencies have to contribute?
› In what form should a sustainability analysis be communicated? In what form should it be incorporated in existing political processes (e.g. as part of a Federal Council Opinion)?
› How can sustainability assessment be embedded in existing structures and processes at the least possible additional cost?

Well-founded, practical answers to these questions should be formulated at a later date, with particular reference to the planned test application of sustainability analysis methodology.

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