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Summary of the Final Report on "Environmental Decision-Making: Methods and Tools"

Continuing debate and uncertainty with regard to possible environmental damage caused by the release of GMOs; increasingly congested traffic despite ozone alerts; the lack of adequate measures to curb the emission of greenhouse gases; a pile of radioactive waste but (as yet) no definite storage place; controversies over the health threats posed by the emission of pollutants, etc. These topical issues suffice to call into question the effectiveness of environmental policy.

This assertion constituted the starting point for the project on "Environmental Decision-Making: Methods and Tools", which was carried out by STEM within the broader framework of the programme entitled "Levers for a policy aimed at sustainable development" of the OSTC (Federal Office for Scientific, Technical and Cultural Affairs).

In the initial phase of the research project, the problems with which environmental policymaking is confronted were placed within the framework of a broader social analysis. This resulted in, among other things, an essay by former STEM-researcher D. Holemans: "Ecologie en burgerschap" (*Ecology and Citizenship*). The analysis of the environmental crisis presented in this publication provided the cornerstones of our search for effective support tools for environmental policymaking.

Furthermore, developments in three decision-supporting scientific disciplines were examined, namely Technological Assessment Research, Formal Analytical Decision Science, and Quantitative Environmental Assessment.

On the basis of observed developments and a broad social analysis, we were able to formulate criteria which innovative approaches and tools for environmental policy must meet.

Further, we drew up a draft guideline for developing a 'tailor-made' policy supporting process.
After all, each problematic situation has a 'unique' combination of characteristics, so that it is impossible to put forward a single procedure or method for dealing with policy issues relating to sustainable development.
The guideline is intended to provide a solid starting-point for a thorough analysis of problems and contexts that gives due consideration to the advantages and drawbacks of the methods to be employed.

The activities of STEM within the framework of a number of policy-oriented research projects for various government bodies allowed us to ascertain both the feasibility and the practicability of the proposed approach.

In the following paragraphs, we shall elucidate some of the results of the research project.

The social context in which tools for environmental policy must be applied
The issues which current environmental policy faces, including those already mentioned, are extremely complex, not only from a policymaking perspective, but also from a social and scientific viewpoint.

Policy-related complexity
None of the above listed issues is related exclusively to environmental policy: other areas of policymaking, such as technology, infrastructure and transport, agriculture and economics are equally relevant. Therefore, sustainable development must inevitably entail an integrated approach to the effects of decisions in each of these policy areas. Conversely, it must consider the environmental consequences of decisions in any other policy area. It speaks for itself that this increases the complexity of decision-making.

Scientific complexity
Health threats posed by pollution, global environmental change through human interference: man-in-the-environment is such a complicated system that complete knowledge of all influencing factors is out of the question. It has emerged that the request from policymakers for certain problem analyses and solution proposals was based on unrealistic expectations. In recent years, many ecological issues have been hotly debated by disagreeing scientists.

Societal and ethical complexity
However, not only scientists are disagreed on the nature and the cause of problems as well as on how they should be resolved. Citizens and groups in society have equally disparate opinions on ecological issues. Some believe firmly that a ‘bio’ lifestyle is the right solution, while others believe that business can carry on as usual, provided that certain ‘green’ corrections are made. This broad range of responses is occasioned by disagreement within society on values. The farmers’ union and consumers, the business manager and local residents, the driver and the cyclist, the plastic producer and the environmentalist: each actor emphasises different aspects of the same policy issue. Their positions are based on deeper, sometimes diametrically opposed, convictions and values. In short, society is made up of a multitude of perspectives on environmental issues.

Moreover, as the German sociologist U. Beck rightly asserts, in late-industrial society such underlying value systems are increasingly interpreted in a personal way. Tradition and institutionalised bodies have largely lost their significance as beacons, or pioneers or representatives of public opinion. Citizens increasingly respond to policy issues that affect them by forming ‘temporary coalitions’ in order to influence the policy agenda and to exact measures by means of ‘subpolitical’ actions. This is especially apparent in the environmental policy arena. Although this dynamics can be very positive, its unpredictable nature can represent an additional problem for a decision-making process that is geared to solution schemes.

The end of technocratic temptation
These fixed solution schemes usually attribute a dominant role in decision-making to technocratic expertise.

It would appear that policymakers, scientists and interest groups continue to believe that policy is based on so-called 'objective' knowledge. Scientists are expected to defuse or neutralise the debate on values and social objectives, and to treat problems that present themselves as purely technical issues.
This 'linear' solution scheme is untenable, not only because of the incompleteness and uncertainty of knowledge, but also because scientists themselves work within paradigms that offer different perspectives on the world. And these perspectives, which help determine the premises and hypotheses of experts, are not incorporated into such schemes as points for debate.
There is a real danger that using linear schemes may actually give rise to lasting controversies. Value-related concerns are not discussed in the 'objectified' discussion, but they may result in lasting debate on the scientific findings. The result is a purely strategic use of scientific information.

Towards a more participatory and interactive policy development

More participation and interaction can offer a way out of the complexity and lasting controversies.
By 'public participation', we mean that policymaking processes should be made accessible to groups and individuals who are 'traditionally' not involved. Decision-making will thus become less elitist and less '*we know best*'. Public participation is a process that supports decision-making by allowing interest groups, consumers, citizens, employees, voters, victims, target groups, … to provide information, put forward possible solution, or contribute to decision-making.
This differs in terms of form, participants and content from current procedures within advisory councils. In order to motivate citizens to participate in decision-making, a number of new forums are required. At its very best, participation may after all be conceived as genuine 'interaction' between the different perspectives involved in a policy issue, so that innovative solutions become possible.

In the light of the problems outlined above, the argumentation in favour of participation and interaction is threefold:

- Content-related argument: content of policy is defined more clearly
  Social and ethical considerations, experiential expertise and other forms of knowledge that are not involved in technocratic decision-making are now called upon. Through participation, a whole array of existing perspectives may be considered in the decision process. Under normal circumstances, this would be restricted to the perspectives of institutionalised discussion partners or appointed 'objective' scientists. Policy will ultimately be based on 'better' and more complete knowledge; its analytical power will be enhanced.

- Instrumental/pragmatic/functional argument: more efficient policy
  Participation leads to broadly shared responsibility for policy choices and possible unforeseen effects; it thus enhances the acceptance and robustness of decisions. By involving all relevant actors in the various phases of policy formation and policymaking, one increases the chance that the eventual measures can count on broader support and will meet with less resistance during implementation.

- Moral argument: a more democratic governance

Participation enhances the legitimacy of decisions. From the perspective of democratisation, it is often argued that political decision-making is too elitist and technocratic. In participatory initiatives, all parties concerned are given access to decision-making.

It would however be premature to regard participation as a 'paved road without obstacles towards a cleaner environment'.
First, it should be pointed out that it concerns social experiments whose dynamics and outcome are unpredictable.
Moreover, participation is not guaranteed to result in the most environmentally sound decisions.
It would however appear that increased participation is essential to developing environmental policy.
Another central question in this STEM-project was which elements of existing solution schemes and approaches are worth retaining?

Developments in a number of decision-supporting disciplines

The altered context we have just described (policy-related, actual and social complexity) also affects evolutions that we were able to ascertain in different disciplines. The assessment of these disciplines and reflection on what they might and should be able to contribute has prompted change in these areas.

Technological Assessment Research: from early warning to interactive development
Technological Assessment Research focuses on interactions between (desirable) social and technological developments, with the purpose of tuning them more closely to one another. TA consists in a collection of strategies, all of which are aimed at improving the functioning of technology in society, and increasing the impact of society on technological development.

TA emerged in response to questions regarding possible unforeseen negative effects of new technologies on public safety, health, employment, the environment etc.

The purpose of TA has always been to help influence technological choices in society. But the formula that is applied has changed quite significantly. TA has, over the past 20 years, developed from a rather objectifying social cost-benefit analysis of technological developments (by determining impacts and advantages) to a strategic activity for the benefit of decision-makers and policymakers. This evolution within the field of TA was influenced by changing views on technology (technology as a complex social construct whose consequences are not easy to predict) and society (society as a network of interacting players).

In the course of the past 20 years, the following shift of emphasis has taken place in TA:

- Early warning TA (EWTA). Originally, the aim of TA was to identify as quickly as possible all possible unintended side effects of technological development. EWTA ties in with technocratic decision-making. It produces scientific reports in which predictions are made of the societal impact of technological developments. Politicians can use such neutral, matter-of-fact information in decision-making.

Neither the scientists working on technological innovation, nor the public at large are involved in TWA.

- Constructive TA (CTA). From the 1980s, attention shifted to TA as an activity that can help steer the development process of technologies. The conviction grew that good TA must be based on deliberation between the various perspectives on the societal impact of technologies. Thus, the emphasis shifted towards the active involvement of all possible actors participating in the development, implementation and consumption of technologies. But CTA still represents a rather slow response to technological developments that are already underway. It is kept outside the laboratory and strategic decision-making.

- Interactive TA (iTA) or Participatory TA (pTA). In the current variants of TA-research, multiple perspectives are assumed, including those of laymen, the corporate world, environmental organisations and authorities. In other words, one takes due account of the viewpoints of all actors: those who are affected by the technology (the stakeholders) and those playing an active role in its development, implementation and incorporation into society (e.g. suppliers, sponsors, and implementers). Thus, the actors are able to work on development trajectories that are meaningful from the various perspectives. This far-reaching involvement in iTA produces more reliable and more robust results and recommendations. In this approach, one works on methods such as citizens' juries, consensus conferences, focus groups…

Formal decision science: from selection to support for debate and communication
Formal decision science is concerned with the application of formal rationality on complex problems so that the key elements in the decision –the goals, alternatives and uncertainties- are determined explicitly.

It concerns methods -often of a mathematical or numerical nature- such as multicriteria analysis, computer modelling, Delphi method, scenario analysis, cost benefit analysis, value tree analysis…

Using the above methods was long seen as a way of rationalising policy choices as strictly as possible. Multicriteria analysis was intended to determine mathematically an 'absolute' hierarchy of policy options. It was felt that, in this manner, one could ascertain which option was objectively the best and should therefore be chosen. Cost-benefit analysis, on the other hand, was intended to reduce all consequences of policy options to their monetary equivalent in order to determine which option would be optimal.

It speaks for itself that such a naïve outlook on policy issues conflicted with the observations regarding complexity described above.
A calculation of the optimum, an objective ranking, is hard to achieve as not all impacts of options can be assessed correctly beforehand. Matters become even more complicated if certain presuppositions of such methods are called into question after societal debate.

Therefore, there is a feeling, including within the field itself, that a different outlook on these methods is required and that they should be used in a different way in a decision-making context.

Consequently, more emphasis is now put on the possibilities they offer for structuring the debate and for supporting communication. These methods can indeed be incorporated into a participatory decision-making process, providing the required methodology and transparency. Policymakers, experts, stakeholders and citizens can, by means of some of these methods, be involved in an interactive process that takes due account of the reality of societal and ethical complexity. Participating actors could, for instance, select experts to evaluate the consequences of policy options. And these experts could debate possible effects and uncertainties (e.g. in Delphi rounds) in order to arrive at a realistic assessment. Actors could also be involved actively in the selection of criteria for analysis and evaluation.

Of the available methods in decision science, some are more suitable for such incorporation into an interactive process than others. For example, value tree analysis, which makes more explicit value-oriented concerns and priorities, can offer valuable support for an open and inclusive decision-making process.
Another example is multicriteria analysis, provided that it puts more emphasis on connecting scientific information with value-oriented arguments than on finding the optimal solution.
Cost-benefit analysis, on the other hand, would appear to be less appropriate in a context of multidimensionality, incomparability and value judgements – all of which are characteristics of the complex reality of decision-making.

Integrated Environmental Assessment: robust vs. contested knowledge
In environmental science, too, many methods have been developed for supporting decision-making. These include life cycle analysis, substance flow analysis, materials flow analysis, indicators, and risk assessment.

All these methods have in common that their implementation involves a 'system definition' phase (i.e. determination of the boundaries of the 'system' that one wishes to examine) and, after data collection, an interpretation phase.
In both phases, one is confronted with the phenomenon of complexity, the incompleteness of data and the uncertain nature of certain conclusions.

It is therefore not surprising that generating robust knowledge by means of these methods is no straightforward matter.
Research on the role and the use of such assessments in policy issues has shown that robustness of knowledge is, however, not solely dependent upon the quality of the actual data, but is also influenced by the existence of different perspectives (or mental frames) from where these issues are approached.
The Dutch researcher A. Tukker, for example, distinguishes between three perspectives in debates on the toxicity of chlorine and PVC in the Netherlands and Sweden:

- The 'business as usual' mental frame, which largely follows the traditional risk assessment approach (great confidence that people can acquire adequate knowledge regarding emissions and impacts, great confidence in technological

interventions aimed at restricting emissions and their consequences, great confidence in the 'resilience' of nature in dealing with human 'errors')
- A 'strict control' mental frame, which recognises the limitations of risk assessments (moderate confidence in the knowledge capacity, great confidence in technological solutions, belief in the vulnerability of nature)
- A 'phase-out' mental frame, which gives preference to a preventive and prudent approach (little confidence in human knowledge of emissions and effects, little confidence in technological solutions, belief in the vulnerability of nature).

If one wishes to acquire knowledge about complex systems, one must inevitably make choices and assumptions, formulate hypotheses… This process is however 'coloured' by the mental frames in which it unfolds. And the knowledge thus generated will therefore be contested by certain actors, if these choices are incongruent with their own mental frame. For this reason, robustness of knowledge, i.e. its capacity to remain 'standing' within the societal arena, depends upon the room that the debate creates for mental framework-related elements and arguments.

Tukker was able to conclude from his analyses that it is still possible in complex environmental issues to identify robust knowledge. Substance flow analysis data, for example, is almost always accepted in debates. Only a few elements from LCA and RA studies were also retained as robust: it concerns small amounts of data (e.g. about emissions), which can help shape a debate by establishing a link with other information and knowledge. A so-called linear application of RA and LCA ('LCA indicates that with regard to the chlorine-chain the best option is to …') appeared to be impossible. The reason cited by Tukker is that RA itself is situated within one of the above mental frames. Therefore, the results obtained can only be applied to a limited extent in socially charged debates.

Consequently Tukker argues in favour of a limited use of such methods and, first and foremost, in favour of their incorporation into a process in which all perspectives are taken into account.

Plurality and methodology: cornerstones for the design of open knowledge and policy processes in support of a sustainable development.

It is apparent from the description above that these disciplines have undergone a number of similar evolutions. The realisation of uncertainty and incompleteness and the necessity to broaden participation in the decision-making process are the driving forces behind these evolutions.

It therefore appears to us that there is a real opportunity for a synthetic approach whereby the best aspects of all these different disciplines are united into a 'tailor-made participatory decision-supporting process'.

The two keywords for shaping this process are: plurality and methodology.

Plurality

The approach must explicitly recognise and honour the existence of different mental frames.

The development of pTA and iTA is a good example in this respect. This kind of TA is a good way of looking for appropriate methods for making more explicit the arguments of the various actors involved regarding problem definitions, solutions, ways of thinking and deeper preferences. Gradually, through repeated confrontation, this approach can lead to an innovative synthesis offering new solutions.

Methodology

The approach must be transparent, among other things in terms of the method used in the assessment of options.

The methods used in formal decision science and integrated environmental assessment are intended to evaluate policy options by means of economic, physical, and administrative criteria. If applied correctly, they exhibit scientific earnestness; where possible, they provide arguments based on the persuasive power of data. Furthermore, tools have been developed in this tradition that allow one to present differences between expert opinions to the public in an understandable way (scenario building, multicriteria analysis, Group Delphi…).

Confronted with topical issues in environmental decision-making, this tradition has opened itself up to a more qualitative and interactive approach.

Criteria for a synthetic approach

At best, a synthesis of the two above traditions would imply a mutual enrichment of the social, policy and scientific discourse. It could lead to evaluations that integrate values and scientific knowledge and that are useful to policymakers. It could, for example, provide knowledge about more options, insight into the criteria that are relevant to decision-making, as well as insight into the source, the nature and the perception of uncertainties.

The purpose of a synthetic approach is to provide a framework for learning processes as well as a systematic exploration of issues. Key concepts are therefore: transparency, scepticism, independence, responsibility; but also: a broadening of the approach, taking due account of alternative options, plurality of societal perspectives, recognition of uncertainty and ignorance, and taking into consideration the question of usefulness and merit.

In order to attain these goals, we have, on the basis of our broad societal analysis and developments in decision-supporting disciplines, drawn up a list of relevant criteria that a synthesis must meet:

- Flexibility and a broad focus.
  The approach and methods as such should not impose restrictions in terms of the kind of criteria and arguments that one wishes to use for the assessment of policy options.

- Openness with regard to choices, values, mental frames and assumptions.

It should be possible to take account of a great variety of interests, values, priorities and assumptions. There should also be openness with regard to possible policy strategies and options.

- Honesty with regard to uncertainty.
  Uncertainties must be recognised and studied. The analysis must 'explore' a wide range of possible outcomes.

- Heuristic exploration rather than unusable precision.
  The methods used should not be regarded as an 'analytical fix' which itself determines a specific 'rational' decision. They must also provide support for the acquisition of relevant knowledge and an exploration of policy strategies.

- Analytical discipline and sincerity
  The methods used must have an adequate theoretical basis. Their application must be systematic and verifiable.

- Transparency in order to allow review
  A form of audit must be possible in order to connect the results with different 'inputs', assumptions and parameters.

- Openness towards broad participation
  The methods must allow an open, participatory and argumentative approach.

- The possibility of incorporation into regulatory processes.
  The requirements that methods impose must be 'realisable', their implementation must not be excessively expensive. The dangers of ambiguity and non-robust results must be minimised.

- Feedback, iteration, reflexivity
  A successful approach to dealing with complex issues must allow learning processes, and thus provide feedback.

- Stimulate multidisciplinarity
  The incorporation of different disciplines is necessary for dealing with such complex issues. The approach must enhance co-operation between these disciplines.

Toolbox

Methods from these different traditions, which we have retained for a tailor-made process, have been collected in a tentative 'toolbox'.

- Consensus conferences
- Citizens' juries
- Scenario workshops
- Focus groups
- Interactive surveys
- Value tree analysis
- Decision analysis
- Multicriteria analysis

- Sensitivity analysis
- Scenario analysis
- Delphi

A tailor-made decision process

The above list of methods to be used should not create the impression that one can outline ex ante the entire approach to any decision-making process in relation to sustainable development.
The list merely represents a set of approaches, methods and tools that can be applied flexibly. An analysis of the problem and the policy context constitutes a necessary phase and will provide a guideline for the eventual shaping of the decision-making process.

Therefore, in the next phase of our research, we dealt at length with the characterisation of policy issues and contexts.
To this end, we consulted the literature and conducted a transversal analysis of a series of case studies in which STEM was involved. All of these cases were relevant to policy issues relating to sustainable development.

The characteristics of policy issues and contexts that were considered to be important were:

- whether or not the policy issue was structured (which is determined by the uncertainty over facts and values involved);
- the development stage of policy issues (is it at an exploratory phase, the policy formulation phase or the policy implementation phase?);
- the maturity of technology development and its position within the policy debate;
- the socio-political context of the policy issue:
  - Who are the stakeholders?
  - To what extent has the issue been institutionalised?
  - What is the extent of antagonism? (i.e. are there very obvious differences of opinion and/or interests among the actors involved?)
- the public and the political agendas:
  - Is the issue visible and has it drawn much interest?

Taking into account these characteristics, a number of choices need to be made with regard to the design of the process, including:

- the selection of participants in the process: should participation be limited to experts or stakeholders, or should the public at large also be involved? How should the notion of 'representativeness' be approached?
- the intended role of the policy-supporting process in decision-making: does one wish to achieve direct policy support or is the process meant to keep a certain distance from political decision-making?
- the rules of interaction and communication: what is the role of the various participants?
- problem formulation.

The choices that are made in the design will therefore determine the selection of supporting tools.

Building on the emphasis that we put on the need for interaction and debate, and in order to guarantee the legitimacy of the decision-making process, we believe that it may be necessary for the shaping of the process itself to proceed on the basis of a so-called 'open and exclusive design'.

Putting theory into practice

In the international literature, a number of examples can be found of policy-supporting methods that combine plurality and methodology.

The British researcher A. Stirling, for example, proposes a multicriteria mapping process involving participation by stakeholders. He has tested the method on applications in energy- and technology-related policies (including with regard to GMOs).

The German researcher O. Renn, for his part, developed a three-phased approach in which stakeholders, experts and citizens all play a role. This model, too, has been implemented in the context of energy policy.

STEM uses the acquired expertise on innovative decision-making in a number of policy-oriented research projects on the environment and technology, including with regard to biotechnology, environment and health and sustainable mobility.

A good illustration of this approach is the design of a participatory concept for the design of a Strategic Environmental Impact Assessment (S-EIA). STEM developed this concept as part of the Draft Mobility Plan for Flanders (Ontwerp Mobiliteitsplan Vlaanderen).
We shall elucidate some relevant aspects of this plan.

Decision context

Decision-makers in Flanders put forward certain views on 'sustainable mobility', which have been translated into five strategic goals with regard to reachability, accessibility, liveability, environment and safety. Generally speaking, this view is shared by the stakeholders.
However, a consensus is still lacking on the actions and measures required for reaching these goals.
In this instance, the political objective of the debate will be: how to filter the proposed approach scenarios in order to arrive at a mobility plan for which there is sufficient support?

Question put to STEM and consortium of environmental experts:

How should the legal procedure of an S-EIA be used in order to filter (i.e. to evaluate and to select) the proposed scenarios (i.e. packages of measures) in an effective and pluralistic way?

- Effective: supporting the policy option for a scenario that offers the greatest likelihood that the goals set will be realised, by incorporating all relevant knowledge and perspectives;
- Pluralistic: broadening of perspectives (i.e. taking due account of social and environmental considerations besides economic factors) and involvement of more

actors in the debate (i.e. specific target groups and individual citizens besides established stakeholders).

Suggestions from STEM with regard to the concept of participation (draft)

The participatory concept within the legal frameworks of S-MER (European Draft Directive on Planning and Programmes) is vague with respect to the following questions:

- Who may participate in which phases of the design of an S-EIA?
- What is meant by participation, and which participation strategy may be followed?
- What will be the impact of participation on the various decision moments in the planning process?

One of the basic principles of an S-EIA is that the entire planning process should be made transparent for a broad public. This translates into a necessity of communication about the different phases of the planning process with a broad public, and participation in analyses, choices and decisions on the part of organisations and citizens involved.

Assessing the future effects of existing mobility scenarios involves two types of uncertainty:

- with regard to knowledge: scientific uncertainty about the prediction of the scope of effects;
- with regard to values: uncertainty about the importance that is attributed to different impacts.

Therefore, there is a need for participatory methods that take due account of these two types of uncertainty.

STEM makes a number of other suggestions with regard to the interpretation of the notion of participation in the different phases of an S-EIA.

1. *Screening:*

In this phase, one needs to answer the question: is an S-EIA required for this plan? And if it is, then which procedure should be followed for drawing up the report?
At present, screening procedures are often conducted by the authorities, without any involvement of the directly or indirectly affected public. By involving the public at this very early stage, one creates trust and a basis of support for subsequent decisions.
Proposed method: experts as well as laymen should interactively fill in a matrix, in which horizontals represent the proposed activities for the mobility plan, and verticals represent the significant social and environmental impacts. For each intersection, one debates whether there are likely effects, and how significant they may be. On this basis, one can decide whether or not an S-EIA should be carried out.

2. *Scoping:*

In this phase, one determines which environmental and social impacts will be considered and which frame of reference will be applied for the assessment of different options or scenarios. We suggest that value tree assessment be used to this end.
Value tree analysis is based on the assumption that all concerns can be structured within a generally accepted framework. It is therefore a tool for enhancing communication and interaction between stakeholders in their search for shared solution strategies.

The product is a value tree consisting in a hierarchically structured list of values or criteria that represent the concerns of the stakeholders. The criteria retained are translated by the research team into indicators (and their targets), so that the performance of alternative policy options could be assessed. These indicators should in turn be presented to the stakeholders and, if so required, adapted until they are approved.

3 Impact assessment
In this phase, scenarios are generated and assessed.
Principle: do not work towards one preferred option too quickly, but proceed gradually, and try to acquire better insight into alternatives and their consequences through debate and negotiation (with experts, stakeholders, policymakers). Or: not the solution is central, but the process of scientific knowledge-building in relation to the values and concerns of stakeholders.
Proposed method:

- future-oriented workshops with participation by experts, civil servants, stakeholders, with a view to generating scenarios;
- A Delphi Round to provide performance profiles for each scenario: with contributions by different kinds of expertise (various disciplines, different perspectives within one discipline, professional experience, anecdotal knowledge and experiences…) and with explicit mention of uncertainties and mental frames.
- Multicriteria analysis and mapping: citizens' panels to assess proposed scenarios by means of criteria that appear in the value tree.

4. Review:
This phase provides an opportunity for voicing critical comments on the S-EIA. At present, this is seen primarily as a matter for the public administration. However, it is very important that a broad public also be given an opportunity to formulate remarks. Besides independent experts, interest groups and the general public need to be consulted. The report on this phase should be made public and any remarks should be incorporated into decision-making on the plan.
Proposed method: assessment of the report may happen on the basis of a checklist of topics referring to the quality of the analytical and the participatory process.

5. Decision-making
We propose that a report of the decision-making phase be drawn up that contains a justification for the choices made: why were environmental and societal factors balanced against other factors in this particular way? And why was a choice made for the plan in its present form, considering the possible alternatives?
This report, too, should be publicised broadly.

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