Exercise Knowlegde Quality Assessment

In the attached course materials you find:

- The *RIVM/MNP Guidance for Uncertainty Assessment and Communication: Minichecklist and Quickscan Questionnaire*
- A Pedigree Matrix for evaluating models (use it for question 4 of Quickscan)
- The Uncertainty Matrix (use it for question 5 of Quickscan)

Select a case to work on
For this exercise you can choose a quantitative risk assessment study on an issue with which you are familiar. It can be for instance a health risk or an environmental risk. The organisers of this course have selected a few cases from which you can choose, but you can also work on a case that you selected yourself. The subject of your case is not so important, because the goal of this exercise is to learn to apply tools for knowledge quality assessment to a quantitative risk assessment study.

Assignment (group work, in groups of about 6 person):
Suppose you have the task to write a report to inform policy makers on the risk-issue of the case that you selected. You want to be explicit in your report about the uncertainties so you use the Uncertainty Guidance to assess and identify the most important uncertainties.

Apply the *Quickscan Questionnaire* to your case.

Step 1: Read the risk assessment study and make a reconstruction of all the steps taken in that study to quantify the risk. What indicators have been used to express the risk? What methods have been used to quantify this indicator? What are the inputs of each calculation of the indicator? What are the outputs of the calculations? What are the causal relationships between input and output? What extrapolations and or interpolations are made? What are the main assumptions made in this study? Draw a **scheme representing the chains of calculations** behind the indicator used in this study. Put this scheme on a transparency or a flip-over (***product 1***).

Step 2: Apply the *Quickscan Questionnaire* to assess and identify the main uncertainties in the study. **Start on page 9 with Question 1.** Keep track of all uncertainty issues that you identify on a **"gross list of key uncertainties"**

Depending on the answers you give you will be referred to Hints and Actions, which you can look-up in the *Quickscan Hints and Action list*. One copy of this document is available for each group. Look up those hints and actions, and collect the relevant ones on a **"to-do list"**. If you think a deeper analysis is needed, the *Quickscan Hints and Action list* has a column "More details in", which refers you to relevant parts of the "*Detailed Guidance*" that you can use for further elaboration.

> Note that the Quickscan checklist was designed for use in the context of the Netherlands Environmental Assessment Agency to use it during making an assessment. In this exercise you use it differently, so use it with some flexibility. For instance, the first 2 questions under 1a talk about "the client's view" and "other views". Do not take this literally in this exercise. The point here is to make an inventory of different views that may exist on the problem, so do a brainstorm here to identify different ways in which the problem can be defined.

At third sub-question under Quickscan question 4, use the *Pedigree Matrix for evaluating models*. Give a pedigree score on each of the six criteria and carefully document your argumentations and reasons for giving each score. Put the pedigree scores for each method on a transparency or a flipchart and write a short elaboration motivating the reasons why you decided to give these scores and not higher or lower scores for each criterion (***product 2***)

At Quickscan question 5, start with applying the *Uncertainty Matrix*. Some hints on how to apply the Uncertainty Matrix can be found on page 17 of the *Quickscan Hints & Actions List.*

Step 3. Prioritize the list of key uncertainties and the hints and actions collected on your ToDo list. Put the prioritized list of ke y uncertainties (most important uncertainty on top) on a transparency (***product 3***). Put the prioritized list to-do list of hints and actions (most important hint or action on top) on a transparency (***product 4***).

End products of the group work to be presented in the plenary (put on transparencies or flip-charts):

- Product 1: A causal scheme of the calculations made in the risk assessment study that you worked on
- Product 2: The pedigree scores and elaboration of argumentation for each score
- Product 3: A prioritized list of key uncertainties
- Product 4: A prioritized list of hints and actions on how to deal with these uncertainties.

Table 1 Pedigree matrix for evaluating the tenability of a conceptual model

Score	Supporting empirical evidence		Theoretical understanding	Representa-tion of understood underlying mechanisms	Plausibility	Colleague consensus
	Proxy	Quality and quantity				
4	Exact measures of the modelled quantities	Controlled experiments and large sample direct measurements	Well established theory	Model equations reflect high mechanistic process detail	Highly plausible	All but cranks
3	Good fits or measures of the modelled quantities	Historical/field data uncontrolled experiments small sample direct measurements	Accepted theory with partial nature (in view of the phenomenon it describes)	Model equations reflect acceptable mechanistic process detail	Reasonably plausible	All but rebels
2	Well correlated but not measuring the same thing	Modelled/derived data Indirect measurements	Accepted theory with partial nature and limited consensus on reliability	Aggregated parameterized meta model	Somewhat plausible	Competing schools
1	Weak correlation but commonalities in measure	Educated guesses indirect approx. rule of thumb estimate	Preliminary theory	Grey box model	Not very plausible	Embrionic field
0	Not correlated and not clearly related	Crude speculation	Crude speculation	Black box model	Not at all plausable	No opinion

UNCERTAINTY MATRIX			Level of uncertainty *(from determinism, through probability and possibility, to ignorance)*			Nature of uncertainty		Qualification of knowledge base (backing)			Value-ladenness of choices		
Location ↓			**Statistical uncertainty (range+ chance)**	**Scenario uncertainty (range as 'what-if' option)**	**Recognized ignorance**	**Knowledge-related uncertainty**	**Variability-related uncertainty**	**Weak** –	**Fair** 0	**Strong** +	**Small** –	**Medium** 0	**Large** +
Context		Ecological, technological, economic, social and political representation											
Expert judgement		Narratives; storylines; advices											
Model	**Model structure**	Relations											
	Technical model	Software & hardware implementation											
	Model parameters												
	Model inputs	Input data; driving forces; input scenarios											
Data (in general sense)		Measurements; monitoring data; survey data											
Outputs		Indicators; statements											

Table 1a: Uncertainty Matrix

RIVM/MNP GUIDANCE FOR UNCERTAINTY ASSESSMENT AND COMMUNICATION

MINI-CHECKLIST & QUICKSCAN QUESTIONNAIRE

Arthur C. Petersen, Peter H. M. Janssen, Jeroen P. van der Sluijs, James S. Risbey and Jerome R. Ravetz

Contents

This brochure contains the *Mini-Checklist* and the *Quickscan Questionnaire* of the *RIVM/MNP Guidance for Uncertainty Assessment and Communication*. The Guidance has been developed under the direction of Peter Janssen (RIVM/MNP) and Jeroen van der Sluijs (Utrecht University) as part of the strategic research project 'Uncertainty Analysis' (S/550002) at RIVM.

The following volumes are currently scheduled for publication in the *RIVM/MNP Guidance for Uncertainty Assessment and Communication Series*:

1. *Mini-Checklist & Quickscan Questionnaire*, A. C. Petersen, P. H. M. Janssen, J. P. van der Sluijs *et al.*, RIVM/MNP, 2003
2. *Quickscan Hints & Actions List*, P. H. M. Janssen, A. C. Petersen, J. P. van der Sluijs *et al.*, RIVM/MNP, 2003
3. *Detailed Guidance*, J. P. van der Sluijs, J. S. Risbey *et al.*, Utrecht University, 2003 (to be published in the summer)
4. *Tool Catalogue for Uncertainty Assessment*, J. P. van der Sluijs, J. S. Risbey *et al.*, Utrecht University, 2003 (to be published in the summer)

Title: *RIVM/MNP Guidance for Uncertainty Assessment and Communication: Mini-Checklist & Quickscan Questionnaire* (*RIVM/MNP Guidance for Uncertainty Assessment and Communication Series*, Volume 1)
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Introduction to the Guidance

The *RIVM/MNP Guidance for Uncertainty Assessment and Communication* offers assistance to employees of the Netherlands Environmental Assessment Agency (MNP) in mapping and communicating uncertainties in environmental assessments.[1] It was judged that the Guidance should support dealing with uncertainties *in a broad sense* (that is, broader than only applying ready-made tools for uncertainty analysis and communication), for in all parts of environmental assessments choices are made which have a bearing on the way uncertainties are dealt with.

In the Guidance special attention is paid to the following parts of environmental assessments:

- problem framing;
- involvement of stakeholders;
- selection of indicators;
- appraisal of knowledge base;
- mapping and assessment of relevant uncertainties;
- reporting of uncertainty information.

A directed effort to analyse and communicate uncertainty is usually made in the last two parts mentioned. However, the choices and judgements which are made in the other four parts are also of high importance for ascertaining the most relevant uncertainties and for communicating about them. The Guidance is intended to stimulate *reflection* on choices which are made in different parts of environmental assessments. This can lead to more conscious choices and – as we would argue – a better way of dealing with uncertainties.

Purpose of the Guidance

Besides stimulating reflection during the execution of environmental assessments, the Guidance is intended to signal timely which bottlenecks could occur with respect to dealing with uncertainties (and what additional effort should perhaps be made in the field of uncertainty assessment). The Guidance offers advice on the selection of methods and tools to adequately estimate uncertainties in the given context and to communicate them to scientific researchers, the clients (usually ministries), other actors in the policy process, and the broader public.

[1] The Dutch name of the agency is 'Milieu- en Natuurplanbureau', abbreviated as MNP. The agency forms a part of the National Institute for Public Health and the Environment (RIVM).

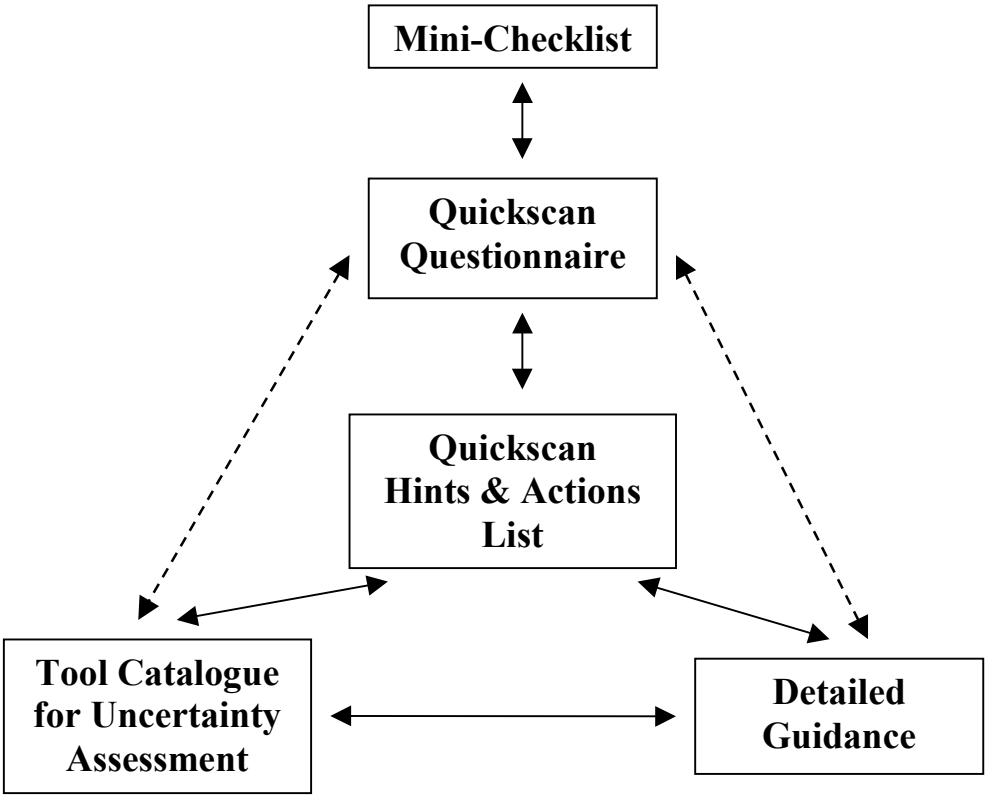
Using the Guidance

The group of intended users of the Guidance comprises a large fraction of the employees of the MNP (among others, those who fulfil the roles of project leader, project-team member, researcher or policy adviser). The Guidance will not be used with a similar frequency and at a similar level by all. As a rule, project leaders will use those components of the Guidance which are at a high level of aggregation (the *Mini-Checklist* and the *Quickscan*), while project-team members, researchers and policy advisers will more often also take up the more detailed Guidance.

The Guidance can be used in different phases of a project (in the beginning, during, after). *In the beginning* of a project, the Guidance can play an important role in designing and elaborating the way uncertainty will be dealt with during the project. *During* a project, the Guidance can be of assistance in performing the uncertainty assessment and communicating the results. *After* a project, the Guidance can be of use in reviewing and evaluating the project.

The Components

The Guidance has a layered structure and can therefore be used at varying levels of aggregation. Schematically, the structure looks as follows:



For each component details follow below:

- The **Mini-Checklist** is central and can serve as:
  - reminder list and instrument for reflection on the (desired) way of dealing with uncertainty in providing policy advice (this reflection can be done in one's head);
  - brief account of the way uncertainty has been dealt with;
  - entry/portal to the relevant components of the (remainder of the) Guidance, by referring the user to questions in the Quickscan Questionnaire if elaboration is required.

- The **Quickscan Questionnaire** has the following functions:
  - reflection on, accounting of, and putting down in writing the way uncertainty will be/has been dealt with;
  - (optional) referring of the user to the Quickscan Hints & Actions List if hints and/or comments are required.

- The **Quickscan Hints & Actions List** has an advisory, guidance function and describes some possible implications of the answers given to the questions in the Quickscan Questionnaire.

- The **Detailed Guidance** is an analysis tool with which various aspects of dealing with uncertainty can be further explored. The Detailed Guidance also contains a glossary of terms related to uncertainty assessment and communication.

- The **Tool Catalogue for Uncertainty Assessment** offers information on the different tools that can be utilized to assess uncertainties.

The *Detailed Guidance* and the *Tool Catalogue for Uncertainty Assessment* are available as reports published by the Copernicus Institute for Sustainable Development and Innovation, Utrecht University (available from www.nusap.net).

When to Use Which Components?

Which components of the Guidance will be used in an environmental assessment largely depends on the importance, the nature and level of the uncertainties in the assessment concerned and on the resources available. The following scheme makes a suggestion for the use of the different components:

	Importance of uncertainty ↓		
Resources available ↓	**Small**	**Medium**	**Large**
Few	**MC**	**MC(+QS)**	**MC+QS**
Medium	**MC+QS**	**MC+QS**	**MC+QS(+DG)**
Many	**MC+QS**	**MC+QS(+DG)**	**MC+QS+DG**

Abbreviations

MC Mini-Checklist
QS Quickscan Questionnaire and Hints & Actions List
DG Detailed Guidance

Authors of the Guidance

The Guidance has many authors. The *Mini-Checklist* and *Quickscan* have been written by Peter Janssen, Arthur Petersen, Jeroen van der Sluijs, James Risbey and Jerry Ravetz. The following persons participated in the production of the *Detailed Guidance* and *Tool Catalogue*:

- Jeroen van der Sluijs, James Risbey, Penny Kloprogge (Utrecht University)
- Jerry Ravetz (Research Methods Consultancy, U.K.)
- Silvio Funtowicz, Serafin Corral Quintana, Ângela Guimarães Pereira (Joint Research Centre, Italy)
- Bruna De Marchi (Institute of International Sociology, Italy)
- Peter Janssen, Arthur Petersen, Willemijn Tuinstra (RIVM)
- Rob Hoppe, Simône Huijs (University of Twente)
- Marjolein van Asselt (Universiteit Maastricht)

The material has been reviewed (inter)nationally (a.o., by means of an expert workshop held in October 2001). Furthermore, many employees of the MNP have contributed to the development of the Guidance through the user workshop held in November 2001, through reviews and through trial sessions in which some components of the Guidance were tested. For more information about the Guidance, please contact the current 'Uncertainty Analysis' project leader, Dr. Arthur C. Petersen (arthur.petersen@rivm.nl).

Mini-Checklist

1. Problem Framing In our assessment we pay attention to: (i) existing views on the problem other than the client's (including our own view), (ii) the interwovenness with other problems, (iii) possibly relevant aspects of the problem that are not dealt with in the research questions, (iv) the role the study is expected to play in the policy process, and (v) the way the study connects to previous studies on the subject. Wholly / Partly / Insufficiently	**Elaboration required (possibly for specific parts)?** ❍ No, because . . . ❍ Yes, because . . . → *Go to Quickscan question **1***
2. Involvement of Stakeholders We have a clear picture of: (i) the relevant stakeholders, (ii) their views and roles with respect to the problem, and (iii) the problem aspects about which they disagree. On the basis of all this, we have decided *if*, *how* (in formulating research questions, contributing information/data, evaluating findings/results), and *when* (in the beginning, during, after) we should involve *which* stakeholders in this assessment. Wholly / Partly / Insufficiently	**Elaboration required (possibly for specific parts)?** ❍ No, because . . . ❍ Yes, because . . . → *Go to Quickscan question **2***
3. Selection of Indicators We can provide adequate backing for the selection of indicators and their mutual relationships, we have considered alternative indicators, and in our report we discuss the limitations of the use of these indicators for this problem; we know the level of support among scientists and within society (including decision makers/politicians) for the use of these indicators. Wholly / Partly / Insufficiently	**Elaboration required (possibly for specific parts)?** ❍ No, because . . . ❍ Yes, because . . . → *Go to Quickscan question **3***

4. Appraisal of Knowledge Base We have determined the adequacy of the knowledge base by establishing: (i) the knowledge and methods which are needed to obtain answers of the required quality, (ii) the most important bottlenecks in the available knowledge and methods, and (iii) the impact of these bottlenecks on the quality of the results. In consultation with the (internal and external) client, we have decided what should be done about these bottlenecks. Wholly / Partly / Insufficiently	**Elaboration required (possibly for specific parts)?** ❍ No, because . . . ❍ Yes, because . . . → *Go to Quickscan question **4***
5. Mapping and Assessment of Relevant Uncertainties We have a clear picture of: (i) the uncertainties most relevant to the problem, (ii) the effort associated with an adequate mapping and assessment of these uncertainties, and (iii) the consequences of these uncertainties for the conclusions of this assessment. On the basis of all this and in consultation with the (internal and external) client, we have decided how to map and assess the relevant uncertainties given the available resources (money, time, expertise, etc.). Wholly / Partly / Insufficiently	**Elaboration required (possibly for specific parts)?** ❍ No, because . . . ❍ Yes, because . . . → *Go to Quickscan question **5***
6. Reporting of Uncertainty Information We have a clear picture of: (i) the context of reporting (why, to whom, on behalf of whom, when, where) and (ii) the robustness of the main messages. We report in a manner which is clear and tailored to the audience: (a) the policy-relevant uncertainties and (b) their possible consequences for policy making, politics, and society (what are the consequences of these uncertainties in terms of potential effects or risks?). In written reporting, we see to a balanced and consistent depiction of results in the different parts of the report, while providing traceability and adequate backing for the material presented. Wholly / Partly / Insufficiently	**Elaboration required (possibly for specific parts)?** ❍ No, because . . . ❍ Yes, because . . . → *Go to Quickscan question **6***

Quickscan Questionnaire

Question 1. How has the problem been framed (which contextual factors have been included/excluded)?

1a. Problem View

- ✓ What is the client's view on the problem (in two sentences)?
- ✓ Are there other views on the problem than the client's? What are these (two sentences per view)? (This question relates both to views held by the MNP employees involved and to views held by third parties. Elaborate both political/societal and scientific aspects.)
  ⇨ *1a-H1,1a-H2*[*]
- ✓ How strongly is the problem interwoven with other problems? With what other problems?
  ⇨ *1a-H3*

1b. Knowledge Needs and Research Questions

- ✓ What knowledge does the client need with regard to the problem (in two sentences)?
- ✓ In which research questions have these knowledge needs been translated by the MNP (one sentence per research question)?
  ⇨ *1b-H1*
- ✓ Which possibly relevant aspects of the problem are not dealt with in the research questions? For what reason have these aspects not been dealt with (one sentence per aspect)?
  ⇨ *1b-H2, 1b-H3*

1c. Policy Context and Problem History

- ✓ What is the role of the assessment in the policy process? (Check all that apply.)
  - ad hoc policy advice
  - to evaluate existing policy
  - to evaluate proposed policy
  - to foster recognition of new problems
  - to identify and/or evaluate possible solutions
  - to provide counter-expertise
  - other (describe)
    ⇨ *1c-H1*
- ✓ What has been told about this problem in the past?
  ⇨ *1c-H2*

[*] The coding refers to entries in the *Quickscan Hints & Actions List*.

Question 2. Which are the main parties (stakeholders/actors) involved, what are their views and roles with respect to the problem, and what implications does all this have for the way they should be involved in the assessment?

2a. Inventory of Stakeholders and Their Views on the Problem

✓ Which are the main parties (stakeholders/actors) involved in this problem and to what extent has the problem been recognized by these parties (taking into account their possibly different views and roles with respect to the problem)?
(Fill out the first two main columns of table 1.)
⇨ *2a-H1, 2a-H2*

2b. Problem Characteristics

✓ Do any of the following characteristics apply to this problem? (Check all that apply.)

- there is dissensus about policy goals with respect to the problem and/or about the direction in which solutions need to be found
  ⇨ *2b-H1*
- decision stakes are high
  ⇨ *2b-H2*
- there is dissensus about the (type of) knowledge needed to solve the policy problem
  ⇨ *2b-H3*
- major uncertainties exist regarding the behaviour of the (natural and social) system(s) under study
  ⇨ *2b-H4*

2c. Required Stakeholder Involvement

✓ What role and contribution of stakeholders in the assessment is considered and during which phase (in the beginning, during, after)?
(Fill out the final main column of table 1.)
⇨ *2c-H1*

Table 1: The Main Stakeholders and Their Involvement in the Assessment

Identify the main stakeholders for this problem: ↓	**Has the issue been recognized as a problem? (question 2a)**				**What involvement in the assessment is required? (question 2c)[2]**		
	Hardly	Partly	Mostly	Elaboration[3]	Problem framing and/or selection of indicators	Source of knowledge and/or data/infor-mation	Evaluation of results and/or process (extended peer review)
❑ Cabinet and ministries (national)	❑	❑	❑				
❑ Parliament (national)	❑	❑	❑				
❑ Governmental advisory councils (e.g., VROM-raad, SER, RMNO, Health Council)	❑	❑	❑				
❑ Other governmental actors (local/regional/international)	❑	❑	❑				
❑ Other national 'planning offices' (CPB, SCP, RPB)	❑	❑	❑				
❑ Research institutes/consultancies	❑	❑	❑				
❑ Scientists/universities	❑	❑	❑				
❑ Sector-specific stakeholders/actors (from, e.g., agriculture, transport, industry)	❑	❑	❑				
❑ Umbrella organisations (e.g., VNO)	❑	❑	❑				
❑ Environmental and consumer organisations	❑	❑	❑				
❑ Unorganised stakeholders; citizens	❑	❑	❑				
❑ Media	❑	❑	❑				
❑ Other (specify) . . .	❑	❑	❑				

[2] Briefly elaborate the required involvement; also indicate in which phase of the assessment the stakeholder should be involved.
[3] Specify the role and the (possibly deviating) problem view of the identified stakeholder.

Question 3. What are the main indicators used in this assessment and how do these correspond to the problem definition?

- ✓ What are the main indicators used in this study, and how well do these address key aspects of the problem as it has been framed?
  - ⇨ *3a-H1, 3a-H2, 3a-H3*
- ✓ How much support is there among scientists and within society (including decision makers/politicians) for the use of these indicators for this problem?
  - ⇨ *3b-H1, 3b-H2*

Question 4. How adequate is the knowledge base that is available for the assessment?

- ✓ What quality criteria are relevant for the answers to the research questions?
  - ⇨ *4a-H1*
- ✓ What policy-relevant controversies exist with regard to the knowledge base?
  - ⇨ *4b-H1*
- ✓ What are the major bottlenecks in the knowledge base for obtaining answers of the required quality, in the light of existing controversies and the strengths and weaknesses in the knowledge base?
  - ⇨ *4c-H1*
- ✓ What are the implications of these bottlenecks for the scope, quality and acceptance of the findings of this assessment?
  - ⇨ *4d-H1,4d-H2,4d-H3,4d-H4*
- ✓ How can these bottlenecks be tackled best, either during or after this assessment?
  - ⇨ *4e-H1*

Question 5. What are the relevant uncertainties for this problem and what is their nature and location?

✓ How do uncertainties need to be dealt with in the assessment? (Check all that apply; note that the answers may vary per indicator. Briefly elaborate the reasons for your choices.)

- uncertainties are expected not to play a significant role
- the *robustness* of policy-relevant conclusions in the light of underlying uncertainties is investigated and explicitly reported
- the uncertainties most relevant to policy are identified
  - the *possible implications* of these uncertainties for policy-relevant conclusions are discussed (e.g., what may be the implications for meeting/not meeting the policy targets, etc.?)
  - information is given about the *nature* of the policy-relevant uncertainties (e.g., is the uncertainty primarily caused by limited knowledge[4] or does it stem from the unpredictable and variable nature of the system at hand[5]?)
  - information is given on the (im)possibility to *reduce or control* these uncertainties and on their possible effects (e.g., is it possible to reduce knowledge uncertainties by gathering more knowledge in the future? Can the effects of intrinsic uncertainty be reduced by taking specific policy measures?)
- uncertainties in the major *outcomes* are stated explicitly.
  - a quantitative description of policy-relevant uncertainties is required (e.g., ranges, outcomes of scenario studies)
  - a qualitative description of policy-relevant uncertainties suffices
- the major *'sources of uncertainty'* are identified and their contribution to the overall uncertainty is determined
  - A quantitative analysis is required (e.g., a quantitative sensitivity analysis)
  - A qualitative analysis suffices

⇨ *5a-H1, 5a-H2*

[4] E.g., controversies; lack of insight; preliminary research; limited empirical basis (few measurements available or possible).
[5] E.g., limited predictability of human behaviour; socio-economic developments; degree to which policies and measures are implemented; degree of compliance, etc.

✓ Which aspects of uncertainty require additional attention, based on the following problem characteristics?
(Check all that apply. Note that this may vary per indicator.)

- various assumptions are critical
  ⇨ *5b-H1*
- the estimate of an indicator is close to a (legal) norm or (policy) target for that indicator
  ⇨ *5b-H2*
- a small change in an indicator estimate may have a significant influence on the estimated costs, impacts or risks
  ⇨ *5b-H2*
- there is dissensus about policy goals
  ⇨ *5b-H3*
- decision stakes are high
  ⇨ *5b-H4*
- there is dissensus about the (type of) knowledge required to solve the problem
  ⇨ *5b-H5*
- major uncertainties exist regarding the behaviour of the (natural and social) system(s) under study
  ⇨ *5b-H6*
- the assessment method used has typical uncertainties associated with it, which require additional attention (e.g., model-structure uncertainties when models are used)
  ⇨ *5b-H7*

✓ Where are the most important uncertainties expected to be found and what is known about their nature?
⇨ *5c-H1*

✓ What actions or methods are required to better map the most important uncertainties and how feasible is this given the available resources? What uncertainty-assessment activities will be carried out?
⇨ *5d-H1*

Question 6. How is uncertainty information reported?

6a. Identifying Audience and Main Messages (and Tuning These to One Another)

✓ What are the main messages that you want to convey and how do these match the interest and needs of the receiver(s) and what the receivers intend to do with the information?

⇨ *6a-H1, …, 6a-H5*

6b. Identifying Robustness of Main Messages

✓ What are the major assumptions on which the main messages of the policy advice/report are based and how robust are the major conclusions in the light of these assumptions as well as uncertainties in the underlying knowledge base?

⇨ *6b-H1,…,6b-H3*

6c. Identifying Policy-Relevant Aspects of Uncertainty

✓ Which aspects of uncertainty require additional attention in the light of their policy relevance?

⇨ *6c-H1*

6d. Clearly Reporting Uncertainties

✓ How is the clarity of statements on uncertainty warranted?

⇨ *6d-H1,…,6d-H4*

6e. Balancing and Ensuring Consistency of Reported Uncertainty Information

✓ How does one achieve a balanced and consistent reporting of uncertainties?

⇨ *6e-H1,…,6e-H9*

6f. Providing Traceability and Backing in Written Reporting

✓ How does one provide for a traceable and well-documented backing of the material presented?

⇨ *6f-H1,…,6f-H3*