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INTERGOVERNMENTAL PANEL ON climate change

**Decisions taken by the Panel at its 32nd Session**

With regards to the Recommendations resulting from the
Review of the IPCC Processes and Procedures by the InterAcademy Council (IAC)

Busan, Republic of Korea, 11-14 October 2010

**Preamble:**

The IPCC welcomes the IAC's review. Its recommendations will be important to improve the way the IPCC works and how it is governed on behalf of the thousands of scientists who conduct careful, thorough assessments on all aspects of climate change and on behalf of the global community that utilizes its work.

The IPCC is taking decisive action to respond to these recommendations in a way that is transparent and open, and ensures that the highest quality assessments are produced and made available to the international community.

At its 32nd Session, the Panel agreed to immediately implement many of the recommendations. On others, the Panel has formed Task Groups to undertake further work with a view to completion at its next Session, in line with guidance from the IAC.

The IAC review highlights the contribution the IPCC has made to improve the understanding of the scientific, technical and socio-economic aspects of climate change, and the commitment of the world's leading scientists and other experts to a robust assessment process.

The work of preparing the Fifth Assessment Report (AR5) remains on course and will benefit from the Panel's decisions on the IAC recommendations.

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## Contents

This document presents the Panel's decisions relevant to the IAC's Review of the Processes and Procedures of the IPCC and terms of reference (TOR) and work plan for the Task Groups established to consider issues further and prepare proposals for consideration and decision by the Panel at its next Session (IPCC-XXXIII) scheduled to be held in the first half of 2011.

## 1 DECISIONS BY THE PANEL ON PROCEDURES

The Panel welcomed and acknowledged the recommendations and suggestions by the IAC on the IPCC's assessment process (Chapter 2 and 3 of the IAC Report), and made the following specific decisions:

### Scoping

The Panel noted that in its report the IAC has recommended:

"The IPCC should make the process and criteria for selecting participants for scoping meetings more transparent."

The Panel agreed with this recommendation
Implementation plan to be determined by the Task Group on Procedures with the view to make a decision at its next Session (IPCC-XXXIII).

### Author Selection

The Panel noted that in its report the IAC has recommended:

"The IPCC should establish a formal set of criteria and processes for selecting Coordinating Lead Authors and Lead Authors."

The Panel agreed with this recommendation
Formal criteria are included in the existing procedures. Enhanced implementation and transparency as well as potential additional criteria and procedures to be considered by the Task Group on Procedures with the view to make a decision at its next Session (IPCC-XXXIII) for future work.

The Panel noted that in its report the IAC has recommended:

"The IPCC should make every effort to engage local experts on the author teams of the regional chapters of the Working Group II report, but should also engage experts from countries outside of the region when they can provide an essential contribution to the assessment."

The Panel agreed with this recommendation
This is already implemented for AR5. Further implementation to be considered by the Task Group on Procedures with the view to make a decision at its next Session (IPCC-XXXIII) for future work.

### Sources of Data and Literature

The Panel noted that in its report the IAC has recommended:

"The IPCC should strengthen and enforce its procedure for the use of unpublished and non-peer-reviewed literature, including providing more specific guidance on how to evaluate such information, adding guidelines on what types of literature are unacceptable, and ensuring that unpublished and non-peer-reviewed literature is appropriately flagged in the report."

The Panel agreed with this recommendation
The Panel decided to strengthen the application of its procedures on the use of unpublished and non-peer reviewed literature. It decided to implement this recommendation and further key elements through its procedures and guidance notes. The Panel noted the General Guidance on the Use of Literature in IPCC Reports (contained in IPCC-XXXII/INF.4) as revised in General Guidance on the Use of Literature in IPCC Reports **(Appendix 1)** which addresses the related aspects in the IAC recommendations and decided to endorse them as a Guidance Note. The Panel

urges the Co-Chairs of Working Group I, II, III and TFI to take any necessary steps to ensure that this guidance note is applied in the development of IPCC reports.

**Handling the Full Range of Views**

The Panel noted that in its report the IAC has recommended:

"Lead Authors should explicitly document that a range of scientific viewpoints has been considered, and Coordinating Lead Authors and Review Editors should satisfy themselves that due consideration was given to properly documented alternative views."

The Panel agreed with this recommendation
The Panel emphasizes that handling the full range of scientific views is a core principle of the IPCC. Its procedures clearly require the representation of differing scientific viewpoints and encourages rigorous adherence by the CLAs, LAs, and REs. The Panel urges the IPCC Chair, the Co-Chairs of the Working Groups and TFI to take any necessary steps to ensure that this principle continues to be applied in the development of IPCC reports. Further implementation to be considered by the Task Group on Procedures with the view to make a decision at its next Session (IPCC-XXXIII).

**Report Review**

The Panel noted that in its report the IAC has recommended:

"The IPCC should adopt a more targeted and effective process for responding to reviewer comments. In such a process, Review Editors would prepare a written summary of the most significant issues raised by reviewers shortly after review comments have been received. Authors would be required to provide detailed written responses to the most significant review issues identified by the Review Editors, abbreviated responses to all non-editorial comments, and no written responses to editorial comments."

The Panel agreed with this recommendation in principle
Implementation options to be considered by the Task Group on Procedures with the view to make a decision at its next Session (IPCC-XXXIII).

The Panel noted that in its report the IAC has recommended:

"The IPCC should encourage Review Editors to fully exercise their authority to ensure that reviewers' comments are adequately considered by the authors and that genuine controversies are adequately reflected in the report."

The Panel agreed with this recommendation

The Panel decided to strengthen its application of procedures, and amend them where necessary, to enable Review Editors to fully exercise their role. The Panel noted the new Guidance Note on the Role of Review Editors **(Appendix 2)** which addresses the related aspects in the IAC recommendations. The Panel urges the Co-Chairs of Working Group I, II, III and TFI to take steps to ensure that this guidance note is implemented in the development of its work.

**Summary for Policymakers**

The Panel noted that in its report the IAC has recommended:

"The IPCC should revise its process for the approval of the Summary for Policymakers so that governments provide written comments prior to the Plenary."

The Panel acknowledges the importance of both written comments and inputs from the floor, which are current practice. No revision to the process is required.

**Procedure for the handling of potential errors identified after approval of IPCC reports**

IAC discussion and suggestion in the Box analyzing the Himalayan glacier error (IAC Report page 22). Discussion of time required for a response on Himalayan glacier error (IAC Report page 54).

The Panel agreed on the need to establish a process for evaluating, addressing and correcting, if necessary, potential errors and further developing errata as appropriate.

The Panel noted the "Proposed IPCC Protocol for Addressing Errors in Previous Assessment Reports" **(Appendix 3)** which describes a clear decision tree, based on the nature of the material and the steps necessary to avoid bias, so that potential errors could be addressed as rapidly as practical.

The Panel urges the IPCC Chair, the IPCC Vice-Chairs, the Co-Chairs of Working Group I, II, III and TFI to take any necessary steps to ensure that this protocol is finalized and then used for evaluation of potential errors and developing errata as appropriate. Further analysis to be considered by the Task Group on Procedures with the view to submit a proposal for a decision at the next Session (IPCC-XXXIII).

**IPCC's Evaluation of Evidence and Treatment of Uncertainty**

The Panel noted that in its report the IAC has made several recommendations:

"All Working Groups should use the qualitative level-of-understanding scale in their Summary for Policymakers and Technical Summary, as suggested in IPCC's uncertainty guidance for the Fourth Assessment Report. This scale may be supplemented by a quantitative probability scale, if appropriate."

"Chapter Lead Authors should provide a traceable account of how they arrived at their ratings for level of scientific understanding and likelihood that an outcome will occur."

"Quantitative probabilities (as in the likelihood scale) should be used to describe the probability of well-defined outcomes only when there is sufficient evidence. Authors should indicate the basis for assigning a probability to an outcome or event (e.g., based on measurement, expert judgment, and/or model runs)."

"The confidence scale should not be used to assign subjective probabilities to ill-defined outcomes."

"The likelihood scale should be stated in terms of probabilities (numbers) in addition to words to improve understanding of uncertainty."

"Where practical, formal expert elicitation procedures should be used to obtain subjective probabilities for key results."

The Panel agreed with these recommendations

The Panel decided to improve the IPCC guidance on evaluation of evidence and treatment of uncertainty. It is implementing the six recommendations in the IAC Review as part of a broader package of updates to procedures and guidance notes. The Panel noted with appreciation the Draft Guidance Note for Lead Authors of the Fifth Assessment Report on Consistent Treatment of Uncertainties **(Appendix 4)** and requested the Co-Chairs of Workings Group I, II and III to present the final document to the Panel at its next Session. The final document should provide more detail on traceable accounts, the evolution of the guidance since AR4 and explain how each of the six recommendations in the IAC review is addressed. The Panel urges the Co-Chairs to take any necessary steps to ensure that the guidance note is implemented in the development of its work.

## Terms of reference for a Task Group on Procedures

The Panel welcomed and acknowledged the recommendations and suggestions by the IAC on the IPCC's assessment process (Chapters 2 and 3 of the IAC Report) and decided to establish an inter-sessional Task Group on Procedures to develop proposals on further implementation of the recommendations. The Task Group is specifically requested to address, inter alia, the issues listed in Annex I to this decision and propose amendments, including Appendix A to the Principles Governing IPCC work and relevant Guidance Documents, if necessary, by *31 January 2011.* Governments will then be invited to provide comments on the proposals *by 28 February 2011* to allow preparation of a revised draft for consideration and decisions by the Panel at its next Session (IPCC-XXXIII).

The Task Group on Procedures is open to participation by the members of the IPCC and consists of Australia, Bolivia, Brazil, Canada, Chile, Germany, India, Iran, Maldives, Netherlands, New Zealand, Niger, Norway, Peru, Saudi Arabia, South Africa, Swaziland, Switzerland, Thailand, and USA. The Task Group will elect Co-Chairs to coordinate its work.

The Task Group will seek the advice of the IPCC Chair, the IPCC Vice-Chairs, Working Group and TFI Co-Chairs and the Secretary. The duration of the Task Group is until the IPCC's 33rd Session unless decided otherwise.

**Annex I**

The Task Group should address the issues listed below as mentioned in the IAC recommendations (Chapters 2 and 3), IPCC responses at its 32nd Session and IPCC-XXXII/Doc. 22. For each of the issues the Task Group should establish a timetable for action, consider resource implications and identify responsibilities for implementation. It should propose amendments to the Appendix A to the Principles Governing IPCC Work and relevant guidance documents if needed taking into account decisions made at IPCC-XXXII.

## Chapter 2: Evaluation of IPCC's Assessment Process

### Scoping

1. Recommendation: The IPCC should make the process and criteria for selecting participants for scoping meetings more transparent.

### Author Selection

2. Recommendation: The IPCC should establish a formal set of criteria and processes for selecting Coordinating Lead Authors and Lead Authors.

3. Recommendation: The IPCC should make every effort to engage local experts on the author teams of the regional chapters of the Working Group II report, but should also engage experts from countries outside of the region when they can provide an essential contribution to the assessment.

### Sources of Data and Literature

4. Recommendation: The IPCC should strengthen and enforce its procedure for the use of unpublished and non-peer-reviewed literature, including providing more specific guidance on how to evaluate such information, adding guidelines on what types of literature are unacceptable, and ensuring that unpublished and non-peer-reviewed literature is appropriately flagged in the report.

### Handling the Full Range of Views

5. Recommendation: Lead Authors should explicitly document that a range of scientific viewpoints has been considered, and Coordinating Lead Authors and Review Editors should satisfy themselves that due consideration was given to properly documented alternative views.

### Report Review

6. Recommendation: The IPCC should adopt a more targeted and effective process for responding to reviewer comments. In such a process, Review Editors would prepare a written summary of the most significant issues raised by reviewers shortly after review comments have been received. Authors would be required to provide detailed written responses to the most significant review issues identified by the Review Editors, abbreviated responses to all non-editorial comments, and no written responses to editorial comments.

7. Recommendation: The IPCC should encourage Review Editors to fully exercise their authority to ensure that reviewers' comments are adequately considered by the authors and that genuine controversies are adequately reflected in the report.

### Summary for Policymakers

8. Recommendation: The IPCC should revise its process for the approval of the Summary for Policymakers so that governments provide written comments prior to the Plenary.

**Procedure for the handling of potential errors identified after approval of IPCC reports**

IAC discussion and suggestion: Box analyzing of Himalayan glacier error (IAC Report page 22). Discussion of time required for a response on Himalayan glacier error (IAC Report page 54).

**Chapter 3: IPCC's Evaluation of Evidence and Treatment of Uncertainty**

9. Recommendation: All Working Groups should use the qualitative level-of-understanding scale in their Summary for Policymakers and Technical Summary, as suggested in IPCC's uncertainty guidance for the Fourth Assessment Report. This scale may be supplemented by a quantitative probability scale, if appropriate.

10. Recommendation: Chapter Lead Authors should provide a traceable account of how they arrived at their ratings for level of scientific understanding and likelihood that an outcome will occur.

11. Recommendation: Quantitative probabilities (as in the likelihood scale) should be used to describe the probability of well-defined outcomes only when there is sufficient evidence. Authors should indicate the basis for assigning a probability to an outcome or event (e.g. based on measurement, expert judgment, and/or model runs).

12. Recommendation: The confidence scale should not be used to assign subjective probabilities to ill-defined outcomes.

13. Recommendation: The likelihood scale should be stated in terms of probabilities (numbers) in addition to words to improve understanding of uncertainty.

14. Recommendation: Where practical, formal expert elicitation procedures should be used to obtain subjective probabilities for key results.

## 2 DECISIONS BY THE PANEL ON GOVERNANCE AND MANAGEMENT

### The Panel

The Panel noted that in its report the IAC has recommended:

> "The IPCC should establish an Executive Committee to act on its behalf between Plenary sessions. The membership of the Committee should include the IPCC Chair, the Working Group Co-Chairs, the senior member of the Secretariat, and 3 independent members, including some from outside of the climate community. Members would be elected by the Plenary and serve until their successors are in place."

The Panel at its 32nd Session:

I. Agreed to work toward establishing a formal body to provide governance functions that are necessary between sessions of the panel, strengthen coordination activities, and have oversight of the organisation's administration and communications; according to the mandate to be agreed in the 33rd Session.

II. The Task Group should consider options for the implementation of the decision concerning the recommendation mentioning the establishment of an Executive Committee. These options include those for the mandate, size, composition, functions and reporting of the body referred to in this recommendation.

III. The Task Group shall make recommendations on the options mentioned in decision II to the 33rd Session of the Panel, with a view to taking a decision.

### The Secretariat

The Panel noted that in its report the IAC has recommended:

> "The IPCC should redefine the responsibilities of key Secretariat positions both to improve efficiency and to allow for any future senior appointments."
>
> "The IPCC should elect an Executive Director to lead the Secretariat and handle day-to-day operations of the organization. The term of this senior scientist should be limited to the timeframe of one assessment."

The Panel at its 32nd Session:

I. Requested the Task Group to examine the role of the Secretariat in its relation with WMO, UNEP, the IPCC-Chair, the Vice-Chairs, Co-Chairs of the WGs and the TFI, and Technical Support Units. The Task Group is requested to review the responsibilities of key Secretariat positions and consider the issues associated with it and to make recommendations to the Panel at its 33rd Session. It is also requested to consider issues associated with the potential creation of a new post of an "Executive Director" to lead the Secretariat.

### The IPCC Chair; Working Group Co-Chairs

The Panel noted that in its report the IAC has recommended:

> "The term of the IPCC Chair should be limited to the timeframe of one assessment." "The terms of the Working Group Co-Chairs should be limited to the timeframe of one assessment."

The Panel at its 32nd Session:

I. Requested the Task Group to consider issues related to the IAC recommendations on the term of the IPCC Chair and working group Co-Chairs, including continuity issues.

II. Noted that any amendments to the existing IPCC Rules of Procedure for Elections could be applied only to subsequent elections.

III. Requested the Task Group to report their recommendations to the 33rd Session for decision.

**Conflict of Interest Policy**

The Panel noted that in its report the IAC has recommended:

> "The IPCC should develop and adopt a rigorous conflict of interest policy that applies to all individuals directly involved in the preparation of IPCC reports, including senior IPCC leadership (IPCC Chair and Vice Chairs), authors with responsibilities for report content (i.e., Working Group Co-Chairs, Coordinating Lead Authors, and Lead Authors), Review Editors, and technical staff directly involved in report preparation (e.g., staff of Technical Support Units and the IPCC Secretariat)."

The Panel at its 32nd Session:

I. Agreed with this IAC recommendation.

II. Decided to implement a rigorous conflict of interest policy, taking into consideration the specific circumstances related to participation in IPCC activities.

III. Established a Task Group on Conflict of Interest Policy to propose options for such a policy, consulting with relevant organisations, for its decision at the 33rd Session.

**The IPCC Bureau**

The Panel noted that in its report the IAC has recommended:

> "The IPCC should develop and adopt formal qualifications and formally articulate the roles and responsibilities for all Bureau members, including the IPCC Chair, to ensure that they have both the highest scholarly qualifications and proven leadership skills."

The Panel at its 32nd Session:

I. Decided to refer this issue to the relevant Task Groups with a particular focus on roles and responsibilities for all Bureau members, including the IPCC Chair.

II. The Task Group on Governance and Management should report back to the Panel at the 33rd Session.

## Terms of reference for a Task Group on Governance and Management

The Panel welcomed and acknowledged the recommendations and suggestions by the IAC on the IPCC's governance and management (Chapter 4 of the IAC Report) and decided to establish an inter-sessional Task Group on Governance and Management to develop proposals related to the recommendations by the IAC and the decisions taken at the 32nd Session as listed above. The Task Group is specifically requested to address, inter alia, the issues listed in Annex II to this decision and propose amendments, including to the Principles Governing IPCC Work, and its Appendices, and other relevant documents, if necessary, by *31 January 2011.* Governments will then be invited to provide comments on the proposals *by 28 February 2011* to allow preparation of a revised draft for consideration and decisions by the Panel at its next Session (IPCC-XXXIII). Matters related to conflict of interest policy will be addressed by a dedicated "Task Group on Conflict of Interest Policy" as described below.

The Task Group on Governance and Management (*) is open to participation by the members of the IPCC and consists of Belgium, Canada, China, Cuba, France, Germany, India, Iran, Korea, Lesotho, Maldives, Mali, New Zealand, Norway, Peru, Russia, Saudi Arabia, Slovenia, South Africa, Spain, Sweden, UK, and USA. The Task Group will elect its Co-Chairs to coordinate its work.

The Task Group will seek the advice of the IPCC Chair, the IPCC Vice-Chairs, Working Group and TFI Co-Chairs, and the Secretary. The duration of the Task Group is until the IPCC's 33rd Session unless decided otherwise.

(*) Correction on 26.10.2010: Norway and Spain have been added as they indicated their willingness to participate in the Task Group on Governance and Management (also corrected on Page 15, List of Task Groups formed at IPCC-XXXII and Composition).

**Annex II**

The Task Group on Governance and Management should address the issues listed below as mentioned in the IAC recommendations (Chapter 4 of the IAC Report), IPCC responses at its 32nd Session and IPCC-XXXII/Doc. 22. For each of the issues the Task Group should establish a timetable for action, consider resource implications and identify responsibilities for implementation. It should propose amendments to the Principles Governing IPCC Work, its Appendices, and other relevant documents if needed taking into account decisions made at IPCC-XXXII.

**Chapter 4: Governance and Management**

**The Panel**

1. Recommendation: The IPCC should establish an Executive Committee to act on its behalf between Plenary sessions. The membership of the Committee should include the IPCC Chair, the Working Group Co-chairs, the senior member of the Secretariat, and 3 independent members, including some from outside of the climate community. Members would be elected by the Plenary and serve until their successors are in place.

**The IPCC Chair**

2. Recommendation: The term of the IPCC Chair should be limited to the timeframe of one assessment.

**The IPCC Bureau**

3. Recommendation: The IPCC should develop and adopt formal qualifications and formally articulate the roles and responsibilities for all Bureau members, including the IPCC Chair, to ensure that they have both the highest scholarly qualifications and proven leadership skills.

4. Recommendation: The terms of the Working Group Co-chairs should be limited to the timeframe of one assessment.

**The Secretariat**

5. Recommendation: The IPCC should redefine the responsibilities of key Secretariat positions both to improve efficiency and to allow for any future senior appointments.

6. Recommendation: The IPCC should elect an Executive Director to lead the Secretariat and handle day-to-day operations of the organization. The term of this senior scientist should be limited to the timeframe of one assessment.

## Terms of reference for a Task Group on Conflict of Interest Policy

The Panel welcomed and acknowledged the recommendations and suggestions by the IAC on the IPCC's conflict of interest policy (as discussed in Chapter 4 of the IAC Report) and decided to establish an inter-sessional Task Group on Conflict of Interest Policy as discussed in Chapter 4 of the IAC Report to develop proposals on further implementation of the IAC recommendations and decision taken by the Panel at its 32nd Session. The Task Group is specifically requested to address, inter alia, the issues listed in Annex III to this decision and propose amendments, including to the Principles Governing IPCC Work and relevant documents, if necessary, by 31 January 2011. Governments will then be invited to provide comments on the proposals by 28 February 2011 to allow preparation of a revised draft for consideration and decisions by the Panel at its next Session (IPCC-XXXIII).

The Task Group is open to participation by the members of the IPCC and consists of: Bangladesh, China, Malaysia, New Zealand, Slovenia, Sudan, UK and USA. The Task Group will elect its Co-Chairs to coordinate its work.

The Task Group will seek the advice of the IPCC Chair, the IPCC Vice-Chairs, Working Group and TFI Co-Chairs and the Secretary. The duration of the Task Group is until the IPCC's 33rd Session unless decided otherwise.

## Annex III

The Task Group should address the issues listed below as mentioned in the IAC recommendations (Chapter 4), IPCC responses at its 32nd Session and IPCC-XXXII/Doc. 22. For each of the issues the Task Group should establish a timetable for action, consider resource implications and identify responsibilities for implementation. It should propose amendments to the Principles Governing IPCC work and relevant documents if needed taking into account decisions made at IPCC-XXXII.

### Chapter 4: Governance and Management

### Conflict of Interest Policy

1. Recommendation: The IPCC should develop and adopt a rigorous conflict of interest policy that applies to all individuals directly involved in the preparation of IPCC reports, including senior IPCC leadership (IPCC Chair and Vice Chairs), authors with responsibilities for report content (i.e., Working Group Co-Chairs, Coordinating Lead Authors, and Lead Authors), Review Editors, and technical staff directly involved in report preparation (e.g., staff of Technical Support Units and the IPCC Secretariat).

## 3 DECISIONS BY THE PANEL ON A COMMUNICATIONS STRATEGY

The Panel noted that in its report the IAC has recommended:
"The IPCC should complete and implement a communications strategy that emphasizes transparency, rapid and thoughtful responses, and relevance to stakeholders, and which includes guidelines about who can speak on behalf of IPCC and how to represent the organization appropriately."

The Panel accepts the recommendation to develop a communication strategy.
Taking into account the core products of the organization, the Strategy will clarify the scope and objectives of IPCC communication, with clear guidelines on authority, representation and identification of spokespeople.

The Panel decided to establish a Task Group to guide the development of the Communications Strategy. The first draft should be presented to the IPCC Bureau at its next Session with a view to adopting the Communication Strategy at the 33rd Session of the Panel.

### Terms of reference for a Task Group on a Communications Strategy

The Task Group on the IPCC Communications Strategy will, taking into account the core scientific review and assessment role of the IPCC and its scientific and intergovernmental nature, guide the development of a comprehensive and concise communications strategy that:

- Defines the scope of IPCC communications, including about (a) the results and products of assessments, (b) errors, corrections and other issues arising from the work of IPCC, and (c) improving understanding of the processes and governance of IPCC;
- Provides guidance regarding whether balanced communications materials derived from IPCC products that have been approved or accepted by the Panel should be developed, and under what circumstances;
- Articulates a set of general objectives for IPCC communications, including its website, emphasizing transparency, rapid and thoughtful responses, political neutrality, and relevance to stakeholders;
- Identifies targeted audiences and stakeholders, recognizing their diversity of languages;
- Includes guidelines on who can speak on behalf of IPCC and how and when authorized spokespersons should represent the organization appropriately, as well as how communication materials will be authorized; and
- Addresses any potential conflicts of interest regarding communications.

The Task Group will seek the advice of the IPCC Chair, the IPCC Vice-Chairs, Working Group and TFI Co-Chairs and the Secretary. The Task Group membership is open to representatives of governments that are members of the IPCC. The Task Group consists of Belgium, Canada, Gambia, Germany, Iran, Japan, Madagascar, Mexico, Netherlands, Norway, Saudi Arabia, Senegal, UK, USA, and Zambia. The Task Group will elect its Co-Chairs to coordinate its work.

The work of the Task Group will be supported by the Communications team within the Secretariat.

The Task Group will produce a first draft of the Strategy for consideration at the first Bureau meeting in 2011, with a view to the Panel adopting the Strategy at its 33rd Session.

## 4 THE TASK GROUPS

The Task Groups are open to participation by the members of the IPCC. Via a show of hands at the closing Plenary Session, country participation of the four Task Groups dealing with a) Procedures, b) Governance and Management, c) Conflict of Interest Policy and d) Communications Strategy was agreed, and is provided below.

The Task Groups will elect their Co-Chairs in due-time.

To facilitate the work of the Task Groups, the Panel decided on the 14th of October, 2010 that 25 trips would be allocated from the IPCC Trust Fund budget for travel to any necessary meetings for the four established groups.

The four Task Groups will report back to the Panel at its 33rd Session. The duration of the Task Groups' mandates is until the IPCC's 33rd Session, unless decided otherwise.

### List of Task Groups formed at IPCC-XXXII and Composition

**Task Group on Procedures**
Australia, Bolivia, Brazil, Canada, Chile, Germany, India, Iran, Maldives, Netherlands, New Zealand, Niger, Norway, Peru, Saudi Arabia, South Africa, Swaziland, Switzerland, Thailand, and USA

**Task Group on Governance and Management** (*)
Belgium, Canada, China, Cuba, France, Germany, India, Iran, Korea, Lesotho, Maldives, Mali, New Zealand, Norway, Peru, Russia, Saudi Arabia, Slovenia, South Africa, Spain, Sweden, UK, and USA

**Task Group on Conflict of Interest Policy**
Bangladesh, China, Malaysia, New Zealand, Slovenia, Sudan, UK and USA

**Task Group on Communications Strategy**
Belgium, Canada, Gambia, Germany, Iran, Japan, Madagascar, Mexico, Netherlands, Norway, Saudi Arabia, Senegal, UK, USA, and Zambia

(*) Correction on 26.10.2010: Norway and Spain have been added as they indicated their willingness to participate in the Task Group on Governance and Management (also corrected on Page 11, Terms of reference for a Task Group on Governance and Management).

INTERGOVERNMENTAL PANEL ON climate change

# General Guidance on the Use of Literature in IPCC Reports

## Introduction

The Technical Support Units (TSUs) of the three IPCC Working Groups drafted this guidance document to recall the Principles Governing IPCC Work, particularly the "Procedure for using non-published/non-peer-reviewed sources in IPCC Reports", and to enhance implementation of the underlying principles by posing questions whose answers will help ensure that the requirements are met. Following these principles will ensure that all relevant statements and lines of discussion are properly substantiated by adequate literature, and that all relevant text undergoes appropriate review. These guidelines will be presented and discussed at Lead Author meetings and backed up by further training as needed.

## Guidance on the use of non-published/non-peer-reviewed ("grey") literature

### 1. Overview of current Principles Governing IPCC Work

Appendix A, Section 4.2.3, to the Principles Governing IPCC Work states

> *Contributions should be supported as far as possible with references from the peer-reviewed and internationally available literature*

Extract from Annex 2 of Appendix A to the Principles Governing IPCC Work:

> ***Procedure for using non-published/non-peer-reviewed sources in IPCC Reports***
>
> *Because it is increasingly apparent that materials relevant to IPCC Reports, in particular, information about the experience and practice of the private sector in mitigation and adaptation activities, are found in sources that have not been published or peer-reviewed (e.g., industry journals, internal organisational publications, non-peer reviewed reports or working papers of research institutions, proceedings of workshops etc) the following additional procedures are provided. These have been designed to make all references used in IPCC Reports easily accessible and to ensure that the IPCC process remains open and transparent.*
>
> ***1. Responsibilities of Coordinating, Lead and Contributing Authors***
>
> *Authors who wish to include information from a non-published/non-peer-reviewed source are requested to*
>
> *a. Critically assess any source that they wish to include. This option may be used for instance to obtain case study materials from private sector sources for assessment of adaptation and mitigation options. Each chapter team should review the quality and validity of each source before incorporating results from the source into an IPCC Report.*
>
> *b. Send the following materials to the Working Group/Task Force Bureau Co-Chairs who are coordinating the Report:*
>
> - *One copy of each unpublished source to be used in the IPCC Report*
> - *The following information for each source:*
>   - *Title*
>   - *Author(s)*
>   - *Name of journal or other publication in which it appears, if applicable*
>   - *Information on the availability of underlying data to the public*
>   - *English-language executive summary or abstract, if the source is written in a non-English language*
>   - *Names and contact information for 1-2 people who can be contacted for more information about the source.*

*(…)*

***5. Treatment in IPCC Reports***

*Non-peer-reviewed sources will be listed in the reference sections of IPCC Reports. These will be integrated with references for the peer-reviewed sources.[1] These will be integrated with references to the peer reviewed sources stating how the material can be accessed, but will be followed by a statement that they are not published.*

The two distinct but related principles that are at the core of these procedures are (1) to ensure the quality, robustness and validity of the information assessed and (2) to ensure the accessibility of the sources for reviewers of the report drafts.

## 2. Questions to help determine the appropriateness of including a non-published/non-peer reviewed reference

Non-published/non-peer-reviewed sources are often called grey literature. Although highly relevant information can be contained in the grey literature, use of this literature brings with it an extra responsibility for the author teams to ensure the quality and validity of cited sources and information. Authors need to be clear why a particular source is used and in some circumstances may need to explain this in the text.

Considering the following questions will help ensure that the principles underlying the IPCC Rules and Procedures are properly implemented.

a) Who (e.g., what organization) is the source of the grey literature citation?

b) What information does the citation add to the assessment?

c) Is the information cited available from a peer-reviewed journal source? If yes, is the citation needed?

d) Are there lines of evidence from other (peer-reviewed or non-peer-reviewed) sources that support the citation or reach different conclusions? If yes, is the citation needed?

e) What are the qualifications of the author(s) of the document?

f) Was there any review of the material presented? If so, how wide or extensive was that review? How credible are the reviewers?

g) Why was the document written? How was the research funded? Could the researcher and/or publisher of the document be perceived as having a particular bias or agenda? If yes, what caveats are needed?

h) Why wasn't the information published in a peer-reviewed journal?

## 3. Acceptability of sources in IPCC Reports

Since the development of the Principles Governing IPCC Work, there has been a rapid growth in new forms of communication and media in which the public finds climate relevant information. The IPCC principles for use of non-published/non-peer reviewed sources do not change with this move to more electronic communication. Blogs, social networking sites (e.g., Twitter, Facebook), and visual media do not currently meet the standards for use in scientific assessments and developing key findings in IPCC Reports, and are therefore **not acceptable** for use. In the absence of other sources, newspapers and magazines may provide limited ancillary information for an assessment, but not for key findings.

Personal communications of scientific results are also **not acceptable sources**.

[1] Non-published sources also will be listed in the reference sections of IPCC Reports.

## 4. Accessibility of non-published/non-peer reviewed references

Non-published/non-peer-reviewed references need to be accessible by the reviewers at the time of the review. In order to ensure a minimum level of accessibility of all sources used in the report, **authors MUST provide a copy of each source of information that is not publicly available** (preferably as a non-editable electronic document) and the additional information specified in the IPCC principles. These must be received by the TSU by the time that the First Order Draft **(FOD)** and Second Order Draft **(SOD)** respectively are due to the TSU.

## 5. Guidance on the use of sources going through peer-review and literature cut off dates

After the distribution of the SOD, authors may only include additional literature that further supports statements that have already been substantiated by one or more references. Authors may not introduce new information in the Final Draft (FD) that substantially alters the content and conclusions of the report compared to the SOD.

In order to be included in the respective chapter drafts, literature must meet the following requirements:

- **For inclusion in the First Order Draft (FOD)**: **submitted** for peer-review and a copy provided to the TSU prior to the date when the **FOD** is due to the TSU;
- **For inclusion in the Second Order Draft (SOD)**: **submitted** for peer-review and a copy provided to the TSU prior to the date when the **SOD** is due to the TSU;
- **For inclusion in the Final Draft (FD)**: **accepted** for publication and a copy provided to the TSU prior to the date when the **FD** is due to the TSU. **Acceptance for publication MUST be substantiated by (i) letter from the editor, (ii) DOI-Nr., or (iii) published as accepted on the journal's website.**

The specific cutoff dates will be provided to the authors by the TSU early in the assessment cycle.

Any reference that does not fulfill these criteria will be removed from the draft contribution together with the statement(s) that it supports if there are no other supporting references. It is therefore not advisable to base a line of argument or conclusion on a single, not-yet accepted paper.

INTERGOVERNMENTAL PANEL ON climate change

## Role of Review Editors

Annex I of the IPCC Procedures (Appendix A to the Principles Governing IPCC Work) states that Review Editors (REs) will:

- *Assist the Working Group in identifying reviewers for the expert review process;*
- *Ensure that all substantive expert and government review comments are afforded appropriate consideration;*
- *Advise lead authors on how to handle contentious/controversial issues;*
- *Ensure genuine controversies are reflected adequately in the text of the Report; and*
- *Submit a written report to the Working Group Session. REs also may be requested to attend Sessions of the Working Group.*

*REs will need to ensure that where significant differences of opinion on scientific issues remain, such differences are described in an annex to the Report.*

*REs are not actively engaged in drafting Reports.*

Review Editors are critical for achieving the IPCC mandate of producing comprehensive and objective assessments in an open and transparent manner. They also help ensure that IPCC reports are neutral with respect to policy. To achieve these goals, REs undertake a number of activities:

Before the First Order Draft (for review by Experts) and the Second Order Draft (for review by Governments and Experts) are sent for review, the REs should identify possible reviewers for the entire chapter and for sections that reach key conclusions. The Technical Support Unit (TSU) will contact these reviewers. During the review period, the REs should read their Chapter carefully to prepare for the review comments and to identify possible crosscutting issues that will need to be addressed.

It is important to note that REs may not submit a review of their own Chapter but may do so on others. The REs do not rewrite the text – this is the job of the authors.

When the review comments are received, they will be collated by the TSU and sent to the Chapter Coordinating Lead Authors (CLAs) and REs. The REs should read all comments on their Chapter to identify critical issues that will likely require discussion with the Chapter author team. The focus should be on sections where the review comments are inconsistent or contradictory, where considerable rewriting will likely be needed, and where scientific controversies exist. The REs should come prepared to the subsequent Lead Author Meeting to ensure that the author team fully and appropriately addresses the review comments, and that the author team fairly represents the range of scientific opinion.

This process will be repeated for the Second Order Draft.

Important dates for REs include (i) when the review periods begin, i.e., when you get access to your chapter, (ii) when comments are distributed to the CLAs and REs, and (iii) the two Lead Author meetings that you are expected to attend. At the end of the process, the REs will provide a brief written report to the Working Group Co-Chairs. The exact format of the report has yet to be determined. Where appropriate, REs will be requested to attend Sessions of the Working Group and of the IPCC to communicate their findings from the review process and to assist in finalizing the Summary for Policymakers (SPM).

**Appendix 3**

## Proposed IPCC Protocol for Addressing Errors in Previous Assessment Reports

## Draft

Note: The Panel urges the IPCC Chair, the IPCC Vice-Chairs, the Co-Chairs of the Working Group I, II, III and TFI to take any necessary steps to ensure that this protocol is finalized and then used for evaluation of potential errors and developing errata as appropriate. Further analysis to be considered by the Task Group on Procedures with the view to make a decision at its next Session (IPCC-33).

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At its 40th Session (May 2010) the IPCC Bureau discussed a protocol for correcting errors in reports already released. The specific protocol below was prepared by Working Group II (WGII) Co-chairs to assist further consideration of that matter.

This protocol is intended to be used only to correct errors that could have been avoided in the context of the information available at the time the report was written. It should not be used to make changes that reflect new knowledge or scientific information that became available only after the literature cut-off date for the report in question. It should also not be invoked to reflect a change in opinion. Rather, it should be reserved for errors of fact or accuracy in representing the underlying science.

This protocol is intended to address the full range of possible errors from simple typos through complicated issues of sourcing, interpretation, analysis, or assessment. The protocol is intended to be invoked when at least one Co-Chair of the report containing the putative error, one Coordinating Lead Author (CLA) of the chapter containing the putative error, or one member of the current Bureau requests evaluation of a putative error.

The protocol is presented as a dichotomous tree (if condition n (where n is 1-9) is met), follow the tree below the condition. If condition n is not met, go to option a, with the same number value. For example, if statement 1 is correct, go to statement 2. If statement 2 is incorrect, go to statement 2a, etc.

Proposed protocol

1) If the putative error is in a working Group (WG) report, the CLAs of the relevant chapter are approached and asked whether they agree that there is an error.

2) If the CLAs agree that there is an error, then they are asked to decide whether the fix requires a simple erratum or a more thorough evaluation.

3) If the fix is a simple erratum, then one is constructed by the CLAs and submitted to the current WG Bureau for approval.

3a) If a more complicated evaluation is required, then the current Chair appoints a Review Team containing, as a minimum, two experts who were not involved in drafting the chapter, plus at least one CLA or Lead Author (LA) from the chapter with the error, and charges that Review Team with proposing, within one month's time, a simple erratum statement. The Chair then submits this to the relevant WG Bureau for approval.

2a) If the CLAs of the chapter containing the putative error feel there is no error, then the current Chair appoints, within two weeks, an Initial Review Group of three Bureau members and/or CLAs/LAs from the current assessment to analyze the text in question and see if they agree with the CLAs of the chapter with the putative error. The response from the Initial Review Group is due in two weeks.

4) If the Initial Review Group agrees that there was no error, then the CLAs of the chapter with the putative error are tasked with preparing, within two weeks, a brief document, to be posted on the IPCC and WG web sites, explaining why the text in question was in fact not an error.

4a) If the Initial Review Group feels there is an error, they ask the current Chair to appoint, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the chapter with the putative error and not involved as a Bureau Member, CLA, or LA on the assessment with the putative error or the current assessment.

5) If the Independent Review Committee decides there is no error, then the CLAs of the chapter with the putative error are tasked with preparing, within two weeks, a brief document, to be posted on the IPCC and WG web sites, explaining why the text in question was in fact not an error.

5a) If the Independent Review Committee decides that there is an error, they are tasked with providing, within one month, an erratum statement. If the erratum is approved by the current WG bureau, Co-chairs, and Chair, then the Chair makes a decision on whether the erratum can be posted at that point or needs to be approved by the plenary.

1a) If the putative error is in a Synthesis Report, then the Chair and Co-chairs (from the assessment cycle with the putative error) and CLAs of the chapter that was the source of the underlying information are approached and asked whether they agree that there is an error.

6) If all agree that there is an error, then the Chair (from the assessment cycle with the putative error) is asked to decide whether the fix requires a simple erratum or a more thorough evaluation

7) If the fix is a simple erratum, then one is constructed by the Chair (from the assessment cycle with the putative error) and submitted to the current Bureau for approval.

7a) If a more complicated evaluation is required, then the current Chair appoints a Review Team containing, as a minimum, two experts who were not involved in drafting the chapter, plus at least one CLA or LA from the chapter with the underlying information, and charges that review team with proposing, within one month's time, a simple erratum statement. The current Chair then submits this to the current Bureau for approval.

6a) If any of the Chair and Co-chairs (from the assessment cycle with the putative error), and the CLAs of the chapter that was the source of the underlying information feel there is no error, then the current Chair appoints, within two weeks, an Initial Review Group of three Bureau members and/or CLAs/LAs from the current assessment to analyze the text in question and see if they agree that there was no error. The response from the Initial Review Group is due in two weeks.

8) If the Initial Review Group agrees that there was no error, then the Chair (from the assessment cycle with the putative error) is tasked with preparing, within two weeks, a brief document, to be posted on the IPCC and WG web sites, explaining why the text in question was in fact not an error.

8a) If the Initial Review Group feels there is an error, they ask the current Chair to appoint, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the chapter with the putative error and not involved as a Bureau Member, CLA, or LA on the assessment with the putative error or the current assessment.

9) If the Independent Review Committee decides there is no error, then the Chair (from the assessment cycle with the putative error) is tasked with preparing, within two weeks, a brief document, to be posted on the IPCC and WG web sites, explaining why the text in question was in fact not an error.

9a) If the Independent Review Committee decides that there is an error, they are tasked with providing, within one month, an erratum statement. If the erratum is approved by the current WG bureau, Co-chairs, and Chair, then the current Chair makes a decision on whether the erratum can be posted at that point or needs to be approved by the plenary.

If any of the individuals identified as playing leading roles on behalf of author teams of previous reports are not available, then the current Chair will identify an individual or individuals best qualified to play those roles.

# Guidance Notes for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties

## Draft

The Panel requested the Co-Chairs of Working Group I, II and III to present the final document to the Panel at its next Session.

These guidance notes are intended to assist Lead Authors of the Fifth Assessment Report (AR5) in the consistent treatment of uncertainties across all three Working Groups. These notes define a common approach and calibrated language that can be used broadly for developing expert judgments and for evaluating and communicating the degree of certainty in findings of the assessment process. These notes refine background material provided to support the Third and Fourth Assessment Reports [1] and [2]; they represent the results of discussions at a Cross-Working Group Meeting on Consistent Treatment of Uncertainties convened in July of 2010 [3]. They also address key elements of the recommendations made by the 2010 independent review of the IPCC by the InterAcademy Council [4]. Alternative approaches in the literature can be used, but should be related to the approach outlined here. Each Working Group will supplement these notes with more specific guidance on particular issues consistent with the common approach given here.

The AR5 will rely on two metrics for communicating the degree of certainty in key findings:

- Confidence in the validity of a finding, based on the type, amount, quality, and consistency of evidence (e.g., mechanistic understanding, theory, data, models, expert judgment), and the degree of agreement. Confidence is expressed qualitatively.
- Quantified measures of uncertainty in a finding expressed probabilistically (based on statistical analysis of observations or model results, or expert judgment).

In order to develop their key findings, author teams should evaluate the associated evidence and agreement. Depending on the nature of the evidence evaluated, teams have the option to quantify the uncertainty in the finding probabilistically. In most cases, author teams will present either a quantified measure of uncertainty or an assigned level of confidence. It is important for author teams to develop findings that are general enough to reflect the underlying evidence but not so general that they lose substantive meaning. For findings (effects) that are conditional on other findings (causes), consider independently evaluating the degrees of certainty in both causes and effects, with the understanding that the degree of certainty in the causes may be low. In particular, this approach may be appropriate for high-consequence conditional outcomes with a high degree of certainty.

Sound decision making that anticipates, prepares for, and responds to climate change depends on information about the full range of possible consequences and associated probabilities. Such decisions often include a risk management perspective. Because risk is a function of probability and consequence, information on the tails of the distribution of outcomes can be especially important. Low-probability outcomes can have significant impacts, particularly when characterized by large magnitude, long persistence, broad prevalence, and/or irreversibility. Author teams are therefore encouraged to provide information on the tails of distributions of key

variables, reporting quantitative estimates when possible and supplying qualitative assessments and evaluations when appropriate.

**Treat issues of uncertainty**

1. At an early stage, consider approaches to communicating the degree of certainty in key findings in your chapter. Identify key findings as they emerge and give attention to evaluating confidence and quantifying uncertainties in them. Determine the areas in your chapter where a range of views may need to be described, and those where the author team may need to develop a finding representing a collective view. Agree on a carefully moderated and balanced process for doing this well in advance of actually confronting these issues in a specific context.

2. Be prepared to make expert judgments in developing key findings, and explain those judgments by providing a traceable account by describing in the chapter text your evaluation of relevant evidence and agreement. Such a description may include standards of evidence applied, approaches to combining or reconciling multiple lines of evidence, conditional assumptions, and explanation of critical factors. When appropriate, consider using formal elicitation methods to organize and quantify these judgments [5].

3. Be aware of a tendency for a group to converge on an expressed view and become overconfident in it [6]. Views and estimates can also become anchored on previous versions or values to a greater extent than is justified. One possible way to avoid this would be to ask each member of the author team to write down his or her individual assessments of the level of uncertainty before entering into a group discussion. If this is not done before group discussion, important views may be inadequately discussed and assessed ranges of uncertainty may be overly narrow [7]. Recognize when individual views are adjusting as a result of group interactions and allow adequate time for such changes in viewpoint to be reviewed.

4. Be aware that the way in which a statement is framed will have an effect on how it is interpreted [8]. (A 10% chance of dying is interpreted more negatively than a 90% chance of surviving.) Avoid value-laden statements, and consider complementary statements (e.g., chances of dying and of surviving).

5. Consider that, in some cases, it may be appropriate to describe findings for which the evidence and understanding are overwhelming as statements of fact without using uncertainty qualifiers.

**Review the information available**

6. Consider all plausible sources of uncertainty. Experts tend to underestimate structural uncertainty arising from incomplete understanding of or competing conceptual frameworks for relevant systems and processes [6]. Consider previous estimates of ranges, distributions,

or other measures of uncertainty, their evolution, and the extent to which they cover all plausible sources of uncertainty.

7. Assess issues of uncertainty and risk to the extent possible. When probabilistic approaches are available, consider ranges of outcomes and their associated probabilities with attention to outcomes of potential high consequence. Additional value can come from information that supports robust decisions for a wide range of climate and socioeconomic futures [9].

**Evaluate and communicate at the appropriate level of precision**

The following process and language should be applied to evaluate and communicate the degree of certainty in key findings. Paragraph 8 explains the basis of confidence in terms of level of evidence and degree of agreement. Paragraph 9 defines the confidence scale. Paragraph 10 discusses quantified measures of uncertainty. Finally, paragraph 11 provides criteria for communication of uncertainty at different levels of precision.

8. Consider the following dimensions for evaluating the validity of a finding: the type, amount, quality, and consistency of evidence (summary terms: "limited," "medium," or "robust"), and the degree of agreement (summary terms: "low," "medium," or "high"). Generally, evidence is most robust when there are multiple, consistent independent lines of high-quality evidence. Provide a traceable account describing your evaluation of evidence and agreement in the text of your chapter.

   - For findings with high agreement and robust evidence, present a level of confidence or a quantified measure of uncertainty.

   - For findings with high agreement or robust evidence, but not both, assign confidence or quantify uncertainty when possible. Otherwise, assign summary terms for your evaluation of evidence and agreement.

   - For findings with low agreement and limited evidence, assign summary terms for your evaluation of evidence and agreement.

   - In any of these cases, the degree of certainty in findings that are conditional on other findings should be evaluated and reported independently.

9. A level of *confidence* is expressed using five qualifiers "very low," "low," "medium," "high," and "very high." It is used to synthesize author teams' judgments about the validity of findings as determined through evaluation of evidence and agreement. Figure 1 depicts summary statements for evidence and agreement and their relationship to confidence. There is flexibility in this relationship; for a given evidence and agreement statement, different confidence levels could be assigned, but increasing evidence and agreement is correlated with increasing confidence. Confidence cannot necessarily be assigned for all combinations of evidence and agreement in Figure 1 (see paragraph 8). Presentation of findings with "low" and "very low" confidence should be reserved for areas of major concern, and the reasons for

their presentation should be carefully explained. Confidence should not be interpreted probabilistically, and it is distinct from "statistical confidence." Additionally, a finding that includes a probabilistic measure of uncertainty does not require explicit mention of the level of confidence associated with that finding if the level of confidence is "high" or "very high."

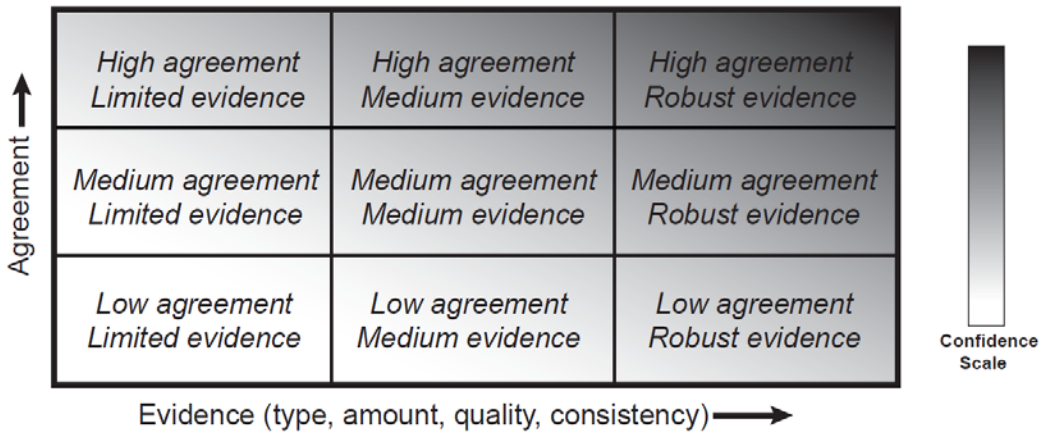


**Figure 1:** A depiction of evidence and agreement statements and their relationship to confidence. Confidence increases towards the top-right corner as suggested by the increasing strength of shading.

10. *Likelihood*, as defined in Table 1, provides one method of describing quantified uncertainty with calibrated language. It can be used to express a probabilistic estimate of the occurrence of a single event or of an outcome, e.g., a climate parameter, observed trend, or projected change lying in a given range. Likelihood may be based on statistical or modeling analyses, elicitation of expert views, or other quantitative analyses. The categories defined in this table can be considered to have "fuzzy" boundaries. A statement that an outcome is "likely" means that the probability of this outcome can range from ~66% (fuzzy boundaries implied) to 100% probability. This implies that all alternative outcomes are "unlikely" (0%-33% probability). When there is sufficient information, it is preferable to specify the full probability distribution or a probability range (e.g. 90-95%) without using the terms in Table 1. "About as likely as not" should not be used to express a lack of knowledge – see paragraph 8 for that situation. Additionally, there is evidence that readers may adjust their interpretation of this likelihood language according to the magnitude of perceived potential consequences [10].

**Table 1. Likelihood Scale.**

| Term | Likelihood of the outcome |
|---|---|
| *Virtually certain* | 99-100% probability |
| *Very likely* | 90-100% probability |
| *Likely* | 66-100% probability |
| *About as likely as not* | 33 to 66% probability |
| *Unlikely* | 0-33% probability |
| *Very unlikely* | 0-10% probability |
| *Exceptionally unlikely* | 0-1% probability |

11. Characterize key findings using calibrated uncertainty language that conveys the most information to the reader, based on the criteria (A-F) below [11]. These criteria provide guidance for selecting among different alternatives for presenting uncertainty, recognizing that in all cases it is important to include a traceable account of relevant evidence and agreement in your chapter text. The criteria given below describe how to report an assessed finding regarding a variable (e.g., a measured, simulated, or derived quantity or its change).

    A. *A variable is ambiguous, or the processes determining it are poorly known or not amenable to measurement:* Confidence should not be assigned; assign summary terms for evidence and agreement (see paragraph 8). Explain the governing factors, key indicators, and relationships. If a variable could be either positive or negative, describe the pre-conditions or evidence for each.

    B. *The sign of a variable can be identified but the magnitude is poorly known:* Assign confidence when possible; otherwise assign summary terms for evidence and agreement (see paragraphs 8 and 9). Explain the basis for this confidence evaluation and the extent to which opposite changes would not be expected.

    C. *An order of magnitude can be given for a variable:* Assign confidence when possible; otherwise assign summary terms for evidence and agreement (see paragraphs 8 and 9). Explain the basis for estimates and confidence evaluations made, and indicate any assumptions. If the evaluation is particularly sensitive to specific assumptions, then evaluate confidence in those assumptions.

    D. *A range can be given for a variable, based on quantitative analysis or expert judgment:* Assign likelihood or probability for that range when possible; otherwise only assign confidence (see paragraphs 8-10). Explain the basis for the range given, noting factors that determine the outer bounds. State any assumptions made and estimate the role of structural uncertainties. Report likelihood or probability for values or changes outside the range, if appropriate.

    E. *A likelihood or probability can be determined for a variable, for the occurrence of an event, or for a range of outcomes, e.g., based on multiple observations, model ensemble runs, or expert judgment:* Assign a likelihood for the event or outcomes, for which confidence should be “high” or “very high” (see paragraphs 8-10). In this case, the level of confidence need not be explicitly stated. State any assumptions made and estimate the role of structural uncertainties. Consider characterizing the likelihood or probability of other events or outcomes within the full set of alternatives.

    F. *A probability distribution or a set of distributions can be determined for the variable either through statistical analysis or through use of a formal quantitative survey of expert views*: Present the probability distribution(s) graphically and/or provide a range of percentiles of the distribution(s), for which confidence should be “high” or “very high” (see paragraphs 8-10). In this case, the level of confidence need not be explicitly stated.

Explain the method used to produce the probability distribution(s) and any assumptions made, and estimate the role of structural uncertainties.

**In summary, communicate uncertainty carefully, using calibrated language for key findings, and provide traceable accounts describing your evaluations of evidence and agreement in your chapter.**

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