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**FUTURE IPCC ACTIVITIES AND
SCOPING OF THE IPCC 5TH ASSESSMENT REPORT**

**The Future of IPCC: Suggestions to help the production of the AR5
Report of the Task Group**

(Submitted by Jean-Pascal van Ypersele (Belgium), IPCC Vice-chair, on behalf of the Task Group)

The Future of IPCC:

Suggestions to help the production of the AR5

Report of the Task Group

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Contents:

List of proposals (justified in the document).....	3
Introduction	4
Section 1: The Synthesis Report and the treatment of cross-cutting issues	6
1.1. Introduction	6
1.2. Timing of the Synthesis Report (SYR)	6
1.3. Experience from previous assessments and Implications for AR5 SYR.....	6
1.4. Options and Implications for the Treatment of Cross-cutting Topics.....	7
1.5. Policy-relevant Questions to be Addressed in the SYR	7
Section 2: Special Reports and Technical Papers (complementarity and achievability)	8
2.1. General Views on Special Reports	8
2.2. Panel Considerations of Special Reports.....	8
2.3. Process Considerations regarding Special Reports	9
Section 3: Cooperation and Consistency between the Working Groups.....	10
Section 4: Treatment of regional aspects.....	10
Section 5: Broadening participation and the literature basis (language, grey literature)	12
5.1. Developing/EIT country participation.....	12
5.2. Use of Grey and non-English Language Literature.....	13
Section 6: Improving access to the assessed information (FAQ, new technologies).....	13
6.1. Introduction:	13
6.2. New IPCC Products.....	14
Appendix I: Proposals for issues to be considered in the Scoping of AR5 (Based on the “Future of IPCC” submissions)	15
Appendix II: Cross-cutting Topics suggested in submissions and Topics for Special Reports	16
Appendix III: Example of Use of Electronic Documents to Provide More and Enhanced Graphics	17
Appendix IV: Detailed Motivation of the Splitting of the WGII Report in Two Parts.....	18

List of proposals (justified in the document)

- Proposal 1:** The scoping of the SYR and the identification of cross-cutting issues begins with the first scoping meeting, but provision is made for a second scoping meeting dedicated to refining the SYR structure and resulting in further integration.
- Proposal 2:** In preparation of the scoping process, IPCC Vice-Chairs, with assistance from the IPCC Secretariat and Technical Support Units, are invited to carry out an evaluation of the treatment of cross-cutting topics in the TAR and AR4, summarizing issues that were well covered and the elements that could be strengthened, and to identify the new cross-cutting topics for AR5. They are encouraged to consult past Bureau members to benefit from their experience, and to share their views within the IPCC Bureau.
- Proposal 3:** That Plenary agrees to invite governments to submit, before the Venice scoping meeting, their views on policy-relevant questions they would like to see addressed in the SYR and/or that are of a cross-cutting nature.
- Proposal 4:** Seek proposals on possible topics and consider a slate of Special reports to the extent feasible at the beginning of the AR5 cycle, in the overall context of AR5 scoping (looking for complementarities and avoiding overlaps)
- Proposal 5: (Alternative to Proposal 4):** Consider proposals for Special Reports, e.g. requests from the UNFCCC, on an ad-hoc basis, as presented to the Panel, applying the framework of considerations for whether a special report is appropriate.
- Proposal 6:** WG Bureaux are invited to consider the merits of holding Joint expert meetings, and possibly Lead Authors meetings held jointly or back to back, and/or appointing a limited number of “bridge authors” dealing with cross-cutting topics across WGs.
- Proposal 7:** Consider a more detailed regional division, in better agreement with climatic and socio-economic features.
- Proposal 8:** Restructure and strengthen the regional assessment in the WGII contribution by separating it from the global-scale assessment and publishing it as a separate volume, possibly integrating contributions from WGI and WGIII as well.
- Proposal 9:** The TSUs are encouraged to study the possible extension of the agreement set up by WGI, whereby free online access to major scientific journals was granted to Lead authors from developing/EIT countries in the course of the AR4.
- Proposal 10:** Charge the IPCC Vice-chairs to carry out over the next six months an assessment of the current shortcomings in involving developing/EIT country scientists and to propose approaches to address them.
- Proposal 11:** The possibility of assessing some of the grey literature around topics particularly relevant for AR5 through expert meetings or workshops should be considered by the WG Bureaux and TSUs.
- Proposal 12:** FAQ’s should be considered as part of all future assessments (and reviewed accordingly). They could also be tailored for specific stakeholders, with questions specific to individual regions, sectors, climate processes, or mitigation or adaptation strategies.
- Proposal 13:** The IPCC Secretariat jointly with the Technical Support Units of the three Working Groups be encouraged to collectively explore using the full range of electronic technologies to enhance the accessibility of IPCC products.
- Proposal 14:** As a matter of urgency, an easily searchable version of the AR4 (including SYR and possibly language versions of the SPMs and TSs) should be made accessible electronically in the same way the TAR was.

Introduction

Background

At the 27th session of the IPCC, 12-17 November 2007 in Valencia, Spain, the IPCC Chair circulated a discussion paper regarding the future of the IPCC to IPCC Members, authors involved in Reports prepared during the 4th assessment cycle and observer organisations. Comments received were compiled in an information document¹ and summarized by the Secretariat in a synthesis paper². These comments, together with contributions from the Task Group members have been used, under the sole responsibility of the Chair of the Task Group to inform the suggestions formulated here for the AR5.

Decisions Already Taken

A number of decisions affecting the AR5 were taken by the Panel at the 28th Session in Budapest, such as retaining the existing three Working Groups as well as the Task Force on Emission Inventories and TGICA. It was decided that the IPCC would prepare a Fifth Assessment Report (AR5) including a Synthesis Report (SYR) the planning of which should start early in the assessment process. A staggering of the Working Group Reports was decided: AR5 (including the SYR) is to be completed at the earliest feasible date in 2014, with a target date of early 2013 for the release of the Working Group I Report. It was also agreed to organize the new assessment work around a revised set of scenarios of socio-economic, climate and environmental conditions. The relevance of AR5 to the work programme of the UNFCCC was noted.

Recent Progress and Purpose of this Report

On the basis of the list of issues identified in September 2008 at the 29th Plenary³ we agreed to prioritise and structure the Task Group's work to first address the issues related to the present assessment cycle such as:

1. The Synthesis Report and the treatment of cross-cutting issues;
2. Special Reports and Technical Papers (complementarity and achievability);
3. Cooperation and consistency between the working groups;
4. Treatment of regional aspects;
5. Broadening participation and the literature basis (language, grey literature);
6. Improving access to the assessed information (FAQ, new technologies)

A list of issues proposed for consideration in the scoping of AR5 is provided in Appendix I. Appendix II covers materials from the submissions which are relevant for cross-cutting topics and possible Special reports. These lists are clearly not exhaustive, as Parties were invited at the last conference of the Parties to the UNFCCC convention⁴ to inform the IPCC through their IPCC Focal point about "scientific and technical questions and information that they wish to be considered in the AR5 process in order to support deliberations under the UNFCCC process". Appendix III deals with improving access to IPCC documents through electronic means, including through graphics. Appendix IV explains in detail why proposal 8 on the splitting of the WGII report has been made.

¹ IPCC-XXVIII/INF.1 and INF.1 add.1, see also additional comments in IPCC-XXVIII/INF.1

² IPCC-XXVIII/Doc.7

³ see IPCC-XXIX/INF.5

⁴ see UNFCCC document FCCC/SBSTA/2008/13

The Task Group on IPCC Future

Chair: Jean-Pascal van Ypersele, IPCC Vice-chair (supported by the Belgian Federal Science Policy Office, Martine Vanderstraeten, Philippe Marbaix and Nicolas Moureau (Belgium))

Members: Hoesung Lee, IPCC Vice-chair (Republic of Korea); Thomas F. Stocker, WGI Co-chair (Switzerland); Christopher Field WGII Co-chair (USA) ; Youba Sokona WGIII Co-chair (Mali); Ronald Flippi (Netherlands); Marc Gillet (France); Howard Larsen (New Zealand), Abdalah Mokssit (Morocco); Yong Luo (China), Stephen Magezi (Uganda), and Trigg Talley (USA).

Invited to comment: R.K. Pachauri (IPCC Chair); Renate Christ (IPCC Secretary); Gilles Sommeria (IPCC Deputy Secretary); Andy Reisinger (Former Head of the AR4 SYR TSU); John Stone (Canada, Former Co-chair of the Outreach Group), and David Warrilow (United Kingdom, Chair of the Task Group on the Reinforcement of the IPCC Secretariat)

NB: Given the variety of suggestions arising from the submissions and comments received, some of the proposals are provided in the form of alternative options.

The Chair of the Task Group bears the sole responsibility for the final version submitted to the Plenary.

Section 1: The Synthesis Report and the treatment of cross-cutting issues

1.1. Introduction

There was a clear message from governments that the Synthesis Report⁵ (SYR) was valuable to policymakers. Part of this value was in the way a SYR could present an integrated view of the science that cannot be achieved by reading the individual Working Group's reports. The SYR is also valuable by providing a brief overview of the topics covered by the Report.

1.2. Timing of the Synthesis Report (SYR)

Comments overwhelmingly suggested an early start to the SYR, including consideration of it by authors and governments during the scoping process, so that sufficient material is available in the WG contributions at the time of synthesis. This would mean that most requirements of the SYR would feed into the detailed planning for the individual Working Groups. On the other hand, there also the concern that the SYR outline should not pre-determine the WG conclusions (“The synthesis can only follow the theses”). Clearly, elements of an iterative procedure are needed to resolve this, since the synthesis must also “*address a broad range of policy-relevant but policy-neutral questions*”⁵.

1.3. Experience from previous assessments and Implications for AR5 SYR

Decisions taken in Budapest by the 28th Session of the IPCC already place significant time constraints on the production of the AR5 SYR and the scheduling of WG Reports. Given the relevance of AR5 to the work programme of the UNFCCC it is desirable to complete the AR5 before COP-20, which will be held in December 2014 at the latest. In this case, the WGII and WGIII Reports would need to be completed no later than late April 2014 to leave time for the production of the AR5 SYR. Any later completion of the WG Reports would jeopardise the robustness and consistency of the AR5 SYR, or its timeliness for COP-20. Some limited options exist to adjust the timing and sequence of reports and their reviews but would require careful consideration by the Bureau. It may be necessary for IPCC to request UNFCCC to schedule COP-20 as late as possible in the year 2014.

A single scoping meeting may not be able to achieve a thorough a consideration of synthesis and cross-cutting topics since a large part of a single meeting is likely to be required for Working Groups to develop their detailed outlines for later approval by the Panel (at the 31st Session in November 2009). To start the iterative process evoked in section 2.2, it is essential that the identification of the main policy-relevant questions and cross-cutting topics for the AR5 is integrated in the scoping process from the beginning, but their detailed definition would benefit from a second scoping meeting. If the structure of the SYR is based on answering policy-relevant questions, the content of WG contributions will really determine the content of the SYR, but its quality will also depend from the awareness that the WG have from the start of the questions to address.

⁵ “*The Synthesis Report will synthesise and integrate materials contained within the Assessment Reports and Special Reports and should be written in a non-technical style suitable for policymakers and address a broad range of policy-relevant but policy-neutral questions approved by the Panel.*” (Appendix A to the Principles Governing IPCC Work)

Proposal 1: *The scoping of the SYR and the identification of cross-cutting issues begins with the first scoping meeting, but provision is made for a second scoping meeting dedicated to refining the SYR structure and resulting in further integration.*

1.4. Options and Implications for the Treatment of Cross-cutting Topics.

Based on the experience with the TAR and the AR4 the following proposal is made:

Proposal 2: *In preparation of the scoping process, IPCC Vice-Chairs, with assistance from the IPCC Secretariat and Technical Support Units, are invited to carry out an evaluation of the treatment of cross-cutting topics in the TAR and AR4, summarizing issues that were well covered and the elements that could be strengthened, and to identify the new cross-cutting topics for AR5. They are encouraged to consult past Bureau members to benefit from their experience, and to share their views within the IPCC Bureau.*

Once the scoping has ended, other mechanisms to ensure appropriate treatment of cross-cutting topics include expert meetings, background papers, and the preparation of guidance material for WG authors to support consistent treatment of cross-cutting topics across different Working Groups. The expert workshop and resulting guidance paper on treatment of uncertainties in the AR4 is one example of such an approach that was instrumental for promoting consistency across Working Groups, without this necessarily forming a focus of the SYR. Different issues may require different approaches to ensure consistency and integration and therefore an analysis of past practices is encouraged.

Appendix II lists cross-cutting topics suggested in the submissions collected before the Budapest Plenary (April 2008).

1.5. Policy-relevant Questions to be Addressed in the SYR

To provide guidance to the scoping meeting on the possible content of the SYR input should be sought in advance from governments. A specific request by the Plenary may help further in providing input for the SYR in time:

Proposal 3: *That Plenary agrees to invite governments to submit, before the Venice scoping meeting, their views on policy-relevant questions they would like to see addressed in the SYR and/or that are of a cross-cutting nature.*

These key policy-relevant questions could be analyzed during the scoping meeting and be split into 3 categories:

- those that can be dealt with within a single working group,
- those that require inputs from several working groups and hence require cross-WG coordination (including possible expert meetings and scoping papers) but do not necessarily require recognition in the WG outlines,
- those that may require that the WG outlines be structured such that the WG Reports pay particular recognition to an issue and provide the necessary inputs to the SYR.

Section 2: Special Reports and Technical Papers (complementarity and achievability)

2.1. General Views on Special Reports

Most governments supported in general the preparation of well-targeted and coordinated Special Reports (SR) during the first 2-3 years of an assessment cycle. Most urged careful planning of those SR's to avoid over-burdening the scientific community and to ensure that the results are reflected in the AR5. Frequently, reference was made to the framework and criteria for establishing priorities for Special Reports, Methodology Reports and Technical Papers, decided by the Panel at its 20th Session in Paris, February 2003, and it was suggested to keep them in force. SR's were also seen as means to address certain scientific topics in more cross cutting manner and a number of suggestions for cross WG Special Reports were made. A few submissions specifically discouraged the preparation of SR's and recommended focussing only on the AR5.

Several countries provided specific ideas for special reports. These are included in section Appendix II.

2.2. Panel Considerations of Special Reports

Working Groups have generally been able to handle one Special Report per cycle without difficulty. Reports from former TSU's indicate more than one Special Report has presented management challenges, especially if it overlaps with finalization of drafts of the overall assessment.

Working Group III currently is responsible for the Special Report on Renewable Energy Sources. A scoping meeting has been scheduled for a possible Special Report on the Extreme Events and Disasters that would involve Working Groups I and II. In addition, there are expert meetings that will draw resources of the Working Groups, such as the meeting on GHG metrics that will mostly involve members of WGI.

In this context, it may be recalled that the Panel has developed considerations to guide decisions about whether specific topics are worth the investment of the Working Group and the scientific community. At its 20th session in Paris, the IPCC adopted a framework and set of considerations for establishing priorities for Special Reports, Methodology Reports and Technical Papers for the period of the Fourth Assessment. This framework was to be applied in accordance with the Principles governing IPCC work, and is to serve to guide, but not prescribe, future decisions by the Panel regarding its work programme, noting that decisions regarding the conduct of these reports will be considered on a case-by-case basis. At the 28th Session the Panel decided that this framework will also be applied for the 5th Assessment period. Following a proposal presented by Australia at the 29th Session, the Panel made an addition to these framework and criteria, requiring that it should also be considered that issues require (or not) "input from more than one Working Group of the IPCC". The revised procedures are attached in Annex 5 of the report of the 29th Session.

2.3. Process Considerations regarding Special Reports

Broadly speaking, there appear to be two options for the process by which Special Reports may be considered:

Proposal 4: *Seek proposals on possible topics and consider a slate of Special reports to the extent feasible at the beginning of the AR5 cycle, in the overall context of AR5 scoping (looking for complementarities and avoiding overlaps)*

Proposal 5: *(Alternative to Proposal 4): Consider proposals for Special Reports, e.g. requests from the UNFCCC, on an ad-hoc basis, as presented to the Panel, applying the framework of considerations for whether a special report is appropriate.*

The advantage of the first option is that it allows the Panel to set priorities for the entire assessment, considering a range of possible topics. The advantage of the second option is that it better enables the Panel to respond to requests that might come up at a slightly later stage in the assessment cycle.

It is worth bearing in mind that Special Reports constitute, at a minimum, a 2-year commitment. Decisions on Special Reports would need to occur early in the cycle in order to avoid coinciding with work on the Assessment Reports, especially for WG1, which will finalize its assessment earlier than other Working Groups for this fifth cycle. The bar for any Working Group undertaking more than one Special Report should be relatively high, given management constraints.

It may be recalled that several topics were considered by the Panel early in the last assessment period. Ultimately, however, the two Special Reports that were developed (on Carbon Dioxide Capture and Storage and on Safeguarding the Ozone Layer and the Climate Change) were undertaken in response to a request of the UNFCCC.

If consideration is given to a slate of proposed topics, it would be necessary to make decisions as soon as practicable. We recommend that the selection of SR's takes place in parallel with the scoping of AR5, to ensure complementarity. The Panel could set deadlines for the completion of SR's either at the next session, which would allow maximum time for the Working Groups to develop the reports, or at the following session, to give Panel members time to more fully consider options for specific topics.

A preliminary list of possible Special Reports or Technical Papers, mostly based on the submissions received before Budapest, can be found in Appendix II.

Section 3: Cooperation and Consistency between the Working Groups

There is a large agreement that cooperation among WG's needs to be strengthened. The spirit of fellowship and cooperation between WG Bureaux can be enhanced by keeping WG's informed of each other's plans, activities and recent findings, and by initiating collaboration where necessary.

A longer-term mechanism is also necessary in order to carry the cross-cutting topics through the development of the AR5. This clearly has to involve and have the support of the WG Bureaux. The following proposal could be considered by them:

Proposal 6: *WG Bureaux are invited to consider the merits of holding Joint expert meetings, and possibly Lead Authors meetings held jointly or back to back, and/or appointing a limited number of "bridge authors" dealing with cross-cutting topics across WGs.*

Cooperation between WG authors would be also facilitated if there was timely access given to Lead Authors to all Working Groups drafts. In addition it is suggested to use electronic means such as webconferencing (suggested in the document on programme and budget) to enhance integration and cooperation.

The above recommendations would also facilitate the preparation of the SYR.

Section 4: Treatment of regional aspects

One of the requests made to the IPCC, particularly but not only by developing country governments, is for more information at regional-scales such as changes in the climate, potential impacts and response options. Clearly, by involving more developing country scientists in the IPCC assessment process the capacity to contribute to the understanding of climate change in their countries and regions can be enhanced.

Further, it has also been often pointed out that the regional division used until now in IPCC reports may not necessarily be the best solution, concerning in particular climatic characteristics, land areas, population and general socio-economic homogeneity. On this point, it would be worth giving some thought at different regional approaches. A more detailed division into 23 more homogeneous and representative regions such as the one that was used in parts of the TAR (e.g. in WG1 technical summary figure 21) and of AR4 (e.g. Figure 3.14) could be considered. Drawing on socio-climatic consistent regions would also make much easier explaining climate change than when it is presented over too large and inhomogeneous geographical entities. It is clear for instance that in Europe, the evolution within the Mediterranean area and the evolution over Northern Europe will be totally different. Also, dealing in AR5 with the Mediterranean area region would have the advantage, in addition to a better homogeneity in issues, of encouraging the cooperation of scientists from all around this sea, which were before divided between Africa, Europe and Asia. The case is the same with Africa, where a clear distinction should be done between Mediterranean, Sahel, West Africa, East Africa and South Africa.

Proposal 7: *Consider a more detailed regional division, in better agreement with climatic and socio-economic features.*

REMARK: *The following proposal, submitted by Chris Field, WGII Co-Chair has not yet been fully discussed among the Task Group, but the TG Chair takes the responsibility to forward it to the Plenary as food for thought and with a suggestion to consider it as a proposal to the Scoping meeting for including a more detailed and integrated regional assessment in AR5 (please see also Appendix IV)*

Proposal 8: *Restructure and strengthen the regional assessment in the WGII contribution by separating it from the global-scale assessment and publishing it as a separate volume, possibly integrating contributions from WGI and WGIII as well.*

The motivation for separating the regional and global components of the WGII assessment comes from two main considerations. First, the regional assessment will be much more useful and much stronger scientifically if it builds effectively on the relevant science across all three working groups. Many of the issues that motivate a regional assessment come from the regional juxtaposition of the local climate changes, the way these changes unfold in the context of local coping capacity, and the extent and effectiveness of local adaptation. Second, both parts of the WGII assessment will benefit from the smaller size and greater focus that come from separating it into global and regional components. Separating the regional assessment into a separate volume will effectively highlight the increased importance of adaptation and vulnerability. It will also facilitate targeting stakeholders.

Solid assessments of regional impacts, adaptation, and vulnerability starts from the output of the global models, but much of the richness will emerge as researchers build on the global-scale information with work on downscaled climate and regional-scale impacts, adaptation, and vulnerability, taking the specific regional controls into account. Separating the regional assessment will facilitate the coordinated treatment of regional-scale issues, integrating across mechanisms treated in WGI, II and III.

The specific implementation of this proposal could proceed along at least three pathways:

1. Prepare the regional and global components of the WGII assessment in parallel, so that both can be considered at a single Plenary approval meeting. This option would decrease access to the benefits that could come from delaying the work on the regional assessment, but the process could be structured so that the regional assessment emphasizes synthesis across the traditional domains of the three Working Groups.
2. Merge the regional assessment with the Synthesis Report. With this option, the section of the Synthesis Report containing the regional chapters would integrate material from all three working groups, presenting it from the perspective of each region. If the regional chapters are integrated into the Synthesis Report, they will be approved at the Plenary for that report.
3. Structure the regional assessment as a Special Report, as for the first formal treatment of regional effects in the 1997 *Special Report on Regional Impacts of Climate Change*.

In all three cases, WGII would remain the official administrative and operational home for the regional assessment. With the third pathway, the special report might be started under the AR5 leadership, but it would probably be completed under AR6.

Each of the three pathways introduced here creates opportunities for helping the regional assessment reach its full potential. Pathway 1, with parallel development of the regional and global assessments, opens new opportunities primarily by recasting the structure and purpose of the re-

gional chapters, with much more emphasis on downscaling and integration across themes. It does not, however, access other opportunities that arise from delaying the regional assessment. Pathways 2 and 3, integration with the Synthesis Report and management as a Special Report, are better suited for regional integration, because they allow the regional assessment to start with the new information in the global assessment. These options, however, are not cost free. A regional assessment integrated with the Synthesis Report would need to be much less detailed than one released as a separate document. Development of the regional assessment as a Special Report, perhaps the best option scientifically, would require delaying the release of critically important information.

On the other hand, the concern has also been expressed that separation of regional issues from the global ones can negatively affect the methodological integrity of the WGII work. Regional authors may have an inclination to consider very specific regional vulnerabilities that makes difficult the overall evaluation of impacts across regions.

Section 5: Broadening participation and the literature basis (language, grey literature)

5.1. Developing/EIT country participation

Over the evolution of the IPCC's Assessments significant efforts have been made to broaden participation, particularly of developing/EIT country scientists. This participation of developing/EIT countries' scientists is an issue that has been addressed in the government comments of the IPCC Chairman's paper on the "Future of the IPCC". It was noted that, one hand, there is not always a capacity in some developing/EIT countries for conducting climate change related research or adequate research funding to properly address the issues of climate vulnerability and climate change. As a result, for example, climate change scenarios and observational data in particular in some vulnerable regions remain limited.

Integration of scientific results of scientists from developing countries and countries in transition remain a challenge. One stumbling block for those colleagues is the cost of journal access and thus the availability of information and international exchange. What has been achieved here during AR4 needs to be fostered. On the other hand the relative inaccessibility of climate change literature of specific regions caused by language barriers or absent publishing infrastructure must be reduced. New climate change journals for entire regions with translated abstracts would be an idea. This may be a long shot but can be done as some recent examples have shown.

One area where IPCC could have some leverage quickly is in the electronic access to scientific magazines for Lead authors from developing/EIT countries.

<p>Proposal 9: <i>The TSUs are encouraged to study the possible extension of the agreement set up by WGI, whereby free online access to major scientific journals was granted to Lead authors from developing/EIT countries in the course of the AR4.</i></p>
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Continuing efforts need to be made to ensure as full a participation of developing country scientists as possible so that we have access to the richness of literature in languages other than English and the valuable perspectives of these scientists in writing the Assessment Reports. However, to be most effective we should first identify the present shortcomings and second develop new approaches in association with developing country scientists so that there can be a shared learning

and strengthened capacity. We should also take better advantage of the existing IPCC procedures and the diversity of regions represented in the IPCC Bureau. To facilitate this, we propose:

Proposal 10: *Charge the IPCC Vice-chairs to carry out over the next six months an assessment of the current shortcomings in involving developing/EIT country scientists and to propose approaches to address them.*

5.2. Use of Grey and non-English Language Literature

Increasingly, literature is now available in the grey literature or in languages other than English, on regional-scale impacts as well as on response options – adaptation and mitigation – that reflect local observations, modelling and circumstances. The “grey literature” is material that has not been published in peer-reviewed journals but available as conference proceedings and technical reports. The IPCC has recognized the value of this material, particularly that originating from the private sector that contains information on experience with climate change response options – for example, the introduction of new technologies. In consequence a decision was taken that such grey literature would be acceptable as long as it was generally available for review. It would seem that the best way of accessing this material is through the wise selection of authors with greater efforts to engage authors from the developing countries, the private sector and non-governmental organizations.

Proposal 11: *The possibility of assessing some of the grey literature around topics particularly relevant for AR5 through expert meetings or workshops should be considered by the WG Bureaux and TSUs.*

Section 6: Improving access to the assessed information (FAQ, new technologies)

6.1. Introduction:

The primary role of the IPCC is to provide policy-relevant but not policy-prescriptive information on climate change to stakeholders, especially governments. Over the past 20 years, the mix of products for providing the information has included Assessment Reports, Special Reports, and Technical Papers. The Assessment Reports and Special Reports contain a Summary for Policy-Makers (approved in Plenary) and a Technical Summary. The WGI report for the AR4 also included a collection of frequently asked questions (FAQ).

This mix of products has effectively served to convey credible and useful information to governments. There is general agreement that the IPCC should not consider dropping any of its key products. However, it could benefit from a thorough assessment of ways to improve the effectiveness of its outreach to the full range of interested stakeholders. Options to consider include both *new kinds of products* and taking advantage of *new technologies for presenting* existing products more effectively.

Two of these products (FAQs and enhanced interactive graphics) should be considered in preparing for the AR5.

6.2. New IPCC Products

a) FAQ's:

The evidence available so far indicates that both stakeholders and IPCC authors are enthusiastic about the utility of the "Frequently Asked Questions" (FAQ) document developed by WGI to help communicate the main messages in the AR4. FAQ's quickly gets to important findings without needing to invest in the text necessary to explain all of the scientific concepts. FAQ's could be an efficient vehicle for the regional chapters in WGII with the use of key questions focussing on the issues most important for each region.

Proposal 12: *FAQ's should be considered as part of all future assessments (and reviewed accordingly). They could also be tailored for specific stakeholders, with questions specific to individual regions, sectors, climate processes, or mitigation or adaptation strategies.*

b) Enhanced electronic access to IPCC documents, and interactive graphics

Electronic documents provide the potential for information or graphics that convey much more information than printed pages. Specifically, electronic documents can provide the opportunity to present more time steps, more scenarios, output from more models, animations, more spatial detail, and more variables. Features as simple as allowing stakeholders to zoom into particular time periods or change colours could have a big impact. In particular during the period of the TAR the Secretariat has advanced the use of electronic means such as searchable versions of Special Reports and Assessment Report on the internet and CD-rom, available at that time to disseminate IPCC Reports. Further advances in technology should be used proactively for future IPCC reports, and necessary features, such as keywords, built into the text.

All these features are already widely available on the Internet and are continuously developing. There are real questions about whether an emphasis on electronic documents might limit access in developing countries. Strategies to reduce this risk include 1) designing the electronic document (or a version of it, or its key features) to be compatible with a slow internet connection, 2) designing the document so that the key messages can be presented in a printed version, and 3) designing the document so that the key features can be accessed through a DVD that does not require an internet connection. It may also be the case that, by the time the AR5 is released, such a large fraction of stakeholders have internet access that these strategies are not necessary.

Proposal 13: *The IPCC Secretariat jointly with the Technical Support Units of the three Working Groups be encouraged to collectively explore using the full range of electronic technologies to enhance the accessibility of IPCC products.*

Proposal 14: *As a matter of urgency, an easily searchable version of the AR4 (including SYR and possibly language versions of the SPMs and TSs) should be made accessible electronically in the same way the TAR was.*

Appendix I: Proposals for issues to be considered in the Scoping of AR5 (Based on the “Future of IPCC” submissions)

The initial discussion paper did not focus on the concrete content of the next assessment report, so that submissions do not seek to provide a comprehensive list of the views of governments and authors on the issues of interest for the AR5. However, some of the mentioned issues may have interest for the scoping of AR5, so that we provide a list intended as starting point for more elaborate propositions.

Those issues that received attention in the submissions include:

- WG I Monitoring and attribution activities to assess observed changes in climate. *Is climate change accelerating?*
- WG I A much greater need for understanding the full climate system.
There is a need for WG I to provide useful information on climate variables other than temperature, e.g. the influence of the range of human activities on precipitation, heat waves, sea level rise, ice sheet changes, drought, hurricanes, typhoons and other storms, sea ice and related polar climate changes, the understanding of carbon cycle, rates of change of observed carbon dioxide and other forcing agents etc as well as non-linear and irreversible climate change, high impact/low probability events, their thresholds and magnitude and the availability of backstop options.
- WG I, II Improved regional scale projections and improved risk assessment at the regional level.
Regional climate projections are critically dependent on the knowledge of the full global climate system. There is a general wish that risks be better assessed at the regional level so as to provide policy-makers with policy-relevant information on potential damages and adaptation potential.
- WG I, II Regional climate change and adaptation over the coming decades.
What are the likely rates of regional climate change over the coming decades to which societies around the world will have to adapt? (Probabilistic regional climate change predictions integrated with climate impacts assessments).
- WG I, II, III Quantified evaluation of the mitigation efforts that are needed to reduce the risk of particular impacts below specified level.
Link future rates of regional climate change with risks of impacts and infer corresponding emissions, with uncertainties.
- WG II, III Provide a better economic evaluation of climate change impacts, adaptation and mitigation. *The need for being more policy-relevant about those issues has clearly been identified. Some warned that such improved economic evaluation should not result into a shift towards more emphasis on economic aspects, as these must be balanced by resource, environmental and sustainability aspects.*
- WG II, III Consider broader sustainable development issues and context in all WG reports, in particular WG2 and WG3.
A limitation to this is literature availability: this may call for further research integrating sustainable development and climate change adaptation and mitigation.

Appendix II: Cross-cutting Topics suggested in submissions and Topics for Special Reports

A) Cross-cutting topics:

NB: The following list is not an exhaustive list of cross-cutting topics, but simply a list of those already mentioned in the submissions made before the AR5 was even decided.

Sustainable development and climate change: Assessing impacts adaptation and mitigation has deep links with development and sustainability issues, as shown by successive IPCC reports. The concept of sustainability and its links with climate change is overwhelmingly present in the submissions, with the words “sustainable” or “sustainability” appearing more than 190 times. While attention was already paid to sustainability in the previous reports, considering climate change in the broader context of development, society, and environment is difficult, and there were still limitations in the availability of literature integrating those aspects. Better connections with the work and conclusions already produced in the framework of International Conventions (RAMSAR, CBD) or the International Strategy for Disaster Reduction (UN/ISDR) was also suggested (e.g. Chile submission).

Biomass, food production and carbon credits: Issues related to biomass (in particular biofuels), competition between different land uses (food and energy production in particular) and terrestrial carbon credits also involve several dimensions of climate research and are of increasing interest to policymakers.

B) Proposals for Special Reports

At the 28th session of April 2008 in Budapest, the Panel approved the development of a Special Report on Renewable Energy Sources and Climate Change Mitigation. In addition, a Special Report on Extreme Events and Disasters: Managing the Risks has been discussed at a scoping meeting of March 2009.

Other topics for Special Reports (possibly Technical Papers) were proposed in the submissions. We summarize them here as one of the inputs for further discussions.

Main WG's involved	Topic
WG II, I	Regional vulnerability and adaptation, including current impacts and practices, globally and/or on specific regions such as Mediterranean area or Africa. (Ecuador, Lesotho, Pakistan, Mexico, Portugal, Sweden, ...)
	Climate change and desertification, water supply and land degradation. (Institute for Environment and Sustainability, United Nations Convention to Combat Desertification, Uzbekistan, ...)
WG II, III	Sustainable development and climate change (with regional focus): Mitigation measures and their relations to food prices, sustainable land use; general indicators and criteria in assessment of climate change and sustainable development, lifestyle and consumption patterns. (Earth System Science Partnership, Lesotho, Uzbekistan, ...)
	Economic and socio-economic aspects of climate change.
	Forests and deforestation.

WG III, I	Shipping, aviation or more generally transport.
	Climate engineering.
WG I	Sea-level rise, Greenland and West Antarctic Ice Sheets. (Australia, WCRP, CSIRO,...)
	Abrupt changes in the climate system.
WG II	Climate change in Synergy with other Conventions (combat to desertification, biological diversity, trans-boundary water use).
	Climate change and health.
WGIII	Assessment of the performance of Market Mechanisms for climate change mitigation.
	Energy efficiency.

There is also this proposal, coming from WGIII: in general and Megacities in particular are at the forefront of climate change. As large emitters of GHG emissions they represent major contributors to the cause of climate change. Simultaneously, due to their concentration of population and infrastructure assets, cities are especially vulnerable to the impacts of climate change. Moreover, Infrastructure investments in the near future will determine the emission paths of cities in the long-run. Hence, cities are a point where adaptation is necessary and mitigation is possible. Therefore, the Co-Chairs of WG III are discussing a Special Report of "Urban Development, Energy, Water and Transport Infrastructure - Mitigation and Adaptation Strategies."

See also Proposal 8 about a possible Special Report covering regional aspects.

Appendix III: Example of Use of Electronic Documents to Provide More and Enhanced Graphics

Electronic documents provide the potential for graphics that convey much more information than printed pages. Specifically, electronic documents can provide the opportunity to present more time steps, more scenarios, output from more models, animations, more spatial detail, and more variables.

Consider, for example, figure SPM-6 from the WGI, SPM, AR4. In the printed form, the figure presents a multi-model mean for three scenarios and two time slices. It also presents probability density functions for global warming for several models for the same three scenarios and time slices. Because each panel is small, it is difficult to assess patterns at scales finer than the continental, and it is difficult to estimate regional differences associated with different scenarios or time slices. The figures present no information on other scenarios or time slices.

An electronic version of the same figure might appear initially as a single map, or perhaps one map and one probability density function. A stakeholder could click on the map to select a scenario and time point, or she could request an animation stepping through time. Other options might include difference maps (between scenarios or time slices), maps of the variance among models, maps for different seasons, animations of annual cycles for different scenarios and time slices, or different map projections. Stakeholders interested in particular regions might have the option to zoom in, giving them access to the full spatial resolution in the models. They might also switch to X-Y plots to view the trajectory of temperature at a given location. Starting from this

map or from another figure in the document, a stakeholder might switch from average temperature to extreme temperatures, precipitation, extreme precipitation, or sea level. In the pdf panel, a stakeholder might want to step the probability density function through time, look at the full range of scenarios, or look at the global temperature distribution associated with each model. Of course, colour-blind stakeholders (4 to 8% of males, depending on region) can switch to alternative colour scales.

In this example, all of the information presented in the enhanced electronic figures already underlies the printed figure, but it is not accessible. Electronic publication not only opens access to the full range of the underlying information, but it does it in a way that potentially lets the information register with stakeholders of widely varying technical sophistication. For example, using the current figure to estimate the differential warming in Africa between A1B and A2 for 2090-2099 requires a substantial amount of sophistication to get any answer at all, and even a sophisticated stakeholder gets only a rough impression. With an electronic figure, one could plot this difference directly, ask how the difference changes with the seasons, or whether it is similar among models.

The software necessary to provide this kind of dynamic replotting ability is already common. For example, the web site of the NASA Goddard Institute for Space Studies (GISS) already provides software for plotting historical temperature data, with a wide range of spatial, temporal, and seasonal options.

Nearly every figure in recent IPCC reports could be enhanced with electronic options. Features as simple as allowing stakeholders to zoom into particular time periods or change colours could have a big impact. All of the figures with one panel to show one time period and an inset to show another time period (example shown here) period could be simplified and enhanced, so that key parts of the figure get highlighted in an animation or pop-up.

Appendix IV: Detailed Motivation of the Splitting of the WGII Report in Two Parts

The scientific case for greater separation between the global and regional assessments in WGII is strong. Much of the reason that the regional effects are so important is that they play out across a range of diverse physical, ecological, economic, institutional, and cultural backgrounds. A rigorous treatment of adaptation at the regional scale will require thorough analysis of the regional-scale climate changes, of their regional-scale impacts, and of the capabilities for institutional and individual response. Solid assessment of regional impacts, adaptation, and vulnerability starts from the output of the global models, but much of the richness will emerge as researchers build on the global-scale information with work on downscaled climate and regional-scale impacts, adaptation, and vulnerability. Because local and regional scale mechanisms are so important for adaptation and vulnerability, a separate process to explore regional controls will be especially important. At the same time, separating the regional assessment into a separate volume will effectively highlight the increased importance in the AR5 of adaptation and vulnerability.

Separating the regional from the global assessment in the WGII Report will also facilitate the coordinated treatment of regional-scale issues, integrating across mechanisms treated in WGI, II, III. The importance of downscaled climate is clear. Many of the frontiers in the science of climate change concern regional effects. Treated in a separate volume, the regional assessment will be well-positioned to make extensive use of downscaling, beyond that available for the global chapters in WGII. Once the downscaled climate products are available, the authors of the regional assessment will be able to conduct a wide range of regional impacts studies, on a wide range of sectors. Ecological, economic, cultural and institutional factors will be important modulators of adap-

tation and vulnerability, but it is very difficult to treat them thoroughly in the absence of both solid downscaling of climate and guidance on coping capacity, especially from WGIII.

Finally, separating the global and regional assessments in WGII will facilitate the emergence of a more compelling product. Each report will be shorter than the combined WGII report of the AR4, and each will also be more focused. Separating the global and regional analyses will eliminate the sense of redundancy that comes from reporting material in both sets of chapters. It will also facilitate effectively targeting stakeholders, since they will be slightly different for each volume.

The history of the regional chapters in the WGII report is that regional issues were first addressed in detail in the 1997 *Special Report on Regional Impacts of Climate Change*. Regional chapters became a section of the WGII report in the TAR. The AR4 was the second iteration of this organization. The *Special Report on Regional Impacts of Climate Change* entered the planning stage as a Technical Paper in 1996. As planning for the technical paper evolved, it became increasingly clear that the topic of regional impacts, adaptation, and vulnerability could not be effectively addressed on the basis of materials already approved and accepted by the plenary. To incorporate new studies appearing after the SAR literature cut-off date, to take advantage of expertise crossing working group boundaries, and to provide “a better, more inclusive and more useful document” the regional work transitioned to special report status. The Special Report was accepted in September 1997, at the same meeting where the panel agreed that the WGII agenda for the TAR would be to assess economic and social aspects of the vulnerability (sensitivity and adaptability) to climate change of, and the negative and positive consequences (impacts) for, ecological systems, socio-economic sectors and human health, with an emphasis on regional, sectoral, and cross-sectoral issues.

In two iterations of including regional chapters in the WGII Report, there have been many solid successes. The regional chapters provide a treatment tuned for regional stakeholders, highlighting important features that make each region unique. The regional chapters in the main WGII Report have not, however, lived up to their full potential. Raising the quality and impact of the regional chapters depends on returning them to the prominence accorded a separate volume and to the scientific depth that comes from integrating across working groups.