

**REPORT OF THE 31<sup>ST</sup> SESSION OF THE IPCC**  
Bali, Indonesia, 26-29 October 2009

**1. OPENING OF THE SESSION**

The Session was held at the Bali International Convention Center, Nusa Dua, Bali, at the kind invitation of the Government of Indonesia.

Dr Rajendra Pachauri, Chairman of the IPCC, called the Session to order at 10.00 a.m. on Monday, 26 October 2009. In his opening speech, he expressed IPCC's gratitude to the Government of Indonesia for hosting the 31st Session of the IPCC and highlighted the challenges facing the Panel in this crucial period ahead of the 15th Session of the Conference of the Parties (COP-15) of the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen. He recalled the main steps undertaken for the preparation of Fifth Assessment Report (AR5), and stressed the expectations that society and governments place in future IPCC work. He also recalled the leading role of Indonesia in climate negotiations and in the work of IPCC.

Mr Ir. Rahmat Witoelar, Chairman of the National Council on Climate Change of Indonesia, welcomed all participants and expressed his appreciation for the efforts of the Indonesian Agency of Meteorology, Climatology and Geophysics (BMKG) to ensure a successful meeting. He recalled some of the important achievements of IPCC and stressed the importance of climate science for developing countries. He suggested a few key issues for future IPCC work, including reference emission levels, update on carbon sinks, and refinement of stabilization scenarios.

Ms Sri Woro B Harijono, Director General of BMKG, welcomed all participants on behalf of herself and BMKG, recalling the importance of Bali as a venue of earlier climate negotiations. She stressed a few of the key issues that she expects the AR5 to cover, which are particularly important for the region and for Indonesia. These include a better understanding of climate change and monsoons. She also mentioned the need for IPCC to respond to questions raised by the UNFCCC.

Prof. Yan Hong, Deputy Secretary-General of WMO, in his opening address on behalf of the WMO Secretary-General, highlighted the priority expressed by the Executive Council on the issue of climate change and natural disasters. In addition to the forthcoming Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), he urged the IPCC to properly deal with this issue within the AR5 chapters. He recalled the success of the recent World Climate Conference 3 and invited the IPCC community to get actively involved in the development of the planned Global Framework for Climate Services.

Mr Joseph Alcamo, UNEP Chief Scientist, in his opening address on behalf of the Executive Director of UNEP, confirmed the long standing support of his Organization to IPCC and summarized some of UNEP's initiatives which are complementary to IPCC's, for example the yearly review of the status of the global environment and UNEP's support to the coordination of research on climate impacts, vulnerability and adaptation. He stressed the importance of IPCC's role in view of the "avalanche of new scientific results" and "at the turbulent frontier between science and policy".

## 2. APPROVAL OF AGENDA AND OF THE DRAFT REPORT OF THE 30<sup>th</sup> SESSION

The Panel observed a minute of silence in memory of Mr Wolfram Krewitt, Coordinating Lead Author of the Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN), who suddenly passed away on 8 October 2009. Tribute was also rendered to Mr Vladimir Tarasenko (Belarus) who passed away at the SBSTA meeting in June 2009.

The provisional agenda, IPCC-XXXI/Doc.1, Rev.1 (attached as **Annex I**) was presented by Ms Renate Christ, Secretary of the IPCC, and adopted with item 8 pending, as no letter of resignation had been received at this stage from the IPCC Vice-Chair Mr Ogunlade Davidson. Concerns were expressed by several delegations about the consequences of possibly leaving the Vice-Chair position vacant for a long period of time. The issue was left open during the entire meeting but could not be resolved. The Netherlands reiterated the need to post documentation well ahead of Plenary Sessions, that is at least 10 days prior to the meeting.

The list of participants is attached as **Annex VI**.

The draft report of the Thirtieth Session was approved with one modification concerning the support by UK and Japan for a possible Special Report on climate change impacts on marine ecosystems including ocean acidification, inserted in the final version (attached as **Annex II**).

## 3. SCOPING OF THE IPCC 5<sup>TH</sup> ASSESSMENT REPORT

The Chair summarized the scoping procedure and presented a brief report of the 40th Session of the IPCC Bureau held in Geneva on 18 September 2009. Ms Renate Christ introduced to the Panel documentation prepared by the Secretariat, making use of conclusions from the scoping meeting held in Venice (13-17 July 2009), more particularly IPCC-XXXI/Doc.4 , IPCC-XXXI/Doc. 4, Add.1, IPCC-XXXI/Doc. 10, IPCC-XXXI/INF. 3 and IPCC-XXXI/INF.5. The Chair invited initial comments on matters related to the overall process and scope of the AR5 including on cross-cutting matters. A number of comments were taken into account as part of subsequent Working Group (WG) Sessions, and more general aspects, revisited after those Sessions, are summarized below. A number of additional cross-cutting themes were proposed:

- Scenarios: At P-30 in Antalya, the Panel set up a Task Group to consider further activities consistent with the catalytic role of the IPCC in scenario development. The Group is co-chaired by Mr Qin Dahe (Co-Chair of WG I) and Mr Christopher Field (Co-Chair of WG II) and the membership is comprised of Mr Carlo Carraro, Ottmar Edenhofer, Ismail Elgizouli, Hoesung Lee, Leo Meyer, Richard Moss, Thomas Stocker, and Jean Pascal van Ypersele. Given the importance of this issue for all three Working Groups, it was agreed that Mr Ottmar Edenhofer would be a third Co-Chair of the Task Group.

The Chair noted that scenarios are a cross-cutting theme that is being addressed in a separate process that is already in place, including a forthcoming Expert Meeting on Socio-Economic Scenarios for Climate Change Impact and Response Assessment, to be held in the 4th quarter of 2010.

- Greenhouse gas metrics: the work initiated by the first Expert Meeting which was held in Oslo, Norway in March 2009 will be pursued under Working Group I (WG I) leadership (Thomas Stocker) with the participation of one Vice-Chair from Working Group II (WG II) and one from Working Group III (WG III). No further concept note or formal cross cutting theme was considered necessary.

- Article 2 of the UNFCCC: a contact group on issues relating to Article 2, co-chaired by Mr Øyvind Christophersen (Norway) and Mr Saut Lubis (Indonesia), was set up by the Chair.

At 3.45 p.m. on Monday 26 October the Plenary Session was suspended and the Sessions of the Working Groups convened, according to the proposed schedule. Provisions were made to allow two meetings to be held in parallel.

The 31st Session of the Plenary reconvened on Wednesday 28 October at 3.00 p.m.

3.1 Action taken at the Eleventh Session of Working Group I: the two Co-Chairs reported on the outcomes of the WG I meeting and presented the revised outline and the schedule of work.

For the note on WG I AR5 Annex I: Atlas of Global and Regional Climate Projections please see Annex III under the WG I outline.

3.2 Action taken at the Ninth Session of Working Group II: the Co-Chairs reported on the outcomes of the WG II meeting and presented the revised outline and the schedule of work.

3.3 Action taken at the Tenth Session of Working Group III: the three Co-Chairs reported on the outcomes of the WG III meeting and presented the revised outline and the schedule of work.

The Panel was invited to consider proposed topics, scope and approaches for cross-cutting matters and to provide further guidance as appropriate:

- Øyvind Christophersen reported on behalf of the Contact Group on Article 2 of the UNFCCC. The Panel agreed to consider Article 2 as cross-cutting theme and accepted the proposal for a cross-Working Groups meeting to be organized in early 2010, before the SYR scoping meeting. The Chair takes the responsibility for the follow up actions on this issue. As a result of proposals made by several delegations, a few modifications were made to the concept note, and are included in the final version.
- The concept notes on other cross-cutting themes were accepted.
- In the discussion few issues were highlighted, such as the need to ensure consistent treatment of gaps in knowledge, to have a consistent treatment of grey literature by all WG's, and to facilitate online access to scientific journals for scientists in developing countries. It was also agreed that guidelines to authors will be prepared by the Secretariat in due time.

On regional aspects close coordination should be ensured between WG I and WG II, and with WG III involvement on certain aspects. The WG's work-plan should allow interaction between the three WG's and the schedule of releases should enable regional details from WG III to be taken into account in the regional assessments of WG II and of the Synthesis Report.

3.5 The Panel reviewed proposals for workshops and expert meetings, including on cross-cutting matters and confirmed the list of meetings, their scope as well as schedule and budgetary implications as indicated on IPCC-XXXI/Doc.10. The SYR scoping meeting is now scheduled for the second half of August 2010 in Liège. Mr Christopher Field reminded the Plenary about the proposed joint GEO-IPCC workshop on "How GEOSS could serve the data needs of the climate impacts and adaptation research communities and support the IPCC assessments" presented at the two previous Bureau Sessions (BUR-XL/Doc. 5). It was agreed that some travel support, up to 10 trips, will be allocated to this workshop on contingency funds.

3.6 The Panel agreed on the outlines of the three Working Group contributions to the AR5 as decided by the respective Sessions of the Working Groups and decided on a revised timetable for the AR5 as follows: WG I approval Session will take place in September 2013, WG II approval Session in mid-March 2014, WG III approval Session in early April 2014, the SYR approval Session in mid-September 2014. The call for nomination of authors will be initiated in early January 2010 with a deadline set in March 2010. The decision on the list of authors will take place at the next Bureau Session scheduled in May 2010. For convenient reference, material for AR5 including Working Group outlines, cross-cutting concept notes as well as information about planned expert meetings and workshops is compiled in **Annex III**. The WG III Session for approval of the SRREN has been postponed to February 2011 and will be held in Abu Dhabi at the kind invitation of the Government of the United Arab Emirates.

#### 4. IPCC PROGRAMME AND BUDGET FOR 2010-2014

In his introduction of the budget, the Chair referred to IPCC-XXXI/Doc. 2, Add.1, summarizing the status of the IPCC Trust Fund and 2009 contributions as of 30 September 2009. He expressed his concern about the level of contributions received so far and the likely expected imbalance of the budget by the end of year. He invited Governments who might be in a position to do so to increase their level of contributions to the IPCC Trust Fund or to contribute to the budget year 2009 in case they have not yet done so. Norway announced a special contribution for 2009 and offered to sponsor two of the forthcoming meetings for the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.

The Financial Task Team (FiTT) met on two occasions during the Session, and Ms Conchita Martinez, Co-Chair, reported to the Plenary on behalf of the Task Team. The Plenary approved the list of decisions proposed by the FiTT, including the new provision to support the travel of one Government representative for each IPCC Bureau Member from a developing/EIT country. The Plenary adopted the 2010 budget and took note of the budget for the following years as attached (**Annex IV**), taking into account the postponement of the 11th Session of WG III (approval of SRREN) to 2011 and the organization of the 33rd Plenary Session of the IPCC back to back with this meeting.

#### 5. ADMISSION OF OBSERVER ORGANIZATIONS

Mr Gilles Sommeria introduced new applications for Observer Organizations as outlined in IPCC-XXXI/Doc. 5. Consistent with the IPCC Policy and Process for Admitting Observer Organizations, the list of new applicants had been reviewed by the Bureau at its 40th Session, and was presented to the Plenary. He also informed the Panel of four organizations who joined the list of UN participating organizations since the 30th Session, namely the United Nations Human Settlements Programme (UN-HABITAT), the United Nations University (UNU), the World Food Programme (WFP) and the United Nations Development Fund for Women (UNIFEM). The Panel formally accepted as new observers the Global Biodiversity Information Facility (GBIF), the International Council for Local Environmental Initiatives (ICLEI) and the African Center of Meteorological Applications (ACMAD). It also accepted as observer Energy Research Austria, which accreditation had been deferred at the 30th Session.

Mr Andrej Kranjc (Slovenia), on behalf of the Task Group which he co-chaired with Mr Hiroshi Ono (Japan), presented the revised proposal by the European Community (EC) for a special observer status as outlined in IPCC-XXXI/Doc. 6, and indicated that the Task Group supported the proposal. The Chairman noted that the proposal was in conformity with IPCC procedures and the Panel accepted the revised proposal (**Annex V**). Ms Elisabeth Lipiatou expressed her thanks on behalf of the EC to the IPCC for accepting the new status of the EC.

## **6. MATTERS RELATED TO UNFCCC**

Ms Rocio Lichte, on behalf of the UNFCCC Secretariat, provided an update on climate change negotiations, noting the short remaining time until COP-15 in Copenhagen in December 2009. She expected an active participation of the IPCC, as provider of supporting information, in the preparatory meeting to be held in Barcelona the first week of November and in Copenhagen. She also conveyed the message that the UNFCCC looks forward to the engagement of IPCC in SBSTA-32, which will be held in Bonn in July 2010 and to the outcome of the two IPCC Special Reports under preparation. Several Members acknowledged the importance of IPCC participating at the right level in UNFCCC meetings and Mrs Renate Christ provided complementary information on the planned participation in Barcelona and in Copenhagen.

## **7. RULES OF PROCEDURES FOR THE ELECTION OF THE IPCC BUREAU AND ANY TASK FORCE BUREAU**

Ms Renate Christ introduced the documents IPCC-XXXI/Doc.15 and IPCC-XXXI/Doc.18, and, in the absence of the Co-Chairs of the Task Group which was set up on the election rules by the Panel at its 30th Session and co-chaired by the USA and Mauritius, the representative of the United Kingdom provided a brief progress report. A number of issues were raised by Members but it was agreed that further consultations were needed before decisions could be taken on the subject. The Chair invited governments to send their comments to the Secretariat, which will prepare a revised document for P-32.

## **8. IMPLEMENTATION OF DECISIONS TAKEN BY IPCC-30**

- 8.1 Involving developing/EIT country scientists: Mr Masaya Aiba, on leave from Mitsubishi Research, presented on behalf of the Secretariat the results of the survey he had conducted, in consultation with IPCC Vice-Chairs, on the involvement of developing/EIT country scientists in IPCC work, as outlined in IPCC-XXXI/INF1. Mr Jean Pascal van Ypersele, IPCC Vice-Chair, summarized the recommendations made by the IPCC Vice-Chairs as a result of the above survey and comments received from Bureau Members, as outlined in IPCC-XXXI/Doc.11. A number of delegates responded positively to the recommendations, particularly to the need to involve Focal Points more actively in the nomination process and to give explicit responsibility to Bureau Members in ensuring regional balance. In conclusion, Mr Jean Pascal van Ypersele invited delegates to send additional suggestions to IPCC Vice-Chairs, who will update their proposal for the 32nd Plenary Session. Ms Renate Christ indicated that the Secretariat will send proper guidance to Focal Points when issuing the next call for authors in January 2010. She also invited Governments to provide information on their nomination process to the Secretariat, as it could serve as examples for other countries.
- 8.2 Use of the full range of electronic technologies including searchable version of the Fourth Assessment Report (AR4): Mr Thomas Stocker reported on behalf of the Task Group set up on this matter at the 30<sup>th</sup> Session, as outlined in IPCC-XXXI/Doc.12. He stressed that certain communication materials should not be developed or distributed by the IPCC, unless compatible with the assessment process. Mr Jean Pascal van Ypersele suggested that the Co-Chairs of TGICA be involved in the activities mentioned in the document.
- 8.3 Issues to be addressed in the longer term: Mr Jean Pascal van Ypersele reported on behalf of the Task Group on the future of IPCC on some of the longer term issues raised, and suggested to re-address those issues in more depth two years before the end of the fifth assessment cycle.

## **9. PROGRESS REPORTS**

- 9.1 Special Report on Renewable Energy Sources and Climate Change Mitigation: Mr Ottmar Edenhofer, on behalf of the WG III co-chairs, gave a short briefing on the on-going activities (IPCC-XXXI/Doc.8). Mr Ralph Sims will replace Mr Wolfram Krewitt as Lead Author.
- 9.2 Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: Mr Vicente Barros, on behalf of WG II Co-Chairs, gave a short briefing on the on-going activities (IPCC-XXXI/Doc.7).
- 9.3 Task Force on Inventories (TFI): Ms Thelma Krug, on behalf of the Task Force Co-Chairs, presented the activities of the Task Force, as outlined in IPCC-XXXI/Doc.9.
- 9.4 Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA): Mr Richard Moss, on behalf of the Co-Chairs, reported on the Task Group activities, as outlined in IPCC-XXXI/Doc.14.
- 9.5 Development of new scenarios: Mr Christopher Field provided a short oral report on this activity on behalf of the Catalytic Group, mentioning the extension of the Representative Concentration Pathways (RCP) to the year 2300 and the development of more complete socio-economic story lines for each scenario. Mr Richard Moss, reported on the work of the Integrated Assessment and Climate Modeling communities, and indicated that three RCP's are now finalized for use by modelers, and the upcoming release of the fourth one, RCP 6. The Panel requested that the Catalytic Group prepare a written report for next Plenary, addressing the status of RCP's, their extension to the year 2300, the coordination between the Integrated Assessment and Climate Modeling communities, and involvement of TGICA.
- 9.6 IPCC Peace Prize Scholarship Fund: Ms Renate Christ reported on progress made with the development and use of the Trust Fund initiated with the Nobel Peace Prize money, as outlined in IPCC-XXXI/Doc. 13. The Panel expressed appreciation of progress made so far. The proposed title for this activity: "IPCC Climate Education Programme" raised some objections and may need to be revised. Some concerns were also raised with respect to the criteria to be required from possible funding sources. The Programme is scheduled to be formally launched in December 2009 during COP-15 in Copenhagen.
- 9.7 Any other progress reports: Ms Christ reported on IPCC outreach activities, as outlined in IPCC-XXXI/Doc.16. A specific effort is planned for COP-15 with the preparation of leaflets describing some of the key IPCC activities.

## **10. TIME AND PLACE OF THE NEXT SESSION**

The Republic of Korea formally offered to host the 32<sup>nd</sup> Session of the IPCC from 11 to 14 October 2010 in Busan. This offer was accepted by the Panel with thanks.

## **11. CLOSING OF THE SESSION**

The Session was closed by the Chair at 13.00 on 29 October 2009.

**PROVISIONAL AGENDA**

- 1. OPENING OF THE SESSION**
- 2. APPROVAL OF THE DRAFT REPORT OF THE 30<sup>th</sup> SESSION**
- 3. SCOPING OF THE IPCC 5<sup>TH</sup> ASSESSMENT REPORT**
  - 3.1 Action taken at the Eleventh Session of Working Group I
  - 3.2 Action taken at the Ninth Session of Working Group II
  - 3.3 Action taken at the Tenth Session of Working Group III
  - 3.4 Cross cutting issues
  - 3.5 Expert meetings and workshops
  - 3.6 AR5 Synthesis Report
  - 3.7 Finalization of the AR5 Scope and outline
- 4. IPCC PROGRAMME AND BUDGET FOR 2010-2014**
- 5. ADMISSION OF OBSERVER ORGANIZATIONS**
- 6. MATTERS RELATED TO UNFCCC**
- 7. RULES OF PROCEDURES FOR THE ELECTION OF THE IPCC BUREAU AND ANY TASK FORCE BUREAU**
- 8. REPLACEMENT OF MEMBERS OF THE BUREAU**
- 9. IMPLEMENTATION OF DECISIONS TAKEN BY IPCC-30**
  - 9.1 Involving developing/EIT country scientists (Decision 7)
  - 9.2 Use the full range of electronic technologies including searchable version of the AR4 (Decisions 10/11)
  - 9.3 Issues to be addressed in the longer term (Decision 13)
- 10. PROGRESS REPORTS**
  - 10.1 Special Report on Renewable Energy Sources and Climate Change Mitigation
  - 10.2 Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
  - 10.3 Task Force on Inventories (TFI)
  - 10.4 Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA)
  - 10.5 Development of new scenarios
  - 10.6 IPCC Peace Prize Scholarship Fund
  - 10.7 Any other progress reports
- 11. OTHER BUSINESS**
- 12. TIME AND PLACE OF THE NEXT SESSION**
- 13. CLOSING OF THE SESSION**

**REPORT OF THE 30<sup>TH</sup> SESSION OF THE IPCC  
IS POSTED SEPARATELY**

**AGREED REFERENCE MATERIAL FOR THE  
IPCC FIFTH ASSESSMENT REPORT**

- Working Group I outline
- Working Group II outline
- Working Group III outline
- Concept notes on Cross-Cutting issues
- AR5 Expert Meetings and Workshops

# Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis

## Summary for Policy Makers

### Technical Summary

#### Chapter 1: **Introduction**

##### Executive Summary

- Rationale and key concepts of the WG1 contribution
- Treatment of uncertainty
- Climate change projections since FAR

##### Frequently Asked Questions

#### Chapter 2: **Observations: Atmosphere and Surface**

##### Executive Summary

- Changes in surface temperature and soil temperature
- Changes in temperature, humidity and clouds
- Changes in atmospheric composition
- Changes in radiation fields and energy budget
- Changes in hydrology, runoff, precipitation and drought
- Changes in atmospheric circulation, including wind
- Spatial and temporal patterns of climate variability
- Changes in extreme events, including tropical and extratropical storms

##### Frequently Asked Questions

#### Chapter 3: **Observations: Ocean**

##### Executive Summary

- Changes in ocean temperature and heat content
- Ocean salinity change and freshwater fluxes
- Sea level change, ocean waves and storm surges
- Ocean biogeochemical changes, including ocean acidification
- Changes in ocean surface processes
- Changes in ocean circulation
- Spatial and temporal patterns of ocean variability

##### Frequently Asked Questions

#### Chapter 4: **Observations: Cryosphere**

##### Executive Summary

- Changes in ice sheets, including mass balance
- Changes in ice shelves
- Changes in glaciers and ice caps
- Sea ice variability and trends
- Snow and ice cover variability and trends
- Changes in frozen ground

##### Frequently Asked Questions

## **Chapter 5: Information from Paleoclimate Archives**

### Executive Summary

- Characteristics of early instrumental, documentary and natural climate archives
- Reconstruction of radiative forcing and climate response
- Reconstruction of regional variability and extremes
- Abrupt climate changes and their regional expression
- Sea level and ice sheets: patterns, amplitudes and rates of change
- Paleoclimate perspective on irreversibility in the climate system
- Paleodata-model intercomparisons

### Frequently Asked Questions

## **Chapter 6: Carbon and Other Biogeochemical Cycles**

### Executive Summary

- Past changes in CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and biogeochemical cycles
- Recent trends in global and regional sources, sinks and inventories, including land use change
- Processes and understanding of changes, including ocean acidification
- Interactions between the carbon and other biogeochemical cycles, including the nitrogen cycle
- Projections of changes in carbon and other biogeochemical cycles
- Greenhouse gas stabilisation
- Carbon cycle – climate feedbacks and irreversibility
- Geoengineering involving the carbon cycle

### Frequently Asked Questions

## **Chapter 7: Clouds and Aerosols**

### Executive Summary

- Observations of clouds and their representation in models
- Coupling of clouds, water vapour, precipitation and the large-scale circulation
- Cloud and water vapour feedbacks and their effects on climate sensitivity
- Observations of aerosols and their representation in models
- Aerosol types including black carbon: chemistry, sources, sinks and distribution
- Direct and indirect aerosol forcing and effects, including contrails and cosmic rays
- Aerosol-cloud-precipitation interactions
- Geoengineering involving clouds and aerosols

### Frequently Asked Questions

## **Chapter 8: Anthropogenic and Natural Radiative Forcing**

### Executive Summary

- Natural radiative forcing changes: solar and volcanic
- Anthropogenic radiative forcing, including effects from land surface changes
- Effects of atmospheric chemistry and composition
- Spatial and temporal expression of radiative forcing
- Greenhouse gas and other metrics, including Global Warming Potential (GWP) and Global Temperature Change Potential (GTP)

### Frequently Asked Questions

**Chapter 9: Evaluation of Climate Models**

Executive Summary

- The hierarchy of climate models: from global to regional
- Downscaling methods
- Assessing model performance, including quantitative measures and their use
- New model components and couplings
- Representation of processes and feedbacks in climate models
- Simulation of recent and longer term records
- Simulation of regional patterns, variability and extremes

Frequently Asked Questions

**Chapter 10: Detection and Attribution of Climate Change: from Global to Regional**

Executive Summary

- Evaluation of methodologies
- Atmospheric and surface changes
- Changes in ocean properties
- Cryosphere changes
- Extreme events
- Pre-instrumental perspective
- Implications of attribution for projections

Frequently Asked Questions

**Chapter 11: Near-term Climate Change: Projections and Predictability**

Executive Summary

- Predictability of interannual to decadal climate variations and change
- Projections for the next few decades
- Regional climate change, variability and extremes
- Atmospheric composition and air quality
- Possible effects of geoengineering
- Quantification of the range of climate change projections

Frequently Asked Questions

**Chapter 12: Long-term Climate Change: Projections, Commitments and Irreversibility**

Executive Summary

- Scenario description
- Projections for the 21<sup>st</sup> century
- Projections beyond the 21<sup>st</sup> century
- Regional climate change, variability and extremes
- Forcing, response and climate sensitivity
- Climate change commitment and inertia
- Potential for abrupt change and irreversibility in the climate system
- Quantification of the range of climate change projections

Frequently Asked Questions

**Chapter 13: Sea Level Change**  
Executive Summary

- Synthesis of past sea level change and its components
  - Models for sea level change
  - Projections of globally averaged sea level rise
  - Projections of the regional distribution of sea level change
  - Extreme sea level events
  - Potential ice sheet instability and its implications
  - Multi-century projections
- Frequently Asked Questions

**Chapter 14: Climate Phenomena and their Relevance for Future Regional Climate Change**  
Executive Summary

- Patterns of variability: observations, understanding and projections
  - Monsoon systems: observations, understanding and projections
  - Extremes: observations, understanding and projections
  - Interconnections among phenomena
- Frequently Asked Questions

**Annex I: Atlas of Global and Regional Climate Projections**

**Annex II: Glossary**

**Annex III: Acronyms and Regional Abbreviations**

**Annex IV: List of Authors**

**Annex V: List of Reviewers**

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*Note on WG I AR5 Annex I: Atlas of Global and Regional Climate Projections:*

Annex I: Atlas of Global and Regional Climate Projections is an integral part of the Working Group I (WG I) contribution to the IPCC Fifth Assessment Report (AR5). It will provide comprehensive information on a selected range of variables (e.g., temperature and precipitation) for a few selected time horizons (e.g., 2020, 2050, and 2100) for all regions and, to the extent possible, for the four basic RCP scenarios. These results are derived from the Global Comprehensive Climate Models participating in the WCRP CMIP5 coordinated experiment. Material from similar multi-model regional climate modeling projects will be provided, to the extent possible, in Supplementary Material for the appropriate WG I Chapters, where results from those projects are assessed.

In addition, numerical fields corresponding to the figures together with the specification of the data sources and the description of how the figures were constructed will be included in Annex I.

The information used in Annex I will be based on material assessed in WG I Chapters 11, 12 or 14. Each Figure in Annex I will have a caption that will include a reference to the location in the assessment report where the underlying information is assessed and vice versa. Thus each figure will be a part of the chapter in which it is assessed.

Annex I: Atlas of Global and Regional Climate Projections will be produced by an **Editorial Team** consisting of 2 members of the Lead Author Teams of each of WG I Chapters 11, 12 and 14. This Editorial Team is assisted by an **Advisory Board** consisting of 2 WG I Vice-Chairs and an invited member of the WG II AR5 Lead Author Team.

The content of Annex I will be part of the review process of the specific chapters from which it is drawn. This review process is overseen by a **Review Editor Team** consisting of one Review Editor of each of WG I Chapters 11, 12 and 14.

# Outline of the Working Group II Contribution to the Fifth Assessment Report Climate Change 2014: Impacts, Adaptation, and Vulnerability

## Table of Contents

### Summary for Policymakers Technical Summary

*Each sectoral and regional chapter will include a standard set of topics that are referred to as [CONTEXT] in each chapter outline:*

- Observed impacts, with detection and attribution
- Projected integrated climate change impacts, with regional variation by scenario and time slice
- Assessing impacts, vulnerabilities, and risks
  - o Vulnerabilities to key drivers (including extremes)
  - o Economic, social, and environmental context for uncertain futures under alternative development pathways
  - o Multiple interacting stresses
  - o Uncertainty
  - o Valuation of impacts and adaptation
  - o Key vulnerabilities
- Adaptation and managing risks
  - o Adaptation needs and gaps (based on assessed impacts and vulnerabilities)
  - o Practical experiences of adaptation, including lessons learned
  - o Observed and expected barriers to adaptation
  - o Observed and expected limits to adaptation
  - o Facilitating adaptation and avoiding maladaptation
  - o Planned and autonomous adaptation
  - o Potential and residual impacts
  - o Thresholds and irreversible changes
- Case studies
- Research and data gaps

*Each chapter will include an executive summary, FAQs, and references*

## **PART A: GLOBAL AND SECTORAL ASPECTS**

### **Context for the AR5**

1. Point of departure
  - The setting
  - Major conclusions of WGII AR4
  - Major conclusions of Special Report on *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*
  - Major conclusions of WGI AR5
2. Foundations for decisionmaking
  - Key concepts
  - Impacts, adaptation, and vulnerabilities on a range of scales
  - Assessing impacts, vulnerabilities, and risks
    - o Multi-metric valuation
    - o Treatment of uncertainty
    - o Key vulnerabilities
  - Managing risks
  - Climate-resilient pathways: adaptation, mitigation, and sustainable development Interactions

## **Natural and Managed Resources and Systems, and Their Uses**

### 3. Freshwater resources

- Diversity of world water resources and their sensitivity to climate change  
[CONTEXT]
- Cryosphere
- Interactions among water resources, human activities, and the built environment
- Water management, water security, and sustainable development

### 4. Terrestrial and inland water systems

- Diversity of world ecosystems and their sensitivities to climate change: from the mountains to the coast, from the tropics to the poles
  - o Intensively managed systems: forestry, fiber, and fuel production
  - o Wildlands and extensively managed systems
  - o Protected and conservation areas  
[CONTEXT] {for each ecosystem}
- Ecosystem services
- Interactions among ecosystems; land use, land-use change and forestry; and other human activities
- Vulnerability of carbon pools, bio-energy implications, and carbon management potentials
- Threats to human activities, infrastructure, and biodiversity

### 5. Coastal systems and low-lying areas

- Diversity of world ecosystems and their sensitivities to climate change  
[CONTEXT] {for each ecosystem}
- Ecosystem services
- Interactions among ecosystems, human activities, and the built environment
- Sea-level rise, changes in coastal dynamics, and threats to human activities, infrastructure, agriculture, and biodiversity

### 6. Ocean systems

- Diversity of world ecosystems and their sensitivities to climate change  
[CONTEXT] {for each ecosystem}
- Ecosystem services
- Water property changes, including temperature and ocean acidification
- Interactions between ecosystems and human activities
- Threats to human activities and biodiversity

### 7. Food production systems and food security

- Food production: farming, livestock, and fisheries and their sensitivities to climate change  
[CONTEXT]
- Food systems: processing, distribution, and access
- Food security and the means to achieve it

## **Human Settlements, Industry, and Infrastructure**

### 8. Urban Areas

[CONTEXT]

- Urbanization processes, sustainable habitats, and climate change risks
- Urban micro-climates, including urban heat islands
- Civic services and infrastructure
- Housing and settlements
- Economic base
- Development plans and development pathways, including social capital
- Urban planning, management, and governance
- Landscape and regional interconnections

## 9. Rural Areas

[CONTEXT]

- Landscape and regional interconnections (including migration)
- Housing and settlements
- Economic base and livelihoods
- Infrastructure
- Social capital and resilience

## 10. Key economic sectors and services

[CONTEXT]

- Networked infrastructure, including transportation, energy, water, and sanitation
- Industry and manufacturing
- Tourism
- Social and other economic services
- Market impacts (supply chains, systemic risks, and insurance)  
*{Food production, building on Chapter 7}*

## **Human Health, Well-Being, and Security**

### 11. Human health

[CONTEXT]

- Determinants of health: current and future trends
- Health outcomes and their sensitivity to climate change
  - o Extreme events
  - o Air quality
  - o Foodborne and waterborne diseases
  - o Vectorborne and zoonotic diseases
  - o Malnutrition
- Water quality, availability, and sanitation
- Children and other vulnerable populations
- Health inequalities, gender, and marginalized populations

### 12. Human security

[CONTEXT]

- Social and economic activities, including employment
- Education
- Inequalities, gender, and marginalized populations
- Culture, values, and society
- Indigenous peoples
- Local communities
- Local and traditional knowledge
- Migration and population displacement
- Conflict
- Community resilience

### 13. Livelihoods and poverty

[CONTEXT]

- Chronic and transient poverty
- Effects of climate change responses on poverty
- Interactions between climate change and poverty-reduction initiatives
- Inequalities, gender, and marginalized populations

## **Adaptation**

### 14. Adaptation needs and options

- Synthesis of adaptation needs and options
- International, national, and sectoral assessments, including National Adaptation Programmes of Action (NAPAs)
- Measuring adaptation
- Addressing maladaptation

### 15. Adaptation planning and implementation

- Local, national, regional, and global strategies, policies, and initiatives
- Technology development, transfer, and diffusion
- Financing for adaptation
- Insurance and social protection
- Knowledge sharing, learning, and capacity building
- Institutional arrangements: public- and private-sector stakeholders and priorities
- Links between adaptation and development
- Decision support tools and methods
- Adaptation status and indicators

### 16. Adaptation opportunities, constraints, and limits

- Cross-sectoral synthesis
- Limits to adaptation, including ethical dimensions and resources
- Interactions among limits
- Effects of alternative mitigation pathways on adaptation
- Ancillary social and ecological effects of adaptation

### 17. Economics of adaptation

- Adaptation costs and benefits at global, national, sectoral, and local levels
- Inter-relationships between adaptation costs and residual damage
- Economic instruments to provide incentives
- Using market-based approaches for adaptation decisionmaking
- Ancillary economic effects

***Chapters 14-17 will include case studies of, e.g., Least Developed Countries, indigenous peoples, and other vulnerable countries and groups***

## **Multi-Sector Impacts, Risks, Vulnerabilities, and Opportunities**

### 18. Detection and attribution of observed impacts

- Integration of observed impacts across sectors and regions
- Attribution of observed impacts across sectors and regions

### 19. Emergent risks and key vulnerabilities

- Multiple interacting systems and stresses
- Indirect impacts, transboundary impacts, and impacts over longer distances
- Key vulnerabilities, aggregate impacts, thresholds, irreversible changes, and reasons for concern

### 20. Climate-resilient pathways: adaptation, mitigation, and sustainable development

- Multi-metric valuation
- Ecosystem services and biodiversity threats
- Consumption patterns, lifestyles, behavior, culture, education, and awareness
- Human well-being
- Adaptation, mitigation, and sustainable development, including tradeoffs and cobenefits

## **PART B: REGIONAL ASPECTS**

*{Subtitle: Contribution of IPCC WGII Incorporating Inputs from IPCC Working Group I “The Physical Science Basis” and Working Group III “Mitigation of Climate Change”}*

*This part will include analyses of consistently defined sub-regions and crossregional hotspots (e.g., Mediterranean, megadeltas), based on the availability of regional information.*

### 21. Regional context

- Introduction
- Information on observed climate changes and relevant non-climate factors
- Regional projections: added value and limitations
- Similarities and pertinent differences in systems across regions
- Cross-regional hotspots

### **Regional Chapters**

22. Africa
23. Europe
24. Asia
25. Australasia
26. North America
27. Central and South America
28. Polar Regions
29. Small Islands
30. Open Oceans

### Chapter structure (22-30)

- Introduction
- Major conclusions from previous assessments  
*[CONTEXT] {with sub-regional information}*
- Adaptation and mitigation interactions
- Inter- and intra-regional impacts
- Multi-sector synthesis

### **Appendix I: Glossary**

### **Appendix II: Acronyms**

### **Appendix III: Contributors to the IPCC WGII Fifth Assessment Report**

### **Appendix IV: Reviewers of the IPCC WGII Fifth Assessment Report**

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**Working Group III:  
AR5 Outline Agreed by WG III Plenary**

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**Summary for Policy Makers**  
**Technical Summary**  
**Frequently Asked Questions (extracted from the chapters below)**

**I. INTRODUCTION**

**1. Introductory Chapter**

- Lessons learned from AR4
- New challenges for the AR5
- Historical, current and future trends
- The mitigation challenges
- 

**II. FRAMING ISSUES**

**2. Integrated Risk and Uncertainty Assessment of Climate Change Response Policies**

- Risk perception
- Risk and uncertainty in climate change
- Metrics of uncertainty and risk
- Managing uncertainty, risk and learning
- Tools for analyzing uncertainty and risk
- Frequently asked questions

**3. Social, Economic and Ethical Concepts and Methods**

- Assessing methods of policy choice
- Ethical and socio-economic principles
- Metrics of costs and benefits
- Economics, rights and duties
- Justice, equity and responsibility
- Behavioural economics and culture
- Policy instruments and regulation
- Technological change
- Frequently asked questions

**4. Sustainable Development and Equity**

- Determinants, drivers and barriers
- Mitigative capacity and mitigation
- Links to adaptive capacity and adaptation
- Development pathways
- Consumption patterns and carbon accounting
- Integration of framing issues in the context of sustainable development
- Implications for subsequent chapters
- Frequently asked questions

### **III. PATHWAYS FOR MITIGATING CLIMATE CHANGE**

#### **5. Drivers, Trends and Mitigation**

- Global trends in stocks and flows of greenhouse gases and short-lived species
- Key drivers of global change
- Production, consumption and trade patterns
- Contribution of technological change to mitigation
- Contribution of behavioural change to mitigation
- Co-benefits and tradeoffs of mitigation including air pollution
- Carbon and radiation management and other geoengineering options including environmental risks
- The system perspective: linking sectors, technologies and consumption patterns
- Frequently asked questions

#### **6. Assessing Transformation Pathways**

- Tools of analysis
- Climate stabilization: Concepts, costs and implications for the macroeconomy, sectors and technology portfolios, taking into account differences across regions
- Integrating long- and short-term perspectives
- Integrating technological and societal change
- Sustainable development and transformation pathways, taking into account differences across regions
- Risks of transformation pathways
- Integrating sector analyses and transformation scenarios
- Frequently asked questions

#### **7. Energy Systems**

[Note: All sections should consider regional specificities including as appropriate to developed and developing countries and economies in transition.]

- Energy production, conversion, transmission and distribution
- New developments in emission trends and drivers
- Resources and resource availability
- Mitigation technology options and practices (including energy efficiency)
- Infrastructure and systemic perspectives
- Climate change feedback and interaction with adaptation
- Technological, environmental and other risks and uncertainties; and social acceptability
- Co-benefits, tradeoffs, spill-over effects
- Barriers and opportunities (technological, physical, financial, institutional, cultural, legal, etc.)
- Sustainable development and behavioural aspects
- Costs and potentials
- Gaps in knowledge and data
- Frequently asked questions

#### **8. Transport**

[Note: All sections should consider regional specificities including as appropriate to developed and developing countries and economies in transition.]

- Freight and passenger transport (land, air, sea and water)
- New developments in emission trends and drivers
- Mitigation technology options and practices (including energy efficiency)
- Infrastructure and systemic perspectives
- Climate change feedback and interaction with adaptation

- Technological, environmental and other risks and uncertainties; and social acceptability
- Co-benefits, tradeoffs, spill-over effects
- Barriers and opportunities (technological, physical, financial, institutional, cultural, legal, etc.)
- Sustainable development and behavioural aspects
- Costs and potentials
- Gaps in knowledge and data
- Frequently asked questions

## **9. Buildings**

[Note: All sections should consider regional specificities including as appropriate to developed and developing countries and economies in transition.]

- Commercial, residential and public buildings
- New developments in emission trends and drivers
- Mitigation technology options and practices (including energy efficiency)
- Infrastructure and systemic perspectives
- Climate change feedback and interaction with adaptation
- Technological, environmental and other risks and uncertainties; and social acceptability
- Co-benefits, tradeoffs, spill-over effects
- Barriers and opportunities (technological, physical, financial, institutional, cultural, legal, etc.)
- Sustainable development and behavioural aspects
- Costs and potentials
- Gaps in knowledge and data
- Frequently asked questions

## **10. Industry**

[Note: All sections should consider regional specificities including as appropriate to developed and developing countries and economies in transition.]

- New developments in extractive industries, manufacturing and services (including tourism)
- New developments in emission trends and drivers
- Material substitution, material reuse and waste
- Mitigation technology options and practices (including efficiency improvements, household and industry waste)
- Infrastructure and systemic perspectives
- Climate change feedback and interaction with adaptation
- Technological, environmental and other risks and uncertainties; and social acceptability
- Co-benefits, tradeoffs, spill-over effects
- Barriers and opportunities (technological, physical, financial, institutional, cultural, legal, etc.)
- Sustainable development and behavioural aspects
- Costs and potentials
- Gaps in knowledge and data
- Frequently asked questions

## **11. Agriculture, Forestry and Other Land Use (AFOLU)**

[Note: All sections should consider regional specificities including as appropriate to developed and developing countries and economies in transition.]

- Introduction to integrated assessment of AFOLU
- Emission trends (including agricultural productivity) and drivers

- Competition and opportunities for land-use (energy, food, feed and timber production; housing, nature conservation, biodiversity and other land uses)
- Mitigation technologies and practices in forestry, agriculture (e.g. biochar) and livestock farming
- Mitigation effectiveness (non-permanence: human and natural impacts; displacement; saturation)
- Systemic perspectives (including integrated land-use assessment)
- Synergies, tradeoffs and interactions with adaptation and other mitigation options
- Climate change feedback, natural disturbance and extreme events
- Environmental and other risks and uncertainties
- Co-benefits, tradeoffs, spill-over effects
- Opportunities and barriers (technological, physical, financial, institutional, cultural, legal, etc.)
- Sustainable development and behavioural aspects
- Costs and potentials
- Gaps in knowledge and data
- Frequently asked questions

## **12. Human Settlements, Infrastructure and Spatial Planning**

[Note: All sections should consider regional specificities including as appropriate to developed and developing countries and economies in transition.]

[Note: Working Group III Plenary suggests that the WG III Bureau and the authors have the mandate to revisit the structure and the title of the bullets in this chapter based on the outcome of the Expert Meeting on “Human Settlements and Infrastructure” to be held in 2010.]

- Urbanisation challenges and opportunities for climate change mitigation
- Settlement structures, density, forms and lifecycle assessments
- Infrastructure, spatial planning and mitigation
- Lifestyle changes and efficiency
- Waste
- Water/energy nexus
- Human settlements and climate change: Experiences across countries
- Frequently asked questions

## **IV. ASSESSMENT OF POLICIES, INSTITUTIONS AND FINANCE**

### **13. International Cooperation: Agreements and Instruments**

- Introduction
- Framing concepts and an assessment of means for international cooperation
- International agreements: Examples and lessons for climate policy
- Multilateral and bilateral agreements across different scales
- Climate policy architectures
- Mechanisms for technology and knowledge development, transfer, diffusion
- Capacity building
- Linkages between international and national policies
- Linkages between international and regional cooperation
- Interactions between climate change mitigation policy and trade
- Performance assessment on policies and institutions including market mechanisms
- Investment and finance
- The role of public and private sectors and public-private partnership
- Frequently asked questions

#### **14. Regional Development and Cooperation**

- Introduction
- Opportunities and barriers of regional cooperation
- Current development patterns and goals
- Energy and development
- Urbanisation and development
- Consumption and production patterns in the context of development
- Low carbon development: Opportunities and barriers
- Links between mitigation, adaptation and development
- Investment and finance
- The role of public and private sectors and public-private partnership
- Frequently asked questions

#### **15. National and Sub-national Policies and Institutions**

- Introduction
- Characteristics and classification of policy instruments and packages
- Approaches and tools used to evaluate policies and institutions
- Research and development policy
- Assessment of the performance of policies and measures in developed and developing countries taking into account development level and capacity
- Framework: Role of institutions and governance
- Capacity building
- National, state and local linkages
- Links to adaptation
- Synergies and tradeoffs among policies
- Assessing policy design options
- Investment and finance
- The role of public and private sectors and public-private partnership
- The role of stakeholders including NGOs
- Frequently asked questions

#### **16. Cross-cutting Investment and Finance Issues**

- Financing low-carbon investments, opportunities, key-drivers and barriers
- Financing developed countries' mitigation activities
- Financing mitigation activities in and for developing countries including for technology development, transfer and diffusion
- Financing infrastructure and institutional arrangements
- Synergies and tradeoffs between financing mitigation and adaptation
- Directing and leveraging private financing
- Innovative financing
- Approaches and scale of financing at national, regional and international level in short-, mid- and long-term
- Enabling environments
- Frequently asked questions

#### **Glossary**

#### **List of Authors and Reviewers**

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## **FIFTH ASSESSMENT REPORT**

Concept notes on Cross-Cutting issues<sup>1</sup>

### **Consistent Evaluation of Uncertainties and Risks (CCM)**

#### **Background and scope**

The quality of the uncertainty guidance notes for AR4 was recognized, but it was noted that their application has been uneven across and within Working Groups. Aspects of risks have not been treated consistently among Working Groups.

Further, the increased awareness and concern of policy makers regarding low-probability, high-consequence events, and the increased interest in risk assessment and risk management was recognized, even though these concepts are understood differently in different disciplines and Working Groups.

The overarching goal of refining and conveying consistent information on uncertainty and risk is to serve as a useful input for decision making on climate change.

#### **Working Group involvement**

All three Working Groups are and should continue to be involved, with the Co-Chairs of the Working Groups taking the lead.

#### **Suggested approach**

- The Working Group Co-Chairs to discuss their needs for guidance in the area of risk and uncertainty, and engage a process for updating and extending the existing guidance prior to the first LA meeting of each Working Group;
- The distinction between likelihood and confidence and the use of the confidence scale needs to be further clarified;
- The guidance paper to include a discussion of the meaning and significance of risk, specifically to address the treatment of low-probability, high-consequence events;
- Concerning risk assessment and risk management, to use a common language among Working Groups and Special Reports, without being prescriptive regarding its application;
- Once authors have been designated, for each Working Group to designate a small group of authors in order to ensure communication, coordination, and consistency of this issue across Working Groups and throughout the assessment process;
- Early on in the guidance development process, to use concrete case studies to test the approach recommended to deal with uncertainty and risk.

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<sup>1</sup> Cross-Cutting Methodology (CCM)  
Cross-Cutting Theme (CCT)

## **Costing and Economic Analysis (CCM)**

### **Background**

Economic analysis has been widely applied across the climate change domain – analyses of the economic cost of climate-related damages, the costs and benefits of mitigation options, the costs and benefits of adaptation options, the economic implications of policy design and instrument choice, the economic consequences of alternative architectures for international treaties on climate policy, and the economics of decision-making under uncertainty are primary examples. Past IPCC Reports have assessed these analyses, and this tradition will continue in the AR5.

### **Scope**

The application of common economic fundamentals and measurement processes to analyses of adaptation and mitigation depends on the constraints that define their context. Even though these analyses accommodate enormous diversity in context, common fundamentals suggest that common criteria can be applied in the assessment of the resulting disparate literature. The point is not to decide whether the underlying analytical approach of any specific study is right or wrong; it is, instead, to judge the degree to which its specific application recognizes, to the extent practicable, elements that have played critical roles in driving results in one direction or another. The scope of this CCM would also comprise matters related to finance and investment.

### **Working Group Involvement Coverage**

Costing and economic analysis will permeate the work of Working Groups II and III. Exploiting common language and common fundamentals should help in making the confidence assessments of economic conclusions that will be offered in both Reports more comparable and more transparent than in the past.

### **Suggested Approach**

An Expert Meeting is proposed to assist authors in conducting their upcoming work. The expert meeting will not conduct a comprehensive assessment of literatures involved. It will, instead, work to incorporate a diverse set of views and to suggest how assessment frameworks can be created so that confidence levels drawn from economic analyses of all types can be more comparable. If the Meeting were scheduled after the author teams had been assembled but before the writing had begun, Lead Authors who will be responsible for the economic and valuation parts of the various chapters in both Working Groups could attend, participate, and begin the collaborative relationships that will, themselves, facilitate integration. The Expert Meeting should produce a volume that contains invited papers, discussant comments, and summaries of subsequent audience discussions. A Guidance Paper could then be created based on the content of the Meeting Report and other documents. This Paper would be designed to promote quality in the assessment of economic literature included across the various chapters of Working Groups II and III as well as consistency in judgments of quality across multiple chapters and both Working Groups. Elements of the guidance paper might even be incorporated into the both Working Group contributions to the AR5.

## Regional Aspects (CCM)

### Background and Scope

At its 30th Session held in Antalya, Turkey, in April 2009, the IPCC decided that much greater attention was required to improve the treatment of regional issues in AR5. The scoping meeting was also tasked to consider options for a more detailed regional division. The Scoping meeting took note of the following documents: the guidance paper on regional issues prepared for AR4, the report of the Task Group on the Future of IPCC (IPCC-XXX/Doc. 10), the draft report of the 30<sup>th</sup> session of the IPCC, the compromise proposal on the improved treatment of regional information in AR5 (AR5-SCOP/INF.3), and a document titled "Consideration of regional division for the IPCC AR5" prepared by the IPCC Secretariat for this meeting.

### Reflection of Regional Information in the AR5 Working Groups

In order to improve the treatment of regional information in AR5, for the benefit of all users of the AR5 reports, it is suggested that the WGII contribution is split in two parts, completed at the same time and subject to a single review and SPM/TS approval process (There would be only one SPM and one TS, both included in each part, so that the overall context is present in each part.):

General title: *Vulnerability, Impacts, and Adaptation*

- Part A scope and subtitle: "*Global and sectoral aspects*"
- Part B scope and subtitle: "*Regional aspects*". The cover for this Part would also mention: "*Contribution of IPCC WGII, incorporating inputs from IPCC Working Group I "The Physical Science Basis" and Working Group III "Mitigation of Climate Change"*"

For further details see outline of the Working Group II report contained in IPCC-WG-II:9<sup>th</sup>/Doc.2.

### To make this regional Part possible, a number of suggestions were made:

- Ensure consistency in the presentation and transfer of regional information on observed and projected climate changes (including changes in extreme events), future scenarios, and mitigation and adaptation issues between Working Groups I, II and III;
- Holding an IPCC Workshop or an Expert Meeting on Regional Aspects of Climate Change jointly between Working Groups I, II and III at an appropriate stage of the development of the AR5 would be very useful to help achieving this consistency, increase the knowledge base from region specific literature and promote mutual understanding around the regional aspects. One possibility is to organize it in conjunction with a TGICA meeting;
- As in AR4, make use of detailed case studies in specific regions ("hot spots") that focus on different aspects of the climate issue, often spanning different Working Groups;
- Offer mechanisms for making the most efficient use of regional expertise on chapters in different Working Groups requiring the transfer and presentation of regional information, e.g.: WGI and WGIII nominate authors who would be willing to review, from the outset, draft regional chapters in WGII; A small number of Lead Authors from one Working Group accustomed to working in an interdisciplinary perspective be nominated as "Attending" Contributing Authors for another Working Groups. At the invitation of the Co-Chairs they can attend relevant parts of LA meetings (they would be LA in one WG and CA in another WG);
- Make the draft texts of Part A of WGII available in a timely manner to WGIII so that WGIII can take into account the latest information available for integrated assessment. Similarly, timely exchanges of relevant draft texts between WGI and WGII will be useful.
- Promote the use of Geographical Information Systems (GIS) and Internet tools to present and communicate regional information both during AR5 preparation (for technical exchange) and after its completion (for outreach), and could possibly be aided by TGICA and DDC.

- Consider scheduling the WGII final plenary after both WGI and WGIII have completed their volumes. This would allow the WGI and WGIII material to be available in an approved form, and allow the WGI and WGIII author teams and TSUs to be able to contribute effectively with their material to the regional Part B of the WGII report. This would facilitate the effective contribution of WGIII to the regional WGII Part B, and the approval process of this Part B, so that WGIII-related material in WGII Part B can be founded on already approved WGIII material. This is particularly important given the number of WGII chapters.

### **Suggested approach for the division of the world into regions**

For the division of the world into regions to be used in AR5 a number of different criteria, depending of the kind of analysis intended or the discipline concerned need to be considered, while noting that there is no regional division which can satisfy perfectly all needs. A number of principles were suggested, including: no area should be left out of the division, and the sum of the parts should cover the entire globe; a geographical approach is suggested to divide the world into regions, with additional sub-regional information as feasible.

Some of the advantages of such an approach are that it is easy to communicate and widely recognized, and that geography does not change fast. Users can easily know where they can find the information immediately relevant to them. Any other disaggregation (for example socio-economic) could be incorporated in those regions. This is also consistent with AR4.

A regional division and an indicative regional subdivision has been proposed for the regional Part B, but it is suggested that the regional subdivision be finalized by the chapter authors after the Workshop/Expert meeting suggested in section 7.2. For further details see outline of the Working Group II report contained in Section C.

## Water and the Earth system: changes, impacts and responses (CCT)

### Background

The title was changed from "*Hydrological cycle*" to "*Water and Earth system: changes, impacts and responses*" to better reflect the main interests of stakeholders. There needs to be more consistency among Working Groups and more involvement of WGIII on this topic.

### Scope

The following outlines the main variables and activities that should be covered. These are broken into areas relevant to the three IPCC Working Groups. It is recommended that all three Working Groups undertake a synthesis of their components of this CCT.

### Working Group involvement

**WG I** – There should be a comprehensive assessment of information available on variables related to the water cycle including observations, modeling capabilities, attribution of the changes to causes, predictions from daily to decadal time scales, projections of the longer term future, and an assessment of all of these for use by decision makers. Variables of particular interest include the following: precipitation; temperature; water vapor; extremes; runoff, river flow, discharge into the oceans; water storage, soil moisture, lakes, ground water; drought, evaporation; sea level; cryosphere changes; and air pollution. There is a need to use observations to evaluate models and factor these results into model projections, because there are still limitations in simulating precipitation. Simulation needs to be improved of the diurnal cycle, tropical storms, ENSO, and other phenomena. Down-scaling uncertainties need to be properly accounted. Issues include observational networks that are becoming degraded, especially for *in situ* observations, and the science on the attribution of changes to variables beyond temperature should be advanced.

**WG II** – Stakeholder needs should be addressed by:

- *defining the main drivers of change*. In addition to changes in climatic variables, non-climatic drivers include increasing population and water demand, economic development, urbanization; changing diet and lifestyle; and governance on water.
- *addressing fresh water issues on regional scales through observations, attribution, predictions and projections of impacts on the following*: resources; agriculture, food security, fisheries; human well-being, security; desertification, erosion; built environment; infrastructure; ecosystems; sea level; lake storage, ground water, frozen ground; snow cover, glaciers and ice caps, river and lake ice; rivers; trans-boundary aquifers (relationships between ground and surface water, aquifer recharge); extreme frequency and intensity; water quality; virtual water.
- *identifying vulnerabilities of fresh water systems*.
- *addressing coping strategies and responses* including short and long term adaptation.
- *addressing sustainable development*.

**WG III** - Water and climate change mitigation issues include:

- low carbon energy: bioenergy, biofuels (use of water, added pollution); nuclear power (cooling); hydro power; co-benefits and tradeoffs; side effects of solar, wind, etc.
- land use change: sequestration of carbon; fires.
- infrastructure: energy/water efficiency, energy recovery; technology;
- potential changes in precipitation and water quality with some geoengineering options
- questions exist on whether CCS would have side effects
- non-conventional water: (desalination, etc.).

**Suggested approach**

Working Group II should have the lead in addressing this CCT, but all three Working Groups need to be included. All Working Groups should recognize the need for a water cycle theme and provide appropriate insights, including on regions and extremes. There is a need to ensure exchange of information and coordination of information among the three Working Groups and accomplish the coordination among Working Groups. The most appropriate and effective way of doing this would be developed by the Co-Chairs (e.g. designated contributing authors). Links should be established with other activities including the special report on extreme events, the CCT on regions, and the planned "*Human Settlement and Infrastructure*" expert meeting; and water related extreme events should be taken into account at the proper level in each chapter. It is not expected that a new Technical Paper would come from this activity.

## Carbon Cycle including ocean acidification (CCT)

### Background

The carbon cycle is a central component of the Earth system. It integrates multiple forcings, responses and feedbacks related to climate change over a range of different time-scales, concerns additional biogeochemical cycles and is therefore a theme of paramount importance for all Working Groups of the AR5, as well as for the Synthesis Report. Since the completion of the IPCC-TAR, ocean acidification has been identified as a further critical and direct consequence of increasing atmospheric GHG concentrations – a full assessment of it will have to be presented by AR5. Multiple types of active management of the carbon cycle are now envisaged by many governments. Given the emergence of substantial new scientific literature on these themes, it is recommended that all the issues described in this document are reviewed and updated by all AR5 WGs, and that a mechanism is put in place to ensure this coverage, as well as ensuring the avoidance of inconsistencies between different sections of the assessment.

### Scope

- Major *issues* concerning CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O including ocean acidification, feedback mechanisms between biogeochemical cycles and climate, and aspects of land use and land management including competition between bioenergy and food production, etc;
- *process* knowledge including direct CO<sub>2</sub> effects ('fertilization') on physiology and functioning of land ecosystems, variability of carbon pools, ocean acidification, the marine biological pump, nutrient interactions with terrestrial and marine carbon dynamics, interactions among CO<sub>2</sub> effects, climate, and other stressors, carbon feedbacks from land/ocean ecosystems to climate;
- *knowledge of past dynamics* of biogeochemical cycles, ocean pH, anthropogenic GHG emissions, including budgets of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, DIC and other quantities;
- *present day budgets* with improved attribution to different sources and sinks;
- *projections* of atmospheric CO<sub>2</sub>, other GHGs and ocean pH including of relevant feedbacks, the longer-term (beyond 2100) scope, and reversibility;
- sensitivity of major carbon pools to changes in climate, land use etc. including stratification by climate zones (land and ocean) and major regional case studies (coral reefs, Amazon forest, polar oceans);
- impacts of changing biogeochemistry on biological productivity, food web structure, biological resources, fisheries, crops, fibre, bioenergy;
- carbon management for mitigation, changes in energy systems with implications for biogeochemistry and climate, urban carbon metabolism, impacts from agroindustrial system development to GHG emissions from transport, packaging and distribution.
- It is likely that further issues related to global biogeochemistry and climate arise during the coming few years – these will have to be considered as well by the AR5 assessment.

### Working Group involvement

An important role will likely be played by the WGI chapter on carbon cycle and other biogeochemical cycles: it should assess the full range of Earth system wide implications for climate change of changing biogeochemistry. WGII and WGIII should implement suitable sections to summarize this, as well as accounting for any outstanding issues as they are relevant for the respective WG.

### Suggested approach

Coordination meetings (e.g., after completion of the zero-order draft from all WGs) may be held to ensure implementation of the goals stated above. No specific "product" is being envisaged, rather adequate coverage of biogeochemistry and ocean acidification issues across the AR5 are of high importance.

## **Ice Sheets and Sea-Level Rise (CCT)**

### **Background**

The potential significant contribution of the ice sheets to future sea-level rise has raised concern about the implications for adaptation and mitigation policy options. To build on the experience gained in the AR4, there is strong interest in ensuring good communication between all three Working Groups (WGs).

### **Scope**

The focus of the cross-cutting theme was on sea-level rise and its implication for coastal zone and island adaptation and vulnerability. A particularly important focus was the heavily populated megadeltas. For understanding the adaptation issues, there is a need for scenarios of sea-level rise, including the upper and lower end of the range and not just the central estimates. The regional distribution of sea-level rise and trends in extreme events and surface waves (both amplitude and direction) were recognized as important issues. There are also potential implications for mitigation policy.

### **Working Group involvement**

WGI and WG II (and potentially WG III) have strong interest in this cross-cutting theme. Leadership would depend on the appointment of lead authors but would naturally lie in either or both of WGI and WG II. A range of issues will be addressed in the appropriate WGI and WGII chapters.

### **Suggested approach**

Mechanisms for ongoing communication across the Working Groups proposed were:

- exchange of outlines between WGI and WG II;
- video conferences between relevant lead authors. The IPCC budget may need to consider providing financial support to ensure adequate regional representation;
- explore the ability to use the IPCC Data Distribution Centre as a resource to facilitate inter-WG data exchange.

The Co-Chairs of WGI will propose to the Panel at its 31<sup>st</sup> Session an IPCC Workshop on Sea Level Rise and Ice Sheet Instability to be held in June 2010.

Joint lead authors or joint lead author meetings were not seen as essential. No need for a guidance paper or Technical Paper was identified.

There is a need to ensure optimum use is made of authors' time and to facilitate attendance and the communication of outcomes with Working Groups. IPCC Lead Author participation in the relevant workshops should be encouraged.

## Mitigation, Adaptation and Sustainable Development (CCT)

### Background

This cross-cutting theme was addressed in both WGII and WGIII of the IPCC Fourth Assessment Report (AR4). It addresses the ways that processes, responses and outcomes affect for individuals, communities, social-ecological systems, etc., which are experiencing climate change within the context of multiple, interacting stresses. The theme includes not only assessments of the economic, social and environmental costs and benefits of responses to climate change, but the human security implications for present and future generations.

### Scope

This CCT can be considered an overarching framework for considering climate change impacts, adaptation, and vulnerability. Within the AR5, this theme involves identifying the linkages between adaptation and mitigation; and assessing the social, economic, and ecological consequences of adaptation and mitigation responses, evaluating implications for sustainable development, while at the same time highlighting the new challenges to sustainable development raised by climate change. Attention would be paid to all relevant sectors, technologies and practices including biodiversity, land use planning and development, lifestyle and behavioral changes and geo-engineering.

### Working groups involved

The theme is very relevant to both WGII and WGIII, and to the SYR. There is a need to coordinate and integrate approaches and outputs among the chapters and groups.

### Suggested approach

Questions that can be considered within assessments in both WGII and WGIII:

- How do climate change responses influence a wider transition to sustainability and resilience?
- How do adaptation and mitigation policies and strategies influence vulnerability and equity? What are the implications for sustainable development (SD)?
- What types of strategies and approaches to poverty reduction and disaster risk reduction contribute to mitigation, adaptation & SD?
- How does a "sustainable" development pathway influence adaptation and mitigation?
- What is the role of transversal sectors such as energy, transport, tourism, agriculture, and fisheries
- What types of approaches and tools are being used to evaluate costs and benefits, of adaptation and mitigation measures from the perspective of SD? (i.e., what are the "co-costs" and "co-benefits"?)
- Are the metrics and values that are being used to evaluate impacts and responses explicit and transparent?

The relationship and interactions among mitigation, adaptation & SD could be framed and discussed up front in WGII, WGIII and the SYR, and assessed in the concluding chapters or sections. The empirical evidence on the consequences of adaptation and mitigation policies including synergies and conflicts and strategies for SD could also be assessed in relevant chapters. Human and societal implications and significance for SD could be included in each sectoral and thematic chapter that discusses responses to climate change. Equity dimensions of climate change responses and implications for SD could be raised in the introductory chapters of both WGs and in the SYR. Finally, individual authors that take an integrated perspective could be included in key chapters in WGII, WGIII and the SYR, and there is a need for interactions and consultations among CLAs and LAs within and among WGII, WGIII and the SYR. Inputs for dealing with this theme would also be provided from the proposed expert meeting on "*Human Settlements and Infrastructure*".

## Issues related to Article 2 of the UNFCCC

### Aim

The aim of this Cross Cutting Theme is to provide comprehensive and consistent scientific information in the AR5 that is relevant to and informs the consideration of Art. 2 of the UNFCCC, including key vulnerabilities and development.

### Background

The United Nations Framework Convention on Climate Change (UNFCCC)'s Article 2 states: "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

Document IPCC-XXXI/Doc. 4 (*Scoping of the IPCC 5<sup>th</sup> Assessment Report – Background, Cross cutting issues and AR5 Synthesis Report*) addresses the treatment of Cross Cutting Themes in the AR5. Document IPCC-XXXI/INF.3 (*Scoping of the IPCC 5<sup>th</sup> Assessment Report Cross cutting issues – Previous IPCC work related to Article 2 of the UNFCCC*) provides further background on how previous IPCC reports have addressed issues related to Article 2 of the UNFCCC. Furthermore, Document AR5-SCOP/INF. 2 (*Treatment of Cross Cutting Themes (CCTs) in TAR and AR4, and Questionnaire Result*) provides an evaluation of the treatment of the cross-cutting issues in the Third Assessment Report (TAR) and the Fourth Assessment Report (AR4). The AR4 CCT "Key vulnerabilities (including issues relating to Article 2 of the UNFCCC)" was covered by this report.

The Expert Meeting on the Science to Address UNFCCC Article 2 including Key Vulnerabilities was held in Buenos Aires, Argentina in 2004 ("IPCC Expert Meeting on The Science to Address UNFCCC Article 2 including Key Vulnerabilities" Expert Meeting – Long and Short Report). The Expert Meeting considered how this issue could be incorporated in AR4, particularly for an integrated treatment of the subject across the three Working Groups.

### Scope

This cross-cutting theme is to provide comprehensive and consistent scientific information, drawing from the assessments of the working groups in the AR5 that are relevant to and inform the consideration of Art.2 of the UNFCCC. The theme is very relevant to all working groups, and to the synthesis report. There is a need to coordinate approaches and outputs among the chapters and groups. An initial consideration of relevant material in each working group and the cross cutting issues is outlined in the following indicative list:

### WGI

- Anthropogenic and natural radiative forcing; detection and attribution of climate change: from global to regional
- Near-term and long-term climate change projections, including sea level change and regional aspects
- Abrupt climate change, extremes and irreversible climate change
- Scenarios/stabilisation levels, including rate of change
- Other relevant issues

## **WGII**

Related to different magnitudes and rates of climate change under stabilization and other scenarios, including regional aspects, information on:

- Emergent risks and key vulnerabilities
  - Aggregate impacts, thresholds, irreversible changes, and reasons for concern
- Natural and managed resources and systems, and their uses
- Food production systems and food security
- Human settlements, industry, and infrastructure
- Adaptation opportunities, constraints, and limits
- Adaptation planning and implementation
- Climate-resilient pathways: adaptation, mitigation, and sustainable development
- Other relevant issues

## **WGIII**

- Integrated risk and uncertainty assessment of climate change response policies
- Drivers, trends and mitigation
- Climate stabilization: concepts, costs and implications for the macro-economy, sectors and technology portfolios, taking into account differences across regions
- Sustainable development and transformation pathways, taking into account differences across regions
- Integrating long and short-term perspectives
- Integrating technological and societal changes
- Social, economic and ethical concepts and methods
- International cooperation: agreements & instruments
- Regional development and cooperation
- National and sub-national policies and institutions
- Cross-cutting investment and finance issues
- Other relevant issues

There are a number of cross-cutting issues including:

- Linkages and feedbacks between and among: greenhouse gas emissions, atmospheric greenhouse gas concentrations, temperature increase, precipitation, ocean acidification, sea level rise, impacts, adaptation, mitigation and sustainability
- Consistent use of scenarios and treatment of uncertainties and risks throughout the three working group reports

## **Working group involvement**

This CCT involves WGI, WGII and WGIII. All three working groups are asked to provide comprehensive and consistent scientific information pertaining to the consideration of Article 2 of the UNFCCC and to draw from their contributions to these issues.

## **Suggested approach**

Due to the importance of this CCT, the relationship and interactions related to this cross cutting theme between and within the three working group reports should be discussed up front and in the Lead Author meetings of the WGI, WGII, WGIII and the SYR, and assessed in concluding chapters or sections. It is proposed that the indicative list of topics above could be further developed at the scoping meeting of the SYR in 2010 based on the approved scoping documents of the AR5.

It is proposed to arrange a Cross Working Group meeting early 2010. This meeting could provide further guidance including on the arrangement of an expert meeting on this Cross Cutting Theme. This group would prepare a progress report to inform subsequent lead author meetings and for further consideration by the panel at its 32<sup>nd</sup> session. The progress report would further provide recommendations from the cross working group on the arrangement of an expert meeting on this cross cutting theme.

## FIFTH ASSESSMENT REPORT

### Expert Meetings and Workshops<sup>2</sup>

#### PLANNED AR5 EXPERT MEETINGS AND WORKSHOPS (OVERVIEW)

Title	Proposed by Working Groups involved	Related to CCM/CCT or new scenarios	Time	Duration	Location	Participants	Proposal attached
IPCC Expert Meeting on Detection and Attribution Related to Anthropogenic Climate Change	WGI / WGII Co-Chairs		14-16 Sep.09 (Already Held)	3 days	Geneva, Switzerland	40	√
IPCC Expert Meeting on Assessing and Combining Multi Model Climate Projections	WGI / WGII Co-Chairs		25-27 Jan 2010	2.5-3 days	Boulder, CO, USA	40	√
Expert Meeting on Human Settlement, Water, Energy and Transport Infrastructure - Mitigation and Adaptation Strategies	WGIII Co-Chairs	Mitigation, adaptation and sustainable development	March/ April 2010	tbd	tbd	80	√
IPCC Workshop on Sea Level Rise and Ice Sheet Instabilities	WGI Co-Chairs	Ice sheets and sea level rise	21-24 June 2010 (tbc)	4 days	Malaysia (tbc)	120	√
IPCC Workshop on Socioeconomic Scenarios for Climate Change Impact and Response Assessments	Joint WGII / WGIII	New scenarios	Oct 2010 (tbd)	3-4 days	tbd	70	√
Expert Meeting on consistent evaluation of uncertainties and risks	WGII, possibly involving all WGs	Consistent evaluation of uncertainties and risks	Nov 2010 (tbd)	2 days	tbd	tbd	
IPCC Workshop on Impacts of Ocean Acidification on Marine Biology and Ecosystems	Government of Japan, WGI / WGII Co-Chairs	Carbon cycle including ocean acidification	Feb 2011 (tbd)	tbc	Japan	100	√
Expert Meeting on Economic Analysis, Costing Methods and Ethics	WG III/WG II Co-Chairs	Costing and economic analysis	March 2011 (tbd)	3 days (tbd)	tbd	70 (tbd)	√
<b>Other expert meetings and workshops</b>							
Joint IPCC-NRC expert meeting on RCP-2	WG II	New Scenarios	2010	tbd	tbd	tbd	
Expert meetings on bottom-up/top/down	WG III	WG III	4x2 days, back to back with LA meetings			LA s	
Regional expert meetings	WG II	to support Part B of WGII	2011-2012	tbd	tbd	tbd	
Expert meetings with business and NGOs	WG III, possibly other WGs	to support AR5 review process	tbd	tbd	tbd		
GEO-IPCC Expert Consultation: "How GEOSS could serve the data needs of the climate impacts and adaptation research communities and support the IPCC assessments"	WGII	General support	17-19 May 2010	3 days	Geneva, Switzerland	40	√

<sup>2</sup> For any updates please consult the IPCC Website

**IPCC PROGRAMME AND BUDGET**

Decisions taken by the Panel at its 31<sup>st</sup> Session

Based on the recommendations of the Financial Task Team, the Panel:

1. Thanked the Secretariat of IPCC for the interim update of contributions and expenditure as of 30 September 2009, as contained in document IPCC-XXXI/Doc.2.Add.1
2. Approved the modifications to the 2010 budget, as compared to the proposed budget noted by IPCC-XXX, as a consequence of the approval of the work plan of the Working Groups and TFI for that year, and of the decisions on the preparation of the Synthesis Report and Special Reports:
  - Increase of the number of journeys for Working Group I lead authors from 60 to 65 to reflect the proposed outline of 14 chapters.
  - Move the first lead authors meeting for Working Group II from 2011 to 2010 and increase the number of journeys from 80 to 105 taking into consideration the proposed outline for the Working Group II contribution.
  - Replacement of contingency for AR5 cross cutting and coordination meetings of 60 journeys by
    - 40 journeys for a planned Sea Level Rise and Ice Sheet Instabilities Workshop.
    - 16 journeys for a planned WG I/III expert meeting on multi model projections (already approved by IPCC-XXX).
    - 30 journeys for a proposed expert meeting on ocean acidification.
    - 10 journeys for the cross-WG meeting on Article 2 and 10 journeys for the cross-WG meeting on uncertainties and risks (decided by IPCC-XXXI).
    - 20 journeys contingency for possible TFI-response to UNFCCC requests.
  - Decrease of number of journeys for AR5 SYR scoping meeting from 60 to 40 trips.
  - Increase the number of journeys for expert meetings on scenarios from 30 to 40 to allow for 2 expert meetings.
  - Increase of number of journeys by 47 for the Special Report on renewable energy sources to allow for a second expert meeting on scenarios, an expert meeting with reviewers from industry and for the CLA meeting before the WG III session.
  - Adjustment of the number of lead authors journeys for the Special Report on extreme events from 95 to 90, and addition of 12 journeys for an expert meeting on case studies.
3. Approved additional travel support for 1 Government representative for each IPCC Bureau Member from developing/EIT countries (18 additional journeys per Bureau meeting).
4. Taking into account the above, it adopted the revised 2010 budget.
5. Took note of the forecast budget for 2011 and the indicative budget for the three following years 2012-2014, up to the end of the Fifth Assessment cycle, as proposed in IPCC-XXXI/Doc.2.
6. Expressed its gratitude to the WMO and UNEP for their contributions to IPCC Trust Fund and for financing one position each, and to WMO for hosting the Secretariat.
7. Expressed its gratitude to governments, including those from developing countries, for their generous contributions to the IPCC Trust Fund, with special thanks to governments which support the TSUs and a number of IPCC activities, including data centres, meetings and outreach actions.
8. The Panel noted the importance of ensuring alignment of income and expenditures across the Fifth Assessment cycle. The budget of 2009 and 2010 is increasing and will exceed CHF 7,000,000. The Panel noted the likelihood that expenditure will remain at least at this level in future years given the demands on the budget. The Panel requests that countries maintain their generous contribution in 2009 and 2010 and invites governments that may be in a position to do

so to increase their level of contributions to the IPCC Trust Fund or to contribute in case they are not yet doing so.

TABLE 1

## 2010 BUDGET ADOPTED BY IPCC-XXXI

Activity	Purpose	DC/EIT support	Other Expenditure	Sub-total
<b>Governing bodies</b>				
IPCC-32 3 days	programme and budget various	540,000 120 journeys	210,000	750,000
Bureau 4 days	2 sessions and consultations	351,000 78 journeys	125,400	476,400
TFB	1 session	40,500 9 journeys	6,075	46,575
SBSTA/COP/JWG and other UN meetings		67,500 15 journeys		67,500
<b>SUB-TOTAL</b>				<b>1,340,475</b>
<b>Lead Authors, scoping and expert meetings for reports agreed by Panel</b>				
WG I AR5 LA 1	CLA/LA meeting	292,500 65 journeys	43,875	336,375
WG II AR5 LA 1	CLA/LA meeting	472,500 105 journeys	70,875	543,375
Scoping meeting for AR5 SYR		180,000 40 journeys	27,000	207,000
Sea level rise/ice sheet workshop	AR5 workshop (WG I)	180,000 40 journeys	27,000	207,000
Multi Model Climate Projections	AR5 expert meeting (WG I/II)	72,000 16 journeys	10,800	82,800
Expert meeting on ocean acidification	expert meeting (WG II)	135,000 30 journeys	20,250	155,250
Expert meeting on human settlements	expert meeting (WG III)	135,000 30 journeys	20,250	155,250
Cross-WG Mtg on Art. 2	cross-WG meeting	45,000 10 journeys	6,750	51,750
Cross-WG Mtg on uncertainties and risks	cross-WG meeting	45,000 10 journeys	6,750	51,750
SRREN expert meetings and LA 3 and 4	2 CLA/LA mtgs, 2 expert mtg	706,500 157 journeys	105,975	812,475
SREX LA 2 and 3	2 CLA/LA meetings and 1 expert meeting (case studies)	459,000 102 journeys	68,850	527,850
<b>SUB-TOTAL</b>				<b>3,130,875</b>
<b>Other scoping meetings, expert meetings and workshops</b>				
New Scenarios	2 expert meetings	180,000 40 journeys	27,000	207,000
TGICA	2 meetings	63,000 14 journeys	9,450	72,450
EFDB Board	1 meeting	94,500 21 journeys	14,175	108,675
EFDB Expert meeting	2 meetings	90,000 20 journeys	13,500	103,500
TFI Software review	1 meeting	90,000 20 journeys	13,500	103,500
UNFCCC-TFI contingency		90,000 20 journeys	13,500	103,500
TFI Expert meetings	2 expert meetings on IPCC 2006 guidelines	180,000 40 journeys	27,000	207,000
Issues arising from using the IPCC 2006 guidelines		45,000 10 journeys	6,750	51,750
<b>SUB-TOTAL</b>				<b>957,375</b>
<b>Other Expenditures</b>				
EFDB maintenance	update/management			7,000
2006 GL software	software development			60,000
Outreach				400,000
Webconferences	licence and equipment			12,000
Secretariat				1,300,000
Co-Chairs				250,000
<b>SUB-TOTAL</b>				<b>2,029,000</b>
<b>TOTAL</b>				<b>7,457,725</b>

TABLE 2

## FORECAST BUDGET FOR 2011 NOTED BY IPCC-XXXI

Activity	Purpose	DC/EIT support	Other Expenditure	Sub-total
<b>Governing bodies</b>				
WG III, 11th Session; 4 days	approval and acceptance of SRREN	540,000 120 journeys	280,000	820,000
IPCC-33 3 days, back-to-back	programme and budget various	270,000 60 journeys	210,000	480,000
Joint WG I/II; IPCC-34 4 days	approval and acceptance of SR on extreme events	540,000 120 journeys	280,000	820,000
Bureau 4 days	2 sessions and consultations	351,000 78 journeys	125,400	476,400
TFB	1 session	40,500 9 journeys	6,075	46,575
SBSTA/COP/JWG and other UN meetings		67,500 15 journeys		67,500
<b>SUB-TOTAL</b>				<b>2,710,475</b>
<b>Lead Authors, scoping and expert meetings for reports agreed by Panel</b>				
WG I AR5 LA 2 and 3	CLA/LA meetings	585,000 140 journeys	87,750	672,750
WG II AR5 LA 2	CLA/LA meeting	472,500 105 journeys	70,875	543,375
WG II AR5 regional expert meetings	to support part B of WG II	225,000 50 journeys	33,750	258,750
WG III AR5 LA 1	CLA/LA meeting	405,000 90 journeys	60,750	465,750
EM on economics, costin	WG II & III	135,000 30 journeys	20,250	155,250
AR5 cross cutting issues and SYR	expert and SYR CWT meetings	270,000 60 journeys	40,500	310,500
LA 4 SR on extreme events	1 CLA/LA meeting and prep CLA mtg before Session	270,000 60 journeys	40,500	310,500
<b>SUB-TOTAL</b>				<b>2,716,875</b>
<b>Other scoping meetings, expert meetings and workshops</b>				
New Scenarios	1 expert meeting	135,000 30 journeys	20,250	155,250
TGICA	2 meetings	63,000 14 journeys	8,820	71,820
EFDB Board	1 meeting	94,500 21 journeys	14,175	108,675
EFDB Expert meeting	2 meetings	90,000 20 journeys	13,500	103,500
TFI Expert meetings	contingency for 3expert meetings	202,500 45 journeys	30,375	232,875
<b>SUB-TOTAL</b>				<b>672,120</b>
<b>Other Expenditures</b>				
EFDB maintenance	update/management			7,000
2006 GL software	software development			30,000
Publication	SRREN publication/translation			200,000
Outreach				400,000
Webconferences	licence and equipment			12,000
Secretariat				1,400,000
SYR TSU	1 professional staff member			200,000
Co-Chairs				250,000
<b>SUB-TOTAL</b>				<b>2,499,000</b>
<b>TOTAL</b>				<b>8,598,470</b>

TABLE 3

## INDICATIVE BUDGET FOR 2012 NOTED BY IPCC-XXXI

Activity	Purpose	DC/EIT support	Other Expenditure	Sub-total
<b>Governing bodies</b>				
IPCC-35 3 days	programme and budget various	540,000 120 journeys	210,000	750,000
Bureau 4 days	2 sessions and consultations	351,000 78 journeys	125,400	476,400
TFB	1 session	40,500 9 journeys	6,075	46,575
SBSTA/COP/JWG and other meetings		67,500 15 journeys		67,500
<b>SUB-TOTAL</b>				<b>1,340,475</b>
<b>Lead Authors, scoping and expert meetings for reports agreed by Panel</b>				
WG I LA 4	CLA/LA meeting	337,500 75 journeys	50,625	388,125
WG II LA 3	CLA/LA meetings	562,500 125 journeys	84,375	646,875
WG III LA 2 and 3	CLA/LA meetings	886,500 197 journeys	132,975	1,019,475
AR5 cross cutting issues and SYR	experts and SYR CWT meetings	180,000 40 journeys	27,000	207,000
<b>SUB-TOTAL</b>				<b>2,261,475</b>
<b>Other scoping meetings, expert meetings and workshops</b>				
New Scenarios	1 expert meeting	135,000 30 journeys	20,250	155,250
TGICA	2 meetings	63,000 14 journeys	9,450	72,450
EFDB Board	1 meeting	94,500 21 journeys	14,175	108,675
EFDB Expert meeting	2 meetings	90,000 20 journeys	13,500	103,500
TFI Expert meetings	contingency for 3 expert meetings	202,500 45 journeys	30,375	232,875
<b>SUB-TOTAL</b>				<b>672,750</b>
<b>Other Expenditures</b>				
EFDB maintenance	update/management			7,000
2006 GL software	software maintenance			6,000
Publication(contingency)	possible SR on extreme events			200,000
Outreach				400,000
Webconferences	licence			10,000
Secretariat				1,400,000
SYR TSU	1 professional staff member			200,000
Co-Chairs				250,000
<b>SUB-TOTAL</b>				<b>2,473,000</b>
<b>TOTAL</b>				<b>6,747,700</b>

TABLE 4

## INDICATIVE BUDGET FOR 2013 NOTED BY IPCC-XXXI

Activity	Purpose	DC/EIT support	Other Expenditure	Sub-total
<b>Governing bodies</b>				
IPCC-36 2 days	programme and budget various	540,000 120 journeys	140,000	680,000
WG I Session 4 days	approval AR5 WG I Report	540,000 120 journeys	280,000	820,000
Bureau	2 sessions and consultations	351,000 78 journeys	125,400	476,400
TFB	1 session	40,500 9 journeys	6,075	46,575
SBSTA/COP/JWG and other meetings		67,500 15 journeys		67,500
<b>SUB-TOTAL</b>				<b>2,090,475</b>
<b>Lead Authors, scoping and expert meetings for reports agreed by Panel</b>				
WG I Session	preparatory LA meeting before Plenary	45,000 10 journeys	6,750	51,750
WG II LA 4	CLA/LA meeting	562,500 125 journeys	84,375	646,875
WG III LA 4	CLA/LA meeting	481,500 107 journeys	72,225	553,725
AR5 SYR	SYR CWT meetings	180,000 40 journeys	27,000	207,000
<b>SUB-TOTAL</b>				<b>1,459,350</b>
<b>Other scoping meetings, expert meetings and workshops</b>				
TGICA	2 meetings	63,000 14 journeys	9,450	72,450
EFDB Board	1 meeting	94,500 21 journeys	14,175	108,675
EFDB Expert meeting	2 meetings	90,000 20 journeys	13,500	103,500
TFI Expert meetings	contingency for 3 expert meetings	202,500 45 journeys	30,375	232,875
<b>SUB-TOTAL</b>				<b>517,500</b>
<b>Other Expenditures</b>				
EFDB maintenance	update/management			7,000
2006 GL software	software maintenance			6,000
Publications	WG I publication/translation			300,000
Outreach				400,000
Webconferences	licence			10,000
Secretariat				1,400,000
SYR TSU	1 professional staff member			200,000
Co-Chairs				250,000
<b>SUB-TOTAL</b>				<b>2,573,000</b>
<b>TOTAL</b>				<b>6,640,325</b>

TABLE 5

## INDICATIVE BUDGET FOR 2014 NOTED BY IPCC-XXXI

Activity	Purpose	DC/EIT support	Other Expenditure	Sub-total
<b>Governing bodies</b>				
IPCC-37 (or 38) 6 days	Approval/adoption AR5 SYR various	540,000 120 journeys	420,000	960,000
WG II Session 4 days	Approval AR5 WG II Report	540,000 120 journeys	280,000	820,000
WG III Session 4 days	Approval AR 5 WG III Report	540,000 120 journeys	280,000	820,000
Bureau 4 days	2 sessions and consultations	351,000 78 journeys	125,400	476,400
TFB	1 session	40,500 9 journeys	6,075	46,575
SBSTA/COP/JWG and other meetings		67,500 15 journeys		67,500
<b>SUB-TOTAL</b>				<b>3,190,475</b>
<b>Lead Authors, scoping and expert meetings for reports agreed by Panel</b>				
WG II Session	preparatory CLA meeting before Plenary	67,500 15 journeys	10,125	77,625
WG III Session	preparatory CLA meeting before Plenary	171,000 38 journeys	25,650	196,650
AR5 SYR	CWT meetings and preparatory CWT meeting before Panel	135,000 30 journeys	20,250	155,250
<b>SUB-TOTAL</b>				<b>429,525</b>
<b>Other scoping meetings, expert meetings and workshops</b>				
TGICA	2 meetings	63,000 14 journeys	9,450	72,450
EFDB Board	1 meeting	67,500 21 journeys	10,125	77,625
EFDB Expert meeting	2 meetings	90,000 20 journeys	13,500	103,500
TFI Expert meetings	contingency for 3 expert meetings	202,500 45 journeys	30,375	232,875
<b>SUB-TOTAL</b>				<b>486,450</b>
<b>Other Expenditures</b>				
2006 GL software	software maintenance			6,000
EFDB maintenance	update/management			7,000
Publications	WG II/III			600,000
Outreach				400,000
Webconferences	licence			10,000
Secretariat				1,400,000
SYR TSU	1 professional staff member			200,000
Co-Chairs				250,000
<b>SUB-TOTAL</b>				<b>2,873,000</b>
<b>TOTAL</b>				<b>6,979,450</b>

**IPCC POLICY AND PROCESS FOR ADMITTING OBSERVER ORGANIZATIONS**  
**Adopted by the Panel at its 25<sup>th</sup> Session, 26-28 April 2006 and amended following the**  
**decision of 31<sup>st</sup> Session**

### **I. Admission policy for observer organizations**

The following policy for admitting observer organizations to Sessions of the IPCC and any of its Working Groups applies:

1. A body or an agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by the Intergovernmental Panel on Climate Change (IPCC) and which has informed the IPCC Secretariat of its wish to be represented at Sessions of the IPCC and any of its Working Groups, may be so admitted subject to acceptance by the Panel.
2. In judging whether an organization is "qualified in matters covered by the Intergovernmental Panel on Climate Change" the Secretariat should be guided by the Principles Governing IPCC Work.
3. Organizations need to be non-profit organizations and are required to furnish proof of their nonprofit and/or tax-exempt status in a State Member of the United Nations, of one of its specialized agencies or of the International Atomic Energy Agency, or in a State Party to the International Court of Justice.
4. Bodies and organizations, which are part of the UN System, are considered participating organizations of the IPCC and are not requested to submit an application or other documentation.
5. Organizations, which already have observer status with WMO, UNEP or UNFCCC, are considered as observer of the IPCC if they request so, subject to acceptance by the Panel. They are not required to submit other documentation.
6. Applications from national organizations will be brought to the attention of the IPCC Focal Point of that IPCC Member. They need to provide evidence of independence from governments. Otherwise, they are encouraged to participate as part of their government delegations.
7. Only admitted observer organizations may designate representatives to attend Sessions of the IPCC and Sessions of a Working Group at plenary level. Observer organizations have to register their representatives for each Session in advance.
8. The European Community may exercise the following procedural rights at IPCC Sessions: the right to speak in turn, rather than after all participant States have been acknowledged; the right to reply; the right to introduce proposals. These rights are exclusive. They do not grant the ability to vote or to be elected.
9. Being admitted as observer organization to Sessions of the Panel and of its Working Groups does not imply that the organization is admitted or invited to workshops, expert meetings and other closed meetings. During a Session of the Panel or a Working Group certain meetings may be closed to observers. Observer organizations are not admitted to any Session of the IPCC Bureau or Task Force Bureau.
10. Consistent with the IPCC procedures experts from "international, intergovernmental and non-governmental organizations may be invited in their own right to contribute to the work of the IPCC Working Groups and Task Forces."
11. Subject to availability of sufficient space in the conference room UN and other international and intergovernmental organizations will be provided with nameplates.

## II. Process of admitting observer organizations

For admitting observer organizations the following process applies:

1. Organizations interested in being admitted as an observer to Sessions of the Panel and any of its Working Groups will be asked to send by post a letter of application with copies of
  - a) Documents describing the mandate, scope and governing structure of the organization, such as the charter/statutes/constitution/by-laws or articles of association.
  - b) Evidence of the non-profit and/or tax-exempt status of the organization.
  - c) Any other information that supports the competence of the organization in matters related to the IPCC.
  - d) Information on the affiliation with other non-governmental organizations or institutions involved in climate change activities as appropriate.
  - e) Completed form with contact information of the organization and of a designated focal point.
2. New requests for admission as an observer to Sessions of the IPCC and any of its Working Groups shall be submitted at least 4 months before a Session of the Panel or a Working Group.
3. Organizations, which are already on the list of observers of the IPCC Secretariat and which have received invitations to Sessions of the IPCC and any of its Working Groups in the past, will be asked whether they wish to continue to receive invitations to Sessions of the Panel and any of its Working Groups on a provisional basis until the Panel has taken a decision, and if so, they will be asked to submit documentation listed under item 1 above.
4. The Secretariat will bring all requests for admission as observer organization to the attention of Members of the Panel at least four weeks before a Session of the Panel or Working Group.
5. The Secretariat will screen the submissions and make a proposal to be considered by the IPCC Bureau.
6. The list of observer organizations as reviewed by the IPCC Bureau will be presented to the next Session of the Panel for acceptance.
7. An organization is admitted as observer organization by the Panel by consensus.
8. Any organization accepted as observer organization by the IPCC may retain that observer status only as long as they satisfy the conditions set out for observer organizations.
9. The Secretariat of the IPCC maintains information on observer organizations.
10. The Secretariat shall extend invitations to Sessions of the Panel and its Working Groups to accepted observer organizations. The IPCC shall not provide financial assistance to the observers for participating in the IPCC process.
11. Admission of observer organizations will be included as a regular agenda item of Sessions of the IPCC Bureau and the Panel at the discretion of the Chair. The IPCC Bureau and the Panel shall review the list of accepted observer organizations annually.
12. If the observer status has to be withdrawn for any reason, the Chair may suspend the observer status of that organization subject to ratification by the Panel.



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

**THIRTY-FIRST SESSION OF THE  
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE  
Bali, 26-29 October 2009**

**LIST OF PARTICIPANTS**

N.B.	(H)	- Head of Delegation
	(B)	- Bureau member

Rajendra K. PACHAURI <b>Chairman of the IPCC</b> <b>INDIA</b>	<b>B</b>	S M Munjurul Hannan KHAN Ministry of Environment and Forest Dhaka <b>BANGLADESH</b>	<b>H</b>
Mirela KAMBERI Ministry of Environment, Forests and Water Administration <b>ALBANIA</b>		A. H. M. Golam KIBRIA Ministry of Environment and Forests <b>BANGLADESH</b>	
Zineb CHEMLAL IHFR <b>ALGERIA</b>		Jean-Pascal van YPERSELE Institut d'Astronomie et de Géophysique G. Lemaître (ASTR) <b>BELGIUM</b>	<b>B</b>
Vicente Ricardo BARROS CIMA-FCEN Ciudad Universitaria <b>ARGENTINA</b>	<b>B</b>	Philippe MARBAIX Institut d'Astronomie et de Géophysique G. Lemaître <b>BELGIUM</b>	
Daniela PETRILLO Secretary of Environment and Sustainable Development <b>ARGENTINA</b>		Martine VANDERSTRAETEN Belgian Federal Public Planning Service Science Policy <b>BELGIUM</b>	<b>H</b>
Estela Romina PIANA Secretary of Environment and Sustainable Development <b>ARGENTINA</b>		Dennis GONGUEZ National Meteorological Service <b>BELIZE</b>	
Hamlet MELKONYAN Armstatehydromet <b>ARMENIA</b>		Adrano SANTHIAGO de OLIVEIRA Ministry of Science and Technology <b>BRAZIL</b>	<b>H</b>
Martiros TSARUKYAN Environment Protection Department Ministry of Nature Protection <b>ARMENIA</b>		Suzana KAHN RIBEIRO Ministry of Environment Secretaria de Mudanças Climáticas e Qualidade Ambiental (SMCQ) <b>BRAZIL</b>	<b>B</b>
Shayleen THOMPSON Australian Government, Department of Climate Change <b>AUSTRALIA</b>	<b>H</b>	Thelma KRUG International Affairs Office INPE National Institute for Space Research <b>BRAZIL</b>	<b>B</b>
Neville SMITH Bureau of Meteorology <b>AUSTRALIA</b>	<b>B</b>	Teodor IVANOV Ministry of Environment and Water <b>BULGARIA</b>	<b>H</b>
Manfred OGRIS Lebensministerium <b>AUSTRIA</b>	<b>H</b>	Vesselin ALEXANDROV National Institute of Meteorology and Hydrology <b>BULGARIA</b>	
Klaus RADUNSKY Federal Environmental Agency <b>AUSTRIA</b>		Maurice SHIRAMANGA Institut Géographique du Burundi (IGEBU) <b>BURUNDI</b>	
Arthur W. ROLLE Department of Meteorology <b>BAHAMAS</b>		Somaly CHAN Ministry of Environment <b>CAMBODIA</b>	<b>H</b>
Jeffrey W. SIMMONS Department of Meteorology <b>BAHAMAS</b>			

Christophe BRING  
Ministère de l'Environnement et de la Protection  
de la Nature  
**CAMEROON**

Mark BERMAN  
Foreign Affairs and International Trade Canada  
**CANADA**

Katherine CINQ-MARS  
Foreign Affairs and International Trade Canada  
**CANADA**

Brian T. GRAY **H**  
Environment Canada  
**CANADA**

Elizabeth BUSH  
Environment Canada  
**CANADA**

Daniel JUTZI  
Environment Canada  
**CANADA**

Donald LEMMEN  
Natural Resources Canada  
**CANADA**

Francis William ZWIERS **B**  
Environment Canada  
**CANADA**

Joël-Urbain TETEYA **H**  
Météorologie Nationale  
**CENTRAL AFRICAN REPUBLIC**

Fernando FARIAS **H**  
Comisión Nacional del Medio Ambiente  
(CONAMA)  
**CHILE**

Jenny MATURANA  
Servicio Hidrográfico y Oceanográfico de la  
Armada de Chile  
**CHILE**

Xiaonong SHEN **H**  
China Meteorological Administration  
**CHINA**

Xuedu LU  
China Meteorological Administration  
**CHINA**

Yun GAO  
China Meteorological Administration  
**CHINA**

Hongbin LIU  
China Meteorological Administration  
**CHINA**

Guoquan HU  
China Meteorological Administration  
**CHINA**

Botao ZHOU  
China Meteorological Administration  
**CHINA**

Cheng ZHOU  
Ministry of Foreign Affairs  
**CHINA**

Yongqiang YU  
LASG, Institute of Atmospheric Physics  
**CHINA**

Liyan LI  
National Development and Reform Commission  
**CHINA**

Jun XU  
Ministry of Science and Technology  
**CHINA**

Jianping KOU  
Ministry of Agriculture  
**CHINA**

Qingxian GAO  
Chinese Research Academy of Environmental  
Sciences  
**CHINA**

Zuomin SHI  
China Academy of Forestry  
**CHINA**

Dahe QIN **B**  
China Meteorological Administration  
**CHINA**

Marcel MPOUNZA **H**  
Centre de Recherche sur les Tropiques Humides  
(CRTH)  
Université Marien Ngouabi  
**CONGO**

Alphonse KANGA  
Direction de la Météorologie Nationale  
**CONGO**

Roberto VILLALOBOS FLORES **H**  
Instituto Meteorológico Nacional  
**COSTA RICA**

Nazareth ROJAS Instituto Meteorológico Nacional <b>COSTA RICA</b>		Mounir Wahba LABIB Egyptian Environmental Affairs Agency (EEAA) <b>EGYPT</b>	
Kouakou Bernard DJE National Met Service <b>CÔTE D'IVOIRE</b>	<b>H</b>	Gebru JEMBER National Meteorological Agency <b>ETHIOPIA</b>	
Antoine Tano K. SERVAIS CNTIG <b>CÔTE D'IVOIRE</b>		Rajendra PRASAD Fiji Meteorological Service <b>FIJI</b>	<b>H</b>
Zvonimir KATUSIN Meteorological and Hydrological Service <b>CROATIA</b>	<b>H</b>	Paula PERÄLÄ Ministry of the Environment <b>FINLAND</b>	<b>H</b>
Tomás GUTIERREZ PEREZ Director General, Instituto de Meteorología <b>CUBA</b>	<b>H</b>	Heikki TUOMENVIRTA Finnish Meteorological Institute <b>FINLAND</b>	
Juan LLANES-REGUEIRO Centre for Environmental Studies Universidad de La Habana <b>CUBA</b>		Nicolas BERIOT Observatoire national des Effets du Réchauffement climatique (ONERC) <b>FRANCE</b>	
Ramon PICHES MADRUGA Centro de Investigaciones de Economía Mundial (CIEM) <b>CUBA</b>	<b>B</b>	Marc GILLET Météo France <b>FRANCE</b>	
Ladislav METELKA Czech Hydrometeorological Institute <b>CZECH REPUBLIC</b>	<b>H</b>	Jean JOUZEL Laboratoire des Sciences du Climat et l'Environnement (LSCE) Institut Pierre Simon Laplace (IPSL) <b>FRANCE</b>	<b>B</b>
Anne Mette K. JØRGENSEN Danish Meteorological Institute <b>DENMARK</b>	<b>H</b>	Céline GUIVARCH Centre International de Recherche sur l'Environnement et le Développement (CIRED) <b>FRANCE</b>	
Povl FRICH Danish Energy Agency Ministry of Climate and Energy <b>DENMARK</b>		Martin ONDO ELLA Météorologie Nationale <b>GABON</b>	<b>H</b>
Victor VIÑAS Secretaría de Estado de Medio Ambiente y Recursos Naturales (SEMARENA) Subsecretaría de Estado de Gestión Ambiental (SGA) <b>DOMINICAN REPUBLIC</b>	<b>H</b>	Bernard Edward GOMEZ Department of Water Resources <b>GAMBIA</b>	
David ABREU Secretaría de Estado de Medio Ambiente y Recursos Naturales (SEMARENA) Subsecretaría de Estado de Gestión Ambiental (SGA) <b>DOMINICAN REPUBLIC</b>		Amie JARRA DE CLERCQ Department of Water Resources <b>GAMBIA</b>	
Maria Victoria CHIRIBOGA Dirección de Cambio Climático <b>ECUADOR</b>	<b>H</b>	Ramaz CHITANAVA National Meteorological and Hydrological Service (NMHS) <b>GEORGIA</b>	
		Shalva JAVAKHADZE National Meteorological and Hydrological Service (NMHS) <b>GEORGIA</b>	

Marie LINDBERG **H**  
Federal Ministry for the Environment  
**GERMANY**

Astrid SCHULZ  
German Advisory Council on Global Change  
(WBGU)  
**GERMANY**

Karin KARTSCHALL  
Federal Environment Agency  
**GERMANY**

Christiane TEXTOR  
German IPCC Coordination Office  
German Aerospace Centre  
**GERMANY**

Wolfgang CRAMER  
Potsdam Institute for Climate Impact Research  
**GERMANY**

Ottmar EDENHOFER **B**  
Potsdam Institute for Climate Impact Research  
(PIK)  
**GERMANY**

Edwin CASTELLANOS **H**  
Ministry of Environment and Natural  
**GUATEMALA**

Juan LIGORRIA  
Ministry of Environment and Natural Resources  
**GUATEMALA**

Yaya BANGOURA **H**  
Direction Nationale de la Météorologie  
**GUINEA**

Boubacar Madina DIALLO  
Direction Nationale de la Météorologie  
**GUINEA**

Joao Lona TCHEDNA **H**  
Météorologie Nationale  
**GUINEA BISSAU**

Feliciano MENDONÇA  
Direction de la Météorologie Nationale  
**GUINEA BISSAU**

Raquel P. LOPEZ LOPEZ **H**  
National Climate Change Program  
SERNA  
**HONDURAS**

Sachidananda SATAPATHY **H**  
Ministry of Environment and Forests  
**INDIA**

Sri Woro B. HARIJONO  
Meteorological Climatological and Geophysical

Agency (BMKG)  
**INDONESIA**

Haneda Sri MULYANTO  
Ministry of Environment (KLH)  
**INDONESIA**

Dadang HILMAN  
Ministry of Environment (KLH)  
**INDONESIA**

Rima CEMPAKA  
Ministry of Foreign Affairs (DEPLU)  
**INDONESIA**

Carunia Mulya FIRDAUSY  
**INDONESIA**

Amanda Katili NIODE  
National Council on Climate Change(DNPI)  
**INDONESIA**

Yonny KOESMARYONO  
Bogor Agricultural University (IPB)  
**INDONESIA**

Hidayat PAWITAN  
Bogor Agricultural University (IPB)  
**INDONESIA**

Thomas DJAMALUDDIN  
National Institute of Aeronautics and Space  
(LAPAN)  
**INDONESIA**

Ati WASIATI  
Ministry of Agriculture (DEPTAN)  
**INDONESIA**

Edvin ALDRIAN  
Meteorological Climatological and Geophysical  
Agency (BMKG)  
**INDONESIA**

Dodo GUNAWAN  
Meteorological Climatological and Geophysical  
Agency (BMKG)  
**INDONESIA**

NURHAYATI  
Meteorological Climatological and Geophysical  
Agency (BMKG)  
**INDONESIA**

Agus KRISTIJONO  
The Agency for the Assessment and Application  
Technology (BPPT)  
**INDONESIA**

Mahally KUDSY  
The Agency for the Assessment and Application  
Technology (BPPT)  
**INDONESIA**

Hardiv SITUMEANG  
National Planning Agency (BAPPENAS)  
**INDONESIA**

Saut LUBIS  
National Planning Agency (BAPPENAS)  
Jakarta  
**INDONESIA**

Eddy HERMAWAN  
National Institute of Aeronautics and Space  
(LAPAN)  
**INDONESIA**

Nani HENDIARTI  
The Agency for the Assessment and Application  
Technology (BPPT)  
**INDONESIA**

Agus SUPANGAT  
National Council on Climate Change(DNPI)  
**INDONESIA**

H. Ardief ACHMAD  
Central Agency of Statistic (BPS)  
**INDONESIA**

Agus PURNOMO  
Ministry for Environment, National Council on  
Climate Change(DNPI)  
**INDONESIA**

Nelly Florida RIAMA  
Meteorological Climatological and Geophysical  
Agency (BMKG)  
**INDONESIA**

Asep D. MUHAMMAD  
Coordinating Ministry for People's Welfare  
(MENKOKESRA)  
**INDONESIA**

Syamsidar THAMRIN  
National Planning Agency (BAPPENAS)  
**INDONESIA**

Le Istiqlal Amien  
Ministry of Agriculture (DEPTAN)  
**INDONESIA**

R. Sudirman  
Ministry of Environment (KLH)  
**INDONESIA**

Ni Nyoman Santi  
Ministry of Environment (KLH), Management  
Centre for Bali and Nusra  
**INDONESIA**

Endang Titi PURWANI  
Ministry of Agriculture (DEPTAN)  
**INDONESIA**

Tania JUNE  
Bogor Agriculture Institute (IPB)  
**INDONESIA**

ADIDARMA  
Public Works (PU)  
**INDONESIA**

Armi SUSANDI  
National Council on Climate Change (DNPI)  
**INDONESIA**

Kirsfianti GINOGA  
Ministry of Forestry (DEPHUT)  
**INDONESIA**

Aryo HANGGONO  
Agency of Marine and Fisheries Research of  
Indonesia (BRKP)  
**INDONESIA**

Tukul Rameyo ADI  
Agency of Marine and Fisheries Research of  
Indonesia (BRKP)  
**INDONESIA**

Bahris PASENG  
Coordinating Ministry for Economic Affairs  
(Menkoekuin)  
**INDONESIA**

Yudi PRAMADI  
Coordinating Ministry for Economic Affairs  
(Menkoekuin)  
**INDONESIA**

Bobby. C. SIAGIAN  
Coordinating Ministry for Economic Affairs  
(Menkoekuin)  
**INDONESIA**

Indra NI TUA  
National Planning Agency (BAPPENAS)  
**INDONESIA**

I Gusti Ngurah ASTIKA  
Ministry of Agriculture  
**INDONESIA**

Novi Susetyo ADI  
Ministry of Marine Affairs and Fisheries  
**INDONESIA**

Sutarto ALIMUESO  
Ministry of Agriculture  
**INDONESIA**

Fatemeh RAHIMZADEH **B**  
Faculty Member, Atmospheric Science and  
Meteorological Research Center (ASMERC)  
**IRAN, ISLAMIC REPUBLIC OF**

Rahman DAVTALAB SABET  
Ministry of Energy  
**IRAN, ISLAMIC REPUBLIC OF**

Sergio CASTELLARI **H**  
Euro-Mediterranean Center on Climate Change  
National Institute of Geophysics and Volcanology  
**ITALY**

Jacqueline M. SPENCE **H**  
Section Head Applied Meteorology  
Meteorological Service of Jamaica  
**JAMAICA**

Hiroshi ONO **H**  
Ministry of the Environment  
**JAPAN**

Kazunori NISHIYAMA  
Office for Earth and Environmental Science and  
Technology Research Bureau  
Ministry of Education, Culture, Sports, Science and  
Technology  
**JAPAN**

Hiroki KONDO  
Japan Agency for Marine-Earth Science and  
Technology (JAMSTEC)  
**JAPAN**

Chie HAYASHI  
Japan Agency for Marine-Earth Science and  
Technology (JAMSTEC)  
**JAPAN**

Kasumi YASUKAWA  
Environmental Policy Division, Industrial Science  
and Technology Policy and Environment Bureau  
Ministry of Economy, Trade and Industry  
**JAPAN**

Masahiro NISHIO  
National Institute of Advanced Industrial Science  
and Technology  
**JAPAN**

Hiroyuki HAYASHI  
Ministry of Economy, Trade and Industry (GISPRI)  
**JAPAN**

Noriko IRIE  
Ministry of Economy, Trade and Industry (GISPRI)  
**JAPAN**

Toru HASHIMOTO  
Ministry of the Environment  
**JAPAN**

Yukihiro NOJIRI  
National Institute for Environmental Studies  
**JAPAN**

Noriko YAMAGISHI  
Global Environmental Forum  
**JAPAN**

Harumi AKIBA  
Global Environmental Forum  
**JAPAN**

Takashi YOSHIDA  
Japan Meteorological Agency  
**JAPAN**

Takahiko HIRAISHI **B**  
c/o Institute for Global Environmental Strategies  
**JAPAN**

Jabur Ali Mustafa DARADKAH **H**  
Ministry of Environment  
**JORDAN**

Faraj Mohammad ALTALIB  
Ministry of Environment  
**JORDAN**

Svetlana DOLGIKH **H**  
National Hydrometeorological Service  
"Kazhydromet"  
**KAZAKHSTAN**

Alexey CHEREDNICHENKO  
National Expert on Climate Change  
Kazakh Research Institute on Ecology and Climate  
**KAZAKHSTAN**

Kaateti TOOTO **H**  
Ministry of Environment, Lands and Agriculture  
Development  
**KIRIBATI**

Nakibae TEUATABO  
Ministry of Environment, Lands and Agriculture  
Development  
**KIRIBATI**

Inese JAKUBOVSKA  
Latvian Environment, Geology and Meteorology  
Center (LEGMC)  
**LATVIA**

Lea KAI **H**  
Directorate General of Environment  
**LEBANON**

Mabafokeng MAHAHABISA Lesotho Meteorological Services <b>LESOTHO</b>	<b>H</b>	Balraj DUNPUTH Meteorological Services <b>MAURITIUS</b>	<b>H</b>
Arthur GAR-GLAHN Ministry of Transport <b>LIBERIA</b>	<b>H</b>	Premchand GOOLAUP Meteorological Services <b>MAURITIUS</b>	
Khalid I. ELFADLI Libyan National Meteorological Center <b>LIBYAN ARAB JAMAHIRIYA</b>	<b>H</b>	Gerardo ARROYO O'GRADY Instituto Nacional de Ecología - INE <b>MEXICO</b>	<b>H</b>
Marie-Louise RAKOTONDRAFARA Direction Générale de la Météorologie <b>MADAGASCAR</b>	<b>H</b>	Israel LAGUNA MONROY Instituto Nacional de Ecología - INE <b>MEXICO</b>	
Zoharimalala RABEFITIA Direction Générale de la Météorologie <b>MADAGASCAR</b>		Antonina IVANOVA BONCHEVA Autonomous University of Southern Baja California Department of Economics <b>MEXICO</b>	<b>B</b>
Nirivololona RAHOLIJAO Direction Générale de la Météorologie Ministère des Travaux Publics et de la Météorologie <b>MADAGASCAR</b>	<b>B</b>	Tint WAI Department of Meteorology and Hydrology <b>MYANMAR</b>	<b>H</b>
Jailan SIMON Malaysian Meteorological Department Jalan Sultan <b>MALAYSIA</b>	<b>H</b>	Emmanuel N.Z. KAMBUEZA Namibia Meteorological Service Ministry of Works, Transport and Communication <b>NAMIBIA</b>	
Joy Jaqueline PEREIRA Southeast Asia Disaster Prevention Research Institute University Kebangsaan <b>MALAYSIA</b>		Nirmal Hari RAJBHANDARI Department of Hydrology and Meteorology <b>NEPAL</b>	<b>H</b>
Fredolin T. TANGANG School of Environmental and Natural Resource Sciences Faculty of Science and Technology National University of Malaysia (UKM) <b>MALAYSIA</b>	<b>B</b>	Surya Prasad PRAJAPATI Department of Hydrology and Meteorology <b>NEPAL</b>	
Amjad ABDULLA Director General, Ministry of Housing, Transport and Environment <b>MALDIVES</b>	<b>B</b>	Leo A. MEYER Netherlands Environmental Assessment Agency <b>NETHERLANDS</b>	
Ali SHAREEF Ministry of Housing, Transport and Environment <b>MALDIVES</b>		Hajo HAANSTRA Ministry of Agriculture, Nature and Food Quality <b>NETHERLANDS</b>	
Birama DIARRA Direction Nationale de la Météorologie <b>MALI</b>	<b>H</b>	Ronald FLIPPHI Ministry of Housing, Spatial Planning and the Environment <b>NETHERLANDS</b>	
Youba SOKONA Sahara and Sahel Observatory (OSS) <b>MALI</b>	<b>B</b>	Bram BREGMAN Royal Netherlands Meteorological Institute - KNMI <b>NETHERLANDS</b>	
		Albert MARTIS National Meteorological Service <b>NETHERLANDS ANTILLES AND ARUBA</b>	<b>H</b>

Howard R. LARSEN Ministry for the Environment <b>NEW ZEALAND</b>	<b>H</b>	Hoesung LEE Keinyung Universtiy, College Environment <b>REPUBLIC OF KOREA</b>	
Sonia PETRIE Ministry for the Environment <b>NEW ZEALAND</b>		Chung-Kyu PARK Korean Adaptation Center for Climate Change Korea Meteorological Administration <b>REPUBLIC OF KOREA</b>	<b>H</b>
David S. WRATT National Institute of Water & Atmospheric Research (NIWA) <b>NEW ZEALAND</b>	<b>B</b>	Byoung-cheol KIM Korea Meteorological Administration Climate Policy Division <b>REPUBLIC OF KOREA</b>	
Labo MOUSSA Météorologie Nationale <b>NIGER</b>	<b>H</b>	Won-Tae KWON National Institute of Meteorological Research Korea Meteorological Administration <b>REPUBLIC OF KOREA</b>	
Øyvind CHRISTOPHERSEN Norwegian Pollution Control Authority <b>NORWAY</b>	<b>H</b>	Eun-Sil PARK Ministry of Public Administration and Security <b>REPUBLIC OF KOREA</b>	
Torgrim ASPHJELL Norwegian Pollution Control Authority <b>NORWAY</b>		Jeong Sik KIM Ministry of Environment <b>REPUBLIC OF KOREA</b>	
Vigdis VESTRENG Norwegian Pollution Control Authority <b>NORWAY</b>		Sang Won LEE National Emergency Management Agency (NEMA) <b>REPUBLIC OF KOREA</b>	
Marit Viktoria PETTERSEN Ministry of Foreign Affair <b>NORWAY</b>		Jin-Gyu OH Korea Energy Economics Institute <b>REPUBLIC OF KOREA</b>	
Sergio KOSTRITSKY Dirección General de Medio Ambiente Ministerio de Relaciones Exteriores <b>PERU</b>	<b>H</b>	Sung Hee SHIM Korea Energy Economics Institute <b>REPUBLIC OF KOREA</b>	
Eduardo CALVO BUENDIA UNMSM <b>PERU</b>	<b>B</b>	Yong Joo LEE Busan Metropolitan City International Environment Affairs Team <b>REPUBLIC OF KOREA</b>	
Rosalina G. de GUZMAN Climatology and Agrometeorology Dept. PAGASA PAGASA Science Garden <b>PHILIPPINES</b>		Kwang Woo CHO Korea Environment Institute <b>REPUBLIC OF KOREA</b>	
Mirosław MIETUS Institute of Meteorology and Water Management Centre of Poland's Climate Monitoring <b>POLAND</b>	<b>H</b>	Cheong Jung LEE Busan Metropolitan City International Environment Affairs Team <b>REPUBLIC OF KOREA</b>	
Azhari AHMED Qatar Petroleum, Corporation Environment and Sustainable Development <b>QATAR</b>		Eung-Kil JEON Presidential Committee on Green Growth <b>REPUBLIC OF KOREA</b>	
Mohmoud AL-MARWANI Ministry of Environment <b>QATAR</b>	<b>H</b>		

Kwang Min KIM Busan Metropolitan City International Environment Affairs Team <b>REPUBLIC OF KOREA</b>	<b>H</b>	Cosme Manuel do NASCIMENTO DIAS National Institute of Meteorology <b>SAO TOME AND PRINCIPE</b>	
Myung-Sun KIM Prime Minister's Office <b>REPUBLIC OF KOREA</b>		Taha ZATARI Presidency of Meteorology and Environment PME <b>SAUDI ARABIA</b>	<b>B</b>
Dong-Chul SHIN Korea Meteorological Administration <b>REPUBLIC OF KOREA</b>		Ahmad AL KHALIFAH Ministry of Water & Electricity Riyadh <b>SAUDI ARABIA</b>	
Gavril GÎLCA State Hydrometeorological Service <b>REPUBLIC OF MOLDOVA</b>	<b>H</b>	Fayez AL NASSAR <b>SAUDI ARABIA</b>	
Nicolae MOLDOVANU State Hydrometeorological Service <b>REPUBLIC OF MOLDOVA</b>		Mohammed AL ZAYER <b>SAUDI ARABIA</b>	
Aristita BUSUIOC National Meteorological Administration <b>ROMANIA</b>	<b>H</b>	Abdulbasit SAIRAFI PME <b>SAUDI ARABIA</b>	
Victor BLINOV Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) <b>RUSSIAN FEDERATION</b>	<b>H</b>	Cherif DIOP Agence Nationale de la Météorologie du Sénégal (ANAMS) Ministère des Infrastructures, des Transports <b>SENEGAL</b>	<b>H</b>
Yury ANOKHIN Institute of Global Climate & Ecology - IGCE Roshydromet <b>RUSSIAN FEDERATION</b>		Antoine Marie MOUSTACHE Seychelles Agriculture Agency <b>SEYCHELLES</b>	<b>H</b>
Georgy GRUZA Institute of Global Climate & Ecology - IGCE Roshydromet <b>RUSSIAN FEDERATION</b>		Tommy BRAIMA Meteorological Department <b>SIERRA LEONE</b>	<b>H</b>
Tatiana DMITRIEVA Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) <b>RUSSIAN FEDERATION</b>		Alpha BOCKARIE Meteorological Forecast Office <b>SIERRA LEONE</b>	
Didace MUSONI Direction de la Météorologie Ministère des Infrastructures <b>RWANDA</b>	<b>H</b>	Wilson H. LIN Ministry of the Environment and Water Resources <b>SINGAPORE</b>	<b>H</b>
Aimable NGIRIMANA Direction de la Météorologie Ministère des Infrastructures <b>RWANDA</b>		Felicia SHAW Energy Studies Institute, National University of Singapore <b>SINGAPORE</b>	
João Vicente DOMINGOS VAZ LIMA National Institute of Meteorology <b>SAO TOME AND PRINCIPE</b>	<b>H</b>	Youngho CHANG Energy Studies Institute <b>SINGAPORE</b>	
		Rong YAN Institute of Environmental Science and Engineering Nanyang Technological University Innovation Centre <b>SINGAPORE</b>	

Srivatsan VIJAYARAGHAVAN  
Tropical Marine Science Institute  
National University of Singapore  
**SINGAPORE**

Andrej KRANJC **H**  
Ministry of the Environment and Spatial Planning  
**SLOVENIA**

Peter LUKEY **H**  
Department of Environmental Affairs  
**SOUTH AFRICA**

Lemao Dorah NTEO  
Department of Environmental Affairs  
**SOUTH AFRICA**

Jongikhaya WITI  
Department of Environmental Affairs  
**SOUTH AFRICA**

Themba DUBE  
South African Weather Service  
**SOUTH AFRICA**

Concepción MARTINEZ **H**  
Secretaría de Estado de Cambio Climático  
Ministerio de Medio Ambiente, Medio Rural y Marino  
**SPAIN**

Cristina BARRIOS GARCIA  
Oficina Española de Cambio Climático  
Ministerio de Medio Ambiente, Medio Rural y Marino  
**SPAIN**

José Manuel MORENO **B**  
Facultad de Ciencias Ambientales  
Universidad de Castilla-la Mancha  
**SPAIN**

Ernesto RODRIGUEZ  
Agencia Estatal de Meteorología (AEMET)  
Ministerio de Medio Ambiente, Medio Rural y Marino  
**SPAIN**

Hugo LUCAS  
Instituto para la Diversificación y Ahorro de la Energía - IDAE  
**SPAIN**

Gunavi B. SAMARASINGHE **H**  
Department of Meteorology  
**SRI LANKA**

Anusha Rashantie WARNASOORIYA  
Department of Meteorology  
**SRI LANKA**

Ismail Fadl El Moulla MOHAMED DEDAN **H**  
Sudan Meteorological Authority  
**SUDAN**

Ismail A. ELGIZOULI **B**  
Higher Council for Environment & Natural Resources (HCENR)  
**SUDAN**

Anuradha R. KHOENKHOEN **H**  
Ministry of Labour, Technological Development and Environment  
**SURINAME**

Vanessa SABAJO  
Ministry of Labour, Technological Development and Environment  
**SURINAME**

Eric S. SEYAMA **H**  
Swaziland Meteorological Services  
Ministry Tourism & Environmental Affairs  
**SWAZILAND**

Marianne LILLIESKOLD  
Swedish Environmental Protection Agency  
**SWEDEN**

Markku RUMMUKAINEN  
Swedish Meteorological and Hydrological Institute  
**SWEDEN**

Mischa CROCI-MASPOLI  
Federal Office of Meteorology and Climatology, MeteoSwiss  
**SWITZERLAND**

José ROMERO **H**  
Federal Office for the Environment (FOEN)  
Federal Department of Environment, Transport, Energy and Communications  
**SWITZERLAND**

Thomas F. STOCKER **B**  
Climate and Environmental Physics Institute  
University of Bern  
**SWITZERLAND**

Basel ALBERNY **H**  
Climate Change Department  
Ministry of State for Environmental Affairs  
**SYRIAN ARAB REPUBLIC**

Ilhomjon RAJABOV  
State Organization for Hydrometeorology  
**TAJIKISTAN**

Karimjon ABDUALIMOV  
State Organization for Hydrometeorology  
**TAJIKISTAN**

Angkana CHALERMPONG **H**  
Office of Natural Resources and Environmental  
Policy and Planning  
**THAILAND**

Amnat CHIDTHAISONG  
King Mongkut's University of Technology  
**THAILAND**

Sangchan LIMJIRAKAN  
Environmental Research Institute, Chulalongkorn  
University  
**THAILAND**

Supralee JONGDEEPAISARL  
Thailand Research Fund  
**THAILAND**

Natasa MARKOVSKA **H**  
Research Center for Energy, Information and  
Materials, Macedonian Academy of Sciences and  
Art (ICEIM-MANU)  
**THE FORMER YUGOSLAV REPUBLIC OF  
MACEDONIA**

Awadi Abi EGBARE  
Météorologie Nationale  
**TOGO**

Yao Doh KPOGO  
Direction Générale de la Météorologie Nationale  
**TOGO**

Amel AKREMI **H**  
Ministry of Environment and Sustainable  
Development  
**TUNISIA**

Sebahattin DÖKMECI **H**  
Ministry of Environment and Forestry  
**TURKEY**

Selahattin INCECIK  
Istanbul Technical University  
**TURKEY**

Viacheslav N. LIPINSKYI **H**  
State Hydrometeorological Service  
**UKRAINE**

Vitaliy PETRUK  
Ministry of Environment Protection  
**UKRAINE**

David WARRILOW **H**  
Department of Energy and Climate Change  
**UNITED KINGDOM**

Adrian BUTT  
Department of Energy and Climate Change, CESA  
**UNITED KINGDOM**

James SKEA **B**  
Research Director, UK Energy Research Centre  
**UNITED KINGDOM**

Lucy HAYES  
Department of Energy and Climate Change, CESA  
**UNITED KINGDOM**

Rupert LEWIS  
Department for Environment, Food and Rural  
Affairs, DEFRA  
**UNITED KINGDOM**

Philibert F. TIBAIJUKA **H**  
Tanzania Meteorological Agency  
**UNITED REPUBLIC OF TANZANIA**

Emmanuel J. MPETA  
Tanzania Meteorological Agency  
**UNITED REPUBLIC OF TANZANIA**

Sherburne ABBOTT **H**  
Office of Science and Technology Policy  
Executive Office of the President  
**USA**

Jeffrey MIOTKE  
US Dept. of State  
**USA**

Benjamin ZAITCHIK  
Bureau of Oceans and International Environment  
and Scientific Affairs  
U.S. State Department  
**USA**

Ko BARRETT  
National Oceanic and Atmospheric Administration  
(NOAA)  
U.S. Department of Commerce  
**USA**

Dan WALKER  
National Oceanic and Atmospheric Administration  
(NOAA)  
U.S. Department of Commerce  
**USA**

Sarah JOHNSON  
Office of Science and Technology Policy  
Executive Office of the President  
**USA**

Margaret K. WALSH  
Climate Change Program Office  
U.S. Department of Agriculture  
**USA**

Christopher FIELD **B**  
Department of Global Ecology  
Carnegie Institution  
**USA**

Richard GARBACCIO  
U. S. Environmental Protection Agency  
**USA**

Robert Evans KOPP III  
Department of Energy  
**USA**

Raisa TARYANNIKOVA  
National Secretariat of Central Asian Countries  
Initiative on Land Management (CACILM)  
**UZBEKISTAN**

Sergey MAYGKOV **H**  
Hydrometeorological Scientific Research Institute  
**UZBEKISTAN**

Yoliangel RIVAS  
Ministerio del Poder Popular para las Relaciones  
Exteriores  
**VENEZUELA, BOLIVARIAN REPUBLIC OF**

Jose SAN JOSE  
Ministry of Science and Technology  
**VENEZUELA, BOLIVARIAN REPUBLIC OF**

Maria Isabel ALMINANA  
Ministry of Science , Technology and Industry  
**VENEZUELA, BOLIVARIAN REPUBLIC OF**

Ileana VILLALOBOS **H**  
Oficina de Asuntos Multilaterales e Integración  
Unidad de Medioambiente  
Ministerio del Poder Popular para Relaciones  
Exteriores  
**VENEZUELA, BOLIVARIAN REPUBLIC**

Nguyen VAN THANG **H**  
Institute of Meteorology, Hydrology and  
Environment (IMHEN)  
Ministry of Natural Resources and Environment  
**VIET NAM**

Duc Thuan NGUYEN  
Ministry of Natural Resources and Environment  
**VIET NAM**

## ORGANIZATIONS

Elisabeth LIPIATOU **H**  
**European Community**  
European Commission, DG Research  
BELGIUM

Anastasios KENTARCHOS  
**European Community**  
European Commission, DG Research  
BELGIUM

Jeffrey C . HUNTINGTON  
**European Community**  
DENMARK

Hideki KANAMARU  
FAO  
Climate Change and Bioenergy (NRCB)  
ITALY

Michael MANTON  
**GCOS**  
AUSTRALIA

Tetsuya TANAKA  
**ICAO**  
CANADA

Joseph ALCAMO  
**UNEP**  
Environmental Conventions  
KENYA

Yan HONG  
**World Meteorological Organization (WMO)**  
SWITZERLAND

Kathy Ann TEDESCO  
**UNESCO-IOC**  
FRANCE

Rocio LICHTÉ  
**UNFCCC**  
Climate Change Secretariat  
GERMANY

Rafael J. R. TUTS **H**  
**UN-HABITAT**  
KENYA

Fabrice RENAUD **H**  
**UNU**  
Institute for Environment and Human Security  
JAPAN

Ameyali RAMOS CASTILLO  
**UNU**  
Institute of Advanced Studies-Traditional  
Knowledge Initiative  
AUSTRALIA

Haroon KHESHGI  
**IPIECA**  
Exxon Mobil Research and Engineering Company  
USA

Peter BARRETT  
**ICSU**  
Climate Change Research Institute  
Victoria University of Wellington  
NEW ZEALAND

Langston James GOREE  
**ENB (IISD)**  
USA

Anna SCHULZ  
**ENB (IISD)**  
USA

Suzanne CARTER  
**ENB (IISD)**  
USA

Yulia YAMINEVA  
**ENB (IISD)**  
USA

#### **TECHNICAL SUPPORT UNIT**

Pauline MIDGLEY  
**Head, IPCC WG I Technical Support Unit**  
University of Bern  
**SWITZERLAND**

Gian-Kasper PLATTNER  
University of Bern  
**SWITZERLAND**

Melinda TIGNOR  
University of Bern  
**SWITZERLAND**

Kristie EBI  
**Head, IPCC WG II Technical Support Unit**  
Carnegie Institution for Science  
**USA**

Michael MASTRANDREA  
IPCC WG II Technical Support Unit  
Carnegie Institution for Science  
**USA**

Patrick MATSCHOSS  
**Head, IPCC WG III Technical Support Unit**  
Potsdam Institute for Climate Impact Research  
**GERMANY**

Kristin SEYBOTH  
IPCC WG III Technical Support Unit  
Potsdam Institute for Climate Impact Research  
Research Domain "Sustainable Solutions"  
**GERMANY**

Timm ZWICKEL  
IPCC WG III Technical Support Unit  
Potsdam Institute for Climate Impact Research  
Research Domain "Sustainable Solutions"  
**GERMANY**

Susanne KADNER  
IPCC WG III Technical Support Unit  
Potsdam Institute for Climate Impact Research  
(PIK)  
Research Domain "Sustainable Solutions"  
**GERMANY**

Nina SCHUETZ  
IPCC WG III Technical Support Unit  
Potsdam Institute for Climate Impact Research  
Research Domain "Sustainable Solutions"  
**GERMANY**

Simon EGGLESTON  
**Head, IPCC National Greenhouse Gas**  
Inventories Programme  
c/o Institute for Global Environmental Strategies  
**JAPAN**

Richard MOSS  
TGICA  
Joint Global Change Research Institute  
**USA**

#### **CONFERENCE OFFICER**

Francis HAYES  
World Meteorological Organization  
**SWITZERLAND**

#### **IPCC SECRETARIAT**

Renate CHRIST  
**Secretary of IPCC**  
SWITZERLAND

Gilles SOMMERIA  
**Acting, Deputy Secretary of the IPCC**

Sophie SCHLINGEMANN  
Mary Jean BURER  
Carolyn ARNDT  
Masaya AIBA  
Joelle FERNANDEZ  
Annie COURTIN  
Laura BIAGIONI