Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures: Annexes

A

Glossary of Terms

This section provides definitions for many of the concepts and terms used in the Adaptation Policy Framework (APF). In most definitions, references are given to the applicable Technical Papers (TPs) where additional details concerning the particular topic can be found. Citations to the technical literature on a given topic are, in turn, found in the TPs themselves.

For some terms, such as vulnerability and risk, definitions vary between disciplines and contexts. In these cases, a broad definition is provided, together with alternative definitions. The motivation here is to provide flexibility to users to adapt the APF to their own applications.

Adaptation – is a process by which strategies to moderate, cope with, and take advantage of the consequences of climatic events are enhanced, developed, and implemented.

Adaptation baseline – also referred to as an adaptation *policy* baseline, this includes a description of adaptations to current climate that are already in place (e.g., existing risk mitigation policies and programmes) (TP6). See also *project baseline*.

Adaptation Policy Framework – is a structured process for developing adaptation strategies, policies, and measures to enhance and ensure human development in the face of climate change, including climate variability. The APF is designed to link climate change adaptation to sustainable development and other global environmental issues. It consists of five basic Components: scoping and designing and adaptation project, assessing current vulnerability, characterising future climate risks, developing an adaptation strategy, and continuing the adaptation process (Executive Summary and User's Guidebook).

Adaptive capacity – is the property of a system to adjust its characteristics or behaviour, in order to expand its coping range under existing climate variability, or future climate conditions (TP7). The expression of adaptive capacity as actions that lead to adaptation can serve to enhance a system's coping capacity and increase its coping range (TPs 4 and 5) thereby reducing its vulnerability to climate hazards (TP3). The adaptive capacity inherent in a system represents the set of resources available for adaptation, as well as the ability or capacity of that system to use these resources effectively in the pursuit of adaptation. It is possible to differentiate between adaptive potential, a theoretical upper boundary of responses based on global expertise and anticipated developments within the planning horizon of the assessment, and adaptive capacity that is constrained by existing information, technology and resources of the system under consideration.

Adaptive-capacity approach – is one of several conceptual and analytical approaches that can be applied to adaptation projects. With this approach, a project can investigate a system with respect to its current adaptive capacity, and assess ways in which adaptive capacity can be increased (or ways in which it may be lessened) so that the system is better able cope with climate variability and change (TP7). See also *adaptation project approaches*.

Adaptation capacity baseline – includes a description of the current capacity within a priority system to cope with and adapt to climate variability (TP7). See also *project baseline*.

Adaptation project approaches – are conceptual and analytical approaches that can be selected to respond to the unique needs of adaptation projects (TP1). Four major approaches that can be applied to adaptation projects include the hazards-based approach, the vulnerability-based approach, the adaptive-capacity approach and the policy-based approach. See also the individual project approach definitions.

Baselines – used in two distinct ways in the APF, the term "baseline" can refer to either a *project baseline* (definitions) or a future baseline or *reference scenario* (definition). The project baseline describes where the project is starting from (for use in, e.g., subsequent monitoring and evaluation), while the reference scenario provides a plausible picture of a future in the priority system *without* adaptation, to allow for comparison of different adaptation strategies, policies and measures.

Climate change – refers to any change in climate over time, whether due to natural variability or because of human activity (IPCC, 2001). See also *climate variability*.

Climate change vulnerability – is the degree to which a system is susceptible to, or unable to cope with the adverse effects of climate change, including climate variability and extremes (IPCC, 2001) (TPs 4 and 5). See also *vulnerability*.

Climate risk baseline – includes a description of the current climate risk within the priority system (i.e., the probability of a climate hazard combined with the system's current vulnerability) (TPs 4 and 5). See also *project baseline*.

Climate variability – refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may result from natural internal processes within the climate system (internal variability) or to variations in natural or anthropogenic external forcing (external variability) (IPCC, 2001). See also *climate change*.

Coping range – is the range of climate where the outcomes are beneficial or negative but tolerable; beyond the coping range, the damages or loss are no longer tolerable and a society (or system) is said to be vulnerable (TPs 4 and 5).

Cost-benefit analysis – is a quantitative method that makes a detailed comparison of the costs and benefits of a particular measure, or set of measures (TP8). A decision to fund a project, e.g., can depend on the ratio of benefits to costs – the higher the ratio, the more attractive the investment. Its major advantages are its verifiable bottom line and its familiarity to ministries and planning agencies. Disadvantages include limitations regarding the ability to directly address equity considerations and represent non-quantifiable benefits.

Evaluation – is a process for determining systematically and objectively the relevance, efficiency, effectiveness and impact of the adaptation strategies in the light of their objectives (TP9). See also *monitoring*.

Exposure – is the nature and degree to which a system is exposed to significant climatic variations (IPCC, 2001).

Food insecurity – a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal, or transitory. More recent literature focuses on livelihood security – an expansion of food security to include multiple stresses and sectors to which livelihoods might be exposed (TP3).

Hazard – is used here to describe a physically defined climate event with the potential to cause harm, such as heavy rainfall, drought, flood, storm and long-term change in mean climatic variables such as temperature (TPs 4, 5, and 7).

Hazards-based approach – one of several conceptual and analytical approaches to adaptation projects, this approach places its starting emphasis on the biophysical aspects of climate-related risk – i.e., the climate hazard. With the hazards-based approach (also referred to as either the natural hazards-based (TPs 4 and 5) or climate risk-based approach), a project can assess current climate vulnerability or risk in the priority system (TP4), and use climate scenarios to estimate changes in vulnerability or risk over time and space (TP5). See also *adaptation project approaches*.

Hybrid – is used here to refer to approaches that apply uniform and site-specific methods in tandem and within an iterative process to develop and assess the range of adaptation strategies (TP8).

Impacts – are the detrimental and beneficial consequences of climate change on natural and human systems (IPCC, 2001).

Indicators – are quantitative or qualitative parameters that provide a simple and reliable basis for assessing change. In the context of the APF, a set of indicators is used to characterise an adaptation phenomenon, to construct a baseline, and to measure and assess changes in the priority system (TPs 1 and 6). See also *baseline, evaluation* and *monitoring*.

Logical Framework ("Logframe") Analysis Approach – is a project planning tool that includes project goals, objectives and activities, with specific outputs and measurable indicators of achievements.

Measure – see *policies and measures*.

Monitoring – is a mechanism or mechanisms used to track progress in the implementation of an adaptation strategy and its various components in relation to established targets (TP9). See also *evaluation* and *indicators*.

Policies and measures – usually addressed together, respond to the need for climate adaptation in distinct, but sometimes overlapping ways (TP8). *Policies*, generally speaking, refer to objectives, together with the means of implementation. In an adaptation context, a policy objective might be drawn from the overall policy goals of the country – for instance, the maintenance or strengthening of food security. Ways to achieve this objective might include, e.g., farmer advice and information services, seasonal climate forecasting and incentives for development of irrigation systems. *Measures* can be individual interventions or they can consist of packages of related measures. Specific measures might include actions that promote the chosen policy direction, such as implementing an irrigation project, or setting up a farmer information, advice and early warning programme. Both of these measures would contribute to the national goal of food security. See also *strategy*.

Policy-based approach – is one of several conceptual and analytical approaches that can be applied to adaptation projects. With this approach, a project can test a new policy being framed to see whether it is robust under climate change, or test an existing policy to see whether it manages anticipated risk under climate change (TP6). See also *adaptation project approaches*.

Priority system – is the focus of an adaptation project. The priority system (or systems) is generally characterised by high vulnerability to different climate hazards, as well as strategic importance at local and/or national levels. Socio-economic and biophysical criteria are often used to select priority systems by a given stakeholder group, and to set system parameters (indicators) for a given project (TPs 2 and 3). See also *system*.

Probability defines the likelihood of an event or outcome occurring. Probability can range from being qualitative, using word descriptions such as *likely* or *highly confident*, to quantified ranges and single estimates, depending on the level of understanding of the causes of events, historical time series and future conditions (TP4). See also *risk*.

Project baseline – is a description of where the project is starting from e.g., who is vulnerable to what, and what is currently being done to reduce that vulnerability (TP1). Project baselines are generally focused on the priority system, and are thus site-specific and limited to the duration of the project. Depending on the approach used in an adaptation project, a project baseline will be characterised by a set of quantitative and/or qualitative indicators, and may take the form, e.g., of one of the following:

- a *vulnerability baseline* (TP3)
- a *climate risk baseline* (TPs 4 and 5)
- an *adaptive capacity baseline* (TP7)
- or an *adaptation (policy) baseline* (TP6).

See also the individual baseline definitions. Project baselines can later be used in the monitoring and evaluation process to

measure change (e.g., in vulnerability, adaptive capacity, climate risk) in the priority system, and the effectiveness of adaptation strategies, policies and measures.

Reference scenario – is an internally coherent description of a possible future without consideration of climate change; Depending on a project's needs and design, APF users may choose to develop reference scenarios, or future baselines, that represent future conditions in the priority system, in the absence of climate adaptation (TPs 1 and 6). Additional scenarios, in which various adaptations are applied, may also be developed and compared with reference scenarios to evaluate the implications of different adaptation strategies, policies and measures. Reference scenarios differ from project baselines in that they deal with the longer term and are used for informing policy decisions concerned with various development pathways at the strategic planning level.

Resilience – is the amount of change a system can undergo without changing state (IPCC, 2001).

Risk (climate-related) – is the result of the interaction of physically defined hazards with the properties of the exposed systems – i.e., their sensitivity or (social) vulnerability (TPs 3, 4, 5 and 7). Risk can also be considered as the combination of an event, its likelihood, and its consequences – i.e., risk equals the probability of climate hazard multiplied by a given system's vulnerability. See also *probability* and *vulnerability*.

Scenario – is a plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about driving forces and key relationships. Scenarios may be derived from projections, but are often based on additional information from other sources, sometimes combined with a "narrative storyline" (IPCC, 2001) (TP6). See also *reference scenario*.

Sector – refers to a part or division, as of the economy (e.g., the manufacturing sector, the services sector) or the environment (e.g., water resources, forestry).

Sensitivity (climate-related) – is the degree to which a system is affected, either beneficially or adversely, by climate-related stimuli (IPCC, 2001). Sensitivity affects the magnitude and/or rate of a climate related perturbation or stress (while vulnerability is the degree to which a system is susceptible to harm from that perturbation or stress) (TPs 3 and 4). See also *climate change vulnerability*, *exposure* and *vulnerability*.

Site-specific approaches – seek to develop and assess detailed adaptation strategies on the basis of specific perceptions of vulnerability that have emerged from the full range of stakeholders at the site level (e.g., local communities, local project). See also *uniform approaches*.

Socio-economic vulnerability – is an aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of harmful perturbations (TP6). See also *climate change vulnerability* and *vulnerability*.

Stakeholders – are those who have interests in a particular decision, either as individuals or as representatives of a group. This includes people who influence a decision, or can influence it, as well as those affected by it (Hemmati, 2002) (TPs 1 and 2).

Strategy – refers to a broad plan of action that is implemented through policies and measures. A climate change adaptation strategy for a country refers to a general plan of action for addressing the impacts of climate change, including climate variability and extremes. It may include a mix of policies and measures, selected to meet the overarching objective of reducing the country's vulnerability. Depending on the circumstances, the strategy can be comprehensive at a national level, addressing adaptation across sectors, regions and vulnerable populations, or it can be more limited, focusing on just one or two sectors or regions (TP8). See also *policies and measures*.

System – may refer to a region, a community, a household, an economic sector, a business, a population group, etc., that is exposed to varying degrees to different climate hazards (TPs 1 and 3). See also *priority system*.

Uncertainty – is an expression of the degree to which a value (e.g., the future state of the climate system) is unknown (TP5).

Uniform approaches – seek to develop and assess broad adaptation strategies on the basis of a comprehensive perception of vulnerability that may exist – e.g., across sectors, across regions, across development challenges (TP8). See also *site-specific approaches*.

Vulnerability – The degree to which an *exposure unit* is susceptible to harm due to exposure to a perturbation or stress, and the ability (or lack thereof) of the exposure unit to cope, recover, or fundamentally adapt (become a new system or become extinct) (Kasperson et al., 2000). It can also be considered as the underlying exposure to damaging shocks, perturbations or stresses, rather than the probability or projected incidence of those shocks themselves (TPs 3, 4, and 5). See also *climate change vulnerability* and *socio-economic vulnerability*.

Vulnerability-based approach – one of several conceptual and analytical approaches to adaptation projects, this approach places its starting emphasis on the socio-economic aspects of climate-related risk. With the vulnerability-based approach (TP3), a project focuses on the characterisation of a priority system's vulnerability and assesses how likely critical thresholds of vulnerability are to be exceeded under climate change. Use of the vulnerability-based approach can feed into a larger climate risk assessment (TPs 3, 4 and 5). See also *adaptation project approaches*.

Vulnerability baseline – includes a description of current vulnerabilities to climate variability and events (TPs 3 and 4). See also *project baseline*.

References

Hemmati, M. (2002). *Multi-stakeholder Processes for Governance and Sustainability*, Earthscan, London.

IPCC, (2001). *Climate Change 2001: Impacts, Adaptation and Vulnerability.* Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. IPCC/WMO/UNEP.

Kasperson, J.X., Kasperson, R.E., Turner, II, B.L., Hsieh, W. and Schiller, A. (2002). Vulnerability to global environmental change. In *The Human Dimensions of Global Environmental Change*, ed. Andreas Diekmann, Thomas Dietz, Carlo C. Jaeger, and Eugene A. Rosa. Cambridge, MA : MIT Press (forthcoming).

B

List of Additional Reviewers

The National Communications Support Programme would like to acknowledge the following experts, who provided general comments on the APF structure during the review process:

Chris Gordon	cg@afriwet.org
Alexandre Cabral	Directeur National du projet, Changements Climatiques en Guinée-Bissau
Merylyn McKenzie Hedger	Environment Agency, Bristol, UK
Javier Gonzales Iwanciw	Ministry of Sustainable Development, Bolivia
Rachid Ouali	Ministry of Foreign Affairs, Algiers, Algeria
Abdelghani Beloued	Ministère de l'Agriculture et du Developpement Rural, Algiers
Sid Ali Ramdane	Ministère de l' Aménagement du Territoire et de l'Environnement, Algiers
Yumiko Yasada	UNDP-GEF, Kuala Lumpur, Malaysia
Rebecca Carman	UNDP-GEF, New York, United States
Yamil Bonduki	UNDP-GEF, New York, United States
Qin Dahe	China Meteorological Administration
Robert Mendelsohn	Yale School of Forestry and Environmental Studies, New Haven, United States
Ana Rosa Moreno	The United States-Mexico Foundation for Science, Mexico City, Mexico
Rodel D. Lasco	University of the Philippines, Los Baños
Balgis M. E. Osman	Higher Council for Environment & Natural Resources, Sudan
Kees Dorland	Institute for Environmental Studies, Netherlands

The Adaptation Policy Framework went through three major rounds of reviews in November 2002, April 2003 and June 2003. The list of expert reviewers was as follows:

Antigua and Barbuda

Brian Challenger	Ministry of Public Utilities

Argentina

Gracie laMagrin	Instituto Nacional de Tecnología Agropecuaria
Osvaldo Canziani	IPCC WG II Co-Chair
Martin de Zurviria	
Daniel Bouille	Fundación Bariloche

Australia

Tas Sakellaris	Australian Greenhouse Office
Robert Wasson	Australian National University
Chris Mitchell	Commonwealth Scientific & Industrial Research Organisation
Peter Whetton	Commonwealth Scientific & Industrial Research Organisation
John Handmer	Royal Melbourne Institute of Technology
Nick Harvey	University of Adelaide
Jon Barnett	University of Melbourne

Austria

Jill Jäger	Global Environmental Change series

Bahamas

Philip S. Weech	The Bahamas Environment, Science and Technology Commission

Bangladesh

Mozaharul Alam	Bangladesh Centre for Advanced Studies
Atiq Rahman	Bangladesh Centre for Advanced Studies
Nasimul Haque	Bangladesh Centre for Advanced Studies
Mizan Khan	Sustainable Development Networking Programme

Barbados

Neville Trotz	Caribbean Planning for Adaptation to Global Climate Change

Bhutan

Dechen Tsering	National Environmental Commission

Bolivia

Javier Gonzales Iwanciw	Nur University – National Climate Change Program
Oscar Paz	Programa Nacional de Cambio Climático

Brazil

Carlos Nobre	Centro de Previsão de Tempo e Estudos Climáticos
Roberto Schaeffer	Energy Planning Program
Thelma Krug	IPCC Task Force Bureau co-chair
José Miguez	Ministerio da Ciencia e Tecnologia

Canada

Mike Brklacich	Carleton University
David Cooper	Convention on Biological Diversity
Philip Baker	Canadian International Development Agency
Gretchen de Boer	Canadian International Development Agency
Pierre Giroux	Canadian International Development Agency
Liza LeClerc	Canadian International Development Agency
Tana Lowen Stratton	Canadian International Development Agency
Patti Edwards	Environment Canada
John Drexhage	International Institute of Sustainable Development
Pamela Kertland	Natural Resources Canada
Hadi Dowlatabadi	Sustainable Development Research Institute
Barry Smit	University of Guelph
Monirul Mirza	University of Toronto
Jim Bruce	Global Change Strategies International
John Stewart	
Roger Street	Environment Canada

Chile

Juan Pedro Solar Searle	Comisión Nacional del Medio Ambiente
Alejandro León	Universidad de Chile

China

Xu Yinlong	Chinese Academy of Agricultural Sciences
M.A. Aimin	State Development Planning Commission
Lin Erda	Chinese Academy of Agricultural Sciences

Cook Islands

Pasha Carruthers	Pacific Islands Climate Change Assistance Programme

Costa Rica

Roberto Villalobos	National Meteorological Institute
Ana Rita Chacon	National Meteorological Institute

Croatia

Sonja Vidic	Hydro and Meteorology Service

Cuba

Avelino Suarez	Cuban Environmental Agency

Ecuador

Luis Cáceres	Ministerio del Ambiente

Egypt

Ahmed Amin	Information & Decision Support Center
Helmi Eid	Soil, Water and Environment Research Institute
Mohamed El Raey	University of Alexandria

El Salvador

Yvette Aguilar	Environment and Natural Resources Ministry

Ethiopia

Abebe Tadege	National Meteorological Services Agency

Fiji

Kanayathu C Koshy	Pacific Centre for Environment
Mahendra Kumar	University of the South Pacific

Finland

Tim Carter	Finnish Environment Institute

France

Jan Corfee-Morlot	Organisation for Economic Co-operation and Development
Shardul Agrawala	Organisation for Economic Co-operation and Development
Monique Mainguet	Université de Reims

Gambia

Bubu Jallow	Department of Water Resources

Germany

Richard Tol	Hamburg University
Anke Herold	Öko-Institut
Richard Klein	Potsdam Institute for Climate Impact Research
Martin Welp	Potsdam Institute for Climate Impact Research
George Manful	United Nations Framework Convention on Climate Change
Youssef Nassef	United Nations Framework Convention on Climate Change
Martha Perdomo	United Nations Framework Convention on Climate Change
Olga Pilisofova	United Nations Framework Convention on Climate Change
Graham Sem	United Nations Framework Convention on Climate Change
Dennis Tirpak	United Nations Framework Convention on Climate Change
Holger Liptow	Deutsche Gesellschaft für Technische Zusammenarbeit

Ghana

Chris Gordon	Centre for African Wetlands

Guatemala

Carlos Mansilla	Comisión Nacional del Medio Ambiente

Honduras

Mirna Marin	Sub-secretaría de Ambiente

India

Murari Lal	Indian Institute of Technology
Jyoti Parikh	Indira Gandhi Institute of Development Research
Rajendra Pauchari	IPCC Chairman
Wajih Naqvi	National Institute of Oceanography
Sujata Gupta	The Energy and Resources Institute

Italy

Gustavo Best	Food and Agriculture Organization
Paola Rossi	Università di Bologna
Bettina Menne	World Health Organization

Japan

Taka Hiraishi	Institute for Global Environmental Strategies
Taka Hiraishi	IPCC Task Force Bureau co-chair

Kazakstan

Irina Yesserkepova	Scientific Research Institute of the KAZHYDROMET

Kenya

Richard Odingo	IPCC Vice-Chair
John Nganga	Kenya Meteorological Department
Ravi Sharma	United Nations Environment Programme

Lebanon

Samir Safi	Université Libanaise

Malaysia

Mastura Mahmud	Universiti Kebangsaan

Mali

Mama Konate	Direction Nationale de Météorologie

Mexico

Julia Carabias	STAP Chair
Ana Rose Moreno	USA-MEX Foundation for Science
Carlos Gay	Universidad Nacional Autónoma de México
Julia Martínez	Instituto Nacional de Ecología/ SEMARNAT

Morocco

Faouzi Senhaji	Mahgreb

New Zealand

Jim Salinger	National Institute of Water & Atmospheric Research Limited
Alistair Woodward	University of Otago
Paul Kench	University of Waikato
John Campbell	University of Waikato
John Hay	University of Waikato
Richard Warrick	University of Waikato

Nicaragua

Freddy Picado Trana	Ministerio del Ambiente y los Recursos Naturales
Mario Torres Lezama	Ministerio del Ambiente y los Recursos Naturales

Niger

Mohammed Sadeck Boulahya	African Centre of Meteorological Application for Development
Ben Mohamed Abdelkrim	Direction de la Météorologie Nationale

Norway

Karen O'Brien	Center for International Climate and Environmental Research – Oslo
Harald Dovland	Ministry of the Environment

Pakistan

Mahboob Elahi	Ministry of the Environment
Amir Muhammed	National University of Computer & Emerging Sciences

Panama

Ligia Castro	Centro del Agua del Trópico Húmedo para América Latina y el Caribe
Eduardo Reyes	Autoridad Nacional de Ambiente

Samoa

Taito Nakalevu	South Pacific Regional Samoa Environment Programme
Laavasa Malua	Department of Lands, Survey & Environment

Saudi Arabia

Taha Zatari	Presidency of Meteorology and Environment

Senegal

Mamadou Dansokho	University Cheikh Anta Diop
Youba Sokona	Environmental Development of the Third World
Isabelle Niang Diop	Environmental Development of the Third World

Slovakia

Ivan Mojik	Ministry of the Environment

South Africa

Lauraine Lotter	Chemical & Allied Industries Association
Ogunlade Davidson	IPCC WG III Co-Chair
Emma Archer	University of Cape Town
Bruce Hewitson	University of Cape Town
Roland Schulze	University of Natal South
Colleen Vogel	University of Witwatersrand

Sweden

Angela Churie Kallhauge	Swedish Energy Agency

Switzerland

Nicole North	INFRAS
Othmar Schwank	INFRAS
Brett Orlando	International Union for Conservation of Nature and Natural Resources
Annie Roncerel	United Nations Institute for Training and Research
Carlos Corvalan	World Health Organization
Michael Couglan	World Meteorlogical Organization
Paul Llanso	World Meteorlogical Organization
M.V. K. Sivakumar	World Meteorlogical Organization

Tanzania

Hubert Meena	Centre for Energy, Environment, Science & Technology
Richard Muyungi	Division of Environment

Thailand

VuteWangwacharakul	Kasetsart University
Liam Salter	World Wildlife Fund

The Netherlands

Bill Hare	Greenpeace
Rob Swart	Head of TSU, IPCC WG III
Bert Metz	IPCC WG III Co-Chair
Madeleen Helmer	Red Cross
Kees Dorland	National Institute for Public Health and the Environment
Maarten van Aalst	Universiteit Utrecht
Roland Rodts	

The Philippines

Philippine Climate Change Information Center	
Rex Cruz	SysTem for Analysis, Research and Training
Rodel Lasco	EcoMarket Solutions

Togo

Ayite-lo Ajavon	Université de Lomé

Uganda

Stephen Magezi	Department of Meteorology

UNDP

Susan McDade	Bureau for Development Policy/ Energy and Environment Group
Charles McNeill	Bureau for Development Policy/ Energy and Environment Group
Minoru Takada	Bureau for Development Policy/ Energy and Environment Group
Pascal Girot	Bureau for Development Policy/ SURF – Costa Rica
Juha Uitto	Global Environment Facility
Arun Kashyap	Bureau for Development Policy/ Energy and Environment Group
Martin Krause	Global Environment Facility
Walter Baethgen	Uruguay Country Office

United Kingdom

John Gash	Centre for Ecology and Hydrology
John Ingram	Centre for Ecology and Hydrology
Caroline Fish	Department for Environment Food and Rural Affairs
David Warrilow	Department for Environment Food and Rural Affairs
Diana Wilkins	Department for Environment Food and Rural Affairs
Penny Bramwell	Department of the Environment, Transport and the Regions
Tim Foy	Department for International Development
Sam Fankhauser	European Bank for Reconstruction and Development
Merylyn McKenzie Hedger	Environment Agency
Kate Hampton	Friends of the Earth
Jose Furtado	Imperial College
Roy Behnke	Overseas Development Institute
Nabeel Hamdi	Oxford Brooks University
Dennis Anderson	Scientific and Technical Advisory Panel – Climate Change
Nigel Arnell	University of Southampton
Peter Jones	University College – London
Declan Conway	University of East Anglia
Mike Hulme	University of East Anglia
Tim Osborn	University of East Anglia
Martin Parry	University of East Anglia
Emma Tompkins	University of East Anglia
Simon Shackley	University of Manchester Institute of Science and Technology
Gina Ziervogel	University of Oxford Environmental Change Institute
Frans Berkhout	University of Sussex
Julia Hertin	University of Sussex

United States

Adil Najam	Boston University
Rawleston Moore	California Postsecondary Agriculture Articulation Collaborative
Leonard Nurse	California Postsecondary Agriculture Articulation Collaborative
Diana Liverman	Center for Latin American Studies
Robin Reid	Consultative Group on International Agricultural Research
Peter Thornton	Consultative Group on International Agricultural Research
Marc Levy	Center for International Earth Science Information Network, Columbia University
Dennis Ojima	Colorado State University
Roger Pielke Sr	Colorado State University
AntoinetteWannebo	Columbia University
Jack Fitzgerald	Department of Energy
Bev McIntyre	Department of State
Nancy Lewis	East West Center
Eileen Shea	East West Center
Anne Grambsch	Environmental Protection Agency
Michael Slimak	Environmental Protection Agency
Yasemin Biro	Global Environment Facility
Claudio Volonte	Global Environment Facility
William Gutowski	Iowa State University
Mohan Munasinghe	IPCC Vice-Chair
Susan Solomon	IPCC WG II Co-Chair
Jonathon Patz	Johns Hopkins Bloomberg School of Public Health
Andrew Githeko	Malaria Research Network, National Library of Medicine
Susan Capalbo	Montana State University
Ana Iglesias	NASA Goddard Institute for Space Studies
Paul Filmer	National Science Foundation
Fred Semazzi	North Carolina State University
Michael Sale	Oak Ridge National Laboratory

Tom Wilbanks	Oak Ridge National Laboratory
Anne Arquit Niederberger	Policy Solutions
Otto Doering	Purdue University
Joel Smith	Stratus Consulting
Neil Leary	SysTem for Analysis, Research and Training
Hassan Virji	SysTem for Analysis, Research and Training
Tariq Banuri	Tellus Institute
Bill Dougherty	Tellus Institute
Erika Spanger-Siegfried	Tellus Institute
Suzanne Mozer	Union of Concerned Scientists
Robert Harriss	University Corporation for Atmospheric Research
James Shuttleworth	University of Arizona
Soroosh Sorooshian	University of Arizona
Emilio Laca	University of California – Davis
Paul Freeman	University of Denver
Robert Peart	University of Florida
Maria Carmen Lemos	University of Michigan
Camille Parmesan	University of Texas – Austin
Paul Desanker	University of Virginia
Dennis Lettenmaier	University of Washington
Richard Moss	US Global Change Research Program
Ko Barrett	US Agency for International Development
John Kimble	US Department of Agriculture
Dave Schimmelpfennig	US Department of Agriculture
Virginia Burkett	US Geological Survey
Patrick Gonzales	US Geological Survey
Arthur Horowitz	US Geological Survey
Frank Sperling	World Bank
Ajay Mathur	World Bank
Robert Mendelsohn	Yale University
Sally Kane	National Science Foundation
Robert Kates	Maine Global Climate Change

Uruguay

Cecilia Ramos Mane	Comision Nacional sobre el Cambio Global

Uzbekistan

Sergey Myagkov	Main Administration of Hydrometeorology

Venezuela

Lelys Bravo de Guenni	Centro de Estadística y Software Matemático, Universidad Simón Bolívar

Zambia

Lubinda Aongola	Ministry of Environment and Natural Resources

Special Acknowledgements

Maritza Ascencios	UNDP-GEF, New York, United States
Yamil Bonduki	UNDP-GEF, New York, United States
Rebecca Carman	UNDP-GEF, New York, United States
Laurie Douglas	Laurie Douglas Graphic Design, New York, United States