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SUMMARY OF THE EIGHTEENTH SESSION OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: 24-29 SEPTEMBER 2001

The eighteenth session of the Intergovernmental Panel on Climate Change (IPCC-18) was held from 24-29 September 2001, in London, UK. Approximately 280 delegates, experts and representatives of international and non-governmental organizations attended the session.

The session focused on approving/adopting the Synthesis Report of the IPCC's Third Assessment Report (TAR). The Synthesis Report, which consists of a summary for policy-makers (SPM) and an underlying longer part, integrates the information contained within the TAR and draws on all previously approved and accepted IPCC reports to address nine policy-relevant questions identified by the IPCC, based on submissions by governments. It is the first such report prepared by the IPCC.

Participants met in Plenary throughout the six-day session, convening contact groups to address contentious issues. Throughout the week, they approved the SPM using a line-by-line approach and adopted the underlying longer part paragraph-by-paragraph during the final two days. The approval/adoption of the Synthesis Report was completed on Saturday, 29 September. In addition, delegates took a number of management decisions, including to:

- retain the current three working groups, maintain the Task Force on Inventories, and keep the size of the IPCC Bureau at 30 members;
- adopt the IPCC work programme and budget for 2002-2004;
- endorse a scoping paper for the Technical Paper on Climate Change and Biological Diversity and endorse in principle the preparation of a technical paper on climate change and sustainable development;
- accept a work programme on Good Practice Guidance on Land Use, Land-Use Change and Forestry and authorize further work on developing definitions for degradation and devegetation; and
- authorize the preparation of scoping papers for any work requested by the 7th Conference of the Parties (COP-7) to the UN Framework Convention on Climate Change (UNFCCC).

The finalization of the Synthesis Report completed nearly five years of work on the TAR. The issue of how governments will respond to the Synthesis Report and make use of its answers to policy-relevant questions remains to be seen. Their first opportunity to respond will be COP-7, where an in-depth debate on the TAR is scheduled to take place.

The next session of the IPCC will take place in April 2002, at a venue to be determined.

A BRIEF HISTORY OF THE IPCC

The Intergovernmental Panel on Climate Change was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). The purpose of the IPCC is to assess the scientific, technical and socioeconomic information relevant to understanding the risks associated with human-induced climate change. The IPCC does not undertake new research, nor does it monitor climate-related data, but bases its assessments on

IN THIS ISSUE

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published and peer reviewed scientific and technical literature. Its Secretariat is located in Geneva and is staffed by both WMO and UNEP.

Since its inception, the IPCC has prepared a series of comprehensive assessments, special reports and technical papers, providing scientific information on climate change to the international community, including policy-makers and the general public. This information has played an important role in the negotiations under the UNFCCC. The UNFCCC, which provides the overall policy framework for addressing climate change, was adopted in 1992 and entered into force in 1994.

The current structure of the IPCC includes three working groups and a Task Force on National Greenhouse Gas Inventories:

- Working Group I addresses the scientific aspects of the climate system and climate change.
- Working Group II addresses the scientific, technical, environmental, economic and social aspects of the vulnerability (sensitivity and adaptability) to climate change, and the negative and positive consequences (impacts) for ecological systems, socioeconomic sectors and human health, with an emphasis on regional sectoral and cross-sectoral issues.
- Working Group III assesses the scientific, technical, environmental, economic and social aspects of the mitigation of climate change, as well as the methodological aspects of cross-cutting issues.

The current Bureau of the IPCC was established in 1997. It has 30 members representing all six WMO regions (Africa, Asia, South America, North and Central America, South-West Pacific, Europe).

KEY IPCC REPORTS: The IPCC completed its first comprehensive assessment of climate change compiled in the First Assessment Report (FAR) in 1990 and the Second Assessment Report (SAR) in 1995. In 1994 it prepared technical guidelines for assessing greenhouse gas inventories and subsequently revised these in 1996. The Kyoto Protocol in 1997 reaffirmed the use of the Revised IPCC Guidelines for preparing national greenhouse gas inventories by Parties to the UNFCCC and, in the future, by Parties to the Protocol.

The IPCC also prepares special reports and technical papers on topics where independent scientific information and advice is deemed necessary. It prepared, for example, a Special Report on Land Use, Land-Use Change and Forestry (LULUCF) in 2000, at the request of the UNFCCC.

THIRD ASSESSMENT REPORT: The TAR addresses policy-relevant scientific, technical, and socioeconomic dimensions of climate change. It concentrates on findings since 1995 and pays attention to both regional and global scales, including non-English literature to the extent possible. The preparation of the TAR was guided by a decision paper adopted by the Panel in 1997 at its thirteenth session. The preparation of the TAR was also guided by papers on cross-cutting issues, such as equity, uncertainties and costing methodologies, published as IPCC supporting material to ensure a coordinated approach to these issues within all working groups.

The TAR is composed of a comprehensive assessment from the three IPCC working groups, an SPM and technical summary of each working group report, and a Synthesis Report. The comprehensive assessments, Synthesis Report and SPMs have been subject to extensive peer review from experts and governments. The Synthesis Report is written in a non-technical style aimed at policy-makers and is composed of an underlying longer part and an SPM. It addresses nine policy-relevant questions identified by the IPCC based on submissions by governments.

Working Group I Contribution to the TAR: Working Group I met from 17-20 January 2001, in Shanghai, China, to finalize and adopt its part of the TAR. One hundred and fifty delegates from 100 countries adopted the report, "Climate Change 2001: The Scientific Basis," as well as the summary for policy-makers. The report, which is based on work by 123 authors and more than 500 contributors, assesses the current state of understanding of the climate system and provides estimates of its projected future evolution. It notes that "an increasing body of observation gives a collective picture of a warming world" and that the climate is changing more rapidly than predicted in the SAR.

Working Group II Contribution to the TAR: Working Group II met from 13-16 February 2001, in Geneva, Switzerland, to finalize and adopt its part of the TAR. More than 160 delegates from 100 countries approved the report, "Climate Change 2001: Impacts, Adaptation and Vulnerability," as well as the summary for policy-makers. The full report was completed by more than 400 authors and contributors, assessing scientific literature related to the impacts of, and vulnerability to, climate change. The report suggests projected climate changes over the next century could potentially lead to future large-scale and possibly irreversible changes. Focusing on a variety of issues, the report considers the effects of climate change on water resources, terrestrial ecosystems and human health. It also addresses regional concerns, vulnerabilities and adaptive capacities.

Working Group III Contribution to the TAR: Working Group III met in Accra, Ghana, from 28 February – 3 March 2001, to finalize and adopt its part of the TAR. More than 140 delegates from 85 countries approved the report, "Climate Change 2001: Mitigation," as well as the summary for policy-makers. The report was prepared by nearly 400 authors and contributors. It assesses options for cutting greenhouse gas emissions by reviewing: technologies available for controlling emissions; steps that can be taken in the industry and energy sectors to promote a transition to a cleaner energy future; contributions through carbon sequestration by forestry and agriculture; policies for achieving cost-effective and "no-regrets" emissions reductions; and ways to overcome political, cultural and institutional barriers to mitigation.

SEVENTEENTH SESSION OF THE IPCC: At IPCC-17, held from 4-6 April 2001, at UNEP Headquarters in Nairobi, Kenya, participants accepted the actions of the three IPCC Working Groups with regard to adopting the three sections of the TAR. They considered progress on the Synthesis Report, and discussed in depth the future of the IPCC. Participants also approved the preparation of a technical paper on the links between biological diversity and climate change, and considered a proposal for a special report on climate change and sustainable development.

REPORT OF THE MEETING

IPCC Chair Robert Watson opened the eighteenth session of the Panel (IPCC-18) on Monday morning, 24 September. Delegates observed a minute of silence as a mark of respect for the victims of the recent terrorist attacks in the US.

UK Deputy Prime Minister John Prescott welcomed all participants to the UK. Paying tribute to the IPCC, he stated that the Panel's hard work and analysis had helped to defeat the "flat-earthers" who denied the existence of human-induced climate change. He noted that the adoption of the Kyoto Protocol to the UNFCCC had marked a coming together of sound science and political will. He outlined the UK climate change programme, which is expected to cut greenhouse gas emissions by 23%, and emphasized the opportunities for "gain not pain" in climate policy through cost-effective measures and better technology. He expressed hope that the "Bonn Agreements," recently adopted at the resumed UNFCCC COP-6 held in Bonn from 16-27 July 2001, would pave the way for the entry into force of the Kyoto Protocol by 2002. In conclusion, he underscored the important role played by the IPCC in advancing the political process on climate change.

WMO Secretary-General G.O.P. Obasi thanked the UK government for hosting the meeting. Noting that the TAR is eagerly awaited, he commended the IPCC for its work, recalling the critical role that the First and Second Assessment Reports had played in the negotiations on the UNFCCC and the Kyoto Protocol, respectively. Referring to the IPCC's future work and structure, he stressed that the Panel must be "ruthlessly factual," work by consensus, and serve all governments. Finally, he emphasized the need for strengthened climate observation and drew attention to the Integrated Global Observing Strategy that is being developed by WMO and its relevant partners.

UNEP Assistant Executive Director Jorge Illueca, speaking on behalf of UNEP Executive Director Klaus Töpfer, congratulated all those involved in the preparation of the TAR. He noted that scientific consensus on climate change has grown stronger, and that its impacts are already being felt around the world. He highlighted UNEP's role in addressing climate change, notably in the areas of adaptation, renewable energy and public awareness, as well as its work on international environmental governance.

Dennis Tirpak, Coordinator for Methods, Science and Technology, UNFCCC Secretariat, speaking on behalf of UNFCCC Executive Secretary Michael Zammit Cutajar, expressed his appreciation for the fresh material and new insights contained in the TAR. He underlined the importance of UNFCCC COP-7, noting that decisions adopted at that session will close one chapter of the climate change negotiations and start opening a new one. He stated that a key question at UNFCCC COP-7 with regard to the TAR will be the use of its information, and put forward several specific operational, research and policy questions to be considered. In conclusion, he remarked that time will be needed to adequately reflect on the information presented in the TAR and to take decisions on subsequent actions.

Chair Watson thanked delegates for their commitment to the IPCC and remarked that the Panel is entering the final phase of its work on the TAR. He stated that the issue now is not whether climate change is happening, but how much, where and when. He said that the IPCC has helped shape policy and that all those involved in the Panel should be proud of their work in providing decision-makers with the best available evidence to formulate cost-effective and equitable climate change policies. He congratulated governments on the constructive comments received on the draft Synthesis Report and stated that he looked forward to an early approval of the Report.

IPCC Secretary N. Sundararaman stressed the need for the IPCC to uncompromisingly uphold its objectivity in order to remain useful. He emphasized the importance of aggressively increasing the involvement of experts from developing countries and countries with economies in transition, given that climate change affects different communities in different ways.

Chair Watson then introduced the programme of work of the session. He stated that the main task for the Panel was to approve/adopt the draft Synthesis Report of the TAR, including the SPM and the underlying longer part. He noted that a number of "management decisions" were also on the agenda. Delegates agreed on the organization of work for the session.

Editor's Note: *As a matter of policy, the* Earth Negotiations Bulletin *does not directly attribute statements made by governments when requested to do so*.

APPROVAL/ADOPTION OF THE DRAFT SYNTHESIS REPORT

On Monday, 24 September, Chair Watson introduced the SPM of the Synthesis Report and the underlying draft longer part. He reported that approximately 50 lead authors, as well as review editors from the Bureau, had considered comments submitted by governments, NGOs and experts over the past week to prepare a revised draft of the SPM for this meeting.

Noting that some comments had called for greater focus on uncertainties and beneficial effects of climate change while others had sought more emphasis on adverse impacts, Chair Watson underscored the need for a balanced document.

Concerning the organization of work, Watson said that the Plenary would first consider and approve the SPM line-by-line and that the lead authors, working with the review editors, would then revise the underlying longer part to ensure its full consistency with the approved SPM. He stated that the revised underlying longer part would then be considered and adopted paragraph-by-paragraph by the Plenary to ensure consistency in tone, message and structure with the SPM and all underlying documents on which it is based.

APPROVAL OF THE SUMMARY FOR POLICY-MAKERS OF THE SYNTHESIS REPORT: Delegates considered the SPM of the Synthesis Report throughout the week. Many editorial, technical and substantive changes were proposed. Where appropriate, the lead authors responded to proposed changes and clarified issues. Views often differed on how the findings of the working groups should be synthesized, interpreted and reflected, and on how to ensure consistency between the working group and Synthesis Report SPMs. Opinions also differed on the messages that should be conveyed to policymakers. Throughout the discussion, Chair Watson urged delegates not to alter text taken directly from the approved working group SPMs and to refrain from adding more detailed text. The approval of the SPM was completed on Saturday, 29 September.

The report below highlights some of the key issues discussed on each of the nine policy-relevant questions.

Question 1: This question addressed the contribution of scientific, technical and socioeconomic analyses to the determination of what constitutes dangerous anthropogenic interference with the climate system, as referred to in UNFCCC Article 2.

Views differed over whether and how to reflect uncertainty in defining what constitutes "dangerous anthropogenic interference with the climate system." Views also differed over whether to refer to "mitigative capacity" as one of the factors determining what constitutes such "dangerous anthropogenic interference." Some participants expressed concern over including this reference, questioning its meaning and logic. Delegates acknowledged the intellectual complexity of the issue but agreed to include the reference.

Some participants expressed concern over lack of substance in the answer to Question 1 and proposed to include a figure showing that stabilization of CO_2 concentrations would reduce the risks of climate change damages. Others opposed this proposal. Chair Watson recalled that Question 1 had been designed to provide a framework for reflection on dangerous anthropogenic interference with the climate system, and not to present specific information, since doing so would result in a "laundry list" of information and pre-empt the other questions. Delegates agreed not to include the figure.

***Approved Answer*:** The approved answer states that natural, technical and social sciences can provide essential information and evidence needed for decision-making on what constitutes "dangerous anthropogenic interference with the climate system." At the same time, such decisions are value judgments determined through sociopolitical processes, taking into account considerations such as development, equity, and sustainability, as well as uncertainties and risk. The answer also states that the basis for determining what constitutes "dangerous anthropogenic interference" will vary among regions and depends upon mitigative capacity, since the magnitude and the rate of change are both important. It also notes that the TAR assesses available information on the timing, opportunities, costs, benefits, and impacts of various mitigation and adaptation options.

Question 2: This question addressed the evidence for, and causes and consequences of, changes in the Earth's climate since the pre-industrial era.

Views differed over whether to include additional proposed text highlighting differences between satellite and surface temperature measurements. Chair Watson formed a contact group to consider the issue. Delegates eventually agreed to the Chair's proposal to include a sentence stating that temperature changes have not been uniform globally, but have varied over regions and different parts of the lower atmosphere.

Delegates also debated proposed amendments to the sentence "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." Chair Watson guarded against altering this "take home message" from the Working Group I SPM, and the sentence was approved without change.

Other issues debated by participants included the list of observed changes to climate and biophysical systems in the 20th century.

***Approved Answer*:** The approved answer states that the Earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era, with some of these changes attributable to human activities. It explains that, globally, it is very likely that the 1990s was the warmest decade, and 1998 the warmest year, in the instrumental record (1861-2000). The answer notes that changes in sea level, snow cover, ice extent and precipitation are consistent with warming near the Earth's surface, providing examples and noting uncertainties. It states that observed regional climate changes have already affected hydrological systems and terrestrial and marine ecosystems, and socioeconomic vulnerability to climate change appears to be rising. A table provides examples of observed changes during the 20th century in the atmosphere, climate and biophysical system.

Question 3: This question addressed the regional and global climatic, environmental, and socioeconomic consequences in the next 25, 50 and 100 years associated with a range of greenhouse gas emissions arising from scenarios used in the TAR.

Regarding human health, several delegates noted the existence of positive effects of climate change on human health and the small number of studies on vector-borne diseases.

Concerning crop yields, delegates debated whether reference to the level of warming projected to increase food prices globally should be quantified more precisely than "a few degrees Celsius." Several non-Anglophone delegates noted problems in the translation of the term "a few." Agreement was reached not to quantify the degree of warming, but to spell out the English term "a few" in the translated documents.

On water resources, some delegates noted that factors other than climate change contribute to water shortage in many water-scarce areas of the world and proposed to spell out these factors. Others expressed concern at shifting the focus away from climate change. Agreement was reached to identify those additional factors contributing to water shortage.

Concerning the severe social and economic effects faced in particular by populations that inhabit small islands and/or low lying coastal areas, several delegations proposed, and the Plenary accepted, to reference additional areas of concern, such as the loss of beaches, coastal erosion and storm surges. One participant noted that the impacts of climate change are already being felt in small island States.

Other issues debated by delegates included: the extent to which adaptation can reduce the adverse effects of climate change; and the estimated aggregated market sector effects measured as changes in GDP of climate change on developing and developed countries.

***Approved Answer*:** The approved answer to this question states that emission scenarios project the following characteristics for 2100: CO_2 concentrations of 540-970 ppm; an increase in globally averaged surface temperature of 1.4-5.8°C; and an increase in sea level of 0.09-0.88 m. The answer says that projected climate change will have beneficial and adverse environmental and socioeconomic effects, but the larger the changes and rate of change in climate, the more the adverse effects predominate. It explains in more detail projected climate change impacts on: human health; ecological productivity and biodiversity; agriculture; water; small islands and low-lying coasts; and changes in GDP. The answer also discusses the potential for adaptation

to reduce adverse effects of climate change and to produce immediate ancillary benefits, but not to prevent all damages. Several figures are included to illustrate the answer, including: socioeconomic, emissions and greenhouse gas concentration scenarios; temperature and sea-level change; and changes in annual run-off.

Question 4: This question addressed climate fluctuations, extreme events and the risk of abrupt/non-linear changes.

Views differed over how to characterize the nature, degree and likelihood of abrupt/non-linear changes in physical systems resulting from climate change, and the extent to which these may be irreversible. Given the varying terminology used in the different working groups, delegates had difficulty merging material from the SPMs of Working Groups I and II. A contact group was formed to consider this issue.

On examples of projected abrupt/non-linear changes, participants discussed the implication of local warming over Greenland on global sea-level rise. Agreement was reached on a sentence stating that "ice sheet models project that a local warming of larger than 3°C, if sustained for millennia, would lead to virtually a complete melting of the Greenland ice sheet with a resulting sea-level rise of about 7m." Delegates also agreed to strengthen a reference to the effects of permafrost melting to say that landslides will affect water courses and wetland ecosystems, as well as infrastructure.

***Approved Answer*:** The approved answer states that models project an increase in daily, seasonal, inter-annual and decadal climate variability, as well as changes in frequency, intensity, and duration of extreme climate events. It also states that greenhouse gas forcing in the 21st century could set in motion abrupt/non-linear changes in physical and biological systems over the coming decades to millennia, with a wide range of associated likelihoods. Further, the answer stipulates that some of the projected changes in physical systems and in the natural sources and sinks of greenhouse gases could be irreversible, but there is an incomplete understanding of some of the underlying processes. Changes in climate could increase the risk of such changes in many ecosystems. A table gives examples of climate variability and extreme climate events, and examples of their impacts.

Question 5: This question addressed inertia and time-scales associated with changes in the climate system, ecological systems, and socioeconomic sectors and their interactions.

On the inertia of the climate system, some participants noted the need to consider greenhouse gases other than CO_2, particularly short-lived gases, and the text was amended to reflect this point. In response to queries from two delegations, Chair Watson confirmed as factual the statement that stabilization of CO_2 emissions at near-current levels will never lead to stabilization of CO_2 atmospheric concentrations.

Concerning inertia in socioeconomic systems, participants debated the costs of changing socioeconomic systems to address climate change, and how such costs vary depending on the necessary speed of response, the availability of technology and the depreciation of capital stock. Some delegates stated that changes to socioeconomic systems are possible at no net cost, even when responding under pressure, but others disagreed. Delegates approved a sentence noting that costs of change are higher when socioeconomic systems must respond quickly, but lower when there is time to respond.

On the policy implications of inertia, delegates discussed differences in the implications of inertia for mitigation and adaptation, and whether adaptation should be characterized as involving mainly local/regional actions and mitigation as involving coordinated global actions. Some delegations argued that adaptation can be addressed at a global level, while mitigation also involves local level action. Chair Watson formed a contact group to seek a compromise solution. The group reached agreement on a text, later approved by Plenary, which states that inertia has different consequences for adaptation than for mitigation and that adaptation is primarily oriented to address localized impacts of climate change, while mitigation aims to address the impacts on the climate system.

***Approved Answer*:** The approved answer to this question notes that inertia is a widespread and inherent characteristic of the interacting climate, ecological and socioeconomic systems, and thus some impacts of climate change may be slow to become apparent and could be irreversible if thresholds are crossed. The answer explains the nature of inertia in climate systems, ecological systems and socioeconomic systems, as well as its policy implications. Among other findings, the answer reports that: surface air temperature and sea levels will continue to rise after stabilization of greenhouse gas concentrations; inertia makes adaptation inevitable and already necessary in some cases; and anticipatory adaptation and mitigation actions are beneficial, given inertia in the climate system and the possibility of irreversibility. The answer includes a graph showing how CO_2 concentrations, temperature and sea levels continue to rise long after emissions are reduced.

Question 6: This question assesses the implications of stabilizing concentrations of greenhouse gases at a range of levels for the climate, ecological systems and socioeconomic sectors.

Concerning the stabilization of atmospheric CO_2 concentrations, delegates considered a proposal to make explicit reference to the cost of greenhouse gas mitigation. They agreed to include a sentence stating that mitigation actions to stabilize atmospheric greenhouse gas concentrations at lower levels would generate greater benefits in terms of less damage. Throughout debates on Question 6, delegates considered whether or not continuous reference should be made to the cost of mitigation action when addressing its benefits. Chair Watson reminded delegates that Question 7 deals with mitigation action costs, and stated that continuous reference to cost in Question 6 would necessitate similar reference to the benefits of mitigation actions in Question 7. Participants agreed to keep the two questions separate, with only minimal reference to other questions.

Delegates discussed whether reference should be made to the timing of global emissions peaks for specific stabilization levels. Some delegates stressed the importance of such a reference in conveying a clear message to policy-makers, but others disagreed. A sentence referring to two outer stabilization levels (450 ppm and 1000 ppm) and the timings of their respective emission peaks was eventually adopted.

In estimating global mean temperature increase at specified levels of atmospheric CO_2 concentration stabilization, delegates agreed to refer to assumptions made about emissions of non-CO_2 greenhouse gases and aerosols. Further, delegates requested the lead authors to

calculate the contribution of non-greenhouse gases and aerosols to equilibrium warming. Appropriate text on this matter was adopted later in the week.

Delegations considered whether to keep or amend a statement noting that all of the CO_2 stabilization profiles analyzed would avoid much of the upper end of the projected warming of 1.4-5.8°C by 2100. Chair Watson established a contact group to discuss this issue. Further matters on which agreement could not be reached in Plenary and which were referred to the contact group included: an appropriate way of referencing the amount of estimated sea-level rise for specified increases in CO_2 concentration; reference to non-CO_2 greenhouse gases in contributing to sea-level rise; and reference to the reduction of inequity through adaptation and mitigation actions. After some debate, wording devised in the contact group was agreed on for all issues.

***Approved Answer*:** The approved answer states that projected warming and sea-level rise will be smaller, the greater the emissions reductions and the earlier they are introduced. Sea level and ice sheets would continue to respond to warming for many centuries after greenhouse gas concentrations have been stabilized. A wide band of uncertainty exists in the amount of warming that would result from any stabilized greenhouse gas concentration. The answer further notes that reducing emissions of greenhouse gases to stabilize their atmospheric concentration would delay and reduce damages caused by climate change, and that adaptation is a necessary strategy at all scales to complement climate change mitigation efforts.

Question 7: This question examines what is known about the potential for, costs and benefits of, and time frame for, reducing greenhouse gas emissions.

On forests, agricultural lands, and other terrestrial ecosystems that offer significant carbon mitigation potential, several delegations noted the importance of spelling out the strategies by which biological mitigation can occur, namely: conservation of existing carbon pools; sequestration by increasing the size of carbon pools; and substitution of sustainably produced biological products. Wording to this effect was adopted.

Delegates debated whether to include a footnote stating that, in the hypothetical situation that all of the carbon released by historical land-use changes could be restored to the terrestrial biosphere over the course of a century, atmospheric CO_2 concentrations could potentially be reduced by no more than 40 to 70 ppm. The matter was referred to a contact group and the footnote was later approved with minor textual changes.

In response to queries from delegates over the cost estimates for Kyoto Protocol Annex B (developed) countries to implement the Kyoto Protocol, the lead authors confirmed that the figures provided were up-to-date.

Views differed over how to reflect uncertainties in the "spillover" effect of climate change mitigation policies implemented by UNFCCC Annex I (developed) countries on non-Annex I (developing) countries. One participant noted the need for balance between the treatment of uncertainties in "spillover" effects on developing countries and in mitigation costs in Annex I countries. Chair Watson formed a contact group to draft compromise text.

Views also differed over a statement averaging out the long-term costs of mitigating climate change over 100 years. Some participants claimed that a focus on long-term average costs is misleading and downplays short-term transition costs. Others argued that it places mitigation costs in context and demonstrates the importance of gradual mitigation action. Chair Watson convened a contact group to further discuss the issue.

Discussion also took place over the figures to be included to illustrate the answer, and the message that these would send to policy-makers. Several delegates expressed concern at a graph illustrating the estimated costs from different economic models of stabilizing CO_2 concentrations at various levels, arguing that it exaggerates costs and could imply that it is cheaper to delay mitigation action. After consideration in a contact group, delegates agreed to delete the figure from the SPM, but to retain it in the underlying report. After some debate, delegates agreed to include a graph illustrating projected global average GDP reduction in 2050 due to climate change mitigation action according to various scenarios, but to indicate in the figure caption that the data does not take into account the benefits of avoided climate change.

***Approved Answer*:** The approved answer to this question states that there are many opportunities to reduce near-term emissions and that technical progress in this regard has been faster than anticipated, but barriers exist to the deployment of these opportunities. The answer explains reasons behind the varying mitigation cost estimates of different models and studies, and notes substantial opportunities for lowering costs, for example, through use of carbon sinks and emissions trading. The answer discusses the well-established, albeit varied, "spillover" effects on non-Annex I countries of emission constraints on Annex I countries. It explains how technology development and diffusion are important components of cost-effective stabilization, and how the pathway to meeting a particular stabilization target will have an impact on mitigation cost.

Question 8: This question discusses the interactions between climate change, other environmental issues and sustainable development.

Concerning synergies and trade-offs in climate change response options, delegates discussed various means of reducing greenhouse gas emissions, including a proposal to refer to increasing the use of advanced fossil fuel technologies, rather than the substitution of fossil fuel combustion by renewable energy. Chair Watson convened a contact group on the proposal. The contact group agreed to refer to increasing the share of lower carbon emitting fossil fuels, advanced fossil fuel technologies and renewable energy technologies.

On linkages between multilateral environmental agreements, participants discussed how to characterize the interaction between multilateral agreements on ozone and climate change. Several delegates proposed, and the Plenary agreed, to note potential contradictions between the agreements, whereby substances that are replacements for ozone-depleting substances are greenhouse gases.

Approved Answer: The approved answer to this question notes that local, regional and global environmental issues are inextricably linked and affect sustainable development, and that synergistic opportunities exist to develop more effective response options that enhance benefits,

reduce costs, and meet human needs more sustainably. The answer explains how meeting human needs, in many instances, causes environmental degradation, which in turn threatens the ability to meet present and future needs. The answer also discusses linkages between climate change and other environmental issues, such as biodiversity loss, desertification and stratospheric ozone depletion, pointing to synergies and trade-offs.

Question 9: This question calls for a summary of the most robust findings and uncertainties.

Delegates debated the definition of "robust finding," noting that the term is used for the first time in the Synthesis Report, and agreed some minor changes to it.

During discussions on a table listing the most robust findings and associated key uncertainties, several delegates proposed to add robust findings including: the existence of long lived gases; the likelihood of more heat/cold waves and very hot/cold days; and the scale of emissions reductions required from 1990 levels to achieve different CO_2 concentration stabilizations. Several delegates also proposed to add key uncertainties, including the probability distribution associated with temperature and sea-level projections and issues related to large-scale abrupt/non-linear changes.

Concerning robust findings on climate change impacts, there were proposals for greater emphasis on both positive and negative impacts. Emphasizing the need for balance, Chair Watson underscored that most people will be adversely affected by, rather than benefit from, climate change, and that the list should focus on large-scale impacts.

On request of the Chair, the lead authors presented a revised list. After clarifying the confidence level underlying some of its items, delegates adopted the revised list.

Several different proposals were put forward for additions to the list of robust findings on adaptation and mitigation options. Chair Watson requested a contact group, including the lead authors, to prepare a revised list that would ensure balance. When later presenting the revised list to Plenary, he noted that several hours had gone into its preparation and urged delegates to accept it without change. Delegates approved the revised list.

***Approved Answer*:** The approved answer to this question defines a "robust finding" as one that holds under a variety of approaches, methods, models and assumptions and one that is expected to be relatively unaffected by uncertainties. It defines "key uncertainties" as those that, if reduced, may lead to new and robust findings. A table lists examples of robust findings and key uncertainties. The answer also lists important areas where further work is required. A graph illustrates past and future CO_2 atmospheric concentrations.

ADOPTION OF THE UNDERLYING LONGER PART OF THE SYNTHESIS REPORT: Delegates considered the underlying longer part of the Synthesis Report on the final two days of the session. The adopted longer part expands on the SPM, providing further detail, additional data, and more examples and figures to answer the nine policy-relevant questions. Introducing the document, Chair Watson noted that it had been revised during the week to ensure consistency with the approved SPM and to take government comments into account. Participants considered and adopted the underlying longer part paragraph-by-paragraph, a new procedure for the IPCC. A number of amendments were proposed and adopted, mostly correcting errors and reconciling the text with the SPM.

FUTURE OF THE IPCC

Participants discussed the future of the IPCC throughout the week. Chair Watson drew the attention of delegates to recommended decisions on this issue, which had been revised following consideration at IPCC-17 and additional comments from governments. Before considering the decisions, Chair Watson raised the overall issue of the continuation of the IPCC. He recalled the unanimous agreement expressed at IPCC-17 that the Panel should continue its work, and reported that both IPCC's parent organizations, WMO and UNEP, had now formally endorsed the agreement to continue. Chair Watson stated that no further decision on this particular issue was therefore necessary. Participants then discussed eleven decisions pertaining to the future work of the IPCC.

Decision 1: Under this decision, delegates agreed that the IPCC should continue to prepare comprehensive assessments, including an underlying report, SPM and Technical Summary from each working group. The decision also recommends that the IPCC Bureau examine the feasibility of: shortening the underlying reports and increasing their focus on new findings; and shortening the SPMs as well as making them more comprehensible to policymakers.

Decision 2: This decision concerns the timing of the Fourth Assessment Report. Some delegates called for the Fourth Assessment Report to be completed by 2006, emphasizing the needs of policymakers for updated information and noting that negotiations on second period commitments under the UNFCCC are due to start by 2005. Others proposed a later date, noting that scientists must not be overloaded, and that new scientific findings must be available before a new assessment is prepared. Several participants proposed to defer a decision, stating that the IPCC needs to first consider its overall work programme and consult the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) on its requirements. Delegates decided to invite the current IPCC Bureau to consult with the expert community and the SBSTA as an input for further consideration of this issue at IPCC-19.

Decision 3: This decision considers whether Working Group I, which assesses past and future climate change, should produce its report before Working Group II, which assesses impacts, adaptation and vulnerability. Several participants noted the link between this decision and the timing of the Fourth Assessment Report. Chair Watson proposed to invite the current Bureau to consult with Working Group Co-Chairs and lead authors on their experience in preparing the TAR, as an input for further consideration of this issue at IPCC-19. After some debate, delegates agreed to this proposal.

Decision 4: Delegates approved this decision, which: endorses the preparation of Special Reports; requests the Bureau to develop a framework and set of criteria for establishing priorities to be approved by the IPCC Plenary; and states that the preparation of Special Reports will be considered on a case-by-case basis.

Decision 5: Delegates approved this decision, which states that the IPCC will: consider requests for technical papers, special reports or methodological work received from the UNFCCC; and take decisions on a case-by-case basis, using the priority framework and criteria developed under Decision 4.

Decision 6: This decision addresses whether the IPCC should be responsive to requests from other conventions and organizations to prepare reports.

Several delegates expressed caution, noting resource implications and emphasizing that requests from other bodies should be considered according to the priority framework developed under Decision 4. One participant stated that the UNFCCC should be consulted on the relevance of any requests received to climate change. Delegates approved a decision stating that the IPCC will consider requests for Technical Papers, Special Reports or methodological work received from other bodies, and will take decisions on a case-by-case basis, using the priority framework and criteria developed under Decision 4. Delegates also agreed that the Panel should provide specific guidance to the new Bureau on issues that need to be considered in the formulation of the priority framework and criteria under Decision 4.

Decision 7: This decision concerns possible changes to the preparation, peer review and acceptance/approval procedures for Special Reports. Delegates decided to make no change to existing procedures for the time being, and approved a decision to that effect.

Decision 8: This decision concerns the appropriate working group structure of the IPCC. Chair Watson noted that there appeared to be consensus to maintain the current three working groups, while recognizing the need to: enhance coordination between the working groups; improve the consideration of overlapping and cross-cutting issues; improve the treatment of economic aspects in Working Groups I and II; and strengthen the treatment of technical aspects in Working Group III.

In the ensuing discussion, all delegates expressed support for maintaining the three working groups. Several participants called for the establishment of a new body to address developing country participation and others suggested that a Bureau member be charged with working on this issue. One participant called for greater cooperation with scientific bodies of other conventions.

Discussion also took place on the degree of oversight that the Plenary should exert over the working groups' plans to address overlapping issues. Several delegates stated that the Plenary should not "micromanage" the working groups and guarded against excessive bureaucracy. Several delegates underscored the importance of not going against the IPCC's agreed principles and procedures.

Delegates agreed to endorse the continuation of the current working group structure. Chair Watson clarified that the plans of the working groups to deal with cross-cutting issues would be considered by the Plenary as part of broader discussions on the working groups' work programmes at a future session.

Decision 9: Delegates agreed to address this decision, on the management of special reports, at IPCC-19.

Decision 10: This decision addresses the question of whether the Task Force on Inventories (TFI) should remain a task force or become a fourth working group. There was broad agreement on the Chair's recommendation that the TFI remain a task force. Participants also discussed the composition of the TFI Bureau and its links to the IPCC Bureau. Delegates agreed that the TFI Bureau will be composed of two Co-Chairs (one from a developed and one from a developing country), who are members of the IPCC Bureau and of twelve additional TFI Bureau members. The importance of ensuring the technical expertise of Bureau members was emphasized.

Decision 11: This decision addresses the appropriate size, structure and geographical representation of the IPCC Bureau.

One delegate proposed to increase the membership of the Bureau to 50 or more, pointing to the greater decision-making responsibilities placed on it, given that Plenary sessions are now held less frequently. Chair Watson, supported by several delegates, noted that the real issue of concern is not the size of the Bureau, but its mandate and the fact that some members do not participate actively in its work and therefore do not fully represent their regions.

Chair Watson proposed to maintain the current Bureau structure, suggesting that procedures be considered at a future session to enable regional groups to replace Bureau members who fail to participate actively and urged regional groups to select representatives who will truly represent their regions. Delegates agreed to the Chair's proposal. The Bureau will keep its 30 members with the current geographic balance, including a Chair, three Vice-Chairs with specific responsibilities, the two Co-Chairs and six Bureau members of each working group, and the two Co-Chairs of the TFI.

PREPARATORY WORK ON LAND USE, LAND-USE CHANGE AND FORESTRY

Delegates considered this issue on Wednesday, 26 September, and Friday, 28 September. On Wednesday, Chair Watson explained that a draft decision on land use, land-use change and forestry (LULUCF) prepared at the resumed UNFCCC COP-6 had requested the IPCC to: elaborate guidelines and prepare a report on good practice guidance; develop definitions for degradation and devegetation; and develop practicable methodologies to factor out direct human-induced changes in carbon stocks, emissions and removals. He further explained that the SBSTA is likely to request the IPCC to assist it with additional work on biome-specific forest definitions and on issues relating to afforestation and reforestation activities under the Clean Development Mechanism. He noted, however, that these tasks still need to be formally endorsed by UNFCCC COP-7. Chair Watson invited delegates to consider and approve a proposed work programme to carry out the tasks prepared by the TFI Bureau.

One participant stated that the Plenary should consider all tasks requested of the IPCC by the resumed UNFCCC COP-6, not just those relating to LULUCF. Dennis Tirpak, representing the UNFCCC Secretariat, together with Chair Watson, clarified that the request to elaborate guidelines/good practice guidance for the LULUCF sector did not only come from the resumed UNFCCC COP-6, but had been requested previously by SBSTA and discussed at IPCC-17.

Based on this clarification, Chair Watson invited participants to focus first on the individual proposed work programme for guidelines/good practice guidance. Many delegations emphasized the importance of approving this work programme. A number of specific issues were raised, including: the need to address remote sensing methodologies

and cross-cutting issues; the importance of balanced geographic representation among authors; and links with the preparation of national communications under the UNFCCC, especially in developing countries where there is a need to improve data preparation methods and emission factors. Delegates approved the work programme.

On definitions for degradation and devegetation, Chair Watson invited delegates to discuss and approve the work programme in principle, subject to a later discussion on its priority in the context of overall requests endorsed by UNFCCC COP-7. Several delegates and the TFI Co-Chairs expressed concern at the lack of clarity in the request to the IPCC, urging that further guidance be sought from the UNFCCC SBSTA and UNFCCC COP-7 on the exact nature of the task. Chair Watson proposed to invite the TFI Bureau to continue the scoping of its work programme, and submit more detailed terms of reference to IPCC-19, based on further guidance obtained at COP-7. Delegates agreed with the Chair's proposal.

On Friday, delegates continued their consideration of tasks under the proposed work programme. On the factoring out of direct human-induced changes, several delegates stated that the proposed work programme did not adequately reflect: the complexity of the issue; the need for new advances in science; and the importance of involving Working Groups I and II. Several participants recalled that UNFCCC COP-7 has not yet formally approved this request and that the COP may make other requests.

Delegates approved a decision requesting the working groups and TFI Bureau to produce scoping papers, for consideration at IPCC-19, on any activities that UNFCCC COP-7 may request, including on the factoring out of direct human-induced changes and other LULUCF issues.

PREPARATION OF A TECHNICAL PAPER ON CLIMATE CHANGE AND BIOLOGICAL DIVERSITY

Delegates considered this issue on Wednesday, 26 September. Chair Watson recalled that IPCC-17 had approved the preparation of a technical paper on climate change and biological diversity, as requested by the Convention on Biological Diversity (CBD). Habiba Gitay, convening lead author, introduced the scoping paper for the Technical Paper. She explained that the technical paper would only draw on existing IPCC material, and noted that, in response to a request from the SBSTA, it would also look at links between climate change and desertification. She emphasized that the report would be written by members of the CBD roster of experts in conjunction with IPCC authors in order to ensure coordination.

Widespread support was expressed for the scoping paper. Some delegates sought clarification on its approach and content, and others suggested specific topics that should be fully covered, including: mountain area biodiversity; adaptation; and biodiversity in countries particularly vulnerable to climate change and to climate change mitigation action listed in UNFCCC Article 4.8. One representative expressed concern that the focus on biodiversity should not lead to a neglect of desertification.

In summarizing the discussion, Chair Watson encouraged developing countries to nominate authors for the paper to ensure that issues of specific concern to them will be adequately addressed. Delegates approved the scoping paper.

PREPARATION OF A SPECIAL REPORT ON CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

On Wednesday, 26 September, Chair Watson introduced a scoping paper for a proposed special report on climate change and sustainable development. Mohan Munasinghe, Vice-Chair of Working Group III, explained that the aim of the proposed special report was to examine the implications of climate change and response options for the sustainability of future development, as well as the implications of development strategies for climate change and response options. He noted that this focus on sustainable development was part of the "unfinished business" of the TAR. Emphasizing links with the 2002 World Summit for Sustainable Development (WSSD), he underscored that the report would have a practical approach and would avoid "philosophical" issues.

In the ensuing discussion, all delegates acknowledged the link between climate change and sustainable development. Many supported the preparation of a special report and called for work to start immediately, noting that this would enable better coverage of sustainable development issues in the Fourth Assessment Report. Some participants called for caution, emphasizing that the report had to be focused, relevant and provide added value. Expressing concern over the scope and process of the proposed special report, a delegate proposed an alternative "phased approach" that would begin with the preparation of a technical paper based on existing IPCC material. Chair Watson called for a show of hands on whether delegates favored a special report or the alternative phased approach. Noting roughly equal support for both options, he encouraged delegates to consult informally on the issue.

On Saturday, 29 September, delegates considered an outline for a technical paper on climate change and sustainable development, prepared by an informal group as a first step in a possible phased approach to the issue. Several participants expressed support for a technical paper, although some cautioned that formal approval of its preparation should await a more detailed scoping paper. Delegates approved the preparation of a technical paper in principle, with a decision to be taken by the IPCC Bureau at its next meeting, based on a more detailed scoping paper and comments to be submitted by governments.

OTHER ISSUES

PROGRAMME AND BUGET FOR 2002-2004: On Saturday, 29 September, Leo Meyer, Chair of the IPCC Financial Task Team, introduced a draft decision on the IPCC Work Programme and Budget for 2002-2004. He noted that 2002 would be a quiet year for the IPCC, but that resource demands will increase thereafter as preparations for the Fourth Assessment Report begin. He also noted that there was a substantial carry-over from 2001. Chair Watson proposed to add a provision in the budget for the publication of the Synthesis Report as a stand-alone document. Delegates accepted this proposal, and the budget was approved.

IPCC COMMUNICATION STRATEGY: Delegates considered the IPCC Communication strategy on Saturday, 29 September. Rajendra Pachauri, IPCC Vice-Chair and Chair of the *Ad Hoc* Group on the IPCC Communication Strategy, reported on: improvements to the IPCC web site; strategies for the distribution and dissemination of IPCC reports; the development of a popular version of the TAR and

Special Reports by UNEP; outreach activities by Working Group III; and planned IPCC events at UNFCCC COP-7 and the WSSD. He also highlighted the importance of engaging more actively with the popular media and translating IPCC material into non-UN languages. Supported by Chair Watson and several delegates, Pachauri called for a significant increase in resources for the communication strategy.

TIMING OF THE ELECTION OF A NEW BUREAU: On Friday, 28 September, Chair Watson reported a decision by the current Bureau that the next Bureau should be elected at IPCC-19 in April 2002. Delegates endorsed this decision.

APPROVAL OF THE DRAFT REPORT OF THE SEVENTEENTH SESSION: The draft report of the seventeenth session was approved without comment.

OTHER MATTERS: Yuri Izrael, IPCC Vice-Chair, introduced a proposal for an IPCC technical paper on levels of greenhouse gases in the atmosphere preventing dangerous anthropogenic interference with the climate system. Chair Watson recalled that this proposal had been presented to the IPCC Bureau, which had decided to request a scoping paper for consideration at IPCC-19.

Delegates also briefly considered priorities for future work. Chair Watson noted that an in-depth discussion on this issue will take place at IPCC-19.

CLOSING PLENARY

Chair Watson expressed satisfaction at the successful approval/adoption of the Synthesis Report. He said that, despite concerns that the new paragraph-by-paragraph adoption process would lead to lengthy debate, this approach had worked well and had demonstrated that the IPCC could evolve in its work. He thanked all participants for their hard work, and stated that the constructive comments received from governments on the draft Synthesis Report had made an important contribution to the success of the session. He paid tribute to the dedication of IPCC Secretary Sundararaman, who is retiring at the end of the year.

Several other delegates expressed satisfaction at the success of the session and echoed the tribute to Secretary Sundararaman.

Secretary Sundararaman thanked all delegates for their support, recalling how the IPCC's work had developed since 1988. He expressed particular satisfaction at his involvement in efforts to increase the participation of developing countries and underscored that such efforts should continue.

Chair Watson declared the meeting closed at 9:45 pm.

THINGS TO LOOK FOR

CERI 2001 ENERGY ENVIRONMENT CONFERENCE: This conference, entitled "Advancing Energy Efficiency," will be held on 17 October 2001, in Calgary, Canada. It will explore how energy efficiency can encourage the implementation of new technologies, reduce greenhouse gas and other emissions and reduce energy costs. For more information, contact the Canadian Energy Research Institute; tel: +1-403-282-1231; fax: +1-403-289-2344 or 284-4181; e-mail: cvelasquez@ceri.ca; http://www.ceri.ca/confer_env.htm#envi

INTERNATIONAL SYMPOSIUM ON ARCTIC FEEDBACKS TO GLOBAL CHANGE: This symposium will be held from 25-27 October 2001, in Rovaniemi, Finland. It will feature a summary of Global Climate Model results for the Arctic, including in relation to the marine sector, terrestrial ecosystems, freshwater ecosystems and icecaps/glaciers. For more information, contact: Peter Kuhry; tel: +358-16-341-2758; fax: +358-16- 341-2777 e-mail: peter.kuhry@urova.fi; Internet: http://www.urova.fi/home/arktinen/feedback.htm

SEVENTH CONFERENCE OF THE PARTIES TO THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE: COP-7 is scheduled to take place from 29 October - 9 November 2001, in Marrakech, Morocco. For more information, contact: the UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; Internet: http://www.unfccc.int/

SOLAR WORLD CONGRESS OF THE INTERNATIONAL SOLAR ENERGY SOCIETY (ISES 2001): This congress will be held from 25 November – 2 December 2001, in Adelaide, Australia. The technical programme will cover all aspects of renewable energy and energy sustainability. For more information, contact: ISES 2001, c/o Hartley Management Group Pty, Ltd.; tel: +61-8-8363-4399; fax: +61-8-8363-4577; e-mail: ises2001@hartleymgt.com.au; Internet: http://www.unisa.edu.au/ises2001congress/home.html

ANNUAL CONGRESS OF THE SCIENCE CENTRE NORTH RHINE-WESTPHALIA: This congress, "Sustainability - A new business area?" organized by the Wuppertal Institute for Climate, Environment and Energy, will take place from 28-29 November 2001, in Wuppertal, Germany. For more information, contact: WZN-Congress Secretariat 2001; tel: +49-202-2492-0; fax: +49-202-2492-108; e-mail: monika.kieslich@wupperinst.org; Internet: http://www.wupperinst.org

INTERNATIONAL SYMPOSIUM ON THE MANAGEMENT AND TECHNOLOGY OF ENERGY AND ENVIRONMENT: This meeting will be held from 7-8 December 2001, in Vancouver, Canada. It will seek to address energy, environmental management and technology issues. For more information, contact: International Consortium for the Management and Technology of Energy, Environment and Ecology; fax: +1-714-898-8416; e-mail: inquiries@iceee.org; Internet: http://www.iceee.org

THIRD INTERNATIONAL SYMPOSIUM ON NON-GREENHOUSE GASES: SCIENTIFIC UNDERSTANDING, CONTROL AND IMPLEMENTATION: This symposium will be held from 21-23 January 2002, in Maastricht, the Netherlands. For more information, contact the Symposium secretariat; tel: +31-73-621-5985; fax: +31-73-621-6985; e-mail: vvm@wxs.nl; Internet: www.milieukundigen.nl

EARTH TECHNOLOGIES FORUM: This conference and exhibition on global climate change and ozone protection technologies and policies will be held from 25-27 March 2002, in Washington, D.C. The conference will discuss current technologies and efforts to bring them into the marketplace. For more information, contact the Earth Technologies Forum: tel: +1-703-807-4052; e-mail: earthforum@alcalde-fay.com; Internet: http://www.earthforum.com