OMM
WMO

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

PNUE
UNEP

REPORT OF THE NINTH SESSION

OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

(Geneva, 29-30 June 1993)

IPCC Secretariat, WMO, 41, Av. Giuseppe-Motta, C. P. N° 2300, 1211 Geneva 2 SWITZERLAND
Phone: +41 22 7308 215/254/284 **Fax:** +41 22 7331 270 **Telex:** 414199 OMM CH

TABLE OF CONTENTS

REPORT OF THE NINTH SESSION OF THE
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)
Geneva, 29-30 June 1993

1. OPENING OF THE SESSION (agenda item 1)

1.1 Welcoming remarks by the Chairman of the IPCC, Prof. B. Bolin

Prof. B. Bolin, the Chairman of the IPCC, opened the session at 1015 hours on Tuesday, 29 June 1993 at the Palais des Nations in Geneva.

1.2 Remarks by the Secretary-General of the World Meteorological Organization (WMO), Prof. G.O.P. Obasi

Prof. Obasi stated that the WMO Executive Council, at its XLVth session (Geneva, June 1993), had commended the Panel in restructuring its Bureau and Working Groups, endorsed the IPCC plans to complete the Second Assessment Report in 1995 and to make a Special Report to the first session of the Conference of the Parties to the Climate Convention. The Council had also requested the Panel to extend assistance to the Intergovernmental Negotiating Committee for the Convention on Desertification (INCD).

Touching upon the outcome of the Intergovernmental Meeting (IGM) for the World Climate Programme (Geneva, 14-16 April 1993), Prof. Obasi informed the Panel that the IGM had recommended that consolidated proposals on the programme and budget for the WCP be submitted to governments by the sponsoring organizations of the WCP. To this end, the existing Co-ordinating Committee for the WCP would be broadened (the IPCC Chairman is a member of the Co-ordinating Committee) and an Advisory Panel composed of selected members of the governing bodies of the sponsoring organizations established to advise on the preparation of the consolidated proposals. The IGM agreed on the importance of establishing the Global Climate Observing System (GCOS) for dedicated observations of the climate system, and on the need to improve regional climate predictions.

Prof. Obasi stressed the importance of ensuring the full participation of the developing countries in IPCC activities, noting that this greatly assisted in the building of national capacities for effective contribution to the issues addressed by IPCC. Referring to the newly independent states of the former Soviet Union and of Eastern Europe, he was pleased to note that they were already an integral part of the Panel. He noted that the number of countries supported from the Trust Fund had shown a steady growth over the years and expressed his gratitude to those countries which contributed to the Fund; he appealed to them to continue and increase their contributions in the critical years ahead.

Urging the delegates to serve as catalysts in the establishment of national climate programmes, he requested that IPCC assist countries in developing project proposals whose implementation

could help in strengthening their capacity to benefit even more from IPCC-related activities. Such proposals could be submitted to funding sources such as the Global Environment Facility.

Professor Obasi reiterated the unequivocal support of WMO, and that of his own, to the IPCC.

1.3 Remarks by the Executive Director of the United Nations Environment Programme (UNEP), Ms. E. Dowdeswell

Ms. Dowdeswell recalled her past close association with the IPCC process as a member of the its Bureau, and congratulated Mr. J. Bruce, on being designated the Canadian Co-Chairman of the re-organized Working Group III, to succeed her. She assured the session that in her new role as Executive Director of UNEP, she would continue to ensure the realization of the IPCC objectives through firm support to the Panel, and increased co-operation between the IPCC and the various programmes of UNEP.

Ms. Dowdeswell stated that the 17th session of the UNEP Governing Council (Nairobi, May 1993) had expressed its appreciation of the work accomplished by the Panel, and the excellent stewardship provided by its Chairman, Professor Bolin. The Council also endorsed the Panel's new structure which enabled wider participation by developing countries in the Panel's decision making machinery and enabled it to focus more sharply on the major environmental issues, in particular, the process leading to the implementation of the Framework Convention on Climate Change. The Council also fully endorsed the proposed work programme of the Panel.

Ms. Dowdeswell noted the complementary nature of the work undertaken by UNEP in the implementation of the World Climate Impacts and Response Strategies Programme (WCIRP) of the World Climate Programme, and that of IPCC Working Groups II and III. She re-affirmed that UNEP would continue to respond to the needs of IPCC and informed the session of the latest report on Country Studies compiled by UNEP. She observed that the report indicated the broad nature of Country Studies being undertaken by various countries and organizations, stressing that the knowledge such studies provided would be invaluable in the implementation of the Climate Change Convention and in the work leading to the Panel's Second Assessment Report.

She cautioned that with such diverse players on the stage coupled with the significant value of those studies, it was imperative that standard methodologies should be developed. This would ensure comparability of results and their universal usage. She commended IPCC for the work undertaken to develop such methodologies with respect to national inventories of greenhouse gas emissions, coastal zone management and vulnerability to sea level rise, and climate impact assessment.

Ms. Dowdeswell re-affirmed UNEP's continued support to the Panel, and thanked IPCC for maintaining a high standard in its work, thereby fully justifying the initiative by WMO and UNEP in establishing the Panel.

1.4 Opening remarks by the Chairman of the IPCC

Prof. Bolin stated that the ninth session would set the stage for the assessment process envisaged over the next two years, which would culminate in the 1994 Special Report to the first session of the Conference of the Parties to the Climate Convention (COP-1) and in the 1995 IPCC Second Assessment Report. He stated that the Panel was already on track in this regard and that he was looking forward to the decisions of the session which would provide further guidance to the Working Groups. He stressed the need for a high scientific and technical standard which would ensure the best information to decision-makers.

He reported on the sixth session of the IPCC Bureau which recommended that each single writing team of lead authors should have at least one lead author from the developing world, and that within the assessment process, there should be an in-built mechanism to facilitate the resolution of controversies that might arise. He emphasized that different but scientifically valid opinions must be respected.

The Bureau had also addressed the question of collaborating with the International Civil Aviation Organization (ICAO), and the need to take advantage in the IPCC assessment of the expertise existing in the UN, such as for example in the World Health Organization and other international organizations.

Professor Bolin stressed that IPCC should maintain its position as an independent scientific assessment body established by WMO and UNEP, although it was of the utmost importance to respond to the needs of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC/FCCC) and, later, of the Conference of the Parties to the Convention. He stated that he would present a progress report to the eighth session of INC/FCCC in Geneva (August 1993) particularly on the development of the methodology to make national inventories of emissions by sources and removals by sinks of the greenhouse gases not controlled under the Montreal Protocol.

Underscoring the importance of securing sufficient funds to continue the IPCC work and to facilitate the participation of experts from the developing countries, Professor Bolin reported that the Bureau had established an ad-hoc Finance Group under his chairmanship to consider the matter. Argentina, Brazil, Canada, UK, USA and Zimbabwe were the members of the Group. The Group had recommended that the funding venues such as the Global Environment Facility be approached for IPCC funding needs through the completion of the Special Report to COP-1 and the Second Assessment Report.

He expressed the hope that the Second Assessment Report would be better and more carefully prepared, briefer and clearer than the first one. He stated that the Bureau regarded criticism of IPCC work as natural to any scientific assessment process of the type IPCC was undertaking. He mentioned his acceptance of the responsibility to prepare an article for a widely read scientific journal (e.g., Nature) in which he would explain the IPCC process, give the time

schedule leading to the Second Assessment Report and address criticisms aimed at IPCC conclusions.

Professor Bolin expressed pleasure at having the opportunity to lead the IPCC process on behalf of WMO and UNEP. The process was unique and there were already individuals who wished to emulate it in dealing with problems which call for the interplay between science and politics.

1.5 Adoption of the agenda

The agenda, as amended, was adopted and is attached in appendix A.

2. SECOND ASSESSMENT REPORT (SAR) (agenda item 2)

The Panel:

a. decided, after a short discussion, to extend the deadline for governments to submit their nominations of lead/ contributing authors and reviewers to 15 August 1993 to enable countries that had not yet submitted such nominations to do so; urged the governments to identify possible candidates for lead authors in submitting their nominations;

b. agreed that the respective Bureaux of the Working Groups could initiate the formation of lead author teams from available lists of nominations; the Bureaux must, however, maintain the flexibility in adding to the teams other lead authors, particularly those from the developing countries;

c. agreed with the procedure followed by Working Group I in completing its selection of the lead authors for the Working Group's chapters in the IPCC Special Report to the first session of the Conference of the Parties to the Climate Change Convention (see page 2, appendix B, Progress in the implementation of the work plan of the IPCC Working Group I) and the Working Group plans for selecting its lead authors for the Second Assessment Report in November/December 1993;

d. agreed with the Chairman that the work plans were more in the nature of a reminder list of topics for the lead authors;

e. was informed by the Chairman that the time-lines of the Working Groups would be consolidated, taking into account the needs for review procedures, by the IPCC Secretariat, in consultation with the Co-Chairs of the Working Groups; the consolidated time-line should be available in a month.

2.1 Approval of the draft work plan of Working Group II

2.1.1 The Chairman recalled that the draft work plan had been adopted by the Working Group at its first session (as the reorganized

Working Group II, Geneva, 8-12 February 1993) except for the sections on pages 21 and 22 (see appendix C).

2.1.2 A suggestion was made that measures to prepare for adaptation (in addition to measures for adaptation) be considered by the Working Group as this would be of interest to the Conference of the Parties to the Climate Convention. Another suggestion was made that permafrost and vegetation above about 2000 m be included in section II A (4) on mountain regions.

2.1.3 With the understanding that the respective Co-Chairs would take heed of the suggestions in para 2.1.2 and with minor editorial amendments, the Panel adopted the draft work plan of the Working Group. The plan is attached in appendix C.

2.1.4 The Working Group together with Working Group I proposed a joint workshop on the climatic factors involved in desertification for late 1994.

(a) The Panel approved the workshop, subject to the availability of funds, and agreed as follows:

* that the workshop would be held no later than August 1994;
* that it would deal with droughts as well as desertification;
* that it would deal with, inter alia, the causes (both natural and human-induced), impacts and adaptation options (the latter two with particular reference to desertification) and adaptation measures as practised in El-Nino events now;
* that the workshop would include such other topics as may be of interest, within the context of climate change, to the Intergovernmental Negotiating Committee on the Convention on Desertification.

(b) The Chairman would bring the workshop to the attention of the Intergovernmental Negotiating Committee on the Convention on Desertification. The output of the workshop might well be of interest to the Intergovernmental Negotiating Committee for the Framework Convention on Climate Change (FCCC) also and later to the Conference of the Parties to the FCCC.

(c) The Panel accepted the offer to host the workshop from the Co-Chair from Zimbabwe.

2.1.5 It was brought to the attention of the Panel that a World Conference on Natural Disaster Reduction including consideration of droughts and dealing particularly with socio-economic aspects was planned in Yokohama in May 1994.

2.1.6 The Panel was informed of a planned workshop on grasslands and rangelands (section II A (2) in appendix C).

2.2 Approval of the draft work plan of Working Group III

2.2.1 The draft work plan had been approved in full by the Working Group at its first session (as the reorganized Working Group III, Montreal, 3-7 May 1993).

2.2.2 The Panel was informed by the Co-Chairs that 2 or 3 workshops in the developing regions of the world would be needed to sensitize the economists, social scientists and other experts to the subject area of the economics of climate change. The Co-Chairs also informed the Panel that the first meeting of the lead authors was planned for early September 1993 in Seoul.

2.2.3 The Panel approved the draft work plan after minor amendments and gave its approval for the workshops subject to funds being available. The work plan is attached in appendix D. The Panel urged that, in assessing emissions scenarios, the IPCC as well as other scenarios be considered.

2.3 Progress report by the Co-Chairmen of Working Group I

2.3.1 The Co-Chairman from Brazil introduced the document on the progress in the implementation of the work plan of the Working Group (see appendix B). Work was done jointly with the International Ozone Assessment Panel of the Montreal Protocol where possible to avoid duplication of effort.

2.3.2 Responding to concerns about the need for predictions of regional changes of climate, the Co-Chairman stated that a special assessment on the issue had been initiated by the UK Meteorological Office.

2.3.3 The following points were made during the discussion:

* newsletters were being distributed with many details; the process of communication should be further improved including faster circulation of the results of workshops;
* IPCC national delegates should actively promote designation of focal points for communication of IPCC matters within their respective countries and with IPCC. The IPCC Chairman would also write to governments requesting such designation.

2.4 Overlapping issues

2.4.1 The following points were made during the discussion:

* the Co-Chairs were in the best position to identify areas of overlap;
* collaboration between Working Groups I and II took the form of joint workshops on the Implications of Impacts from Science Assessments (see appendix B) and on droughts and desertification; Working Group III would collaborate in the former workshop with contributions on emissions scenarios;

* joint lead authors and contributing authors/reviewers should be used as appropriate to further the collaboration among the Working Groups;
* overlap was foreseen on energy-related issues between Working Group II (Subgroup A) and Working Group III;
* global warming potential was another overlap area;
* methodologies for impacts and adaptation/ mitigation options could be of interest to both Working Group II (included in the work plan) and Working Group III.

2.4.1 The Panel approved the joint WG I/WG II/WG III workshop in April 1994 on the Implications for Impacts from Science Assessments (see appendix B), subject to funding availability.

2.4.2 The Panel agreed with the Chairman's suggestion that it would be desirable for the Panel to attempt a synthesis of the Working Groups' findings on selected key issues in the Second Assessment Report. The workshop mentioned in para 2.4.1 would be a first step in such an attempt. The Panel further agreed that a second workshop for the purpose would probably be needed in late 1994/ early 1995. The Panel requested its Bureau to make a proposal at its tenth session on the details of the synthesis and the second workshop.

3. SPECIAL REPORT TO THE FIRST SESSION OF THE CONFERENCE OF THE PARTIES TO THE FCCC (agenda item 3)

3.1 Remarks by Ambassador R. Estrada-Oyuela, the Chairman of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC/FCCC)

Ambassador Estrada-Oyuela welcomed the offer to open the discussion on this agenda item.

3.1.1 He went on to state:

"I am very glad to be invited to open the discussion on agenda item 3 - Special Report to the first session of the Conference of the Parties to the Climate Convention (COP-1).

Within the conditions created by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), this Panel proposed an international convention on the measures to be adopted in view of the indications that a climate change would occur. The recommendation was accepted by the Second World Climate Conference at the end of 1990, and shortly thereafter the UN General Assembly established the Intergovernmental Negotiating Committee (Res. 45/212).

The success of the subsequent negotiations can be measured by the number of governments which signed the Convention during the year when it was open for signature (in all 166) and the number of ratifications recorded (29). If the rate of ratification is maintained during the next half year, the 50 ratifications for entry into force could be attained before the date initially envisaged.

The IPCC is not and shall not be alien to the operation of the Convention, whose Art. 21, para. 2 specifically stipulates that the interim secretariat will cooperate closely with the Panel to ensure that the latter can respond to the need for objective scientific and technical advice. In pursuance of this provision, the Interim Secretary, Mr. Michael Zammit Cutajar, has established a close, fruitful working relationship.

It will later be necessary to outline the future relationship between the Panel and the subsidiary bodies of the Conference of the Parties (COP). The interim secretariat, in consultation with the IPCC Secretariat and Chairman, is analysing some ideas about this relationship, which will be submitted to the Committee at its next session under the relevant agenda items.

The basic functions assigned to the INC under UNGA Res. 47/195 are to prepare COP-1 and contribute to the effective operation of the interim arrangements. For this purpose, it should carefully define what the Convention requires, and should know precisely what the IPCC can contribute, how it can make this contribution, and when would be a reasonable time for it to be available.

These *what*, *how*, and *when* are important in organizing the work, but also, and perhaps mainly, in dimensioning expectations. Clearly, many sectors would have liked the Framework Convention to contain points which were politically impossible to cover in the limited time available for negotiating. Those sectors which had great expectations showed frustration at the end of the negotiation. There are now new expectations as to what COP-1 should produce, according to the letter of the Convention. We need to know if everything will be possible during the first session and how far the available scientific knowledge and the methods developed using this knowledge will permit further progress, then we must make this public sufficiently in advance to avoid additional frustration.

Amongst the documents distributed for this session, there is a copy of the letter from Prof. Bolin to the chairman of the INC, a copy of the relevant part of the work plan of the Committee's Group I adopted at its seventh session, and a copy of my reply to Prof. Bolin.

The co-chairmen of WG I point out in IPCC-IX/Doc. 9 that a fifth chapter on the relative importance of emissions of different gases had been detached from chapter 4 of the report announced in Prof. Bolin's letter, and that chapter 4 would report on work related to the stabilization of atmospheric concentrations of CO_2, a point of major importance with respect to the objective established in Art. 2 of the Convention.

Unfortunately, the limitations which the Committee itself had imposed for its session last March prevented the points mentioned in Prof. Bolin's letter from being discussed in the necessary detail. This discussion will take place in August.

Considering these circumstances, the Panel's meeting plan and the work plan prepared for the Committee's Group I, I held a series of consultations with a representative number of delegations and sent

the reply which has been copied for you in which I thanked Prof. Bolin for his letter and indicated some other areas of interest.

In order to understand better the requirements which the Committee will be defining as from its next session, I shall point them out, taking as reference the provisions of the Convention.

The first and most obvious is the need to have comparable methodologies for preparing the inventories of anthropogenic greenhouse gas emissions by sources and removals by sinks.

The Convention specifies that these methodologies should be agreed by COP-1, which must take place within the first year of the entry into force of the Convention. However, the first application of these comparable methodologies will occur before COP-1, since the developed countries are committed to communicating the corresponding information six months after the Convention's entry into force[1].

Some wording needs to be clarified here: the Convention speaks of comparable methodologies for making "national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol". The document by the co-chairmen refers to "IPCC guidelines for national inventories of net emissions of greenhouse gases". I do not propose discussing the definitions of these concepts; I only wish to point out that the terms differ and that it was not possible during the negotiations on the Convention to agree on the definition of *net emissions*. My dear friend Dr Gilvao Meira Filho, Co-chairman of WG I, has complete information on the existing difficulties and is the proponent of the wording used in the Convention as it stands. Further discussions on these terms based on an IPCC report would not help us.

In the same context, I might mention that the expression "country studies" is ambiguous, in that it has several meanings (under this heading very varied work has indeed been carried out).

We know the progress which the IPCC and OECD have achieved in the field of methodologies and a significant group of countries, including mine, already has some experience in their application. It has been pointed out that the development of these methodologies is not an easy task. We therefore know that it is reasonable to expect methods which are sufficiently well developed for making an inventory of anthropogenic emissions of CO_2. We also expect to know the methods developed for inventorying methane emissions.

What else can reasonably be expected? What will become of the other gases? Will this first group of comparable methodologies include the requirements for making an inventory of carbon monoxide? nitrogen dioxide? the other nitrogen oxides? and volatile organic compounds?

---

[1] This is referred to in the third paragraph of Prof. Bolin's letter and the third of the points in my letter as identified by the US delegation (Art. 4.1 (a), 7.2 (d), and 12.1).

What is the status of the studies on sinks? Could the IPCC provide comparable methodologies within the next 12 months for assessing the absorption of greenhouse gases?

The earlier these questions can be answered, the less complicated will be the discussions in the COP. Reports based on comparable inventories for only some gases and approximations for only one type of sinks could give rise to political difficulties. In order to avoid them, timely clarification is needed of the understanding of the carbon cycle and the development achieved in the field of methodologies.

COP-1 must also review the information submitted by the developed countries as required under Art. 4.2 (b) (at the end). It seems to me to be only reasonable that the revision in question should be based on technical parameters, which is what is requested of the IPCC[2].

There are two other closely linked tasks to be performed by the COP under Art. 4.2 (d) and Art. 10.

The first task is to assess the aggregate effect of the measures adopted by the Parties, which is why my letter refers in general terms to methodologies for assessing the global results of measures[3].

The other task consists in reviewing the adequacy of Art. 4.2 (a) and (b), and may result in a proposed amendment of the Convention. It will be necessary for this purpose to know the updated scenarios of anthropogenic emissions of greenhouse gases by sources and their absorption by sinks[4]. The analysis of the adequacy of subparagraphs (a) and (b) is to be done by COP-1. By then, the COP will only have the reports of the developed country Parties, but to carry out the task, all the information will be needed and I therefore said in my letter that the evaluation of the current scenarios of greenhouse gas emissions and removals will be necessary.

The Convention established two COP subsidiary bodies: one for scientific and technological advice, and the other for implementation of the Convention. Although the term *scientific* is only assigned to the first body (Art. 9), the second body (Art. 10) is actually in a position to claim the same qualification.

The subsidiary body for scientific and technological advice is to assess the state of scientific knowledge relating to climate change and its effects, for which the IPCC report can form a basis, as expressly indicated in Art. 9[5]. It does not seem that any

---

[2] Sixth point in my letter as identified by the US delegation.

[3] Seventh point in my letter, etc.

[4] Fifth point in my letter, etc.

[5] Reference to the first and fourth points in my letter.

inconvenience is to be expected in receiving this report in the detail indicated in Prof. Bolin's letter (it will also include a review of the current understanding of the carbon cycle and an assessment of the relative warming potential to be assigned to each of the greenhouse gases, as indicated in my letter[6]).

In the work programme adopted for the Committee's Group I, these matters appear under the overall heading of consideration of matters to be dealt with by the INC and COP. Naturally, WG I will greatly benefit from the report co-ordinated by Prof. Bolin , and, to facilitate this task, it is intended to request him, in addition to his overall direction of the plenary Committee, to agree to participate in the first session of WG I, in order to reply informally to delegates' questions.

This group will doubtless prepare more precisely than I those requirements which have been expressed and possibly some others which I have not mentioned. One substantive point which is not expressly noted in my letter is the need to take into account the gases controlled by the Montreal Protocol, which do not appear in the comparable methodology for the reports, but which must be considered in assessing climate change.

In addition to the above, what is important is that adequate relations of reciprocal confidence and efficient collaboration are established between the IPCC, the COP and its subsidiary bodies. The policy organs of this complex system are today the Committee and tomorrow the COP and its subsidiary bodies; the interim operation of the financial mechanism has been entrusted to the GEF. The assessment of the scientific knowledge should come through the IPCC and as a purely technical input[7] to the subsidiary bodies formed by government experts with competence in matters related to climate change. In their reports, these subsidiary bodies should, where appropriate, make a policy translation of the IPCC inputs and the COP will then use these reports as a basis for their decisions.

Someone may possibly have a better formula or we may, later, be able to develop another one, but this is the best formula which I can imagine at this time."

3.1.2 The Chairman thanked Amb. Estrda-Oyuela for his detailed analysis of the needs of INC/FCCC in preparing for COP-1.

3.2 Contribution by Working Group I - report by the Co-Chairmen of the Working Group

3.2.1 The Co-Vice-Chairman of Working Group I, Dr. Hartmut Grassl, informed the Panel that the Special Report being prepared for COP-I would consist of five chapters from Working Group I, namely:

Chapter 1: CO_2 and the carbon cycle;
Chapter 2: Other trace gases and Atmospheric Chemistry;

---

[6] Second point in my letter, etc.

[7] Last (unnumbered) remark in my letter, etc.

Chapter 3: Aerosols;
Chapter 4: Radiative forcing; and
Chapter 5: The relative importance of different emissions of greenhouse gases; this chapter would include the consideration of global warming potentials over different time horizons.

3.2.2 Dr. Grassl listed the following activities in support the Special Report for COP-1:

a. A joint Workshop on ozone and aerosols by the Bureau of Working Group I and the International Ozone Assessment Panel held in Hamburg in May 1993;

b. A special session on illustrative emissions scenarios and the stabilization of CO_2 concentrations, to be convened on 18 September 1993 immediately following the Fourth International CO_2 Conference in Carqueiranne, France;

c. A meeting of lead authors to produce the first draft of the Working Group contributions to the IPCC Special Report, planned in Irvine, California, in January 1994, to be followed by peer review in February 1994; distribution in March 1994 of the revised draft and the first draft of the Summary for Policymakers to governments and organizations for review.

3.2.3 With regard to the methodology for inventories of emissions by sources and removals by sinks of greenhouse gases not controlled under the Montreal Protocol, the Panel was given the following information:

a. Countries had been requested to designate national technical contact points who were supplied with the software for the computation of CO_2 emissions from the energy sector. The software had been modified in accordance with suggestions received from various contact points;

b. A Latin American and Caribbean Regional training workshop was held in Sao Jose Dos Campos, Sao Paulo, Brazil from 9 to 11 March 1993. Two more were planned, one for Bratislava on 5-8 October 1993 and another in Africa, date and place yet to be decided;

c. Country studies to test the methodology were underway in various countries funded by the Global Environment Facility through UNEP and by the Asian Development Bank.

3.3 Contribution by Working Group II - report by the Co-Chairmen of the Working Group

3.3.1 The Working Group would examine the impacts and adaptation of ecological systems, as well as socio-economic systems, and would develop methodologies for impacts analyses, and adaptation and mitigation options. The contribution of the Working Group would be to the Second Assessment Report.

3.4 Contribution by Working Group III - report by the Co-Chairmen of the Working Group

3.4.1 The Working Group would produce an evaluation of available scenarios of future greenhouse gas emissions. It was planned to circulate a draft of the chapter on emissions scenarios for the Special Report to governments and organizations for review during June 1994 after the completion of the peer review.

3.5 Discussion and conclusions

3.5.1 The Panel commended the Chairman for initiating the dialogue with INC/FCCC with his letter to the Chairman of INC/FCCC (see appendix F for copies). It concluded in the course of its discussion of the points[8] raised in the letter from Amb. Estrada-Oyuela to Prof. Bolin, and in the light of the reports from the Co-Chairmen of the IPCC Working Groups, that:

a. on development of comparable methodologies for inventories of greenhouse gases:

the methodology for national inventories of emissions by sources and removals by sinks of greenhouse gases not controlled under the Montreal Protocol should be ready by COP-1; testing the methodology is fundamental to assuring its soundness and wide applicability; the draft methodology would be demonstrated at the eighth session of the INC/FCCC (Geneva, August 1993);

b. on (i) assessment of significant changes in the state of knowledge about the science of climate change (ii) assessment of the relative forcing of different greenhouse gases and (iii) evaluation of current scenarios of greenhouse gas emissions and removals by sinks:

the Summary for Policymakers of the Special Report should be carefully crafted in order to be helpful to the COP-1; the issue of emission scenarios should be dealt with by Working Group III;

c. on (i) assessing significant changes in the state of knowledge of the impacts of climate change, including e.g. ecosystem sensitivity and relevant technical, social and economic information:

all three of the IPCC Working Groups would address these items as part of the preparation of the IPCC Second Assessment Report but results would not be available in time for the Special Report to the first session of the Conference of the Parties to the Climate Change Convention.

3.5.2 The Panel requested its Chairman to report accordingly to the eighth session of the INC/FCCC.

---

[8] The points are underlined in the text of para 3.5.

3.5.3 On technical inputs to develop methodologies for assessing the global results of measures taken by Parties to the Convention, the Panel agreed that consultations between IPCC officers and INC/FCCC officers would be desirable before any commitment is made in respect of this topic. The Panel requested the Chairman to initiate the consultations and report on the results to the Bureau in February 1994. The Panel requested its Bureau to take further actions that might be needed after hearing from the Chairman. In this connection, the Panel recognized that on-going efforts to reduce greenhouse gas emissions should as far as feasible be included in the evaluations of emissions scenarios by Working Group III.

3.5.4 While it wanted the closest co-operation with the INC/FCCC, the Panel expressed the view that, as an intergovernmental body sponsored by WMO and UNEP, it would maintain its flexibility to exercise judgement of what was essential in carrying out its mandates in the field of climate change and that the results of its work were available to other interested bodies such as the Intergovernmental Negotiating Committee on Desertification (INCD) and the Commission for Sustainable Development.

4. PROCEDURES FOR PREPARATION, REVIEW, ADOPTION, APPROVAL AND PUBLICATION OF IPCC REPORTS (agenda item 4)

4.1 The Chairman submitted his draft proposal on procedures for preparation, review, acceptance, approval and publication of IPCC reports. In the course of the discussion, the Panel:

a. agreed that there was need to clearly define the term " IPCC participating organizations";

b. cautioned that material not available in the published literature should be cited with information on its availability in the reports;

c. authorized the Chairman in consultation with the Bureau to decide on the IPCC co-sponsorship of world conferences.

4.2 The Panel approved the Chairman's proposal after making several amendments. The approved document is attached in appendix G.

5. IPCC BUDGET AND OTHER SUPPORT (agenda item 5)

5.1 The Secretary of the IPCC introduced documents IPCC-IX/Doc. 4, and its addenda 1 and 2 and IPCC-IX/Doc. 9 (annexes 2 and 3). The budget as contained in these documents was agreed to by the Panel with the understanding that the IPCC Trust Fund would not be used to support the participation of lead authors from the developed countries in meetings (see footnote 3 on page 1 of document IPCC-IX/Doc. 4, Add. 1). The documents are attached in appendices B and H.

5.2 The Panel:

a. after receiving a proposal for assessment of countries based on the UN scale of contributions for funding its activities, agreed to continue with its current method of

funding, i.e. voluntary contributions by governments, the sponsoring organizations, WMO and UNEP, and other organizations such as the Commission of the European Communities;

b. requested its Chairman to solicit funds for specific projects within the activities of IPCC from the Global Environment Facility (GEF) and to approach governments for increased voluntary fund contributions;

c. requested the Bureau to follow-up on fund-raising activities;

d. urged the need to exercise economy, such as the convening of sessions back-to-back;

e. welcomed offers from commercial houses to publish the IPCC reports with the understanding that enough funds be set aside to purchase a fixed quantity of copies for free distribution to the developing countries and countries with economies in transition;

f. requested the IPCC Secretariat to highlight contributions in kind in the status reports on the IPCC Trust Fund and to maintain regular contact with the donor community and the ad-hoc Finance Group established by the Bureau (see sub-para 5 in section 1.4) through periodic reports.

5.3 The Panel noted with appreciation the following pledges to the IPCC Trust Fund (pledges and contributions made prior to the session and not announced during the session are reported in Appendix H):

(a)	Austria	$	25,000	
(b)	Finland	$	10,000	
(c)	France	FF	100,000	
(d)	Germany	DM	180,000	(for 1994)
(d)	Netherlands	Dfl	200,000	(This amount is for 1993 and 1994. Dfl 300,000 was pledged for the World Coast '93 Conference)

5.4 The Panel also noted with appreciation that:

a. the 1993 contribution from Japan had been received during 1992;
b. two seminars had been funded by Germany to assist IPCC work;
c. Japan intended to fund a workshop on policy instruments for Working Group III in Tsukuba in early 1994;
d. Switzerland intended to fund the workshop on grasslands and rangelands for Working Group II in the last quarter of 1993;
e. Australia had contributed in kind by publishing the 1992 Supplementary Report to the IPCC Impacts Assessment.

6. APPROVAL OF THE DRAFT REPORT OF IPCC-VIII (agenda item 6)

6.1 The Panel adopted the report without amendments.

6.2 The Panel agreed that in its future sessions agenda items calling for approval of draft reports should be taken up before the other agenda item.

7. OTHER BUSINESS (agenda item 7)

7.1 There was none.

8. ADOPTION OF THE REPORT OF THE SESSION (agenda item 8)

8.1 The Panel adopted those parts of the report up to and including agenda item 2. The draft report on the rest of the items would be submitted for approval at the tenth session.

9. TIME AND PLACE OF THE NEXT SESSION (agenda item 9)

9.1 The tenth session will take place during the second week of November 1994 at UNEP Headquarters in Gigiri, Nairobi. The dates would be communicated by the IPCC secretariat as soon as possible.

10. CLOSING OF THE SESSION (agenda item 10)

10.1 The ninth session of the IPCC was closed at 1828 hours on Wednesday, 30 June 1993.

10.2 The list of participants appears in appendix I.

APPENDIX A

AGENDA

1. OPENING OF THE SESSION

   1.1 Welcoming remarks by the Chairman of IPCC, Prof. B. Bolin
   1.2 Remarks by the Secretary-General of the World Meteorological Organization (WMO), Prof. G.O.P. Obasi
   1.3 Remarks by the Executive Director of the United Nations Environment Programme (UNEP), Ms. E. Dowdeswell
   1.4 Opening remarks by the Chairman of IPCC
   1.5 Adoption of the agenda (Doc. 1 and Doc. 2)

2. SECOND ASSESSMENT REPORT (SAR)

   2.1 Approval of the draft work plan of Working Group II (Doc. 5)

   2.2 Approval of the draft work plan of Working Group III (Doc. 6)

   2.3 Progress report by the Co-Chairmen of Working Group I (Doc. 9)

   2.4 Overlapping issues (Doc. 8, Rev. 1)

3. SPECIAL REPORT TO THE FIRST SESSION OF THE CONFERENCE OF THE PARTIES TO THE CLIMATE CONVENTION (COP-1)

   3.1 Remarks by Ambassador R. Estrada-Oyuela, the Chairman of the Intergovernmental Negotiating Committee for the Framework Convention on Climate Change (INC-FCCC)

   3.2 Contribution from Working Group I - report by the Co-Chairmen of the Working Group

   3.3 Contribution from Working Group II - report by the Co-Chairmen of the Working Group

   3.4 Contribution from Working Group III - report by the Co-Chairmen of the Working Group

4. PROCEDURES FOR PREPARATION, REVIEW, ADOPTION, APPROVAL AND PUBLICATION OF IPCC REPORTS (Doc. 3)

5. IPCC BUDGET AND OTHER SUPPORT (Doc. 4 + addenda)

6. APPROVAL OF THE DRAFT REPORT OF IPCC-VIII (Doc. 7)

7. OTHER BUSINESS

8. ADOPTION OF THE REPORT OF THE SESSION

9. TIME AND PLACE OF THE NEXT SESSION

10. CLOSING OF THE SESSION

IPCC WORKPLAN
1993-1995

WORKPLAN OF THE IPCC WORKING GROUP I

REPORT OF THE CHAIRMAN OF THE SCIENCE ASSESSMENT WORKING GROUP OF IPCC, INCLUDING A WORKPLAN FOR IPCC WG I 1992-1995

Approved at the Eighth Session of IPCC,
Harare, Zimbabwe, 11-13 November 1993

1. The 1992 IPCC Supplement

1.1 The substance of the Science Assessment component of the 1992 Supplement was agreed at the WGI plenary held in Guangzhou, China in January 1992, after intensive work by 115 lead authors/contributors from 21 countries, and 341 reviewers from 60 countries and 19 non-governmental organizations. It reaffirmed, or found no reason to question, the key conclusions of the 1990 Science Assessment but also reported significant new research concerning:

* the climate effects of ozone depletion and tropospheric aerosol
* transient climate simulations using coupled ocean-atmosphere GCMS
* recent trends in diurnal temperature range, and in hemisphere and land/sea surface air temperatures.

2. IPCC Guidelines for National Inventories of Net Emissions of Greenhouse Gases

2.1 Work continued on the development of IPCC guidelines, with assistance from the OECD and IEA. In July 1992, under financial support from UNEP, Dr. Buruhani S. Nyenzi of the Tanzanian Directorate of Meteorology, joined the WGI Secretariat in Bracknell to provide organizational support for the work.

3. IPCC/Woods Hole Workshop on Biotic Feedbacks in the Global Climate System

3.1 The aim of this workshop, organized in collaboration with the Woods Hole Research Center, USA and held during 25-29 October 1992, was to review progress in identifying those processes which will determine the answer to the question: "Will the marine and terrestrial biospheres, as they respond now and in the future to climate and other changes, diminish or augment the effects of the human-induced rise in atmospheric concentrations of greenhouse gases?" A workshop statement representing the collective view of the participants will be released shortly. The statement does not carry official IPCC "approval" but it represents important ground work in the preparation of the next science assessment and ultimately in establishing how to meet the requirements of Article 2 of the Climate Convention.

4. Future IPCC Science Assessment Workplan 1992-1995

4.1 At its fifth plenary session (Geneva, March 1991) IPCC agreed to conduct a second assessment in the 1994-95 timeframe, and the proposals below anticipate completion of a second full assessment in 1995 which will provide the same comprehensive cover of the science as did the 1990 report. However, the scientific community, who have put a great deal of effort into the 1990 and 1992 reports, now need some respite from the demands of WGI so that they can progress as rapidly as possible their scientific work.

4.2 At the Appendix of Annex 4 is a provisional list of chapter headings for the 1995 science assessment. We invite written suggestions concerning this. The list is based on the current perception of the key scientific issues and, as our understanding of climate processes evolves, it is likely that there will be changes in the detail of the Appendix. A flexible approach is therefore essential and, in light of this, detailed preparations of the main part of the 1995 report will commence in late 1993/early 1994.

Global Warming Potential

4.3 It is anticipated that, in order to inform the first Conference of the Parties to the Convention about latest scientific thinking on the relative importance of different GGs, IPCC WGI should prepare, by mid-1994, guidance for policymakers on radiative forcing and the concept of the Global Warming Potential (GWP). With financial support from the UK and in conjunction with the WGI Secretariat, Dr. Neil Harris of the Ozone Secretariat of the British Antarctic Survey, will assist coordination of this work.

Climate effects of ozone and aerosols

4.4 An IPCC WGI workshop on the influences of ozone change and of aerosols[1] on global and large-scale regional climate will be held in 1993. The output from this workshop will feed into those chapters of the second assessment dealing with Radiative Forcing with General Circulation Models.

Joint WGI/WGII Workshop on Article 2 of the Climate Convention

4.5 An IPCC workshop will be held in late 1993/early 1994, jointly with WGII, to explore current knowledge and uncertainties, and to assess methodologies related to two issues embodied in Article 2 of the Climate Convention:

(a) the requirements of impact assessments for the best possible information regarding likely regional climate change;

(b) the stabilization of GG concentrations and the implications of different stabilization scenarios for the impact on ecosystems.

Joint WGI/WGII Workshop on Climatic Causes and the Climatic Repercussions of Drought and Desertification

4.6 An IPCC workshop, jointly with WGII is being planned for 1994 to address the problems of drought and desertification, particularly the interaction between land-use, water-resources (including precipitation patterns) and climate change (both due to natural variability and long-term anthropogenic causes).

[1] While all types of aerosol will be included, an important aim of this workshop is to begin to answer those questions raided in the 1992 IPCC Supplement concerning anthropogenic aerosols and their associated radiative forcing.

Progress in Implementation of the WGI Workplan

Submitted by the co-chairs of WGI to the
Ninth session of the IPCC (Geneva, 29-30 June 1993)

1. 1994 Report on Radiative Forcing of Climate

Structure and contents
Lead authors
Joint workshop of the WGI Bureau and the International Ozone Assessment Panel, Hamburg
Estimating future atmospheric concentrations of CO_2

2. 1995 Second Scientific Assessment Report

Structure and contents
Lead authors
Evaluation of regional climate simulations

3. IPCC Guidelines for National Inventories of Net Emissions of Greenhouse Gases

Editing and production of the draft Guidelines
Regional training workshops on the draft methodology
Central greenhouse gas information system (GGIS)
Input to the Intergovernmental Negotiating Committee for the Climate Convention
Funding

4. Participation of Scientists from Developing Countries in Activities of WGI.

Annex 1 Lead authors for the 1994 report
Annex 2 Projected funding requirements for the participation of developing countries in WGI activities.
Annex 3 Budget 1991-95 for the IPCC/OECD programme on national inventories of greenhouse gas emissions.
Annex 4 Joint activities of the IPCC Working Groups

1994 Report on Radiative Forcing of Climate

Structure and contents

A joint meeting of the WGI Bureau and the International Ozone Assessment Panel was held in Bath, UK on 18-19 February 1993, along with invited experts in the fields of carbon-cycle modelling, atmospheric chemistry and radiative forcing. The overall structure of the 1994 report was defined:

Chapter 1: *CO2 and the carbon cycle*
Chapter 2: *Other trace gases and atmospheric chemistry*
Chapter 3: *Aerosols*
Chapter 4: *Radiative forcing*
Chapter 5[2]: *The relative importance of emissions of different gases*

Lead authors

The Bureau reviewed a wide range of nominations for lead authors, selecting between four and six for each chapter. Those accepting the Bureau's invitation to be lead authors are listed in Annex 1. All lead author teams will include at least one scientists from a developing country. Further names may be added if circumstances require.

Lead authors held meetings to further develop their chapter contents, to define detailed workplans and to identify key contributors during April and May.

Joint workshop of the WGI Bureau and the International Ozone Assessment Panel, Hamburg

A joint IPCC WGI/International Ozone Assessment Panel workshop on *Impacts on Climate of Ozone Change and Aerosols* was held in Hamburg, 17-19 May 1993. Organized by the Max Planck Institute for Meteorology, this workshop provided a forum for the exchange of ideas related to ozone and aerosol forcing of climate, two issues that were highlighted by the 1992 IPCC Science Supplement. The outputs rom this workshop will provide an important source of raw material for preparation of the 1994 and 1995 WGI reports.

The link between emissions and atmospheric concentrations of greenhouse gases

A key scientific task is to improve the quantitative understanding of how atmospheric concentrations of greenhouse gases are influenced by their emissions. This work will be reported in Chapter 4 of the 1994 report, and will represent a WGI input to the joint WGI/WGII/WGIII workshop in April, 1994 (see Annex 4).

2. 1995 Second Scientific Assessment Report

Structure and contents

The provisional contents list tabled at IPCC-VIII (see IPCC-IX, Doc 7) has attracted comments and suggestions for improvement from a range of individuals, organizations and countries. These comments are being logged and will be reviewed together at the December 1993 meeting of the WGI Bureau.

Lead authors

According to the WGI timetable agreed by IPCC-VIII (see IPCC-IX, Doc 7) concentrated activity will not begin until the end of 1993 with the appointment of a full complement of Lead Authors. In the meantime nominations of experts are being received from various countries in response to the invitation sent out by the IPCC Secretariat following IPCC-VIII and repeated

[2] At Bath it was originally decided to address this issue, which includes the concept of Global Warming Potential, in an appendix. At Hamburg this decision was reviewed and it was decided that the importance of the subject merited a separate chapter.

in the WGI Newsletter of December 1992. Suggestions are also being received from individual experts involved in the 1990 and 1992 Scientific Assessments.

Evaluation of Regional Climate Simulations

In preparation for both the 1995 Second Assessment and the joint WGI/WGII workshop in April 1994, an evaluation of Regional Climate Simulations has been initiated within WGI. This evaluation will compare the observed climate in seven regions of the world with the corresponding regional climate simulations from control runs of current state-of-the-art coupled atmosphere-ocean GCMs (AOGCMs). The comparisons will examine the ability of current AOGCMs to simulate present-day climate in terms of both averages and extremes. The evaluation will also include comparison of the regional projections of future climate around the time of CO2 doubling.

IPCC/Woods Hole Workshop on Biotic Feedbacks in the Global Climate System

A revised workshop report has recently been circulated to participants for review and will be finalized shortly.

3. IPCC Guidelines for National Inventories of Net Emissions of Greenhouse Gases

Members may recall that the objectives of the IPCC/OECD programme for the development of IPCC Guidelines for national inventories of net greenhouse gas emissions, are:

- Development and refinement of an internationally agreed upon methodology for calculation and reporting of national net emissions;
- Technical cooperation efforts to encourage widespread use of the methodology by countries participating in the IPCC and Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC/FCCC);
- Establishment of procedures and a data management system for collection, review and reporting of national data.

Editing and Production of the Draft Guidelines

The Guidelines will be published in two volumes:

(a) a Workbook - clearly presented and user-friendly, this manual will contain only that information necessary to compile a national inventory.

(b) a Reference Manual - containing background material, additional explanatory text and bibliography, this manual will allow the methods and data appearing in the Workbook to be traced to source.

The work has progressed to the point where technical editing of the Workbook has now begun, with a scheduled completion date of September 1993. In this process the overall strategy for the layout and style of the two volumes will be determined. This overall style will also be imported to related computer software and training material.

In September the technical editors will deliver a fully edited version of the Workbook on paper and computer disk. Translation and printing of the Workbook for peer and country review is a further task beyond that stage.

Technical editing of the Reference Manual (followed by translation and printing) are priority tasks since both volumes - Workbook and Reference Manual must go out for review together. Note that this task cannot begin until and unless the "*Additional Tentative Commitments*" listed in Annex 3 are confirmed.

Regional training workshops on the draft methodology

A Latin American and Caribbean Regional training workshop was successfully held in São José dos Campos, São Paulo, Brazil, 9-11 March, 1993. Representatives from 19 Latin American countries participated actively and enthusiastically and the workshop led to a number of recommendations for further improvement of the methodology in order to widen its applicability.

A Central European training workshop will be held in Bratislava, Slovakia, 5-8 October 1993. Tentative plans have been made for further regional training workshops but detailed planning depends on full funding becoming available.

UNEP country studies

UNEP is funding studies in eleven countries: Uganda, Tanzania, Nigeria, Senegal, Gambia, Morcco, Poland, Costa Rica, Mexico, Venzuela and China. The output of each of these studies, run in close cooperation with government-appointed technical officers, will be a national emissions inventory prepared according to the draft IPCC Guidelines.

In achieving this output, valuable experience will be gained by national staff in developing appropriate national databases, and the studies will provide further tests of the applicability of the draft Guidelines in a range of contexts.

Central greenhouse gas information system (GGIS)

Contractors have almost completed their work on the specification of a central database and information system for the archiving and reporting of national inventory information.

Input to the Intergovernmental Negotiating Committee for the Climate Convention

For the 8th session of the INC (Geneva, 16-27 August) the INC Secretariat has prepared a paper on methodologies for national greenhouse gas inventories, with particular attention given to progress with the IPCC Guidelines.

At INC-8 the Chairman of IPCC will present an overview paper on national inventories; detailed presentations of the draft methodology and demonstrations of associated computer software will be given by members of the IPCC/OECD core group.

Funding

The budget for the IPCC/OECD programme covering the period 1991-95 is at Annex 3. A total of around US$430K is still required to complete the first version of the Guidelines. The implications of shortfalls in funding are described in Annex 3.

4. Participation of Scientists from Developing Countries in Activities of WGI.

The steady increase in the participation of developing countries in WGI activities has not been maintained in 1993 because of the shortage of funds in the IPCC Trust Fund. Projected funding requirements for participation by developing countries through to the completion of the Second Scientific Assessment in 1995 are shown in Annex 2.

Lead Authors for the IPCC WGI 1994 Report on Radiative Forcing of Climate

Chapter	Name	Country
1 - Carbon Cycle	Dr David Schimel *(Convening LA)*	USA
	Dr Ian Enting	Australia
	Dr Diogenes Alves	Brazil
	Dr Martin Heimann	Germany
	Dr Uli Siegenthaler	Switzerland
	Prof Tom Wigley	United Kingdom
2 - Chemistry	Dr Michael Prather *(Convening LA)*	USA
	Dr Paul Fraser	Australia
	Dr Xiuji Zhou	China
	Dr Dick Derwent	United Kingdom
	Dr Eugenio Sanhueza	Venezuela
3 - Aerosols	Prof Peter Jonas *(Convening LA)*	United Kingdom
	Yet to be appointed	*A developing country*
	Dr Henning Rodhe	Sweden
	Dr Bob Charlson	USA
4 - Radiation	Dr Keith Shine *(Convening LA)*	United Kingdom
	Prof Yves Fouquart	France
	Prof J Srinivasan	India
	Dr Susan Solomon	USA
	Dr V Ramaswamy	USA
5 - Relative importance of emissions of different gases		*Lead authors not yet appointed*

Annex 2

Estimate of IPCC WGI Funding Requirements 1993-95

Note: This estimate does not include the UK support of the Technical Support Unit in Bracknell or other support-in-kind. The budget for the IPCC/OECD programme on a methodology for national inventories of net greenhouse gas emissions is shown separately in Annex 3.

	No. of scientists	Travel & pd per scientist (US$K)	1993 (US$K)	1994 (US$K)	1995 (US$K)
1. Open workshops					
Int CO_2 workshop, Carqueiranne , Sep'93	10	3.0	30		
WGI/WGII/WGIII Impacts/Science workshop	30	4.0		120	
WGI/WGII Climate/ Deserts workshop	*Removed from estimates.*				
2. Lead authors' meetings and other specialized WGI activities					
2.1. *1994 Report on Radiative Forcing*					
First drafting meeting of all lead authors and key contributors, Univ. of California, Irvine CA, USA, Jan'94	10	4.0		40	
Second drafting meeting lead authors, Mar'94	10	3.5		35	
Third drafting meeting lead authors, May'94	10	3.5		35	
2.2. *1995 Second Scientific Assessment Report (SSAR)*					
First drafting meeting of all lead authors, Dec'94	20	4.0		80	
Second drafting meeting lead authors, Mar'95	20	3.5			70
Third drafting meeting lead authors, June'95	20	3.5			70
2.3. *Evaluation of Regional Climate Simulations* (this contributes to both the WGI/WGII Impacts/Science Workshop, April'94 and to the 1995 SSAR)					
Coordinating group	1*	6.0	3	3	
Regional experts - travel	7	4.0		28	
Reg. experts - misc costs	7	3.0	10	11	
Sub-totals to carry forward			**43**	**352**	**140**

* Coordinating group consists of at least three scientists; the budget assumes that one is from a developing country.

	No. of scientists	Travel & pd per scientist	1993 (US$K)	1994 (US$K)	1995 (US$K)
Sub-totals brought forward			43	352	140
3. WGI Bureau meetings					
Geneva, June 1993	*covered by budget for IPCC-IX*				
December '93 (with invited experts)	15	3.0	45		
Assume other WGI Bureau meetings occur in the margins of other IPCC meetings, so only marginal costs involved			1	1	1
4. IPCC WGI and Full IPCC Plenaries					
Note: This estimate covers only the travel and per diem **of lead authors and key contributors** from developing countries. Estimates for travel and per diem costs of country representatives, and the costs of simultaneous interpretation, are **not** included in these figures.					
Summer '94 (WGI plenary for approval of 1994 report)	10	3.0		30	
Summer '94 (IPCC plenary for acceptance of 1994 report)	10	3.0		30	
Summer '95 (WGI plenary for approval of 1995 Second Scientific Assessment)	20	4.0			80
Summer '95 (IPCC plenary for acceptance of 1995 Second Scientific Assessment)	20	3.0			60
Totals			**89**	**413**	**281**
Grand total 1993-95					**783**

Figures prepared by B. Callander, IPCC WGI Technical Support Unit, Bracknell, 28 June 1993.

Funding Status and Needs of the IPCC/OECD Programme on a Default Methodology for National Inventories of Net Emissions of Greenhouse Gases.

The IPCC/OECD Liaison Group (IOLG) has periodically updated a detailed work plan and budget summary of the external resources needed by the programme through the middle of Calendar year 1994. The current plan is summarized here:

1. Overview of Three-Year Programme Mid-1991 to Mid-1994

	Funding (US$ 000)	Expenditures through 6/93	Final Year
1. Collection, Evaluation and Reporting of Existing Data	125	80	45
2. Detailed Review and Comparison Studies	150	75	75
3. Information Management System	200	50	150
4. Technical Information Development	300	200	100
5. Technical Cooperation - Dissemination, Regional Applications	400	275	175
6. Development of Guidelines	200	100	100
7. Central IPCC/OECD Support Units	225	150	75
TOTAL NEEDED	**1600**	**930**	**720***

* Last year is somewhat higher because it includes substantial information system development, publication costs, an in-depth or global assessment review meeting.

2. Summary of support received from 1991 to present

Source	Funding (US$ 000)
OECD	40
United States of America	250
Switzerland	105
Italy	17
Norway	8.5
Sweden	14
United Kingdom	15
UNEP	525
European Commission	50
Australia	18
Sub-total	**1,042.5**
Additional Tentative Commitments	
UNEP	100
Canada	30
Total Support incl.tentative commitments	**1172.5**
Estimated Total Requirement	1600
REMAINING FUNDS NEEDED 1993/4	**427.5**

3. Implications of funding shortfall

If full funding is not available, the remainder of the programme would be scaled back to defer or eliminate the following elements in reverse priority order:

1. $100K - Development of an operational information system would be deferred and would have to be addressed by the COP/FCCC later. Could delay implementation of data collection provisions of the FCCC

2. $75K - A Global Assessment Workshop, or In-Depth Review would not be done in 1994. This funding level is based on a small (approximately 30 experts) workshop as part of the scientific peer review process. An alternative proposal is circulating which suggests much more funding, presumably associated with a much larger and more formal meeting.

3. $75-150K could be removed from the budget by scaling back technical support to country studies, regional workshops and other dissemination activities. Even full funding here assumes direct funding for country studies and regional workshops will be provided outside the programme budget.

Note: The above assumes that the additional tentative commitments are fulfilled.

4. Background - In-kind support received 1991-93

Source	In-Kind Support
OECD	9 person-months per year
IEA	12 person-months per year ***
UK	6 person-months per year ***
USA	Draft CO2/Energy Workbook Information System Development - GloED System
Netherlands	Detailed Comparisons of Existing National Data Methane Emissions Methods and Amersfoort Workshop (Feb. 93)
Australia, Canada, Finland, Germany, Netherlands, Norway, UK, US.	Bilateral Comparison Studies

*** significant "overhead" resources provided (i.e. travel, etc.) but not accounted for separately

5. Financial Sponsors for Earlier Background Work 1990/1

Source	Support
OECD	$30K, plus in-kind work on Background Document
IEA	In-kind work on Background Document
USA	$130K, plus in-kind work on Background Document
UK	$25K
Norway	$10K

Annex 4

JOINT ACTIVITIES OF THE IPCC WORKING GROUPS

1. Areas of overlap between the workplans of IPCC WGI and WGII

WGI has a direct interest in the output from WGII wherever a Response to climate change significantly alters the factors which force or control climate. The Response can be *direct* (for example, a shift of a particular ecosystem causing regional changes in mass and energy fluxes) or it can be *indirect* (for example, a change in the economics of farming brought about by climate change causing changes in regional land use).

WGII has a direct interest in the output from WGI wherever the scientific uncertainty surrounding climate change is one of the limiting factors in assessing the impacts of that change.

The chief areas of overlap are therefore:

(i) ***Biotic feedbacks to the global climate system*** - responses in the marine and terrestrial biosphere which can alter the chemical composition of the atmosphere or its rate of change (including the amount and distribution of water vapour), or the surface albedo or the exchange of energy between the atmosphere and the surface.

(ii) ***Human-mediated feedbacks to the global climate system*** - responses in human society, industry and economics which produce any of those effects listed in (i) above.

Note: In this context, future surface emissions of greenhouse gases from human activity lead to an overlap with WGIII.

(iii) ***Scenarios of regional climate change*** - uncertainty in projections of regional climate change currently represents one of the greatest sources of uncertainty in assessing the likely impact of climate change.

These areas of overlap are particularly relevant to 'the ultimate aim' of the Framework Convention on Climate Change (contained in Article 2):

"The ultimate aim of this Convention ... is to achieve ... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."

"Such a level should be achieved within a time frame sufficient:

- *to allow ecosystems to adapt naturally to climate change,*
- *to ensure that food production is not threatened, and*
- *to enable economic development to proceed in a sustainable manner."*

2. Proposed joint activities

Joint WGI/WGII/WGIII workshops on the scientific basis of Article 2 of the Framework Convention on Climate Change. Together these workshops would provide the basis for an IPCC 'synthesis statement' on scientific and technical aspects of Article 2.

Workshop A

Provisional title: *Simulation and prediction of regional climates, CO_2 emission-concentration links and implications for impacts assessments.*
Date: April, 1994
Location: *To be decided*
Purpose: To discuss matters relevant to Article 2 of the Climate Convention and which involve chiefly WGs I and II.
Contents

(i) **Regional climate change.** WGI has initiated the compilation of a database containing data from current, state-of-the-art coupled ocean-atmosphere climate models (AOGCMs). The aim of this initiative is to prompt comparisons of observations of contemporary local and regional climates with the control simulations of the AOGCMs. These evaluations will then assist the evaluation of *predictions* of regional climate produced by the AOGCMs when forced with increased greenhouse gas concentration. A status report of this work will be presented and discussed. WGII will want to establish how its findings can be used in their impact assessments for the 1995 report.

(ii) **The link between emissions and atmospheric concentrations of greenhouse gases** (GHGs). The implications of different emission scenarios for CO_2 stabilization will have been discussed at the IPCC session following *The Fourth International CO_2 Conference* (Carqueiranne, France, 18 Sep 1993). A draft report of the Carqueiranne presentations and any subsequent work will be available. Preliminary work on methane may also be available.

(iii) **The carbon cycle, biofeedbacks and impacts on ecosystems** (including managed, un-managed and coastal ecosystems). This is a complex area and many disciplines are involved. Chapters 1, 3 and 8 of the draft contents of the Second Scientific Assessment Report are relevant (see Appendix). Risk and risk assessment are important concepts in this context and should be included, and the present status of integrated impact assessment models should also be reviewed.

It was recognized that, in order to keep the workshop contents within manageable dimensions, socio-economic issues should not be included in the April 1994 workshop but should be included in the later Workshop B.

Workshop B

Date: late 1994
Location: *To be decided*
Purpose: To discuss matters relevant to Article 2 of the Climate Convention and which involve chiefly WGs II and III, including socio-economic issues.
Contents *To be decided*

Suggested Outline for the 1995 IPCC Science Assessment

Executive Summary

Policymakers Summary

Chapter 1: *Greenhouse Gases*

- Contemporary and palaeo records of atmospheric distributions and trends in GGs and precursors.
- Past, current and future sources, sinks, reservoirs and transformations of GGs and precursors. Particular focus on the carbon cycle:

Chapter 2: *Aerosols and Ozone*

- Contemporary and palaeo records of atmospheric distributions and trends in aerosols and precursors.
- Past, current and future sources, sinks, reservoirs and transformations of aerosols and precursors.
- Climate effects of ozone; chemistry affecting ozone concentrations.

Chapter 3: *Radiative Forcing*

- Solar forcing.
- Microphysical, chemical, and optical properties of tropospheric aerosols.
- Radiative forcing of greenhouse gases, aerosols and their precursors.
- Direct and indirect Global Warming Potentials for the contemporary and future atmospheres.

Chapter 4: *Climate Processes*

- Review important climate processes, in particular:
  - those that affect water vapour, clouds and air-sea exchange
  - those governing planetary and regional albedo - sea-ice, land-ice, land-surface
  - those governing transient response, particularly ocean circulation and deep ocean storage.
- Model representation/parametrizations and tuning (e.g. heat and salinity flux corrections).
- Results from recent field experiments in terms of improving model formulations and validating models, e.g., WOCE, TOGA, FIFE, FIRE and ARM

Chapter 5: *Observed Climate Variability and Change*

- Palaeo- and contemporary climate variability and change, including extremes such as cyclones.
- Requirements and sources of data for validating climate models
- Indicators and "fingerprints" of climate change (with particular reference to detection of the enhanced greenhouse effect?)
- Extreme events; observed regional climate change.

Chapter 6: *Model Predictions and Validation*

(This chapter may become two chapters in order to devote sufficient space and emphasis to the important issue of regional climate analyses and regional climate prediction. Canada has suggested this option. However such a split will need to be considered carefully; GCMs also produce regional climate predictions and much of their validation depends on regional rather than global comparisons).

- Transient and equilibrium coupled GCM model predictions of key climate parameters with a limited number of identical trace gas scenarios (issue of initial conditions needs to be considered).
- Address the issue of "carbon dioxide equivalence", aerosols and atmospheric ozone
- Regional changes using GCMs, statistical and nested models.
- Simulations and predictions of seasonal, inter-annual and inter-decadal changes in climate.
- Comparison of models and observations ('model validation'), by region, for: (i) the contemporary climate, and (ii) for the last 100 years by using more realistic transient coupled GCM model calculations.
- Predictions in the frequency and intensity of extreme events, e.g., monsoon circulation, typhoons and hurricanes, drought, and extreme rainfall events.
- Predictability of climate?

Chapter 7: *Sea Level Rise*

- Contemporary and palaeo regional and global trends in sea level
- Processes responsible for local, regional and global changes in sea level
- Mass balance of Antarctica and Greenland ice sheets.
- Model predictions of sea level rise

Chapter 8 *Biotic responses to environmental change and feedbacks to climate*
(Input from WGI/WGII)

- Effects of changes in climate and atmospheric composition on ecosystem structure, processes, and functions.
- Effect of ecosystem responses on atmospheric composition and climate.

Chapter 9 *Narrowing the Uncertainties*

Annex *National inventories of greenhouse gas sources and sinks, aerosol and precursor emissions*

(or may be published as a separate report)

IPCC WG II/I
WORKSHOP ON DROUGHT AND DESERTIFICATION
(with special emphasis on Africa)

The above workshop/conference, provisionally to be held in Zimbabwe (Victoria Falls/Harare) in August 1994, will among other topics cover the heading listed below. Each key-note address will be given by one-two-three speakers in 45 minutes followed by 45 minutes of discussion. (The workshop will be held over a five-day period)

A.	Climatology of Drought	
a.	Climate change and drought	1
b.	Observed annual and/or inter-annual, rainfall (drought) variability, regional/subregional studies	2
c.	Status of short-term (interannual) forecasting of rainfall (drought) based on models of the El-Ñino (ENSO)	2
e.	Status of observed regional precipitation changes due to natural and man-induced (greenhouse gases) climate change	2
B.	Perceptions, causes and nature of Desertification	
a.	Climate change and Desertification	1
b.	Links and relationships between greenhouse effects, climate change and desertification.	2
c.	Observed extent and features of desertification, especially in the arid land (and other fragile ecosystems,) - importance of mapping these areas using geographical information systems (GIS)	2
d.	Roles of human activities on desertification: - local scales (overgrazing, depletion of fuelwood, etc) - regional and global scales (overpopulation, deforestation, etc.) - shifting cultivation	3
e.	Some case studies (research reports)	2
C.	Impacts of Drought and Desertification	
a.	Impacts on agriculture (crop productivity)	2
b.	Observed subregional/national population habits (over-exploitation of natural resources	2
c.	Impacts on local ecosystems dynamics (especially national and regional assessment studies) Impacts on human settlements	2
d.	Socio-economic impacts of drought and desertification	2
e.	Impacts on and nomadic life	2

Estimated costs of hosting the drought and desertification workshop (Zimbabwe) August 1994

1. Local Organizational costs

- preparatory work telefax + telephone
- transportation (road and air)
- local wages (conference staff)
- information offfice
- postage/mailing

2. Documentation

- printed folders
- writing pads, pens, paper
- photocopying paper
- typing paper
- other consumables

3. Participants

- DSA and (IPCC Secretariat)
- All travel costs
- report preparation
- photocopying

4. Technical facilities

- translation
- interpretation
- ear and microphones

5. Office Space

- secretariat
- admin. office
- typing pool
- WMO office

6. Publication requirements

- report publication
- proceedings publications
- other incidental costs

7. Entertainment

- opening (official)
- host cocktail
- IPCC closing cocktail

8. Proposed Organizing Committee

- IPCC Secretariat
- WGII Co-chair
- Subgroup D Co-chair
- Local (Zimbabwe) Support Unit
- Any other co-opted member

D.	Adaptation and management of Drought and Desertification	
a.	Is desertification reversible (over what time scales?)	2
b.	How do we manage and/or adapt to desertification?	3
c.	Case studies and relevant papers (discussion papers) on drought and desertification	4
E.	An overview including implications of the result of the discussions and meaning for future directions.	
a.	Some additional papers on drought and desertification	4
b.	Review of proceedings of the workshop	1
c.	Report and recommendations of workshops	1
d.	Closure of the meeting	1

Note: Tours before and after the workshop.

APPENDIX C

WORKPLAN OF THE IPCC
REORGANIZED WORKING GROUP II

The continuing work of the IPCC in the areas of impacts and response options - the areas of responsibility for the reorganized Working Group II - will be undertaken according to the following workplan. The terms of reference of the Working Group (WG) are attached in Annex 1 for information. The time-line for the completion of the work, attached in Annex 3, forms an integral part of this plan.

Certain elements of this work are expected to build directly on tasks undertaken as part of the preparations of the 1992 IPCC Supplement. These tasks include the development of guidelines for impacts assessments, the identification of regional and national components of systematic observation programmes for impacts assessments, the compilation of an inventory of technology characteristics, and the conduct and synthesis of thematic studies on specific options.

The Working Group will prepare an integrated assessment of the state of knowledge regarding the impacts of climate change and options for adapting to or mitigating such climate change. These assessments will be the WG's contribution to the IPCC's Second Assessment Report (SAR). In developing this assessment, the Subgroups (Sg) of the Working Group will undertake a number of specific activities and produce a number of discrete products that may be of specific use to individual countries in evaluating their vulnerability to climate change and their options for responding to it. These include thematic or regional workshops, inventories of technologies and compatible methodologies for carrying out analyses.

I. GLOBAL AND REGIONAL ASSESSMENTS

As its input to the SAR, the Working Group will prepare assessments, globally and by ecological/climate/physiographic regions and by broad economic sectors, of the state of knowledge regarding vulnerability, adaptation and mitigation, and advances in knowledge in each area covered by the Subgroups, including degree of endogenous institution and capacity building in developing countries. These assessments will draw on the individual tasks carried out by the Subgroups, including the inventories and methodologies, and will reflect work priorities for the 1992-93 timeframe.

WORKPLAN

-- Each Subgroup will coordinate the preparation by lead authors of chapters related to that Subgroup's areas of concern.

-- These chapters are to be integrated into a synthesis report for input to the 1995 assessment.

II. METHODOLOGIES

Building on previous work, including the work of the former IPCC Working Groups II and III, the Subgroups will prepare methodologies, for use at national, regional and global scales, for:

A. assessing and monitoring impacts of climate change, including geophysical impacts, ecosystem impacts, and monitoring and data estimation methods and practices;

B. assessing vulnerability to the impacts of climate change and further identifying sensitivities to different magnitudes and rates of climate change, including temperature, hydrologic cycle and sea-level change; and

C. assessing the options available to reduce vulnerability to the impacts of climate change and to mitigate climate change, including a component assessing the results of these actions and the costs and benefits of reductions on areas within the Subgroup's purview.

WORKPLAN

-- Each Subgroup will coordinate the development by lead authors or co-authors of methodologies related to specific ecological/climate/ physiographic regions or economic sectors within the Subgroup's purview.

* Methodologies for assessing vulnerability to the impacts of climate change should build on the work of the former Working Group II in developing Preliminary Guidelines for Assessing Impacts of Climate Change and the work of the Coastal Zone Management Subgroup of the former Working Group III on a Common Methodology for Assessing Vulnerability to Sea Level Rise.

* Subgroups should collaborate where appropriate to develop methodologies for certain physiographic regions and systems (e.g., freshwater systems, hydrology and water resources)

* Some methodologies may include components assessing geophysical impacts; this depends on the workplan for Working Group I.

III. INVENTORY OF TECHNOLOGIES, METHODS AND PRACTICES

The Working Group will prepare an inventory of technologies, methods and practices to mitigate or adapt to climate change. The inventory will be supported by thematic studies and analyses to assist countries in choosing technologies and combinations of technologies. This work should facilitate the expeditious and efficient transfer of these technologies, methods and practices, particularly to developing countries.

WORKPLAN

-- Each Subgroup will coordinate the development by lead authors or task groups of an inventory of technologies, methods and practices related to specific ecological/ climate/physiographic regions or economic sectors within the Subgroup's purview.

* There will be an appropriate balance of technologies, relying on, where appropriate, thematic studies.
* This effort will build on existing work.

IV. WORKSHOPS

The Working Group will hold workshops on issues of specific interest to the Subgroups, including regional issues. In conducting these workshops, it will coordinate with other IPCC Working Groups and international institutions and organizations in order to ensure cooperation on common or overlapping work.

V. WORK IN COOPERATION WITH WG I AND THE REORGANIZED WG III

The Working Group will:

-- cooperate with Working Group I on activities related to the objective of the Framework Convention on Climate Change, including (a) the Working Group I work on the relationship between emissions and atmospheric concentrations of CO_2 (the carbon cycle) and (b) the linkages of regional climate change estimates with the Working Group II work on vulnerabilities and sensitivities, especially those of ecosystems. (A joint workshop might be held in early 1994.)

-- cooperate with Working Group I on a workshop to address the problems of drought and desertification, particularly the interactions among land use, water resources (including precipitation patterns) and climate change

(including natural variability and that caused in the long-term by anthropogenic activities).

-- coordinate its activities with those of the other WGs.

GENERAL NOTES

1. Institution and capacity building should be integrated into all IPCC work programmes and outputs.

2. Development of methodologies, particularly for impact assessments, should be coordinated and, as much as possible, harmonized across Subgroups. For example, the existing work of Japan and the U.K in developing preliminary guidelines for impacts assessments is very useful in this regard and should be continued.

OUTLINE

IPCC Working Group II: Second Assessment Report

EXECUTIVE SUMMARY		2 p.
POLICYMAKER SUMMARY		20-35 p.
SECOND ASSESSMENT REPORT		400 p.
I.	INTRODUCTION	10 p.
II.	ASSESSMENT OF IMPACTS AND ADAPTATION OPTIONS	240 p.
	A. Ecological/climate/physiographic Systems	110 p.
	1. Forests (lead: Sg C; support: Sg D)	10 p.
	2. Grasslands and rangelands (including arid and semi-arid zones(lead: Sg C; support: Sg D)	15 p.
	3. Deserts (Sg D)	5 p.
	4. Mountain regions (lead: Sg C; support: Sg D)	10 p.
	5. Wetlands (non-coastal) (lead: Sg C; support: Sg D)	10 p.
	6. Cryosphere, including permafrost (lead: Sg C; support: Sg D)	15 p.
	7. Oceans, large lakes and marine ecosystems (lead: Sg B; support: Sg C)	15 p.
	8. Coastal zones and small islands (Sg B)	20 p.
	9. Freshwater systems and hydrology (lead: Sg C; support: Sgs B and D)	10 p.
	B. Socio-economic systems	120 p.
	1. Energy supply (lead: Sg A; support: Sg D)	10 p.
	2. Industry (lead: Sg A; support: Sg D)	10 p.
	3. Transportation (lead: Sg A; support: Sg B)	10 p.
	4. Human settlements (lead: Sg A; support: Sgs B and D)	20 p.
	5. Agriculture (Sg D)	15 p.
	6. Freshwater supply and quality (lead: Sg D; support: Sgs B and C)	10 p.
	7. Forestry (lead: Sg D; support: Sg C)	15 p.
	8. Fisheries (lead: Sg B; support: Sgs D and C)	15 p.
	9. Financial services including insurance (lead: Sg B; support: all)	15 p.
	C. Health (lead: Sg D; support: all)	10 p.
III.	ASSESSMENT OF MITIGATION OPTIONS	140 p.
	A. Energy supply (lead: Sg A; support: Sg D)	35 p.
	B. Industry (lead: Sg A; support: Sg D)	25 p.
	C. Transportation (Sg A)	20 p.
	D. Human settlements including waste management and disposal (lead: Sg A; support: Sgs B and D)	15 p.
	E. Agriculture (Sg D)	15 p.
	F. Management of forests (Sg D)	20 p.
	G. Cross-sectoral options (all Subgroups)	10 p.
IV.	SUMMARY OF METHODOLOGIES (all Subgroups)	10 p.
	A. Methodologies for assessments of impacts and adaptation options	5 p.
	B. Methodologies for assessments of mitigation options	5 p.

APPENDIX A: METHODOLOGIES
APPENDIX B: INVENTORY OF TECHNOLOGIES, METHODS AND PRACTICES

DETAILED OUTLINE

EXECUTIVE SUMMARY

SUMMARY FOR POLICY-MAKERS

SECOND ASSESSMENT REPORT

I. INTRODUCTION

* Objectives
* Structure of report
* Summary of GHG, climate change scenarios, possible changes of global distribution of ecosystems and assumptions (of WGs I and III) of a socio-economic kind that underlie these analyses, as used in the assessment of WG II
* Definition of ecological/climate/physiographic systems and economic sectors.

II. ASSESSMENT OF IMPACTS AND ADAPTATION OPTIONS

A. Ecological/climate/physiographic systems

1. Forests (lead: Subgroup C; support: Subgroup D)

a. Summary, including methodologies, assumptions and scenarios.

b. Boreal forests
- climate/ecological system characteristics, including biodiversity, human population and other essential factors
- impacts and ranges of, and sensitivities to, climate change
  . abiotic
  . ecological
  . socio-economic
- extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes)
  . contemporary and historical records
  . regional changes due to climate change
  . impacts
  . multi-stress factors.

c. Temperate forests
- climate/ecological system characteristics, including biodiversity, human population and other essential factors
- impacts and ranges of, and sensitivities to, climate change
  . abiotic
  . ecological
  . socio-economic
- extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts in the subtropical zone, drought)
  . contemporary and historical records
  . regional changes due to climate change
  . impacts
  . multi-stress factors.

d. Tropical forests
- climate/ecological system characteristics, including biodiversity, human population and other essential factors
- impacts and ranges of, and sensitivities to, climate change
  . abiotic
  . ecological
  . socio-economic
- extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
  . contemporary and historical records

. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Research and monitoring needs.

2. Grasslands and rangelands (including arid and semi-arid zones) (lead: Subgroup C; support: Subgroup D)

a. Summary, including methodologies, assumptions and scenarios.

b. High latitude zone
- climate/ecological system characteristics, including biodiversity, human population and other essential factors
- impacts and ranges of, and sensitivities to, climate change
  . abiotic
  . ecological
  . socio-economic
- extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes)
  . contemporary and historical records
  . regional changes due to climate change
  . impacts
  . multi-stress factors.

c. Temperate zone
- climate/ecological system characteristics, including biodiversity, human population and other essential factors
- impacts and ranges of, and sensitivities to, climate change
  . abiotic
  . ecological
  . socio-economic
- extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts in the subtropical zone, drought)
  . contemporary and historical records
  . regional changes due to climate change
  . impacts
  . multi-stress factors.

d. Tropical zone
- climate/ecological system characteristics, including biodiversity, human population and other essential factors
- impacts and ranges of, and sensitivities to, climate change
  . abiotic
  . ecological
  . socio-economic
- extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
  . contemporary and historical records
  . regional changes due to climate change
  . impacts
  . multi-stress factors.

e. Adaptation options.
f. Research and monitoring needs.

3. Deserts (Subgroup D)

a. Summary, including methodologies, assumptions and scenarios.

b. Climate/ecological system characteristics, including biodiversity, human population and other essential factors.

c. Impacts and ranges of, and sensitivities to, climate change
. abiotic

. ecological
. socio-economic.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Research and monitoring needs.

4. **Mountain regions (lead: Subgroup C; support: Subgroup D)**

a. Summary, including methodologies, assumptions and scenarios.

b. Climate/ecological system characteristics, including biodiversity, human population and other essential factors.

c. Impacts and ranges of, and sensitivities to, climate change
. abiotic
. ecological
. socio-economic including on tourism.

d. Extreme events (e.g., mountain hazards, temperature and precipitation extremes)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Mountain permafrost areas - stability and spatial analysis based on paleo-contemporary records.

f. Mountain forests.
g. Mountain agriculture.
h. High plateaux.
i. Adaptation options.
j. Research and monitoring needs.

5. **Wetlands (non-coastal) (lead: Subgroup C; support: Subgroup D)**

a. Summary, including methodologies, assumptions and scenarios.

b. Climate/ecological system characteristics, including biodiversity, human population and other essential factors.

c. Impacts and ranges of, and sensitivities to, climate change
. abiotic
. ecological
. socio-economic.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Research and monitoring needs.

6. **Cryosphere, including permafrost (lead: Subgroup C; support: Subgroup D)**

a. Summary, including methodologies, assumptions and scenarios.

b. Climate/ecological system characteristics, including biodiversity, human population and other essential factors
   . contemporary and historical records of snow cover
   . analysis of stability
     - permafrost
     - ice sheets
     - glaciers.

c. Impacts and ranges of, and sensitivities to, climate change
   . abiotic
     - permafrost degradation - gas release, stability of structures and glacier melts.
   . ecological
     - permafrost degradation and vegetation cover, water infiltration
   . socio-economic.

d. Extreme events (e.g., snowstorms and high temperature periods, including frequency and severity)
   . contemporary and historical records
   . regional changes due to climate change
   . impacts
   . multi-stress factors.

e. Tundra regions.
f. Adaptation options.
g. Research and monitoring needs.

7. **Oceans, large lakes and marine ecosystems (lead: Subgroup B; support: Subgroup C))**

Note: The bold numbers in the left margin refer to the desirable disciplines of expertise for lead and contributing authors and reviewers. Their explanation is as follows:

(1) physical/earth sciences (oceans)
(2) bio-chemical sciences (oceans)
(3) ecology and economics (oceans resources)
(4) mapping and monitoring earth/eco sciences (oceans and coasts)
(5) physical/earth sciences (coastal areas)
(6) climatology/oceanography (coastal areas)
(7) coastal ecology
(8) socio-economics and planning of the coastal zone
(9) economics/finance related to extreme events and insurance
(10) data analysis and handling (oceans and coastal zone management)

Items given same numbers could be covered by the same lead author(s).

a. Summary and conclusions
   . general assumptions, scenarios and methodologies
   . conclusions.

b. Characteristics and functions of oceans, large lakes and marine ecosystems

(1)
   . short evaluation of present knowledge with regard to climate change, relevant for oceans, large lakes and marine ecosystems; ocean-atmosphere relations
   . brief description of relevant physical properties and characteristics of oceans (geology, sea level, wave activity, temperature, heat budget, role of carbon cycle, oceanic currents, salinity, El Niño, La Niña, upwelling, role of ice, sources of variability)

(2,3)
   . brief description of the geobiochemical, ecological and socio-economic characteristics and functions of oceans, large lakes and marine ecosystems (resources, fisheries, biodiversity)

(4) . regional and global maps describing relevant characteristics of oceans, large lakes and marine ecosystems.

c. Impacts of, and sensitivities to, climate change, including extreme events

(1) . physical changes, including natural phenomena and extreme events for oceans, large lakes and marine ecosystems (thermal expansion, glacial melting, sea temperature change, spatial and temporal changes in weather patterns, changes in carbon cycle, changes in sea level, changes in regional wave climate, salinity changes, alteration of heat budget, alteration of oceanic currents, changes in ice volume and distribution, El Niño, La Niña, upwelling, other sources of variability, such as tsunamis)

(2,3) . geobiochemical changes (e.g. changes in global carbon cycle, in cooperation with WG I), biodegradation, changes in biosedimentation

. impacts on specific marine ecosystem types, changes in habitats, biological diversity and shifts in ocean production zones

(3) . socio-economic impacts including cultural and traditional aspects, and environmental analysis (fisheries, aquaculture, marine transport, off-shore resource exploitation, dumping, testing)

(1,2,3) . sensitivities of specific ecosystems and other specific elements of the marine environment to the nature and rate of climate change, based on existing scientific evidence.

d. Adaptation options dealing with the impacts of climate change and accelerated sea level rise on oceans, large lakes and marine ecosystems

(3) . effective management of oceans and large lakes can only be impact-oriented (elaboration per sector: ecosystems, fisheries, aquaculture, marine transport, off-shore resource exploitation, dumping, testing)

e. Research and monitoring needs

(1,2,3,4) . specification of research needs to understand and monitor the impacts of climate change on oceans, large lakes and marine ecosystems and research needs to explore adaptation options

. inventory of existing national and international research programmes which address the above needs

. identification of research deficiencies for consideration by relevant research organizations.

(See Annex 2 also)

8. Coastal zones and small islands (Subgroup B)

Note: The bold numbers in the left margin refer to the desirable disciplines of expertise for lead and contributing authors and reviewers. Their explanation is as follows:

(1) physical/earth sciences (oceans)
(2) bio-chemical sciences (oceans)
(3) ecology and economics (oceans resources)
(4) mapping and monitoring earth/eco sciences (oceans and coasts)
(5) physical/earth sciences (coastal areas)
(6) climatology/oceanography (coastal areas)
(7) coastal ecology
(8) socio-economics and planning of the coastal zone
(9) economics/finance related to extreme events and insurance
(10) data analysis and handling (oceans and coastal zone management)

Items given same numbers could be covered by the same lead author(s).

a. Summary and conclusions
. general assumptions, scenarios and methodologies
. conclusions.

b. Characteristics and functions of coastal zones and small islands

(5) . evaluation of present knowledge with regard to climate change, relevant for coastal zones and small islands
. stressing importance and vulnerability of coastal zones and small islands (population, economic activities, infrastructural works, habitats, ecosystems)
. brief description of the ecological and socio-economic characteristics and functions of coastal zones and small islands

(6) . brief description of extreme events including patterns, frequencies, intensities and types of extreme events (types of extremes: excessive precipitation, storm surges, hurricanes, gales, cyclones, typhoons, droughts)

(4) . regional and global maps describing relevant characteristics of coastal zones and small islands, as well as types and distribution of coastal hazards.

c. Impacts and ranges of, and sensitivities to, climate change and accelerated sea level rise

(5) . physical changes (inundation of low-lying areas, alteration of coastal geomorphology, changes in river flows, changes in salinity gradients, saltwater intrusion, nutrients and other chemicals)

(7) . ecological impacts (sensitive coastal ecosystems, including wetlands, mangroves, coastal dunes and beaches, coral reefs, seagrass beds, biodiversity)

(8) . socio-economic impacts including cultural and traditional aspects (agriculture, human settlements, tourism and recreation, water supply, fisheries, including brackish waters, marshes and swamps, aquaculture, marine transport, infrastructure)

(5,7) . sensitivities of specific ecosystems and other specific elements of the coastal environment to the nature and rate of climate change, based on existing scientific evidence.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, drought)

(6) . physical changes
. ecological impacts
. socio-economic impacts, including related risk assessment issues

(6,9) . prevention, preparedness, insurance.

e. Adaptation options dealing with the impacts of climate change and accelerated sea level rise on coastal zones and small islands

(8) . options for adaptation and implementation considerations (retreat, accommodate, protect)

Assessment of vulnerability to climate change and accelerated sea level rise

. factors enhancing the vulnerability of coastal zones and small islands to accelerated sea level rise
. the Common Methodology (background, objectives, foci, applicability, limitations, results)
. international progress in national and regional vulnerability assessments (review of finished and ongoing activities)
. preliminary results of a global vulnerability assessment.

Integrated Coastal Zone Management Planning

. objectives of Integrated Coastal Zone Management
. critical elements: available coastal data, policy-making processes, necessary means (financial, legal, institutional, technical, human resources)
. implications of climate change and related uncertainties for present-day decision making on infrastructural works
. progress on Integrated Coastal Zone Management Programmes at national, regional and international levels
. review of progress on the development of common international concepts and tools
. national, regional and international information exchange

. need for technical assistance in the execution of planning and implementation of Coastal Zone Management plans
. training requirements.

f. Research and monitoring needs
(4,5,6, 7,8)
. specification of research needs to understand and monitor the impacts of climate change on coastal zones and small islands and research needs to explore adaptation options
. inventory of existing national and international research programmes which address the above needs
. identification of research deficiencies for consideration by relevant research organizations.

(See Annex 2 also)

9. Freshwater systems and hydrology (lead: Subgroup C, support: Subgroups B and D)

a. Summary, including methodologies, assumptions and scenarios.

b. System characteristics including associated ecosystem characteristics.

c. Impacts and ranges of, and sensitivities to, climate change
. regional changes of precipitation and evaporation (with WG I)
. river runoff, soil moisture and other water balance characteristics
. physical, chemical and biological processes in inland waters
. regional changes of droughts and other extreme events (with WG I).

d. Impacts on groundwater systems.
e. Adaptation options.
f. Research and monitoring needs.

B. Socio-economic systems

1. Energy supply (lead: Subgroup A; support: Subgroup D)

a. Summary, including methodologies, assumptions and scenarios.

b. Sector characteristics, including anticipated changes due to non-climate factors.

c. Impacts and ranges of, and sensitivities to, climate change.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Needs for future assessments.

2. Industry (lead: Subgroup A; support: Subgroup D)

a. Summary, including methodologies, assumptions and scenarios.

b. Sector characteristics, including anticipated changes due to non-climate factors (e.g., locations).

c. Impacts and ranges of, and sensitivities to, climate change.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)

. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Needs for future assessments.

3. Transportation (lead: Subgroup A; support: Subgroup B)

a. Summary, including methodologies, assumptions and scenarios.

b. Sector characteristics, including anticipated changes due to non-climate factors (e.g. locations).

c. Impacts and ranges of, and sensitivities to, climate change.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Needs for future assessments.

4. Human settlements (lead: Subgroup A; support: Subgroups B and D)

a. Summary, including methodologies, assumptions and scenarios.

b. Sector characteristics, including anticipated changes due to non-climate factors.

c. Impacts and ranges of, and sensitivities to, climate change
. waste management and disposal
. other issues.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Needs for future assessments.

5. Agriculture (Subgroup D)

a. Summary, including methodologies, assumptions and scenarios with special emphasis on the supply and security of food.

b. Rainfed/dryland cropping
- System characteristics, including anticipated changes due to non-climate factors (e.g. projected increases in demand, non-climate-related desertification).
- Impacts and ranges of, and sensitivities to, climate change on factors including local agroclimatic conditions, soil conditions, growth and yields of major regional crops (both annual and perennial) and incidence of pests and diseases.
- Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
  . contemporary and historical records
  . regional changes due to climate change
  . impacts
  . multi-stress factors.
- Adaptation options.

c. Irrigated cropping
   - System characteristics, including anticipated changes due to non-climate factors (e.g. projected increases in demand, non-climate-related desertification).
   - Impacts and ranges of, and sensitivities to, climate change on factors including local agroclimatic conditions, soil conditions, growth and yields of major regional crops (both annual and perennial) and incidence of pests and diseases.

   - Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
     . contemporary and historical records
     . regional changes due to climate change
     . impacts
     . multi-stress factors.
   - Adaptation options.

d. Animal husbandry and wild life management
   - System characteristics, including anticipated changes due to non-climate factors (e.g. projected increases in demand, non-climate-related desertification).
   - Impacts and ranges of, and sensitivities to, climate change on factors including local agroclimatic conditions, soil conditions, pasture growth and incidence of pests and diseases.
   - Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)

     . contemporary and historical records
     . regional changes due to climate change
     . impacts
     . multi-stress factors.
   - Adaptation options.

e. Agroforestry
   - System characteristics, including anticipated changes due to non-climate factors (e.g. projected increases in demand, non-climate-related desertification).
   - Impacts and ranges of, and sensitivities to, climate change on factors including local agroclimatic conditions, soil conditions, growth and yields and incidence of pests and diseases.
   - Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
     . contemporary and historical records
     . regional changes due to climate change
     . impacts
     . multi-stress factors.
   - Adaptation options.

f. Transition from unmanaged to managed land-use (e.g., savannahs, steppes)
   - System characteristics, including anticipated changes due to non-climate factors (e.g. projected increases in demand, non-climate-related desertification).
   - Impacts and ranges of, and sensitivities to, climate change on factors including local agroclimatic conditions, soil conditions, growth and yields and incidence of pests and diseases.
   - Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, desert locusts, drought)
     . contemporary and historical records
     . regional changes due to climate change
     . impacts
     . multi-stress factors.
   - Adaptation options.

g. Research and monitoring needs.

6. **Freshwater supply and quality (lead: Subgroup D; support: Subgroups B and C)**

   a. Summary, including methodologies, assumptions and scenarios.

   b. System characteristics, including anticipated changes due to non-climate factors (e.g., demographic trends, changes in technology, etc.).

   c. Impacts and ranges of, and sensitivities to, climate change
      . water demand
      . water quality
      . hydropower, recreation, and other sectors of water economy.

   d. Exploitation of surface and groundwater systems.

   e. Extreme events: temperature extremes, droughts and floods
      . contemporary and historical records
      . regional changes due to climate change.

   f. Adaptation options.
   g. Research and monitoring needs.

7. **Forestry (lead: Subgroup D; support: Subgroup C)**

   a. Summary, including methodologies, assumptions and scenarios for all types of forests.

   b. System characteristics, including anticipated changes due to non-climate factors (e.g., air pollutants).

   c. Socio-economic impacts of climate change
      . changes in wood supply
      . substitution of alternative species
      . changes in the structure of wood product markets
      . changes in forest industry and infrastructure consequences (due to shifts of forests and species)
      . changes in welfare of producers and consumers (including income, migration, employment)
      . changes in non-timber utilization of forests (e.g., recreation, hunting)

   d. Extreme events (e.g., storms, cyclones, fires, temperature and precipitation extremes, drought)
      . contemporary and historical records
      . regional changes due to climate change
      . impacts
      . multi-stress factors.

   e. Adaptation options
      . implications of silvicultural practices (e.g., sanitary fellings, change in harvest methods)
      . anticipatory planting
      . assisting natural migration (e.g., germplasm transference).

   f. Research and monitoring needs.

8. **Fisheries (lead: Subgroup B; support: Subgroups D and C)**

   a. Summary, including methodologies, assumptions and scenarios
      . fresh and salt water, including aquaculture
      . considerations from marine ecology.

   b. Sector characteristics, including anticipated changes due to non-climate factors
      . heavy utilization

. need for rebuilding
. growth in aquaculture.

c. Impacts and ranges of, and sensitivities to, climate change.

d. Extreme events (e.g., storms, cyclones, fires, temperature and precipitation extremes, drought)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options
f. Research and monitoring needs.

9. Financial services including insurance (lead: Subgroup B; support: all)

a. Summary, including methodologies, assumptions and scenarios.

b. Sector characteristics, including anticipated changes due to non-climate factors.

c. Impacts and ranges of, and sensitivities to, climate change.

d. Extreme events (e.g., storms, cyclones, fires, temperature and precipitation extremes, desert locusts, drought)
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.

f. Needs for future assessments.

C. Health (lead: Subgroup D; support: all)

a. Summary, including methodologies, assumptions and scenarios.

b. Sector characteristics, including anticipated changes due to non-climate factors.

c. Impacts of climate change on health
. direct
. indirect.

d. Extreme events (e.g., storms, cyclones, wildfires, temperature and precipitation extremes, drought).
. contemporary and historical records
. regional changes due to climate change
. impacts
. multi-stress factors.

e. Adaptation options.
f. Needs for future assessments.

III. ASSESSMENT OF MITIGATION OPTIONS

A. Energy supply (lead: Subgroup A; support: Subgroup D)

1. Description of energy sources (e.g., resource base, extraction and processing, storage and processing, storage and distribution), including a summary of greenhouse gas emissions for the sector (as determined by Working Group I) and relevant factors, including changes resulting from non-climate factors.

2. Mitigation options, including implementation measures, for energy supply (e.g., combustion efficiency, substitution by non-GHG-emitting or lower-

GHG-emitting energy sources), technical and socio-economic implications and constraints and their potential impacts.

B. Industry (lead: Subgroup A; support: Subgroup D)

1. Description of industries (including non-energy mining industries), their resource bases, materials and energy use patterns, including a summary of greenhouse gas emissions for the sector (as determined by Working Group I) and relevant factors, including changes resulting from non-climate factors.

2. Mitigation options, including implementation, for energy use, materials supply and use (e.g. energy and material use efficiency, material substitution and recycle, CFCs phase-out, aerosol emission controls), technical and socio-economic implications and constraints, and their potential impacts.

C. Transportation (Subgroup A)

1. Description of transportation modes and infrastructure, including a summary of greenhouse gas emissions for the sector (as determined by Working Group I) and relevant factors, including changes resulting from non-climate factors (e.g., demographic movements, urban planning and existing institutions).

2. Mitigation options, including implementation, for transportation modes and infrastructure (e.g fuel efficiency, fuel substitute, increased vehicle occupancy, modal shifts), technical and socio-economic implications and constraints, and their potential impacts.

D. Human Settlements including waste management and disposal (lead: Subgroup A; support: Subgroups B and D)

1. Description of greenhouse gas emissions from human settlements, including a summary of greenhouse gas emissions for the sector (as determined by Working Group I) and relevant factors, including changes resulting from non-climate factors (e.g., urban planning, institutional and behavioral factors).

2. Mitigation options, including implementation measures for human settlements (e.g. building/housing energy efficiency, district heating/cooling, trees and vegetation, urban planning), technical and socio-economic implications and constraints, and their potential impacts.

3. Mitigation options, including implementation measures for waste management and disposal (e.g. waste recycling and incineration, methane collection), technical and socio-economic implications and constraints, and their potential impacts.

E. Agriculture (Subgroup D)

1. Descriptions of the role rainfed/dryland and irrigated cropping systems, livestock management and agroforestry including production, storage, processing, transportation and marketing, and a summary of greenhouse gas emissions for the sector (as determined by Working Group I) and critical factors, including changes resulting from non-climate factors (e.g changes in projected demand or demographic changes).

2. Management practices to reduce emissions (mitigation options) for example, adapted soil management (e.g. increasing soil organic matter), input management (e.g. fertilizers, animal feeds), modifying land-use, improved residue management (for the different cropping/livestock systems). Evaluation of trade-offs between production alternatives, barriers to implementing changes in agricultural practices and response measures.

F. Management of forests (Subgroup D)

1. Description of forestry practices and sectors, including a summary of greenhouse gas emissions for all types of forests.

2. Forest management practices available to limit greenhouse gas emissions (including conservation and afforestation).

3. Tradeoffs between different forests management systems.

4. Evaluation of opportunities and barriers to implement options (institutional, social and economic).

G. Cross-Sectoral Options

1. Subgroup D: Land Use and Management.

Integrated approach to limit all greenhouse gas emissions to increase carbon storage (in soils and biomass) and to optimize food, bioenergy and biomaterial production.

2. All Subgroups:

Description of mitigation options (e.g., deep-sea carbon storage, sunlight screening, ocean biomass stimulation with iron, kelp plantation) and their potential impacts.

3. Subgroup A:

(i) Description and assessment of policy instruments (e.g. fiscal and financial instruments, public information, education, suasion, regulatory schemes) and their potential implications for mitigation: however, none of these tasks shall involve the Subgroup in making policy judgements.

(ii) Implications of mitigation options implemented in one sector on other sectors (e.g., impacts on supply by fuel switching in end-use sectors).

(iii) Needs for future assessments.

IV. SUMMARY OF METHODOLOGIES (all Subgroups)

This section will contain a summary description of methodologies developed by the Subgroups for use by countries interested in undertaking impact assessments and technologies options assessments. The detailed methodologies will be contained in Appendix A.

APPENDIX A: METHODOLOGIES

A. Methodologies for assessments of impacts and adaptation options.

B. Methodologies for assessments of mitigation options.

APPENDIX B: INVENTORY OF TECHNOLOGIES, METHODS AND PRACTICES

A. Adaptation

1. Coastal zones and small islands (Subgroup B)
2. Oceans, large lakes and marine ecosystems (lead: Subgroup B; support: Subgroup C)
3. Wetlands (non-coastal) (lead: Subgroup C; support: Subgroup D)
4. Grasslands and rangelands (including arid and semi-arid zones) (lead: Subgroup C; support: Subgroup D)
5. Mountain regions (lead: Subgroup C; support: Subgroup D)
6. Agriculture (Subgroup D)
7. Forestry (lead: Subgroup D; support: Subgroup C)
8. Freshwater supply and quality (lead: Subgroup D; support: Subgroups B and C)
9. Human settlements (lead: Subgroup A; support: Subgroups B and D)

B. Mitigation

1. Energy supply (lead: Subgroup A; support: Subgroups A and D)
2. Industry (lead: Subgroup A; support: Subgroup D)
3. Transportation (Subgroup A)
4. Waste management and disposal (lead: Subgroup A; support Subgroups B and D)
5. Human settlements (lead: Subgroup A; support: Subgroups B and D)
6. Agriculture (Subgroup D)
7. Management of forests (lead: Subgroup D; support: Subgroup C)

TERMS OF REFERENCE OF IPCC WORKING GROUP II

Working Group II should assess available scientific, technical, environmental, social and economic information regarding impacts of climate change and regarding response options to adapt to and/or mitigate climate change.

(a) It should consider, inter alia, the impacts of climate change on:

* vulnerable areas;
* resources and ecosystems;
* human activities.

Consideration should include assessment in each of these areas of the sensitivity at the regional and national level to the nature, rate and magnitude of potential climate change.

(b) It should consider, inter alia, assessments of future trends of net emissions of greenhouse gases, impacts of changing technology, adaptation to climate change, response options to adapt to climate change and response options to mitigate climate change by addressing future trends in the net emissions of all greenhouse gases and other factors of climate change, with particular attention given to the special needs of the developing countries.

(c) It should develop common methodologies, where needed, for application by those desiring to use them; such work should include the development of guidelines for making national assessments of the impacts of climate change, methodology to assess vulnerability to climate change and methodology to assess technology options.

The Panel agreed that the Working Group should carry out its terms of reference by forming four Subgroups as follows:

* **Subgroup A**, dealing, inter alia, with energy; industry; transportation; urban issues including related human settlements, air quality and health; waste management and disposal;

* **Subgroup B**, dealing, inter alia, with small islands and coastal zones; oceans and marine ecosystems; tropical cyclones, storm surges and sea level change;

* **Subgroup C**, dealing, inter alia, with unmanaged resources and terrestrial ecosystems, mountain regions, cryosphere, hydrology and terrestrial impacts of climate events such as floods;

* **Subgroup D**, dealing, inter alia, with desertification; droughts; agriculture; forests; land use including various forms of human settlements; health; management of water resources.

A peer review process should be incorporated in the preparation of the reports of the Working Group.

Details of the methodologies and workshops/conferences (Subgroup B)

Note: Please refer to sections II (7) and II (8) of the workplan for an explanation of the numbers on the left margin.

Appendix A, Methodologies

A. Methodologies for assessments of impacts and adaptation options

(8) 1. The Common Methodology to assess vulnerability in the coastal zone.

(8) 2. Concepts and tools for Integrated Coastal Zone Management Planning.

(10) 3. Systematic approach to data (analysis of need, gathering, handling, management, presentation).

Workshops/conferences

* Days 1 and 2 of the **World Coast '93** conference (The Hague, The Netherlands, November 1-5, 1993) and its pre-conference workshops (New Orleans, USA, 13-16 July 1993; Tsukuba, Japan, 3-6 August 1993).

* International workshop on ocean resources: climate change impacts and response options (including distributional changes in fisheries). Dates and venue to be decided.

PROPOSED TIME-LINE FOR THE WORK OF IPCC WORKING GROUP II

February 1993

- Working Group II meeting and Subgroup meetings to develop and approve workplan, discuss procedures, and agree to the extent possible on authors and workshops.

February to June 1993

- Governments suggest additional authors and workshops.

June 1993

- Subgroups agree on authors and workshops.
- IPCC Ninth Session approves workplan for WG II Second Assessment Report (SAR).

June 1993 to April 1994

- Workshops are held and authors prepare chapters.

April 1994

- Lead authors complete chapters.

April to October 1994

- Lead authors distribute chapters for review by experts, receive comments, revise chapters, and forward to Subgroup Co-Chairs.

October 1994

- IPCC Working Group II session - Subgroups adopt WG II SAR chapters in areas of responsibility.

October 1994 to February 1995

- Chapters assembled into full WG II SAR.
- Review of full WG II SAR by Governments.

February 1995

- IPCC Working Group II Session - Adoption of full WG II SAR

February to June 1995

- IPCC WGII Summary for Policy-Makers prepared by IPCC WG II Bureau and IPCC Secretariat, reviewed by Governments, and comments incorporated in a revised draft.

- Subgroup lead authors prepare summaries of any appropriate and important new information becoming available after April 1994 and not included in the chapters; summaries are reviewed by Governments.

June 1995

- Full WGII SAR revised where necessary by full Working Group to include any appropriate and important new information based on lead author summaries.

- IPCC Working Group II Session - Summary for Policy-Makers of WG II SAR adopted.

June to September 1995

- Preparation of the IPCC Second Assessment Report by IPCC Chairman and Secretariat.

September 1995

- IPCC Plenary - Adoption of IPCC Second Assessment Report.

APPENDIX D

WORKPLAN OF THE IPCC REORGANIZED WORKING GROUP III

Explanatory Notes

Scope of Work

The efforts of the newly reconstituted Working Group III of IPCC will be carried out in the manner described in this work plan. Attached, and forming part of the work plan are the outline of the themes to be considered in the Working Group III Second Assessment Report (SAR) (Annex 2) and the time-line for completion of various phases of the work (Annex 3).

The Working Group will, in accordance with its Terms of Reference (see Annex 1), prepare a comprehensive technical assessment of the socio-economics of mitigation of climate change, the impacts of climate change and adaptation to climate change over both the short and long term and at the regional and global levels. This contrasts with the work of Working Group II, which will be assessing the economic impacts on particular economic sectors at a more local level. Nevertheless, considerable collaboration between the two working groups will be necessary.

As reflected in United Nations General Assembly document A/AC.237/30 the chair of the Intergovernmental Negotiating Committee (INC) for the Framework Convention on Climate Change has requested that IPCC prepare, in time for the first meeting of the Conference of the Parties to the Convention (COP), "an evaluation of current scenarios of greenhouse gas[1] emissions and removals by sinks". The proposed time line addresses this request and assumes that the first meeting of the COP will take place in the spring of 1995. If this turns out not to be the case, the timing of activities shown that relate to the evaluation of scenarios would be adjusted accordingly. This element of the work is expected to build heavily on the work of the 1992 IPCC Update, which contained six greenhouse gas emissions scenarios. It is suggested that this work be carried out by examining the major assumptions made in developing the original scenarios and, based on whatever new information is available, assessing the validity and appropriateness of those assumptions and making recommendations on the need for updated or new scenarios. If it is agreed that new scenarios are needed, actions will have to be taken to develop them for the Second Assessment Report. The work on responding to the INC request will be closely co-ordinated with that on the same issue for the SAR by involving the same group of contributors. The IPCC Bureau is seeking clarification of the other elements of the INC's request, which raise cross-cutting issues which Working Group III may need to consider.

In evaluating scenarios and in developing its scientific and technical assessment, the Working Group proposes to undertake a number of specific activities, which are described in this work plan.

Principal Considerations

The work of the Working Group will be carried out with the following considerations in mind:

a) It will place the socio-economic perspectives of climate change in the context of sustainable development. In particular, and in accordance with the Framework Convention on Climate Change, the work of the Working Group will be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation and comprise all economic sectors.

[1] *Throughout this document, the term "greenhouse gas" is as defined in Article 1 of the Framework Convention on Climate Change*

b) Institution and endogenous capacity building in developing countries will be integrated into the work programme.

c) The work of the Working Group will not stand in isolation from other IPCC activities. Consultation and co-ordination with the activities of the other Working Groups will be carried out to the greatest extent possible.

d) The work will, to the greatest extent possible, build on existing work, recognizing that the IPCC role is one of assessing existing knowledge for the Second Assessment Report.

e) The activities of the Working Group will take into account the special situations of developing countries and economies in transition and will be carried out at a pace and be of a type that allows for the full involvement of these countries.

f) The work will be carried out in as cost-efficient a manner as possible, bearing in mind the limited resource capacity of IPCC and all member countries. This implies close co-operation with other bodies working in the same fields in order to avoid duplication of effort.

Activities of the Working Group

The Working Group will prepare a report comprising its contribution to the IPCC Second Assessment Report and containing a technical assessment of the state of knowledge of the socio-economics of climate change mitigation, adaptation and impacts, taking into account the factors described in part (a) of the Terms of Reference of the Working Group. It is proposed that the structure of this report follow the proposed outline of the themes shown in Annex 2.

The Working Group will also prepare a report, in time for the first meeting of the Conference of the Parties to the Convention, on the validity, appropriateness and utility of existing net greenhouse gas emissions scenarios based on the factors described in part (b) of the Terms of Reference of the Working Group. An update of this report, including any new scenarios that it is agreed should be developed, will be included in the Group's contribution to the IPCC SAR.

The preparation of both reports would be carried out as follows, using the dates indicated in the time line in accordance with the procedures described in the IPCC proposal for procedures for preparation, review and adoption of IPCC reports:

- The Bureau of the Working Group will ask governments and participating organizations to identify experts in their countries who could be involved as part of teams of lead authors, contributors, and expert reviewers for each report. Governments will also be asked to identify IPCC contacts for the purpose of co-ordinating later review by their governments.

- The Bureau of the Working Group will ask governments to suggest themes, dates and locations for IPCC workshops that could be held to review the scenarios and the scientific and technical work that is being assessed, bearing in mind the principal considerations noted above and the IPCC workshop policy. For reasons of economy and to avoid overlap and duplication, the Bureau will co-ordinate with other IPCC Working Groups and international organizations in conducting these workshops.

- Based on the suggestions of governments and participating organizations, the Bureau will meet with the Chair of IPCC and possibly with some of the experts identified, to decide on the detailed contents of each section of the reports, assign teams of lead authors for each section, and decide on which workshops should be held. The Bureau will also decide, from the perspective of Working Group III, whether IPCC co-sponsorship should be extended to other workshops, seminars or meetings.

- Lead authors will undertake preparation of the first drafts of each section and submit them to the Co-chairs, bearing in mind the tasks and responsibilities identified for contributors and themselves.

- The first drafts will be circulated for peer review to the specialists. Referenced material will be made available by the Co-chairs, who will collect the comments of the reviewers and make them available to the lead authors. Lead authors will then revise the drafts and if time permits in the schedule indicated in the time line, Co-chairs will circulate the revised drafts again for review.

- The revised drafts will be sent to governments and participating organizations for review.

- The summary for policy makers will be approved at a meeting of the Working Group in Plenary session and adopted by the Panel.

TERMS OF REFERENCE OF IPCC WORKING GROUP III

Working Group III should deal with cross-cutting economic and other issues related to climate change. Two issues have been identified below at this stage. The IPCC may add other issues at subsequent plenary sessions. The Working Group shall establish its work plan for tasks (a) and (b) below, which shall be available to the IPCC for subsequent review as its work proceeds.

(a) Technical assessments of the socio-economics of impacts, adaptation and mitigation of climate change over both the short and long term and at the regional and global levels. The work plan should, inter alia, consider the following topics: top-down and bottom up economic modelling while taking into account assumptions, variables and applicability to and in different national economic circumstances; the evolution of technological change; methods for risk assessment; methods for the generic assessment of response instruments provided, however, that none of these tasks shall involve the Working Group in making policy judgements.

(b) The Working Group should consider and develop as necessary a range of internally consistent scenarios for future emissions based on reasonable economic, demographic and technological projections, and taking account of gaps and uncertainties in available knowledge, especially concerning the evolution of socio-economic development and technology; where possible, policy assumptions should reflect their economic and social consequences. The scenarios are intended to assist Working Groups I and II in their assessment of a range of future changes of atmospheric composition, resulting climate changes, and their impacts.

This work should be carried out in consultation with Working Groups I and II.

A peer review process should be incorporated in the preparation of the reports of the Working Group.

OUTLINE OF THE THEMES TO BE CONSIDERED IN THE WORKING GROUP III SECOND ASSESSMENT REPORT

PREFACE

The preface will outline the mandate and terms of reference of the working group, describe how it went about producing the report, what the intended audience of the report is and the purposes for which the report should be used. The preface will note that none of the tasks shall involve the Working Group making policy judgements. Each chapter will also place the socio-economic perspectives of climate change in the context of sustainable development. The working group should analyze the issues as broadly as possible recognizing the Rio Declaration on Environment and Development, Agenda 21 and in particular the Framework Convention on Climate Change, as adopted.

EXECUTIVE SUMMARY

SUMMARY FOR POLICY-MAKERS

THE SECOND ASSESSMENT REPORT

The SAR consists of three parts. The first part addresses the scope of the assessment, and the remaining two parts address the mandate of the Working Group.

PART I: SCOPE OF THE ASSESSMENT

This assessment will include, inter alia, the socio-economic perspectives of climate change, the nature of the interactions between economic activity and climate change, and emissions scenarios. The assessment will address the global nature of the problem, taking into account particularly the circumstances of countries vulnerable to the impacts of climate change and to the impacts of response measures. In addition, it will cover a scientific evaluation of the appropriateness of the methodologies used for the analysis, including the socio-economic assumptions underlying existing modelling frameworks, its relations to observable data such as national accounts figures (GDP). To fulfil the scope of the analysis, existing supplementary indicators will be assessed.

PART II: THE SOCIO-ECONOMICS OF IMPACTS, ADAPTATION AND MITIGATION OF CLIMATE CHANGE

The mandate of the Working Group states that it should undertake "Technical assessments of the socio-economics of impacts, adaptation and mitigation of climate change over both the short and long term and at the regional and global levels. The work plan should, inter alia, consider the following topics: top-down and bottom up economic modelling...; the evolution of technological change; methods for risk assessment; methods for the generic assessment of response instruments...". For each theme in this part, a key question to be answered that addresses this section of the mandate has been identified.

CHAPTER 1: SOCIO-ECONOMIC FRAMEWORK FOR DECISION-MAKING

Key Question: How do we take socio-economic factors into account when making decisions about the climate change issue? The issues addressed under this theme will include, inter alia:

Socio-economics of climate change in relation to the need for sustainable development

Decision-making under uncertainty

The socio-economic factors to be considered when making decisions in the short and long term.

Risk assessment including, inter alia, discussion of the following questions:

What methods can be used to assess risk and what levels of confidence can be attached to such methods?
What are the perceptions of and responses to risk?
What are possible response measures?
What are the risks of inaction and of undertaking "no-cost" or cost effective "low-cost" response measures and of taking more far reaching response measures? (This section should take into account sequential decision-making, portfolio analysis, benefits and costs of taking action early versus late, and the long-term implications of short-term decisions).

Equity considerations including, inter alia:

Varying contributions between regions for past emissions, the "free rider" problem, efficiency and consumption patterns, inter-regional and inter-generational equity and the question of the time lags between the incurring of costs, the accruing of benefits and/or disbenefits.

Methods and applications of cost-benefit analysis including, inter alia:

Concepts such as opportunity costs, trade-offs, marginal costs and marginal benefits, limitations of cost-benefit analysis and consideration of alternative methodologies, and the value and importance of non-market factors such as biodiversity, long-term discounting, public perceptions, social well-being, thresholds and irreversibilities.

The value of information including, inter alia, discussion of the following:

Significant efforts are being undertaken every year on global climate research in the area of natural sciences. Where are the highest potential payoffs for likely future decisions? What are the most critical uncertainties, including scientific uncertainties? What kinds of research can reduce them and reinforce society's ability to confront uncertainty? What is the value of this scientific research in terms of its ability to describe the linkages between the natural sciences and socio-economics? What are the predictable trends of scientific and technical progress in efficiency of use of different energy types with respect to carbon intensity and in the adaptation of species to new climatic situations?

Sociological considerations

CHAPTER 2: ASSESSING THE BENEFITS OF RESPONSES TO CLIMATE CHANGE

Key Question: What methods exist for assessing the economic and social benefits of action and inaction? The issues addressed under this theme will include, inter alia:

Methods for estimating benefits

The status-quo option. What would be the socio-economic impacts in the absence of any action to deal with the problem of increasing concentrations in the atmosphere of greenhouse gases and aerosols? How would the benefits vary with different degrees and timing of actions to limit climate change?

Methods based on market impacts - for example, adaptation through trade, market agents, migration of population and economic activity.

Methods based on non-market impacts such as ecological and social impacts.

Major issues in estimating benefits

An assessment of the state of knowledge related to issues involved in estimating benefits, including, inter alia, distinguishing between short-term and long-term impacts; the relationship of impacts to the degree, timing and predictability of climate change; techniques for valuing impacts on ecosystems; hard-to-define values such as aesthetics, impacts on land use, impacts on biological diversity and other environmental problems, social well-being; and modelling limits dealing with thresholds, irreversibilities and time horizons.

Methods for estimating the costs of human adaptation

CHAPTER 3: EVALUATING THE COSTS OF MITIGATION OF GREENHOUSE GAS EMISSIONS BY SOURCES AND REMOVAL BY SINKS

Key question: What are economic, social and environmental contributions to understanding, both conceptually and empirically, the costs of mitigation of greenhouse gas emissions? The issues addressed under this theme will include, inter alia:

Variables for measuring costs

A discussion of costs from a long-term perspective, including, inter alia, measures such as social welfare, health and other environmental effects, real incomes, trade, productivity, and income transfers among regions.

Assumptions in empirical analysis including, inter alia:

- Modelling assumptions including uncertainties and ranges
- Technological change
- Macro-economic and demographic assumptions such as productivity growth, population and labour force change and structural change in economies
- Consumption patterns
- Fuel supply schedules, including the potential of renewable fuel and energy technologies, demand and supply elasticities and exchange rates
- Land use

Policy instruments, and their potential effects, for domestic and regional use including, inter alia:

- Economic instruments such as taxes, subsidies, tradeable permits, tradeable absorption obligations, user charges and deposit-refund schemes
- Regulatory instruments including technology-based and performance-based
- Other instruments such as land use programmes and public awareness and education programmes

Modelling Methods

A description of various types of models (eg. "top down" and "bottom up") according to purpose, and a discussion of their relative strengths and weaknesses, including, inter alia, a discussion of data limitations and limitations of model applications, the reasons for differences in the predictions made by them and ways to evaluate those results, and the integration of modelling techniques (eg. bottom up studies of new technologies). The appropriateness of the modelling methods should be discussed in relation to the problems of developing countries and should reflect the concerns and special conditions of developing countries. The models should include as many different policy instruments as possible.

Possible other issues include dynamic versus static models, econometric versus parametric models, perfect versus limited foresight in models, the treatment of international trade, model time horizons and how various modelling techniques could be integrated. Different policy options will be used to derive model outputs.

Model Comparisons

A comparison of results including, inter alia, distributional impacts and reasons for differences, the impact of response measures by industrialized countries on developing countries and a survey of the degree of dependency of countries on the production, exportation and consumption of fossil fuel and associated energy-intensive products. A special effort will be made to incorporate developing country studies.

Major issues of cost estimation

Potential topics include, inter alia, unilateral versus multilateral responses, with trading allowed or not; the timing of responses and the amounts of reductions; and other matters such as eliminating subsidies and recycling revenues.

Topics for future work

A discussion of the types of future research needed such as the integration of bottom up studies into macroeconomic and general equilibrium models, research into the impacts of sustainable development practices, and identification of future work needs, particularly regarding the needs of developing countries.

CHAPTER 4: GENERIC ASSESSMENT OF RESPONSE OPTIONS

Key question: What methods exist for assessing the net costs and effectiveness of different response options in a comprehensive manner?

The discussion of cost evaluation in each of these sections should incorporate a discussion of net costs and should include complementary socio-economic effects, both negative and positive, on such elements as GDP, employment levels, the balance of trade, economic structure, and the environment. The issues addressed under this theme will include, inter alia:

Adaptation options

A discussion of different options for developed countries, developing countries and those with special circumstances (e.g. low lying, arid, and countries in transition).

Mitigation options

A discussion of mitigation measures which should reflect, for example, the concept of comprehensiveness (all greenhouse gases and sinks and sectors), including, inter alia, reducing emissions by correcting market and government policy shortcomings, eliminating subsidies and barriers, dissemination of information and technology co-operation, and introducing economic instruments.

Methods for assessing the effectiveness of options including, inter alia, the use of models and the extent to which models incorporate the full range of options and conditions

Comparison within and between mitigation and adaptation response options

The comparison should include, inter alia, their cost effectiveness, their influence on innovation and promoting environmentally sound technologies, their influence on other environmental matters, their ease of administration monitoring and enforcement, their capacities to cope

with uncertainties, their data requirements and equity and sustainable development considerations.

Technological change

A discussion of the factors determining technological change as a driving force for, as well as a way to control net greenhouse gas emissions (e.g. renewable energy, low energy systems, carbon sequestration, etc.), taking into account the penetration, diffusion and transfer of technology and the different dynamics in developed and developing countries; and which of these factors can be influenced and how.

Internationally-coordinated instruments

A discussion of mechanisms such as "joint implementation", carbon leakages (shifts of carbon-intensive activities) linked to demographics, consumption patterns and economic growth of industrialized and developing countries, assistance and trade aspects, and the possibilities and difficulties of internationally co-ordinated instruments.

PART III: EMISSIONS SCENARIOS

CHAPTER 5: CONSIDERATIONS OF CONSISTENT SCENARIOS

The mandate of the Working Group states that it "should consider...a range of internally consistent scenarios for future emissions based on reasonable economic, demographic and technological projections." With this in mind, the key question to be answered is "Which issues and uncertainties about key variables may critically affect future net greenhouse gas emissions and aerosol concentrations?" The issues addressed under this theme will include, inter alia:

Types of models for scenario development and their application

The assumptions made in developing existing scenarios

A discussion of the key assumptions concerning, inter alia, economic growth, demographics, consumption patterns, technological change, energy prices and supply, international trade flows, distributional issues, social change, sustainable development, land use, and non-greenhouse gas environmental constraints such as acid rain.

The relative importance and sensitivity of different variables in determining future emissions and sinks

The relationships among key variables

The sensitivity of these variables, most notably to government actions

The relationship of scenarios to the emissions inventory methodology developed by Working Group I

- A number of country studies are being completed and could make a useful contribution to scenario analysis

The degree of uncertainty including, inter alia, a discussion of the following questions:

- What are the gaps and uncertainties in available knowledge about these factors and their influences on emissions?
- What does the extent of this uncertainty tell us about the validity of current scenarios? How do existing IPCC scenarios compare with other existing scenarios? Are new scenarios required?

- What are likely to be the impacts of this uncertainty on short and long-term future emission scenarios?

Model structures for analysis of scenarios including, inter alia, a discussion of the following questions:

- How useful are current models in terms of their regional detail, solution algorithms and data?

- What are the characteristics of current models?

- The sensitivity and flexibility of models to technical and structural assumptions

The appropriate uses, capabilities, and limitations of emissions scenarios in scientific assessment and policy-making

An assessment of the need for future work on scenarios to serve the needs of climate modelling, planning of response measures, and provision of information to the Conference of Parties to the Framework Convention on Climate Change

TIME-LINE FOR THE WORK OF IPCC WORKING GROUP III

	Second Assessment Report	Evaluation of Current Emissions Scenarios
Feb 1993	11: Meeting of the WGIII Bureau to formulate agenda and identify speakers for the first workshop	
Mar - May 1993	Development of draft work plan for the Second Assessment Report (SAR) by the WGIII Bureau	
May 1993	3-7: First session, including a workshop on the socio-economics of climate change and scenario assumptions. WGIII Plenary adopts work plan	
May 1993	Bureau call to governments and participating organizations for identification of lead authors for SAR	Bureau call to governments and participating organizations for identification of experts on scenarios
Jun 1993	14-16: OECD conference on the economics of climate change 28: IPCC Bureau meets 29-30: IPCC Ninth session approves work plan	
Jul 1993	29-30: WGIII Bureau meets to agree on lead authors and to assign responsibilities to them and to agree on workshops, based on the recommendations of governments and organizations	
Aug 1993	15: Deadline for country and organization submissions of nominations for lead authors, contributing authors and reviewers	
Sep 1993	Lead authors' meeting	
Sep 1993 - Jun 1994	Workshops are held and lead authors prepare first drafts of SAR chapters	
Oct 1993	IPCC Bureau meets to review collaborative mechanisms and to monitor progress of IPCC work	

Dec 1993	WGIII bureau participates in proposed WGI Bureau meeting to review progress of collaborative efforts	Experts meet to consider the full drafts of evaluation of current emissions scenarios for COP, which are then circulated for peer review to be completed by March 1994
Mar 1994		Peer review of draft of evaluation of current emissions scenarios completed. Experts prepare the first draft of material for the COP
Apr 1994		WGIII participates in proposed joint workshop with WGI and WGII on stabilization of atmospheric concentrations, regional climate change scenarios and implications for impacts assessments
Jun 1994		Final drafts of evaluation of current emissions scenarios for COP circulated for review by countries and organizations
Aug 1994	Co-Chairs distribute first draft of SAR chapters including draft executive summary and contributions for summary for policy makers	
Aug - Nov 1994	Lead authors revise draft of SAR based on peer review	
Oct 1994		WGIII meets to approve material for COP
Nov 1994	Revised draft of SAR circulated for review by countries and organizations	IPCC plenary approves evaluation of current emissions scenarios for COP
Feb 1995	Lead authors and WGIII Bureau prepare final draft of SAR including the summary for policy makers and circulate to all IPCC countries and organizations	
Mar - Jun 1995	Lead authors prepare summaries of any new material available since the last revision of the SAR chapters. The summaries are then peer reviewed and the SAR chapters revised if necessary based on these peer-reviewed author summaries	

Jun 1995	WGIII Plenary considers SAR chapters and approves summary for policy makers
Aug 1995	IPCC Plenary adopts SAR
Aug - Oct 1995	SAR printed and distributed

Note: Joint meetings of the Working Group II and Working Group III Bureaus will be scheduled at appropriate times

---

Workshops not sponsored by IPCC but useful for the work of Working Group III

July 1993	18-30: Meeting on carbon cycle modelling and projections of future atmospheric concentrations, Boulder, Colorado - proceedings and findings available by August, 1994
September 1993	13-17: Fourth international conference on CO_2 measurements and analysis, Carqueiranne, France
October 1993	13-15 (tentative dates): IIASA workshop on the interrelationships between adaptation and mitigation measures
	18-20: IIASA international conference on economic instruments for air pollution control

APPENDIX E

SAME AS ANNEX 4 OF APPENDIX B

OMM WMO

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

PNUE UNEP

No. 30526/M/IPCC/INC Geneva 1 March 1993

Dear Sir,

As I informed the INC/FCCC in December 1992, the IPCC is in the process of deciding on its work-plan for the next two and a half years. It has decided to complete its Second Assessment of the issue of climate change by September 1995. It has further decided to prepare a special report for the first session of the Conference of the Parties to FCCC (COP-1), expecting it to take place in the latter part of 1994 or in early 1995; this special report will be on issues of importance for the agenda items for the session and should be completed in mid-1994.

The IPCC Working Group I has accordingly decided to prepare four chapters for the special report on:

a. carbon cycle
b. atmospheric chemistry
c. atmospheric aerosols
d. radiative forcing.

Furthermore, work is in progress to develop a comparable methodology or methodologies for the assessment of greenhouse gases sources and sinks in order to provide common means to be used by those countries wishing to do so in the preparation of their reports to the first session of the Conference of the Parties. It should, however, be emphasized that this is not an easy task. The IPCC is, obviously, anxious to present methods that have been tested and are scientifically acceptable and is attempting to do its best in meeting the needs implicit in the Convention text. A report on this subject is expected in early 1994.

So far, there have been no plans by the reorganized IPCC Working Group II to initiate similar early assessments. The reorganized IPCC Working Group III will not have its first meeting until early May this year and will therefore hardly be in a position to complete any reviews to be included in the special report for COP-1.

Mr. J. Ripert
Chairman, INC
Climate Change Secretariat
Palais des Nations
8-14 Ave. de la Paix
1211 Genève 10

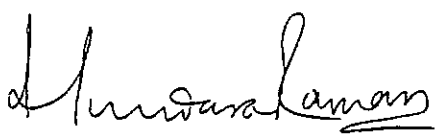
IPCC Secretariat, WMO, 41, Av. Giuseppe-Motta, C. P. N° 2300, 1211 Geneva 2 SWITZERLAND
Phone: +41 22 7308 215/254/284 Fax: +41 22 7331 270 Telex: 414199 OMM CH

The IPCC is presently modifying its review procedures for carrying out scientific/technical assessments, making them more stringent, and these procedures will necessarily require more time. This is, however, most important in order to assure that the final IPCC assessments are credible in the eyes of the scientific community and accordingly of best possible use to policymakers in the activities within the INC and later the Conference of the Parties to the Convention.

I reaffirm that the IPCC is anxious to respond as well as possible to the views and requests from the INC. But I also wish to inform the delegates here that work on any assessments that are not envisaged in the plan described above (namely the IPCC Second Assessment Report and the special report for COP-1) must begin immediately after the next IPCC session (Geneva, 29-30 June 1993), if they are to be part of the special report. Also, requests for extensive assessments can hardly be completed in time.

I know that the INC may not conclude its discussions relevant to, for example, the methodologies for greenhouse gases sources and sinks until August 1993. Nevertheless, the IPCC and I would be grateful if any requests or indications thereof from the INC can be transmitted to the IPCC by the end of May this year in order to permit discussions and a decision at the next session of the IPCC in June.

Yours sincerely,



for Bert Bolin
Chairman, IPCC

UNITED NATIONS
NATIONS UNIES

INTERGOVERNMENTAL NEGOTIATING COMMITTEE
FOR A FRAMEWORK CONVENTION ON CLIMATE CHANGE (INC/FCCC)

COMITÉ INTERGOUVERNEMENTAL DE NÉGOCIATION
D'UNE CONVENTION-CADRE SUR LES CHANGEMENTS CLIMATIQUES (CIN/CCCC)

18 March 1993

Dear Professor Bolin,

I thank you for your letter of 1 March 1993, inviting comments, which could be transmitted to the IPCC by the end of May this year for inclusion in the work programme of IPCC to be finalized at its June session.

Having consulted some of my colleagues on the Committee I can confirm INC's keen interest in and requirement for the preliminary assessment of significant changes in the state of knowledge about the science of climate change, including an assessment of the relative forcing of different greenhouse gases. I note that IPCC will prepare this special report for the first session of the Conference of the Parties and that it should be ready in the latter part of 1994. Likewise, the development of comparable methodologies for inventories of greenhouse gases and, particularly, sinks is of key interest to INC, in the context of Articles 4 and 12 of the Convention.

Another area in which the INC would appreciate the views of IPCC will be in assessing significant changes in the state of knowledge of the impacts of climate change, including e.g. ecosystem sensitivity and relevant technical, social and economic information.

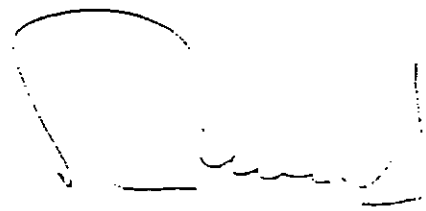
Also an evaluation of current scenarios of greenhouse gas emissions and removals by sinks will be necessary. Further, in accordance with Article 4.2 (b) of the Convention the INC will develop, for use by the Conference of the Parties, criteria for the review of information submitted by developed countries . These will include methodologies for assessing the global results of measures. The technical inputs of IPCC on these matters would be appreciated.

Professor B. Bolin
Chairman, IPCC
IPCC Secretariat
World Meteorlogical Organization
Case postale 2300
1211 Geneve 2

CLIMATE CHANGE SECRETARIAT
15, Avenue Jean Trembley, 1209 GENEVE
Telephone: (41.22) 798.58.50 / 798.84.00
fax: (41.22) 788.38.23

With the above types of information the INC will be in a position to prepare for the necessary action by the COP at its first session, in accordance with the provisions of the Convention. These matters will be discussed by the INC Working Group I during its August 1993 session. I would be grateful therefore if you could keep INC informed of progress in the work of IPCC.

Yours sincerely,



(Raul Estrada-Oyuela)
Chairman, INC.

APPENDIX G

IPCC PROCEDURES FOR PREPARATION, REVIEW, ACCEPTANCE, APPROVAL AND PUBLICATION OF ITS REPORTS

Introduction

The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. IPCC assessments should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies.

Review is an essential part of the IPCC assessment process. Since the IPCC is an intergovernmental body, review of IPCC documents should involve both peer review by experts and review by governments.

This paper contains the procedures for the preparation of IPCC reports which are to be published and sets out the requirements for planning within the work programmes necessary to ensure that IPCC review is carried out on a wide and representative basis and that proper provision is made for acceptance and approval processes.

IPCC Published Reports

Four categories of IPCC-published reports can be identified, each with particular requirements for review, acceptance or approval [1]:

- Supporting material
- Reports accepted by Working Groups
- Reports approved by Working Groups and accepted by the Panel
- Reports approved by the Panel.

Supporting Material

Supporting material consists of (i) published reports and proceedings from workshops, seminars and meetings within the scope of the IPCC work programme that have IPCC recognition, and (ii) material commissioned by Working Groups and Subgroups in support of the assessment process which IPCC decides should have wide dissemination. Procedures for the recognition of workshops, seminars and meetings are given in annex 1.

Arrangements for publication of supporting material should be agreed as part of the process of IPCC recognition or in commissions from Working Groups or Subgroups to prepare specific supporting material. All supporting material should be formally and prominently described on the front and other introductory covers as:

> "Supporting material prepared for consideration by the Intergovernmental Panel on Climate Change. This supporting material has not been subjected to formal IPCC review processes."

Reports Accepted by Working Groups

Reports presented for acceptance by the Working Groups at Plenary level consist principally of the full scientific and technical assessments of Working Groups I, II and III. Methodologies, such as the Methodology on Emissions Inventories and the Preliminary Guidelines for Impacts Assessments, also fall into this group, as do interim reports on particular topics requested by the Panel (e.g., reports prepared in response to the requirements

---

[1] The Panel agreed that definitions of the terms "acceptance" and "approval" should be communicated well to the reader in the IPCC published reports.

of the Framework Convention on Climate Change). The subject matter of these reports shall conform to the terms of reference of the Working Group and to the work plan approved by the Panel.

Reports in this category will undergo a full expert and government review. The objective of this review is to ensure that the reports present a comprehensive, objective, and balanced view of the areas they cover. While the large volume and technical detail of this material places practical limitations upon the extent to which changes to these reports will normally be made by Working Groups or Subgroups at Plenary level, "acceptance" signifies the view of the Working Group that this objective has been achieved.

Reports accepted by Working Groups should be formally and prominently described on the front and other introductory covers as:

> "A report accepted by Working Group X of the IPCC but not approved in detail."

It is essential that Working Group and Subgroup work programmes allow proper time in their schedules for a full review by experts and governments to be carried out. The Working Group and Subgroup co-chairs are responsible for implementing the work programme and ensuring that proper review of the material occurs in a timely manner.

To ensure proper review, the following steps should be undertaken:

1. Compilation of lists of lead authors contributors, expert reviewers and government contacts:

At the request of Working Group or Subgroup co-chairs, all countries and participating organizations should identify their appropriate experts for each Working Group and Subgroup area who can act as potential lead authors, contributors or reviewers. To facilitate later review by countries, governments should also designate their respective IPCC Contacts. These should be assembled into lists available to all IPCC members and maintained by the Working Group or Subgroup co-chairs. The tasks and responsibilities of lead authors, contributors, expert reviewers and government contacts are outlined in annex 2.

2. Organisation of Work:

Preparation of the first draft of a report should be undertaken by lead authors identified by the relevant Working Group bureau from those experts cited in the lists provided by all countries and participating organizations, with due consideration being given to those known through their publication or work. In sofar as practicable, the composition of the group of lead authors for a section of a report shall reflect fair balance among different points of view that can reasonably be anticipated by the Working Group bureau, and should include at least one expert from a developing country.

At the earliest opportunity, Working Groups and Subgroups should inform all IPCC participating countries and organizations about who the lead authors are and the areas they are covering. Experts who wish to contribute material for consideration in the first draft should submit it directly to the lead authors. Contributions should be in the form of text specifically written for the draft report and supported as far as possible with references from the peer-reviewed and internationally-available literature, and with pre-prints of any unpublished material cited; clear indications of how to access the latter should be included in the contributions.

Lead authors will work on the basis of these IPCC contributions, the peer-reviewed and internationally-available literature including scientific and technical publications prepared by national governments and scientific bodies, the latest reports from researchers that can be made available in pre-print form for IPCC review, and IPCC supporting material.

In preparing the first draft, and at subsequent stages of review, lead authors should clearly identify disparities of view for which there is significant scientific or technical support, together with the relevant arguments.

3. Review by Experts:

First draft reports should be circulated by Working Group or Subgroup co-chairs for review by experts. The review circulation should include:

- specialists who have significant publications in particular areas;
- lead authors, contributors and reviewers on the IPCC lists maintained by the Working Group and Subgroup co-chairs;
- IPCC participating countries and organizations;
- specialist reviewers nominated by appropriate international scientific and technical organisations (e.g., WMO, UNEP, ICSU, Third World Academy of Sciences, FAO, IOC, World Bank, Regional Development Banks, OECD).

The Working Group and Subgroup co-chairs should make available to reviewers specific material on request referenced in the document being reviewed which is not available in the international published literature.

Comments by reviewers should be made available to the appropriate lead authors.

Lead authors, in conjunction with Working Group and Subgroup co-chairs, are encouraged to supplement the draft revision process by organizing a wider meeting with principal contributors and reviewers, if time and funding permit, in order to pay special attention to particular points of assessment or areas of major differences.

The time schedule allowed for return of review comments will be constrained by the IPCC work schedule, but normally should not be less than six weeks, except when special circumstances permit only one month. More time may be required for some material. If time allows, a revised draft incorporating comments, together with any appropriate summary, should be circulated again for review by experts.

Contributors and reviewers should make full use of the draft and revised report review procedures to pursue the incorporation of their contributions in the report at the earliest opportunity.

4. Review by Governments:

A revised draft should be distributed by Working Group co-chairs to governments through the designated IPCC government contacts, and to all the original contributors and reviewers.

Governments should send one integrated set of comments for each Working Group report to the appropriate Working Group co-chairs through their IPCC government contacts. They may wish to organize their own mechanisms for consulting experts in preparing their responses. Working Group and Subgroup co-chairs should arrange for a full record to be kept of all comments received and, upon specific request, should make them available.

To facilitate government review, non-government reviewers should send their further comments to Working Group co-chairs with a copy to their appropriate government IPCC contact.

The time available for return of government reviews should not be less than six weeks.

Preparation of a final draft report for submission to Working Group Plenary should be undertaken by lead authors, and Working Group and Subgroup co-chairs as appropriate. If necessary, and timing and funding permit, a wider meeting with principal contributors and reviewers is encouraged in order to pay special attention to particular points of assessment or areas of major differences. It is important that reports describe different (possibly controversial) scientific or technical views on a subject, particularly if they are relevant to the political debate. The final draft should credit all lead authors, contributors, expert reviewers and country reviewers by name and affiliation.

5. Acceptance of the Report:

A final draft taking into account country comments should be distributed to all IPCC participating countries and organizations not less than three weeks prior to a Working Group Plenary meeting called to accept the report and transmit it to the IPCC Plenary. It is for the Working Group co-chairs to assess the time necessary for completing action in a timely manner, according to the complexity of the task and to the amount of work already in hand within the IPCC or other bodies already working in the field.

Reports Approved by the Working Groups and Accepted by the Panel

Reports approved by the Working Groups and accepted by the Panel will principally be the three Executive Summaries and the three Summaries for Policymakers, prepared by the respective Working Groups, of their full scientific and technical assessments. The Summaries should be subject to review by both experts and governments and to final line-by-line approval at a Plenary meeting of the appropriate Working Group. Responsibility for preparing first drafts and revised drafts of the Executive Summaries and the Summaries for Policymakers lies with the respective Working Group and Subgroup co-chairs as appropriate. The Summaries may be prepared concurrently with the preparation of the main Working Group reports or following the acceptance of these reports by the Working Groups. Not less than six weeks should be allowed for the review of the draft summaries, and the final draft for line-by-line approval should be submitted to the Working Group not less than one month before the Working Group meeting to approve the Summaries.

Approval of the Executive Summary and the Summary for Policymakers by the Working Group Plenary signifies that they are consistent with the factual material contained in the full scientific and technical assessment accepted by the Working Group. These Summaries should be formally and prominently described as:

"A Report of Working Group X of the Intergovernmental Panel on Climate Change."

Working Group approval of the Summary for Policymakers constitutes approval by the full Panel because the approval process is open to all countries. However, it is necessary to review the reports in general, note any substantial disagreements, and formally adopt them in order to prepare a synthesis IPCC report.

All Summaries should be transmitted to the full Panel at least one month ahead of the IPCC session at which the IPCC report is to be approved. More time may be necessary depending on the nature of the report.

Reports Approved by the Panel

The Panel will base its synthesis report on a review of the Working Groups' Summaries, will record any substantial disagreements not already taken into account and will include the Summaries in its report.

The IPCC synthesis report is intended to provide an overview and synthesis of the Executive Summaries and the Summaries for Policymakers of the Working Groups. It should receive full review by participating governments and organizations.

Initial drafting of the IPCC synthesis report will be undertaken by the IPCC Chair and Working Group Co-Chairs. The draft should be made available for government and participating organization review for not less than six weeks. The revised draft should be made available to participating governments and organizations not less than one month before the Panel Plenary meeting called for the purposes of line-by-line approval of the draft.

The report consisting of the IPCC synthesis report and the Summaries of the Working Groups is an IPCC report and should be formally and prominently described as:

"A Report of the Intergovernmental Panel on Climate Change."

IPCC WORKSHOP POLICY

IPCC workshops, seminars and meetings are those that have been agreed in advance by an IPCC Working Group or by the Panel as useful or necessary to completion of the Working Group's work plan or a task of the IPCC. Only such activities may be designated as "IPCC" workshops, seminars or meetings. Their funding should be assured in advance from sources other than the IPCC regular budget and should include provision for participation of experts from developing countries and countries with economies in transition.

The proceedings of IPCC workshops, seminars and meetings should normally be published. Such proceedings should:

- include a full list of participants
- indicate when and by whom they were prepared
- indicate whether and by whom they were reviewed prior to publication
- acknowledge all sources of funding and other support
- indicate prominently at the beginning of the document that the activity was held pursuant to a decision of the relevant Working Group or the Panel but that such decision does not imply Working Group or Panel endorsement or approval of the proceedings or any recommendations or conclusions contained therein.

IPCC co-sponsorship may be extended to other workshops, seminars or meetings if the IPCC Chairman, as well as the Co-chairmen of the relevant Working Group and, where appropriate, the Co-chairmen of the relevant Subgroup determine in advance that the activity will be useful to the work of the IPCC. IPCC co-sponsorship of such an activity does not convey any obligation by the IPCC to provide financial or other support. In considering whether to extend IPCC co-sponsorship, the following factors should be taken into account:

- whether full funding for the activity will be available from sources other than the IPCC
- whether the activity will be open to government experts as well as experts from non-governmental organizations participating in the work of the IPCC
- whether provision will be made for participation of experts from developing countries and countries with economies in transition
- whether the proceedings will be published and made available to the IPCC in a time frame relevant to its work
- whether the proceedings will:
  - include a full list of participants
  - indicate when and by whom they were prepared
  - indicate whether and by whom they were reviewed prior to publication
  - specify all sources of funding and other support
  - prominently display the following disclaimer at the beginning of the document:

"IPCC co-sponsorship does not imply IPCC endorsement or approval of these proceedings or any recommendations or conclusions contained herein. Neither the papers presented at the workshop/meeting/seminar nor the report of its proceedings have been subjected to IPCC review."

TASKS AND RESPONSIBILITIES FOR LEAD AUTHORS, CONTRIBUTORS AND EXPERT REVIEWERS OF IPCC REPORTS AND IPCC GOVERNMENT CONTACTS

1. LEAD AUTHORS (LAs)

Functions — To produce designated sections addressing items of the work programme on the basis of the best scientific and technical information available.

Comment — Lead authors will typically work as small groups which have responsibility for ensuring that the various components of their sections are brought together on time, are of uniformly high quality and conform to any overall standards of style set for the document as a whole.

The task of lead authors is a demanding one and in recognition of this the names of LAs should appear prominently in the final report. During the final stages of report preparation, when the workload is often particularly heavy and when lead authors are heavily dependent upon each other to read and edit material, and to agree to changes promptly, it is essential that the work should be accorded the highest priority.

The essence of the lead authors' task is synthesis of material drawn from the peer reviewed literature, generated at workshops or submitted by contributors. Lead authors may not necessarily write original text themselves, but they must have the proven technical ability to develop text that is scientifically sound and that faithfully represents, to the extent that this is possible, contributions by a wide variety of experts. The ability to work to deadlines is also a necessary practical requirement.

Principles Governing IPCC Work require LAs to record views which cannot be reconciled with a consensus view but which are nonetheless scientifically or technically valid.

Lead authors may convene meetings with contributors, as appropriate, in their preparations of their sections and to suggest any workshops in their relevant areas to the Subgroup or Working Group co-chairs.

2. CONTRIBUTOR

Function — To prepare technical information in the form of text, graphs or data for assimilation by the lead authors into the draft section.

Comment — Input from a wide range of contributors is a key element in the success of IPCC assessments, and the names of all contributors should be acknowledged in the reports. Contributions are sometimes solicited by Lead Authors but unprompted contributions are positively encouraged.

Contributed material may be edited, merged and if necessary, amended, in the course of developing the overall draft text.

3. EXPERT REVIEWER

Function — To comment on the accuracy and completeness of the scientific/technical content and the overall scientific/technical balance of the drafts.

Comment — Expert reviewers will comment on the text according to their own knowledge and experience. They may be nominated by Governments, national and international organizations, Working Group Bureaus, Lead Authors and contributors.

4. GOVERNMENT REVIEW

Function — To comment on the accuracy and completeness of the scientific/technical content and the overall scientific/technical balance of the drafts.

Comment — Government review will typically be carried out within and between a number of Departments and Ministries. Countries may convene their own seminars and workshops to review draft reports and advise on comments. For administrative convenience, countries should nominate a single IPCC Government Contact.

IPCC BUDGET AND OTHER SUPPORT
17 JUNE 1993

(Submitted by the Secretary, IPCC)

1. Introduction

1.1 Accounting in the IPCC Trust Fund which is operated under the WMO Financial Regulations is on a biennium basis. The current biennium spans Calendar Years (same as Fiscal Years) 1992 and 1993. Audited accounts for the 1992-1993 biennium will be available after April 1994.

1.2 This document contains:

a. a status report of the IPCC Trust Fund for the period from 1 January 1992 to 17 June 1993;
b. the budget estimate for "core activities" for the balance of the period until the completion of the IPCC Second Assessment Report;
c. a list of unbudgeted activities;
d. a renewal of the plea for increased and timely contributions to the Trust Fund.

1.3 All amounts cited in this document are in Swiss Francs (CHF) unless otherwise stated.

2. Status of the Trust Fund as of 17 June 1993

The receipts and expenditures/commitments as of 17 June 1993 are given below.

2.1 Receipts in the Trust Fund between 1 January 1992 and 17 June 1993

2.1.1 The receipts and the pledges are shown in table 1 below.

TABLE 1

Contributor	Trust Fund (General)	Targeted Activity	Pledges (estimated CHF)
1992 contributions and carry-over from 1991	2,865,345		
Australia	99,078	74,616[1]	
Canada	120,000	18,000[2]	360,000
Germany			160,000
Sweden	17,433	7,117[3]	
Switzerland	200,000	50,000[4]	
UK	191,302	43,142[5]	218,000
USA	595,590	86,000[6]	
CEC	17,840[7]	80,000[8]	160,000
UNEP	125,000		
WMO	125,000		
TOTAL	4,356,588	358,875	898,000

(1) : Support to World Coast 1993 (53,298) and associated Tsukuba pre-conference workshop (21,318)
(2) : Support to regional workshop on methodology for national net emissions of greenhouse gases (South America)
(3) : Support to the pre-World Coast 1993 workshop, New Orleans
(4) : Direct contribution to WG I Technical Support Unit for the methodology on national net emissions of greenhouse gases
(5) : Support to the pre-World Coast 1993 workshop, New Orleans
(6) : Support to the pre-World Coast 1993 workshop, New Orleans
(7) : Balance of the 1992 pledge
(8) : Support to World Coast 1993

2.1.2 It may be seen from table 1 that receipts in the Trust Fund (excluding those for targeted activities) through 17 June 1993 amount to 4,356,588.

2.1.3 The 1993 (through 17 June 1993) contributions for targeted activities have been included in table 1. However, these are not taken into account in estimating shortfalls / surpluses in the Trust Fund, since all the amounts meant for targeted activities have to be spent for those activities. There is an unspent balance of 57,285 associated with the activity on national net emissions of greenhouse gases, which includes a carry-over of 39,285 from 1992.

2.1.4 Annex 1 lists the countries which have contributed to the Trust Fund over the years.

2.2 Expenditures/commitments between 1 January 1992 and 17 June 1993

2.2.1 The summary of expenditures and commitments for 1992 and 1993 (the latter through 17 June 1993) are given in table 2 below. These are in 3 categories:

* category 1: support to representatives / experts from developing countries and, since August 1992, the newly-emerging and other states with economies in transition for participation in IPCC meetings; see annex 2 for the list of countries supported;

* category 2: meeting costs such as (i) interpretation/ translation, (ii) hire of temporary staff and equipment such as PCs and photocopiers, (iii) conference hall costs, (iv) secretariat travel associated with IPCC meetings, (v) support to host countries, (vi) hospitality.

* category 3: IPCC Secretariat costs which include (i) the person-year costs of the 3 clerical/secretarial assistants, (ii) travel such as to INC/FCCC and UNEP Governing Council sessions, (iii) photocopying reports for distribution, for e.g., to INC/FCCC, (iv) communication, mailing, equipment and supplies;

TABLE 2

	1992 Paid	1992 Committed	1993 Paid	1993 Committed through 17.VI.93
Category 1	1,457,096	41,602	309,676	997,716
Category 2	771,982	18,125	148,621	217,664
Category 3	350,125	5,149	140,102	155,135
TOTAL	2,579,203	64,876	598,399	1,370,515

2.2.2 The estimated IPCC Secretariat costs for the balance of 1993 for communication, mailing, equipment and supplies amount to 66,000 (see document IPCC-VII/Doc. 12, Add.1 dated 10.II. 1992). This does not include the costs of contract renewals for the 3 clerical/secretarial assistants in the secretariat (see sections 3.3 and 5 below). Thus,

THE TOTAL EXPENDITURES/COMMITMENTS FOR 1992/1993 FROM TABLE 2 IS 4,612,993

2.3 **Status of the Trust Fund as of 17 June 1993**

It may be seen from tables 1 and 2, that the cash deficit in the Trust Fund on 17 June 1993 was 256,405.

2.4 **The way cash deficits are now handled in the Trust Fund**

Whenever there is a cash deficit in the Trust Fund at the time of a scheduled IPCC activity, the Secretary-General of the WMO authorizes the advance of "hold-back" funds from the WMO Regular Budget to make up the deficit. Such advances are repaid upon receipt of remittances in the Trust Fund. Under mutual agreement between the new Executive Director of UNEP and the Secretary-General of WMO, such hold-back advances will henceforward be shared equally by UNEP and WMO. Nevertheless, this arrangement stresses the Regular Budgets of WMO and (henceforth) of UNEP, when they themselves are experiencing cash flow difficulties and shortfalls in receipts. The persistent cash flow problem in the IPCC Trust Fund is very troublesome, since it places the sponsoring organizations in an awkward position.

3. Budget estimate for "core activities" for the balance of the period until the completion of the IPCC Second Assessment Report

The Second Assessment Report (SAR) is expected to be completed in or about October 1995. In the interim, the IPCC will prepare a Special Report for the first session of the Conference of the Parties to the Climate Convention (COP-1), with the expectation that the latter will take place in early 1995.

3.1 **Suggested schedule for the "core activities" of the IPCC until the completion of SAR**

3.1.1 The core activities are (i) the meetings of the IPCC and of its Bureau and Working Groups (WGs), and (ii) the maintenance of the IPCC Secretariat.

3.1.2 Four sessions of the IPCC Bureau and 2 sessions each of the IPCC and its 3 Working Groups are suggested between now and the time of the completion of the SAR. Under this schedule:

* the Bureau would meet towards the end of 1993, once in 1994 and twice in 1995;

* the IPCC would meet once in 1994 and once in 1995;

* the Working Groups would meet once each in 1994 and again once each in 1995.

3.2 **Costs of the core sessions**

3.2.1 The following assumptions are made in estimating the costs of the core sessions:

a. all sessions will take place in Geneva;

b. the IPCC will meet for 3 days in 1994 and 4 days in 1995 (the 1995 session may also have to elect a new Bureau, assuming that the IPCC continues);

c. the Working Groups will meet every time in 4-day sessions;

d. travel support will be extended to an increased number, i.e., 100 experts/ representatives, one per country, from developing countries/ countries with economies in transition to each of the sessions in (b) and (c) above. The estimate of average cost per trip is 6,300;

e. the IPCC Bureau will meet in 2-day sessions;

f. the meeting cost per day of a session is 39,000.

3.2.2 Using the information given in para 3.2.1 above, the cost of these sessions can be estimated as follows.

TABLE 3

Activity	Support for developing countries	Meeting costs	Sub-total
Bureau 7, 1993	75,600	78,000	153,600
Working Group I, 1994	630,000	156,000	786,000
Working Group II, 1994	630,000	156,000	786,000
Working Group III, 1994	630,000	156,000	786,000
Bureau 8, 1994	75,600	78,000	153,600
IPCC-10, 1994	630,000	117,000	747,000
Bureau 9, 1995	75,600	78,000	153,600
Working Group I, 1995	630,000	156,000	786,000
Working Group II, 1995	630,000	156,000	786,000
Working Group III, 1995	630,000	156,000	786,000
Bureau 10, 1995	75,600	78,000	153,600
IPCC-11, 1995	630,000	156,000	786,000
Total	5,342,400	1,521,000	6,863,400

3.3 IPCC Secretariat costs

3.3.1 The current fixed annual costs for the IPCC Secretariat are 400,000 (see document IPCC-VII/Doc. 12, Add.1 dated 10.II.1992). Current contracts for the 3 clerical/secretarial assistants would need to be renewed in October and November 1993. Two of the assistants are on 6 month-contracts and the other is on a one-year contract.

3.3.2 The person-year cost and the cost of housing the IPCC Secretariat are borne by the WMO while the person-year cost of the Senior Programme Officer in the IPCC Secretariat is borne by UNEP; under a Memorandum of Understanding, WMO and UNEP also make annual cash contributions of 125,000 each to the IPCC Trust Fund.

3.4 Summary of the budget estimate

The budget estimate for the core activities of the IPCC for the balance of the period until the completion of the SAR is given in table 4 below.

TABLE 4

	1993	1994	1995
IPCC Secretariat costs[1]	466,000	400,000	400,000
Support to developing and other countries[2]	75,600	2,595,600	2,671,200
Meeting costs[2]	78,000	663,000	780,000
TOTAL	619,600	3,658,600	3,851,200

[1]: Vide paras 2.2.2 and 3.3.1
[2]: See table 3.

4. Unbudgeted activities

4.1 The IPCC work programme requires more than its core activities; it includes programme-related meetings, translation and publication of IPCC material.

4.2 Meetings

It is suggested that the following meetings form a minimum set to implement the IPCC work plan. The Panel and the Working Groups may wish to alter or add to this list. A budget estimate can be developed for the meetings once the number of lead authors and the number and nature of the meetings are known:

* individual and joint coordination meetings of the Bureaux of the Working Groups;

* meetings of lead authors; lead authors may need to meet (i) once in a pre-drafting session, (ii) twice before the completion of the special report for COP-1, once for review and revision of the draft after the expert (peer) review and once after the governmental review in 1994 and (iii) twice in 1995 before the completion of the SAR, in a same schedule as in 1994;

* coordination meetings between lead authors of different Working Groups;

* regional workshops of the Working Groups;

* meetings/workshops/seminars associated with the finalization and dissemination of and training in the methodology for national net emissions of greenhouse gases; this may apply to other IPCC methodologies also.

4.3 Translation

4.3.1 The working language of the IPCC is English. Only selected documents/reports of the IPCC are now translated, either in part or fully, into all the official UN languages (see some examples below). This is due to lack of adequate funds. The selection, when made, is by the IPCC Secretariat and depends entirely on the funds available.

* Documents such as the agenda of sessions and letters of invitation to IPCC meetings are routinely translated into all the official UN languages.

* The 1990 IPCC Overview and the Policymaker Summaries and the 1992 IPCC Supplement were translated into all the official UN languages.

* Some reports such as that of the eighth session of the IPCC are translated in part in all the UN languages (the part on ceremonial matters and appendices such as the list of participants and budget matters are normally not translated).

* Some documents such as documents 3 and 6 for this ninth session of the IPCC (proposal on procedures) are translated into selected UN languages, in this case, into French and Spanish.

* The 1990 Scientific Assessment Report, the 1990 Impacts Assessment Report and the 1990 Report on Response Strategies were translated into Chinese, French, Russian and Spanish through courtesy of the Governments of China, Canada, the former USSR and Spain respectively.

4.3.2 The cost of translation is approximately CHF 100 per page per language.

4.4 Publication and distribution

4.4.1 As indicated in page 6 of document IPCC-VIII/Doc. 8 dated 21.IX.1992, the cost of publication runs to about CHF 50,000 per 5,000 copies of a 200-page report. Colour plates would cost extra (CHF 3000 per plate). The quality would not be the same as the Cambridge University Press or similar publication.

4.4.2 Given below is the way the IPCC publications have been handled in the past:

* The 1990 scientific Assessment Report (Working Group I), the 1990 Impacts Assessment Report (former Working Group II) and the 1990 Report on Response Strategies (former Working Group III) were published and distributed through courtesy of the Governments of the United Kingdom, Australia and the United States respectively; 600 copies of the first and 2000 copies of the other two were made available free of charge to the IPCC Secretariat for distribution to developing countries and countries with economies in transition;

* The 1990 IPCC Overview and Policymaker Summaries and the 1992 IPCC Supplement were published in a single volume by a consortium of countries, with lead taken by Canada. These are in English, French and Spanish;

* The Spanish version of the 1990 Reports of the 3 Working Groups were published and were or are being distributed by the Government of Spain;

* The French version of the 1990 Reports of the 3 Working Groups have been prepared in the final publication form by the IPCC Secretariat and are ready for publication and distribution;

* Many reports of IPCC workshops (e.g., the Canberra Workshop on Agriculture & Forestry in relation to Global Climate Change, the Margarita Island workshop on the Rising Challenge of the Sea, the Berkeley workshop on Country Studies) have been published by the sponsoring governments;

* the 1992 Science Supplement was published and distributed through courtesy of the Government of the United Kingdom; 800 copies were provided to the IPCC Secretariat free of charge for distribution to the developing countries and countries with economies in transition.

5. Summary of the financial requirements from now until the completion of the SAR

The current situation can be summarized as follows:

a. the cash deficit in the IPCC Trust Fund as of 17 June 1993 is 256,405 (see para 2.3);

b. the estimated needs for the balance of 1993 amount to 619,600;

c. the total deficit for 1993 is thus 876,005;

d. when the pledges amounting to 898,000 (see table 1, last column) are received in the Trust Fund, there will be a small positive balance of 22,000;

e. the estimated needs for 1994 amount to 3,658,600 almost all of which would be required in the first half of the year;

f. the estimated needs for 1995 amount to 3,851,200 almost all of which would again be required in the first half of the year.

ANNEX I

LIST OF CONTRIBUTORS TO THE IPCC TRUST FUND
OVER THE YEARS

Australia
Austria
Canada
China
Denmark
Finland
France
Germany
Italy
Japan
Netherlands
Norway
Saudi Arabia
Sweden
Switzerland
United Kingdom
United States
CEC
Rockefeller Foundation
UNEP
WMO

COUNTRIES SUPPORTED FOR PARTICIPATION IN IPCC DURING 1992-1993
(THE LATTER THROUGH 31 MAY 1993)

ANGOLA
ANTIGUA
ARGENTINA
ARMENIA
AZERBAIJAN
BAHAMAS
BANGLADESH
BARBADOS
BELARUS
BENIN
BERMUDA
BOLIVIA
BRAZIL
BULGARIA
BURKINA FASO
BURUNDI
CAMEROON
CENTRAL AFRICAN REPUBLIC
CHILE
CHINA
COLOMBIA
COMOROS
CONGO
COSTA RICA
COTE D'IVOIRE
CUBA
CZECHOSLOVAKIA
DOMINICAN REPUBLIC
ECUADOR
EGYPT
ESTONIA
ETHIOPIA
GABON
GAMBIA
GEORGIA
GHANA
GUINEA BISSAU
GUINEA
HONDURAS
HUNGARY
INDIA
INDONESIA
IRAN
IRAQ
JAMAICA
JORDAN
KAZAKHSTAN
KENYA
KIRGYSTAN
KIRIBATI
KOREA (DPR)
LATVIA
LESOTHO
LIBERIA
LITHUANIA

MADAGASCAR
MALAWI
MALAYSIA
MALDIVES
MALI
MALTA
MARSHALL ISLANDS
MAURITANIA
MAURITIUS
MEXICO
MOLDOVA
MONGOLIA
MOROCCO
MOZAMBIQUE
MYANMAR
NEPAL
NICARAGUA
NIGER
NIGERIA
PAKISTAN
PANAMA
PAPUA NEW GUINEA
PERU
PHILIPPINES
POLAND
ROMANIA
RUSSIAN FEDERATION
RWANDA
SENEGAL
SEYCHELLES
SIERRA LEONE
SRI LANKA
SUDAN
SURINAME
SWAZILAND
TAJIKISTAN
TCHAD
THAILAND
TONGA
TRINIDAD & TOBAGO
TUNISIA
TURKMENISTAN
UGANDA
UKRAINE
UNITED REPUBLIC OF TANZANIA
URUGUAY
UZBEKISTAN
VANUATU
VENEZUELA
VIETNAM
WEST INDIES (ST. LUCIA, ST. VINCENT, DOMINICA)
WESTERN SAMOA
YEMEN
ZAIRE
ZAMBIA
ZIMBABWE

CONTRIBUTIONS TO THE IPCC TRUST FUND: 1989 TO MID JUNE 1993

(AMOUNTS IN CHF)

CONTRIBUTOR	1989	1990	1991	1992	1993
Australia	24,963	83,490	141,107	104,829	173,694
Austria				6,300	
Canada	14,519	30,506		143,206	138,230
China	16,400				
Denmark	7,550	153,000			
Finland	7,950	15,742			
France	25,303	97,145		78,320	
Germany	43,750	70,494	112,840	259,460	
Italy		83,500			
Japan	151,000		149,150	68,500	
Netherlands	40,250	151,384	155,083	68,427	
Norway	25,050	33,985	44,598	47,055	
Saudi Arabia	16,500				
Sweden		43,075		59,940	24,550
Switzerland	55,000	30,000	110,000	120,000	200,000
United Kingdom	90,578	111,224	247,191	105,260	234,444
United States	199,500	298,570	650,316	628,266	681,590
CEC				141,041	17,840
Rockefeller Foundation		68,000			
UNEP	125,000	329,000	125,000	125,000	125,000
WMO	125,000	125,000	125,000	125,000	125,000
TOTAL	968,313	1,724,115	1,860,285	2,080,604	1,720,348

IPCC BUDGET ESTIMATE FOR 1993-1995

(submitted by the Chairman, IPCC)

All amounts cited in the estimate are in Swiss Francs unless otherwise stated.

1. Budget estimate for the balance of 1993 and 1994-1995

	1993	1994	1995	Total
IPCC Secret. support[1]	466,000[2]	400,000[2]	400,000[2]	1,266,000
Meeting costs		741,000[2]	780,000[2]	1,521,000
Support to DCs/EITs for IPCC meetings		2,671,200[2]	2,671,200[2]	5,342,400
Lead Authors support (DCs and others)	140,000[3]	930,000[3]	930,000[3]	2,000,000
Workshops		800,000[3]	800,000[3]	1,600,000
Publica-tions		200,000[4]	?[4]	200,000+
Emissions Invento-ries	300,000	300,000		600,000
Current cash deficit	256,000[2]			256,000
Total	1,162,000[5]	6,042,200	5,581,200+	12,785,400 +

1: This does not include the person-year costs of the IPCC Secretary and the Senior Programme Officer; these are 200,000 and 150,000 and are borne by the WMO and UNEP respectively.

2: Taken from IPCC-IX/Doc.4. The Bureau meeting shown for late 1993 has been moved to 3-4 February 1994 in Geneva.

3: Taken from BUR/VI/Doc.2, Add.1 for WG I and estimated for WGs II and III. Includes: Lead Author support : WG I - DCs and EITs, 500,000; WG II - DCs and EITs, 700,000; WG III - DCs and EITs, 400,000; all 3 WGs - about 20 LAs from industrialized countries who cannot find other support, 400,000. Workshops: WG I - 500,000; WG II -700,000; WG III - 400,000.

4: Translation and publication of a 200-page special report to COP-1. 5000 copies. Quality of report similar to the "WMO catalogue of publications". Cost of publishing the Second Assessment Reports still to be estimated.

5: Outstanding pledges for 1993 amount to some 898,000.

It should be noted that there are contributions in kind which are hard to estimate (e.g., support of technical support units, translation, related activities of Co-chairs). These are considerable, however.

2. Funding options

a. Continue the current method, i.e., voluntary contributions by governments, CEC, WMO and UNEP.

b. Adopt assessing contributions of governments according to the WMO (or the UN) scale of assessment.

c. Approach funding organizations (e.g., GEF, UNDP, private) with specific funding requests.

OMM
WMO

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

PNUE
UNEP

INTERGOVERNMENTAL PANEL
ON CLIMATE CHANGE
NINTH SESSION

Geneva, 29-30 June 1993

LIST OF PARTICIPANTS NINTH SESSION IPCC

(Geneva, 29-30 June 1993)

(Distributed during the ninth session and
not attached here to save bulk)

IPCC Secretariat, WMO, 41, Av. Giuseppe-Motta, C. P. N° 2300, 1211 Geneva 2 SWITZERLAND
Phone: +41 22 7308 215/254/284 Fax: +41 22 7331 270 Telex: 414199 OMM CH