

2440

EARTHWATCH

GLOBAL ENVIRONMENT MONITORING SYSTEM

**GEMS
REPORT SERIES
NO. 11**

**NAIROBI
MARCH 1992**

**Meeting of the Eighth Session of the Scientific
Advisory Committee of the World Climate Impact
Assessment and Response Strategies Programme**

Budapest, 1-4 October 1991



UNITED NATIONS ENVIRONMENT PROGRAMME



© UNEP 1992

For bibliographic purposes this publication should be referred to as:

Meeting of the Eighth Session of the Scientific Advisory Committee of the World Climate Impact Assessment and Response Strategies Programme, Budapest, 1-4 October 1991.

**GEMS Report Series No. 11, pp. 28
Global Environment Monitoring System
United Nations Environment Programme
Nairobi, 1992**

EARTHWATCH

GLOBAL ENVIRONMENT MONITORING SYSTEM

**GEMS
REPORT SERIES
NO. 11**

**NAIROBI
MARCH 1992**

**Meeting of the Eighth Session of the Scientific
Advisory Committee of the World Climate Impact
Assessment and Response Strategies Programme**

Budapest, 1-4 October 1991



UNITED NATIONS ENVIRONMENT PROGRAMME



1. Opening of the Meeting

The Eighth session of the Scientific Advisory Committee of the World Climate Impact Assessment and Response Strategies programme was opened by the Chairman Professor James Dooge, at the Hotel Flamenco, Budapest, Hungary on 1 October 1991. Professor Dooge welcomed Committee members and observers and introduced representatives of the Hungarian Government which had hosted the meeting on behalf of the United Nations Environment Programme.

Mrs. Tarján, Parliamentary State Secretary, Ministry for Environment and Regional Policy, welcomed participants to Hungary. She outlined the main goals of the Ministry concerning the protection of natural resources and the prevention of degradation of the environment. She noted the increasing role of anthropogenic factors in environmental change and referred to the stress upon human social and economic systems which was unprecedented in history. Mrs. Tarján said that much can be done nationally, regionally and globally to reduce greenhouse gas emissions but, nevertheless, climate would still change whatever action was taken as a consequence of previous and present greenhouse gas emissions. She said that Hungary recognized the importance of the WCIRP in identifying the potential impacts and the range of possible responses.

Dr. Nathon, Head of the Department for International Economic Relations, Ministry of Foreign Affairs, laid great stress on developing and influencing environmental cooperation. He said Hungary wished to catch up western governments in environmental protection measures. He said that the Hungarian Government was embarked on a political transformation into a market economy, but, at the same time, was ensuring that strict environmental standards were set and adhered to. He said that Hungary needed assistance from international organizations and richer countries to ensure that the desired environmental standards were achieved.

Mr. Adám of the Committee for Technological Development informed the SAC of the work of his committee and referred to the great challenge faced by his country in the ongoing process of economic change. He said that there was an important role for science and technology in assisting the transition. He outlined planned cooperative programmes to be implemented in association with the European Community, including a third framework programme scheduled for 1994 which would involve Hungary in environmental, biomedical and non-nuclear energy programmes. He also spoke of the mid European collaboration programme in which meteorological programmes would play a significant part.

Dr. Mersich, President of the Hungarian Meteorological Service, and (the host organization arranging the SAC meeting), expressed his organization's pleasure in being able to assist UNEP in this regard. He described the main tasks of the Meteorological Service, noting that among the most important were to find means to reduce greenhouse gas emissions, improvement in meteorological observations and research and to trace sources of pollution. He urged closer cooperation between Hungary and international organizations.

In reply, Mr. Peter Usher, Coordinator of the Global Environment Monitoring System (Atmosphere) of the United Nations Environment Programme, thanked Dr. Mersich and the Hungarian Meteorological Service for hosting the Eighth session of SAC. He welcomed Advisory Committee members and observers to the meeting and outlined the purpose of the meeting and its importance at a time when global climate change was high on the political agenda. Mr. Usher described several important recent events that had been held in order to better understand the climate change issue and to find a solution to global warming. He cited the work of the Intergovernmental Panel on Climate Change which had produced a definitive assessment of the science of climate change, its impacts and the range of response options, and the work of the Intergovernmental Negotiating Committee which is currently elaborating a framework convention on climate change for adoption at the United Nations Conference on Environment and Development Brazil in June 1992. Mr. Usher called for an international partnership of effort similar to those employed previously to solve the ozone layer problem, in order to minimize the potential risks associated with climate change.

Mr. Usher drew attention to some of the issues that would be discussed by the SAC and, in referring to the establishment of national climate impact programmes and international climate impact networking plans of UNEP, he noted the initiatives of Hungary in establishing a national climate programme and suggested that SAC and UNEP could learn from the Hungarian experience in establishing the proposed international programme.

In outlining the range of activities which would be addressed by the WCIRP in 1992 and 1993 he asked that, in considering climate change as a priority element of the future programme, the devastating effects of other climate phenomena including drought and the potential for repeated disasters in Africa should not be forgotten and SAC should recommend appropriate activities in this regard. He said that the ability to handle future climate and to control its impacts has yet to be demonstrated and that future action may well be compromised if we cannot deal with the challenge of the present.

2. Participants

The full list of participating SAC members and observers is contained in Annex 1.

3. Adoption of the Agenda

The following Agenda was adopted:

1. Opening of the session
2. Approval of Provisional Agenda
3. Report on implementation of WCP by representative of WMO
4. Report by the Coordinator of GEMS/Atmosphere on implementation of WCIP and consideration of results
5. Reports of representatives of IPCC and INC on activities of their bodies related to WCIRP.
6. Report of representatives of specialized agencies on activities related to WCIRP.
7. General discussion of the future activities of WCIRP:
 - (i) Objectives and overall planning,
 - (ii) Special projects for impact studies,
 - (iii) Special projects on desertification and drought
 - (iv) Special projects on response strategies,
 - (v) Monitoring,
 - (vi) Institutional arrangements for cooperation and coordination including networking of national programmes of impact studies.
8. Presentation by Hungarian Meteorological Service on Climate Impact Studies in Hungary
9. Public information
10. Membership of SAC and other questions
11. Date and place of the Ninth meeting
12. Closure of the meeting

4. Implementation of the World Climate Programme (WCP)

A report was presented by Dr. Victor Boldirev of the World Meteorological Organization and Director of the World Climate Programme Department. He reported on the development of the WCP in accordance with the recommendations of the Second World Climate Conference and resolutions of the Eleventh World Meteorological Congress. Decisions made by Eleventh Congress on the WCP co-ordination were particularly mentioned including the establishment of the Co-ordinating Committee for WCP (CCWCP) and convening an intergovernmental meeting on WCP co-ordination and responses.

SAC welcomed the plans for improved coordination of the World Climate Programme and for plans to establish the Global Climate Observing System (GCOS), urging that GCOS should serve the needs of all WCP components. It was also noted that Chairman of SAC will be a member of the CCWCP.

Dr. Boldirev described the work of the components of the WCP implemented by WMO.

The World Climate Data and Monitoring Programme

The World Climate Data and Monitoring Programme continued its help in improving climate data management. Dr. Boldirev outlined the results of the six projects comprising the programme. The climate change detection project, climate system monitoring, global baseline data sets, data rescue and Clicom. He announced that the next session of the Advisory Committee for Climate Application and Data (ACCAD) established by the WMO Executive Council would be held in Geneva on 18 and 19 November 1991.

Before this session, two working groups of the WMO Commission for Climatology will meet: namely, the Working Groups on Climate Data and Climate Change Detection Project. Within the Climate System Monitoring (CSM) project, monthly bulletins continue to be prepared and disseminated. The CSM Biennial Review series will be continued through preparation of the 1990-1991 issue at the beginning of 1992. These activities were supported by UNEP. UNEP also supported in 1991 the DARE (Date Rescue) Project.

The World Climate Applications and Services Programme

The World Climate Applications and Services Programme has developed an inventory of climate application related activities in WMO member countries. Other developments have been the encouragement of national climate programme development and projects related to mitigation of drought. A major activity has concerned the organization of the development and dissemination of climate application methods and techniques and includes:

- definition of user information requirements for specific climate applications,
- description of climate effects on food production,
- determination of climate implications in water-resource management,
- determination of climate implications in energy,
- training seminar in Nepal
- Meteorological Information for Development of Renewable Energy,
- implementation of climate applications in human activities (urban climatology, human health),
- Tropical Urban Climate Experiment,
- development of techniques to combat drought effects,
- development of a Climate Applications Referral System (CARS),

- promotion of the development of new application methods (including forecasting techniques for specific applications).

The World Climate Research Programme

The World Climate Research Programme is organized through seven main projects:

- Climate model development
- Research on climate processes
- Global Energy and Water Cycle Experiment (GEWEX)
- Tropical Ocean and Global Atmosphere (TOGA)
- World Ocean Circulation Experiment (WOCE)
- Study of global change
- Scientific exploration of satellite data.

WCRP addresses causes of scientific uncertainty in the projections of future climate change, in particular in the areas of:

- clouds and the hydrological cycle,
- transport of greenhouse gases and their distribution in the atmosphere,
- global ocean circulation and transport of heat and chemicals,
- polar climate and sea ice,
- surface hydrological processes and their relation to vegetation.

In the context of Dr. Boldirev's presentation discussions took place on WMO's attempts to encourage the development of National Climate Programmes. Dr. Boldirev suggested that further work was needed to determine how such programmes could be made interdisciplinary and how they would be integrated within the WCP. During the discussion, the risk of an overproliferation of committees was mentioned given that there were committees for IPCC and UNCED. Nevertheless, SAC felt that the establishment of NCPs and their coordination internationally to ensure participation in the World Climate Programme were important ideas to pursue.

5. Implementation of the World Climate Impact Studies Programme 1990-1991

In accordance with the recommendations of the SAC at its seventh session in 1990, the WCIP in 1990/91 was structured to give priority to:

- (i) Greenhouse Gases/Climate Change
- (ii) Coordination of Climate Impact Activities
- (iii) Methods of Climate Impact Assessment
- (iv) Monitoring

Under (i) the principal activity was in support of the UNEP/WMO Intergovernmental Panel on Climate Change. Through the provision of staff and by contribution to the Trust Fund established for IPCC implementation, the IPCC were assisted in carrying out its first assessment of the Greenhouse Gas/Climate Change issue. Its report was adopted in August 1980 and was presented at the Second World Climate Conference in November 1980. The SWCC was financially supported by UNEP and a staff member was provided to the Secretariat for the final year of preparations. The Conference Report and Ministerial Statement has significant implications for current international action to elaborate a Framework Convention on Climate Change. Sessions of the Intergovernmental Negotiating Committee have been supported by UNEP which also makes financial contribution and staff secondment to the Secretariat.

Other climate change related conferences were supported by the WCIP in developing country regions under the generic title, "The Warming of the Earth, Perspectives and Solutions for the Third World" with meetings held in Nairobi, Sao Paulo and Bangkok.

Because of recent institutional changes, the Advisory Group on Greenhouse Gases had not met but a major product on Analysis of limitation strategies, Targets and Climate Change and on Assessments had been published by the Stockholm Environment Institute on AGGG recommendations.

The importance of public information on global warming had been recognized in these activities and a video film for international release had been made for the SWCC. A prize winning film 'Can Polar Bears Tread Water' made by Television Trust for the Environment with WCIP assistance had been widely shown. A seminar on Global Environmental Issues organized by Centre for Natural Resources Management and Environmental Studies, University of Hanoi (CERED) was supported by UNEP and an overview of current issues was presented by the WCIP secretariat. A series of media briefings on international response to climate change held in Geneva and London was supported by and participated in by UNEP. UNEP had also assisted in INC and IPCC briefings as well as holding its own environmental briefing sessions for environmental interest groups in Nairobi.

The establishment by UNEP with the financial assistance of the Government of Switzerland of an Information Unit on Climate Change would place the public information programme on a more formal footing.

(ii) Coordination of climate impact activities

It had been planned to establish an international network of country climate impact activities and to encourage the development of country programmes where they did not exist. Serious staff shortages had delayed this important activity with the WCIP secretariat losing staff to the IPCC (Mr. Tewungwa), the SWCC (Mr. Alusa) and the INC (Ms. Schlosser). The recruitment of Dr. Adebayo under a Dutch Junior Programme Officer provision

scheme had eased the Coordinator's workload but insufficiently to dedicate a full-time staff person to Networking as estimated. The programme is to be relaunched in 1992. Coordination of IPCC activities concerning country studies had been recommended as an additional task for UNEP and a data gathering exercise had been initiated.

(iii) Methods of Climate Impact Assessment

UNEP's Roving Seminar Programme had continued with a fourth session in Southern Africa utilizing the publication 'Assessing the Social Implications of Climate fluctuations (a guide to climate impact studies)' prepared by Dr. Riebsame. In a similar vein, programmes on methods of drought preparedness had been convened with UNEP support by the International Drought Information Centre. These seminars held in Latin America, Africa and South-east Asia had been successful in sensitizing national planners in drought preparedness and management.

The UNEP supported award winning publication 'Climate and World Agriculture' by Martin Parry had been based on the earlier UNEP/IIASA study on the Impact of Climate Variations Agriculture.

UNEP's Regional studies in Vietnam, jointly in Indonesia, Thailand and Malaysia and Brazil had developed and tested analytical methods for assessing the impact of climate variability and change on climate sensitive sector in the study regions. Final publication of the reports would be available in their final form in early 1992. Similar regional studies in coastal areas were being conducted under the auspices of UNEP/OCA PAC. Four Coastal Area Management Programmes for the Mediterranean are in implementation and several others are in preparation. Each programme has a climate change impact assessment component. Other studies are underway in the South Pacific Region Environment Programme (SPREP) concentrating specifically on the impacts of sea level rise.

(iv) Monitoring

UNEP's monitoring programme continued as a long term programme under the general umbrella of the Global Environment Monitoring System and included activities on background air pollution, on glaciers and climate systems monitoring carried out by the World Meteorological Organization and other relevant organizations.

(v) Other activities

The publication 'Reduction of Vulnerability of Food Systems to climate in Eastern India' completes the WCIP's oldest project. An agroclimatological study of the humid tropics of South America is in preparation. The WCIP part of this WMO/FAO/UNEP project dealing with socio-economic aspects had been completed and would be published when the remainder of the study was ready.

The Working Group on socio-economic impacts of ENSO had not met since the last SAC session but would meet in November 1991 to address the issue of climate change and El Nino. It would also consider the potential impacts of the current incipient El Nino event. A GEMS library volume on El Nino was undergoing final technical checking before publication.

In accordance with recommendations of the Second World Climate Conference and Resolutions of the WMO Executive Council and Decision 16/41 of the Governing Council of UNEP, the subprogramme of the WCP implemented by UNEP concerning climate impact studies is renamed the World Climate Impact Assessment and Response Strategies Programme (WCIRP) to reflect additional responsibilities related to Response Strategies assigned to the subprogramme.

6. Summary of the ongoing activities in the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change which are related to WCIRP - August 1991

1. Discussions in the Intergovernmental Negotiating Committee (INC) cover the following areas:
 - i. Appropriate commitments, beyond those required by existing agreements,

for limiting and reducing net emissions of carbon dioxide and other greenhouse gases,

on the protection, enhancement and increase of sinks and reservoirs, and

in support of measures to counter adverse effects of climate change,

taking into account that contributions should be equitably differentiated according to countries' responsibilities and their level of development,
 - ii. Appropriate commitments on adequate additional financial resources to enable developing countries to meet incremental costs required to fulfil the commitments referred to above and

to facilitate the transfer of technology expeditiously on a fair and most favourable basis,
 - iii. Commitments addressing the special situation of developing countries, taking into account their development needs, including, inter alia, the problems of

small island developing countries,
low-lying coastal areas and areas threatened by:

- erosion,
- flooding,
- desertification and
- high urban atmospheric pollution,

also taking into account the problems of countries with economies in transition,

iv. Legal and institutional mechanisms related to scientific co-operation, monitoring and information,

v. Legal and institutional mechanisms related to adequate and additional financial resources and technological needs and co-operation, and technology transfer to developing countries corresponding to the commitments agreed under i, ii, and iii. above.

2. In establishing the INC as a "single negotiating process under the auspices of the General Assembly, supported by the United Nations Environment Programme and the World Meteorological Organization",

and deciding that

"the negotiations for the preparation of an effective framework convention on climate change, containing appropriate commitments, and any related legal instruments as might be agreed upon, should be completed prior to the United Nations Conference on Environment and Development in June 1992",

The General Assembly of the United Nations requested the Executive Secretary of the INC to cooperate closely with the Intergovernmental Panel on Climate Change (IPCC) to ensure that the Panel respond to the needs and requests for objective scientific and technical advice made during the negotiating process. It is important, therefore that the WCIRP ensure the successful and early pursuit of work in the area of overlap within the terms of reference of WCIRP, the IPCC and the INC, as above. The SAC may note that, whilst INC has, so far, made no requests to the IPCC and the results of IPCC's work become widely known to negotiators.

3. Until June 1992, cooperation between the INC and WCIRP seems likely to continue along these lines, with scientific and technical information flowing to the negotiators through assessments generated in IPCC. For the foreseeable future thereafter, scientific and response strategies in relation to climate change will continue to be needed by States Parties to the Framework Convention to ensure its effective and continuing implementation: the scientific and technical work will clearly continue to be undertaken in those subject areas and by those bodies whose work is coordinated within the WCIRP.

In introducing the report, the INC representative, Mr. Cornford said: "negotiating a convention was itself part of the strategy of states to respond to climate change".

He outlined the history leading to the creation of the INC by the General Assembly of the UN and the terms of reference of INC under GA Resolution 45/212. He also outlined the commitments and mechanisms being considered in the two Working Groups of INC. He mentioned developments during the negotiations such as debates on Pledge and Review, the role of oceans, the need for transfer of financial and technological resources and the current state of documentation.

Seminars run by INC were specifically intended for negotiators from developing countries eligible under the Special Voluntary Fund of INC.

The places and dates of Meetings in 1992 would be decided by the General Assembly but 18-28 February in New York seemed likely with another short meeting in April a possibility.

He foresaw the present good co-operation with WMO, UNEP, IPCC and the IOC of UNESCO continuing until June 1992. The constitutional and institutional position thereafter was still to be decided. The final content of the convention, too was still to be decided: the interests of states were deeply involved.

It was important that bodies such as IPCC and agencies involved in WCP have a clear view on how they could best help their Member States achieve the best implementation of the convention.

The SAC welcomed the information on the work of INC and discussed the potential role of SAC and the WCIRP in support of the INC process. It was considered that consideration of impacts was important to the INC's choice of actions. It was agreed that the WCIRP should include a range of activities that would result in information that INC might wish to consider. These could include support to compiling national emission inventories, national and regional impact studies and country studies of the costs and benefits of limitation strategies.

7. Summary of ongoing activities of the Intergovernmental Panel on Climate Change

The IPCC mandate from its two sponsoring organizations, WMO and UNEP, is to continue its assessments of the climate change issue. This activity would include, at request, advice to the Intergovernmental Negotiating Committee (INC).

The continuing work programme spans two time scales: short term leading up to the UNCED (Rio de Janeiro, June 1992) and long term. The IPCC First Assessment Report would be updated through a Supplement in the Short term (by February 1992) and through another full assessment in the long term (ca. 1994/95). The 1992

supplement would be made up of contributions from the 3 IPCC Working Groups.

Working Group I: (SCIENCE) would concentrate on sources and sinks of GHG model studies and climate data trends. The first topic would include, inter alia, updates on methane emissions, improved calculations of global warming potentials, updated emissions scenarios and development of an IPCC methodology for making national inventories of net GHG emissions (this last task would be based on the recent OECD work and is expected to be completed in 1993).

Working Group II: would explore further impacts assessments on the regional scale. It is not expected that better predictions of the regional distributions of climate change would be available for the Supplement. The Working Group would, therefore concentrate on assessments based on paleo-analogue scenarios, inventories of available national impacts assessments (in collaboration with UNEP), development of guidelines for impacts assessments and a review of monitoring needs for application to impact studies. Further the working group would work with Working Group III on issues related to energy and industry, agriculture and forestry and sea level rise (see below).

Working Group III: would concentrate on the following tasks:

a. Energy and industry

Technology assessments (including better and more efficient technologies, possible factors inhibiting their timely application), thematic studies (electricity end-use, natural gas substitution) and economic implications of technology options.

b. Agriculture and forestry

Emissions of GHGs related to agriculture and forestry, forestry management practices, the Noordwijk remit of the feasibility of net annual afforestation of 12 million hectares by the year 2000, and carbon cycle in the boreal, temperate and tropical forest systems.

c. Sea level rise

Studies on national vulnerabilities to sea level rise including the development of common methodology.

In its ongoing work, a primary IPCC role would be that of developing internationally-accepted, consistent, common methodologies were necessary. With regard to country studies for different purposes (e.g., national net GHG emissions, vulnerability to sea level rise) that may be required, the IPCC would not undertake or direct such studies but would be a user of their results.

With regard to the requirement for national impact assessments the representative of UNESCO (IHP) said that existing methods for the impact assessment of hydrological processes were unsatisfactory and that more reliable methods were needed.

8. Activities of UNESCO (International Hydrological Programme (IHP))

ACTIVITIES INITIATED FOR DEVELOPING SCIENTIFIC ESTIMATES OF CLIMATE CHANGE IMPACTS ON WATER RESOURCES AND HYDROLOGICAL REGIMES, AT BOTH GLOBAL AND REGIONAL LEVELS

In accordance with the recommendations of the Second World Climate Conference, it was decided to strengthen and give greater support to the climate component of the IV-Phase of the IHP (1990-1995) as a significant contribution to the World Climate Programme (WCP) and its sub-programmes, and to the International Geosphere-Biosphere Programme (IGBP) - A Study of Global Change. Climate change impact assessment and prediction in the field of hydrology and water resources are of particular concern in this connection.

The following activities were initiated for this purpose and first results achieved:

1. An IAHS-Core Group has been established for IHP Project H-1-1 "Interface processes of water transport through the atmosphere-vegetation-soil system at an elementary catchment and grid size scale" which coordinates ongoing activities in different projects and programmes, will organize and convene an International Symposium and will prepare a report on the state-of-art, recent developments and requirements in 1992 (first draft) and 1994 (publication).
2. An IHP Working Group has been established for IHP project H-2-1 "Relationship between climate variability (and expected change) and hydrological systems".
3. A proposal has been prepared on "A Climatic - Water Resources - Environmental Model and Information System - A Pilot Study for South America" which has been presented to international agencies for financial support. This proposal, after preliminary approval, is now being developed further and will then be presented in an elaborated form.

The proposed system will be used as a pilot example for large scale investigations and predictions of impacts on water resources and hydrological regime of climate and environmental changes. It will be an important contribution to the WCRP, in particular to GEWEX, and the IGBP, and it is planned to closely co-ordinate the activities with GCIP (GEWEX Mississippi).

4. In continuation of the long-term close co-operation with the International Commission on Snow and Ice (ICSI) of the IAHS efforts have been made to intensify work in some fields of

activities, in particular those under IHP projects H-4-1 "The effect of large scale snow and ice covers on global and regional precipitation systems" and H-4-2 "Snow and ice hydrology in specific areas and regions with special attention to long term variations in water storage". Particular emphasis will be given to the following subjects:

- * the finalization of the "World Atlas of Snow and Ice Resources",

- * the next volumes of "Fluctuation of Glaciers (1985-1990)" and of the "Glacier Mass Balance Bulletin" (two joint IAHS/ICSI/UNEP/UNESCO publication series),

- * the compilation of a Technical Document in Hydrology on "Variation of Snow and Ice in the Past and Present Time on Global and Regional Scales".

5. Efforts have also been initiated to include aspects of climate change, and of its impacts and consequences on hydrology and water resources, into other IHP-projects and themes, such as for instance H-5-1: "Hydrological research and water resources management strategies in the humid tropics and other warm humid regions", H-5-2: "Hydrological research and water resources management strategies in arid and semi-arid zones", H-5-5: "Application of methods of hydrological analysis using regional data sets (Flow Regimes from International Experimental and Network Data Sets /FRIENDS)", H-5-6: "Hydrology of mountainous regions", M-1: "Methodologies for water resources assessment and hydrological design", M-2: "Scientific and technical water-related information and documentation systems", M-3: "Integrated water resources development and the incorporation of risk-based decision-making".

The IHP of UNESCO is also active in the field of education and training (in particular, through its International Post-graduate Courses in Hydrology), and also in public information as was illustrated by the presentation of the recently issued pamphlet on "World Water Resources". Similar efforts are developed also in other UNESCO divisions working in the field of environmental sciences which is well illustrated by the "Ecology Chronicle" (1989-90) lastly issued as a contribution to the Man-and-the-Biosphere Programme (MAB) of UNESCO.

The meeting welcomed the information on these activities and encouraged UNESCO to further strengthen its efforts in support of UNEP's programme of activities in the field of Climate Change Impacts on the Environment. As particular subject areas to be considered the following were suggested: Regional Studies (including the Pilot Project for South America, specific areas such as arid and semi-arid regions, humid tropics, coastal zones, mountainous regions), Climate Change and the City, Snow and Ice Cover Variations, Large International River Basins Management.

9. Activities of the Intergovernmental Oceanographic Commission related to WCIRP

The Intergovernmental Oceanographic Commission (IOC) of UNESCO informed on its co-sponsoring (UNEP OCA/PAC) of ten Regional Task Teams on Climate Change and the IOC-led Global Task Team on Coral Reefs as well as the joint effort with WMO in the establishment of a long-term monitoring programme for coastal and near-shore areas. The experience of IOC programmes addressing the regional assessment of environmental change and response actions was offered, e.g. also in the area of changing storm paths, taking experience from the IOC International Tsunami Warning System (ITSU) established more than two decades ago in the Pacific.

The Commission's Global Sea-Level Observing System (GLOSS) already in place and the existing integrated Global Ocean Services System (with WMO) contribute to the goal of the proposed Global Climate Observing System (GCOS) to provide comprehensive information on the total climate system and its variability and change. The establishment of a Global Ocean Observing System (GOOS) for physical, chemical and biological measurements will during the next decades enhance the multi-disciplinary range of operational and scientific observing systems.

IOC recently supported in Malta (July 1991) a scientific expert meeting to discuss the role of ocean processes as sinks and sources of greenhouse gases, including existing knowledge gaps and other scientific uncertainties, which have to be reduced through promoting relevant ocean research and related services.

10. Activities of the Food and Agricultural Organization of the United Nations

FAO sets its activities on climate change impacts and response strategies in the broader context of environment and development. The main objective is to consider the potential long-term impacts as they may impinge on present day agricultural problems, particularly land degradation, if they remain uncorrected, because these problems could have far greater socioeconomic and ecological consequences than climate change. Economic losses, for example, from land degradation are currently equivalent to 5-10% of GDP in some African countries. Land losses could be intensified by climate change.

PAST AND CURRENT ACTIVITIES

Most of FAO's activities fall into two groups: the development and improvement of analytical tools and data for impact assessment, and the preparation of regional or national impact studies.

ANALYTICAL TOOLS AND DATA

Notable data base activities include the revision of the FAO/UNESCO Soil Map of the World and its establishment as a GIS; and determination of population distribution by agro-ecological zone as a part of a contribution to the work of the CGIAR on agricultural research priority setting and an International Food Policy Research Institute study on who are the poor and where are they. Also on the data/model parameter front is the revision of the FAO manual on crop water requirements. Baseline data for impact assessment could come from the FAO Global Forest Resources Assessment project which is nearing completion. Whilst the ARTIMIS project as well as providing real time information for food security purposes, also supplies remote sensing data on shifts in desert boundaries and agro-ecological zones plus estimates of changes in biomass production because of climate variation, all of which have a role to play in impact analysis.

METHODOLOGY DEVELOPMENT

The major activity in this group is the further refinement of FAO's Agro-Ecological Zones Approach. FAO first developed this approach in associations with the UNFPA and IIASA to assess the population supporting capacity of lands in developing countries. It superimposes a climate inventory onto the soils inventory provided by the FAO/UNESCO Soil Map of the World to delimit areas with unique climate and soil characteristics for which crop growth requirements and potential crop outputs are identified. It can be used to assess how climate change may influence agricultural production by changes in length of growing season, soil moisture, thermal regimes etc. Thus it provides a sounder conceptual base and more comprehensive data than natural vegetation classifications like those of Thornthwaite or Holdridge.

REGIONAL IMPACT STUDIES

A SAHEL case study was completed in 1990. An analog model approach was adapted using time series for the pre- and post 1960 periods to capture the major decline in rainfall over the years 1965-85, which may be equated to the decline in Sahelian rainfall projected by the GCMs. The study looks at economic as well as physical impacts, particularly possible changes in the costs of production and in population supporting capacity.

PLANNED ACTIVITIES

Five proposed or ongoing activities are particularly relevant to the WCIRP and SAC:

(a) Development of the FAO Agro-ecological Zones approach for climate change impact analysis. Details are given in the FAO/Environmental Change Unit (University of Oxford) proposal to the U.N. Environment Programme "Climate change, global agricultural potential and regional population supporting capacity".

- (b) Improvements in methodologies to establish soil erosion/crop loss relationships.
- (c) Monitoring and assessment of soil carbon/soil organic matter levels as an indicator of sustainable agriculture and of climate change impacts on the role of soils as sink or source of carbon dioxide.
- (d) Impact of climate change on fishing resources (jointly with IOC).
- (e) Assessment and methodology development regarding impact of climate change on crop yields (jointly with IIASA).

11. Activities of International Council of Scientific Unions

The representative of ICSU, Professor James Dooge, described some of the relationships between IGBP and WCIP. He emphasized the desirability of extending the cooperation between the IGBP and the WCP beyond cooperation in relation to the WCRP. He described the recent developments in relation to START (System for Analysis, Research and Training) programme involving the establishment of networks for data, research and training in different regions and the need to establish links between START and WCIP. He instanced the collaboration between IGBP and ISSC in relation to the IGBP project on land use as an example of cooperation between the natural sciences which should be of interest to WCIP in respect of both content and methodology. In the cause of the discussion it was agreed that members of SAC should be placed on the mailing list for IGBP publications.

12. Future Activities of the World Climate Impact Assessment and Response Strategies Programme (WCIRP) 1992-1993

A report was provided by the Secretary who advised SAC that the future direction and content of the WCIRP had to take full account of the decision and of the recommendations of the Second World Climate programme and had to be in accord with the Resolutions of the Eleventh World Meteorological Congress and Decision GC.16/41 of the sixteenth session of the Governing Council of UNEP which:

'Requests the Executive Director to assume responsibility for the World Climate Impact Assessment and Response Strategies Programme in collaboration with relevant organizations, in particular, with the World Meteorological Organization, which should continue to provide the overall coordination in the implementation of the World Climate Programme'

The secretariat suggested that in line with the above, the highest priority should be given to the issue of climate change. This was in accordance with the high status accorded the issue by international policy-makers and was designed to be supportive of

international efforts to deal with the problem of greenhouse gases and potential climate change. The programme has to be implementable and thus the availability of financial resources and programme staff had to be taken fully into account. SAC welcomed the provision of additional financial resources and drew attention to its opinion stated at previous SAC meetings, that staff allocation to the WCIP was inadequate. Now, with considerable additional programme responsibilities the necessity for appointing additional staff to the programme becomes even more pressing.

It is recommended that continued support be given to the IPCC and that direct assistance be increased to meet IPCC requests for UNEP to contribute to the coordination of country studies and to directly initiate a project under the Global Environment Facility on developing an inventory of Greenhouse Gas sources and sinks. Another project concerning country economic studies has already been initiated with RISO, UNEP Collaborating Centre on Energy and the Environment. Support for national regional climate change impact assessment and response strategy studies should be continued with pilot studies initiated in Africa and Eastern Europe. A proposed conference on regional impacts of climate change to be organized by the SADCC countries with possible UNEP support in March 1992 could be used to define a regional assessment project suitable for the WCIRP.

The role of the World Climate Programme, expanded to include programmes of UNESCO, FAO and other international organizations, must be kept under consideration by SAC. Activities initiated by other international bodies as a contribution to the WCIRP, particularly those that may be financially supported by UNEP, also need the close scrutiny of SAC.

The efficacy of the past public information programme should be reviewed and recommendations made as to future activities.

Attention needs to be given to the role that may be played by the newly established Information Unit on Climate Change in Geneva.

Activities not specifically climate change related, particularly those related to drought, El Nino, teleconnections and GEMS monitoring programmes, should also be addressed.

The main activity other than that designed specifically for climate change is that related to coordination of climate impact studies undertaken independently of the WCIP by national bodies and institutions. The role of networking and the encouragement of national climate impact programme development, as recommended by SAC at its previous session, should be reviewed and updated in the light of recent developments.

Coordination of the World Climate Programme as a whole as decided by the Eleventh World Meteorological Congress, and as described by the World Meteorological Organization representative, should

be noted by the SAC and recommendations should be made regarding the future constitution and role of SAC in this revised programme. The adequacy of resources and efficiency of the Secretariat needs advice of SAC.

General discussion

It was agreed that intensified attention should be given to climate change but members noted that aspects of climate variability and its impacts, particularly drought and flood, were of vital importance and that attention had to be given these issues. The committee drew attention to the recommendations of its previous meeting (Mauritius, January 1990) which identified Greenhouse Gases/Climate Change; Coordination of Climate Impacts, Methods of Climate Impact Assessment and Monitoring as the priority elements of the Impacts programme during 1991. The Committee agreed that the above topics still rated the highest priority but added two additional topics to reflect international concerns and needs identified during the Second World Climate Conference, at the IPCC and INC, and as decided at the XIth session of the WMO Congress and 16th session of the UNEP Governing Council. These were Response Strategies and Information, Education and Training. SAC said that these activities should be implemented at national, regional and global levels and the Committee constructed an organizational matrix of programme activities which would identify priority elements which should be given full consideration in programme development on climate change matters.

13. Criteria for project selection

UNEP supported studies of climate change

	National	Regional	Global
Climate Change			
Assessment	*	***	**
Coordination	***	*	*
Methods	**	**	*
Monitoring	*	**	***
Responses	***	*	**
Information	***	**	*

*** denotes highest priority

* + ** are lesser but still important priorities

The Committee discussed Guidelines for project identification by the WCIRP secretariat.

(a) National activities

Among the elements of highest priority suggested by SAC it was considered that coordination through the establishment of a network of national climate impact studies was an

important prerequisite for countries undertaking their own impact assessments.

Information, Training and Education at the national level was also identified as a vital programme element to be included in the WCIRP.

(b) Regional activities

Regional climate related elements were considered essential in dealing with transboundary issues such as pollution; shared natural resources; fisheries etc. They would provide basic information for national response option determination.

(c) Global activities

Support to the Global Climate Observing System is represented by the high priority allocated to global monitoring programmes.

It was considered that those countries participating in the proposed international network would facilitate the identification and subsequent financial support for undertaking climate impact assessments on sensitive sectors of the economy.

The responsibility of UNEP in cooperating with United Nations specialized agencies in undertaking relevant climate impact projects relevant to the WCIRP objectives was noted. It was agreed that priority should be given to requests by UN bodies for joint activities with UNEP, as necessary, soliciting projects proposals relevant to WCIRP priorities from relevant, competent bodies and organizations. UNEP would also ensure that programmes to provide information materials, study methodologies as well as education and training programmes were developed by appropriate institutions for use by concerned nations.

Criteria for the selection of projects to be implemented under the World Climate Impact Assessment and Response Strategies Programme would be developed as follows:

1. The first consideration in the overall planning concerns the impacts of climate variability on development, especially in the particularly sensitive sectors:

- (a) agriculture-including forestry, etc.
- (b) water resources
- (c) energy
- (d) human settlement
- (e) health.

At national levels, both the framework for action and the institutional framework (national machinery, national framework, resources, etc.) need to be addressed.

2. A second consideration relates to likely impacts of climate change on development. Similar sensitive sectors need to be considered together with:
 - (f) sea-level rise issue
 - (g) response strategies (limitation, adaptation)
3. SAC supported programmes (under 1 and 2 above) may relate to:
 - (a) assisting countries to develop national programme(s) of action.
 - A country programme may comprise:
 - (i) technical elements
 - (ii) mechanism for implementation
 - (b) promoting and assisting regional programmes - building regional networks for coordinating (and exchanging of information) national components.
 - (c) global studies including:
 - (i) world-wide assessment of impacts and
 - (ii) associated programmes of training and information exchange.
4. To be supported by SAC, projects should be either:
 - (a) site specific (national programmes, regional programmes), or
 - (b) subject specific:
 - (i) basic studies
 - (ii) methodologies
 - (iii) training: materials, manuals, etc.
 - (iv) information material.
5. Projects should, in general address:
 - (a) the technical assistance needs of developing countries,
 - (b) the value to countries, particularly developing countries, of project results in building up state-of-art literature as a basis for studies on methodologies. The studies would also identify research gaps.

It was noted that priorities, as indicated in the matrix, should be given appropriate consideration. (Priorities may be subject to reconsideration and possible change at future sessions of the Scientific Advisory Committee).

14. Project selection

- (i) Project proposals for impact studies tabled at the eighth session of SAC.

The Committee did not wish to evaluate the project proposals available at the meeting. It was suggested that they should be reviewed by the Secretariat, as necessary in consultation with the SAC chairman, in accordance with the criteria for project selection outlined above. It was expected that many more projects would be proposed for support as the programme for 1992-93 developed; as an outcome of the proposed networking programme, and also from UN specialized agencies wishing to cooperate in implementing the WCIRP. The committee recommended a set a basic activities which the secretariat should initiate. These are described in subsequent paragraphs.

- (ii) Projects related to drought and desertification.

The committee stated the importance it attached to these issues and proposed that a study be developed on:

- (a) the possible impacts of desertification on global climate,
- (b) the likely impact of climate change and global warming on desertification.

It was noted that the first part of the proposed study fell within the remit of the World Climate Research Programme and consultation with the programme director was necessary in developing the project. Consultation with UNCED, in view of its consideration of desertification issues was also necessary. It was noted that there were many existing studies available in French as well as English and any consultant hired in connection with the project should be bilingual.

With further respect to drought, SAC said priority should be given to:

- (a) Improving early warning capability
- (b) Developing national "insurance" against drought through effective preparedness.

The representative of FAO offered to make available national guidelines on drought preparedness developed with the assistance of FAO in the context of food security programmes. These should be considered in developing a guidebook on drought preparedness, as recommended by the Drought Management and Preparedness Training Seminar for Asia and Pacific Regions (25-29 March 1991)

- (iii) Special projects on response strategies

The requirements of the Governing Council at its sixteenth session for the initiation of economic based studies in selected countries which should also identify available technology and technology needs were noted. SAC drew attention to the proposed study to be coordinated by RISO, UNEP Collaborating Center on Energy and Environment which was being initiated in response to GC decision 16/41 and noted that the costs and benefits related to the impact of climate changes were not included in the studies which concentrated on limitation strategies rather than adaptation strategies. SAC stressed the importance of exploiting the range of measures of adaptation to reduce the negative effects of climate change and enhance the positive ones. One area of worldwide study, particularly because of its current state of development, is the investigation of the array of management responses in agriculture to climate change (crop cultivation selection; irrigation and fertilizer amounts etc.). SAC recommended a meeting of scientists who are currently using crop-climate models to estimate the impacts of climate change. Modelers would be brought from both developed and developing countries and from international agencies. A similar study concerning fisheries could also be considered.

(iv) Institutional arrangements for cooperation and coordination.

It was felt that the proposed networks should be of climate impact studies, and that the international node would service the national and regional components which would be autonomous and not subject to direction from the international center. The International Center would assist communication among network collaborators and its network newsletter should be utilized in this regard. SAC recommended the preparation of a background paper and the convening of a second networkshop as a part of the launching of the proposed network. SAC welcomed the success of the first networkshop which had resulted in active national networks being developed in Vietnam, Hungary and Brazil among others. SAC suggested that national networks should consider, site specific and subject specific studies and that UNEP should consider financial and technical support as appropriate.

(v) Monitoring

It was agreed that the existing important monitoring programmes under GEMS should be continued and strengthened. These include Integrated Monitoring, Climate System Monitoring, Background Air Pollution Monitoring and Glacier Monitoring. Limited support to the International Satellite Land-surface Climatology Project (ISLSCP) for the purpose of assisting its coordination should also be considered. UNEP is required by GC decision to support the Global Climate Observing System (GCOS) and to ensure that

it incorporated a monitoring programme of elements important to climate impact study such as ecological impact indicators. Note was taken of the requirement for the lead agencies developing GCOS to consult relevant organizations including UNEP in developing the programme.

15. Presentation by Hungarian experts on climate impact studies in Hungary

Representatives of the Hungarian network of climate-related impact research community summarized the principles of, and their experiences in, establishing multidisciplinary and international cooperation in this field. In his introductory presentation, Dr. Tibor Faragó stated the main guiding aspects in this activity:

(i) the recognition of the need for disciplinary cooperation,

(ii) the need to forge close links among the scientific community, the decision-makers and the general public,

(iii) the requirement for international collaboration because of the transboundary, transnational character of the relevant phenomena. The scientific community engaged in the climate change issue is greatly interested in further developing the proposed worldwide network which would be essential in facilitating exchange of the latest information on scientific and institutional activities. It could also serve as an international standard to be utilized by potential sponsors and decision-makers, as well as by the mass-media within the particular countries. He emphasized that although Hungarian Meteorological Service was unstinting in exchanging scientific information within the country, the problems of climate change and its consequences has not been accorded the priority given to many short-term and critical socio-economic problems. This shortcoming was, he said, characteristic for countries of Eastern Europe. Dr. Faragó expressed the opinion that the scientific community in Hungary is in a learning phase on how to establish and maintain such a network, but at the same time they would be ready to share their experience with colleagues pathing through similar situations.

Dr. Sándor Szalai presented an overview of Hungarian activities in the field of climate change. Following sporadic studies on climate changes and variability since the early 1970's, a concentrated research activity, sponsored by the Hungarian Academy of Sciences, was initiated in 1985. The objective of the programme was the estimation of climate factors in Hungary for the next several decades in connection with the increased greenhouse effect. Dr. Szalai said its first results could

serve as starting point to an interdisciplinary approach to possible impacts on hydrology, forestry, economic conditions, energy, industry and agriculture. This work has been supported by the Ministry of Environment and Regional Policy since 1989. He said that the Hungarian Meteorological Service acts as coordinator of these investigations, but the work is being undertaken in cooperation with leading scientists from other relevant institutions.

Dr. János Mika demonstrated recent work on regional climate scenario construction. He emphasized that unless there is a generally accepted methodology combining elements of separate study techniques and various data sources no reliable results can be achieved. The work also takes advantage of the close cooperation of researchers from various disciplines.

Dr. Emánuel Antal analyzed the probable climatic impacts on agriculture in Hungary. Preliminary assessments suggest that the likely overall consequences are expected to be negative (with partial benefits in certain areas and for certain crops). Because of this it might be necessary to undertake a transformation of the structure of plant cultivation and livestock farming in Hungary. Consequently, changes in the food industry as would also be expected (nationally, regionally and worldwide). Water requirements for irrigation would also rise in the Carpathian basin, in step with the expectation of decreasing water resources. This creates a new challenge to water management in Hungary and it also stresses the importance of co-operation between neighbouring countries, mainly in the catchment areas of rivers Danube and Theis.

Dr. Béla Nováky expressed the urgent need for quantitative investigations of the regional hydrological consequences of the expected global warming. Using an example to show the sensitivity of annual outflow in a water catchment, he demonstrated the significant effects of climate variations in the context of the regional climate scenarios for Hungary.

Following these brief presentations, members of SAC asked questions on scientific issues and asked for elaboration of the experts experiences in interdisciplinary work. They also identified some problems of organization related to climate networking. The committee said it was highly desirable to make available national experiences of interdisciplinary cooperation and the scientific information gathered into the international network. Financial sources should be allocated to the translation and publication of specifically valuable national reports into UN languages. SAC drew the attention of Hungarian researchers to the importance of regional cooperation with scientists working in the neighbouring countries.

The SAC expressed its gratitude to the Hungarian experts for their interesting presentations and said that useful information relevant to the establishment of climate networks had been gathered which would be useful to the WCIRP in its future programme.

16. Public Information

Reference was made to the newly created Information Unit on Climate Change. SAC agreed that use should be made of expertise at the Center to generate useful climate impact information including briefing material and visual aids for use in IPCC and INC briefings and in seminars and other training programmes initiated by UNEP.

Special mention was made of the UNEP Environmental Library Volumes on Greenhouse Gases and Ozone Layer Depletion and on how valuable they had been in creating world-wide public awareness. UNEP (GEMS) was congratulated for producing this earlier work and were urged to produce comparable volumes of the same standard for further public awareness building.

The issue of roving seminars was considered. SAC agreed the concept was good but wondered at the cost-effectiveness of the programme. SAC said there was a need to refocus future impact-related seminars and to improve coordination of the range of existing briefing programmes (IPCC, Climate Institute, UNCED, Wood s Hole and UNEP Roving Seminary) to ensure compatibility and avoidance of duplication.

Reference was again made to the Network Newsletter published by NCAR on behalf of UNEP and the Environmental Societal Impacts Group. SAC expressed its special appreciation to Maria Krenz and Jan Stewart who played a leading role in its production. It was agreed that UNEP's focus in the newsletter should be sharpened and that the secretariat and SAC members should make regular contributions to the publication.

17. Membership of SAC and other questions

SAC recommended that the membership should be reconstituted in the light of new responsibilities given to the WCIRP. All members present at the meeting expressed their willingness to serve on the future SAC except for the Chairman Professor Dooge, who because of new responsibilities in other organizations, could no longer continue on the Committee. SAC expressed their sincere regret at this decision and offered congratulations to Professor Dooge on the excellent manner in which he had carried out the duties of chairman over the past eleven years. However, to ensure adequate representation in the newly established Coordinating Committee for the WCP it was proposed that Professor Dooge should represent SAC at the first meeting of the new Committee in February 1992. The Executive Director of UNEP is

asked to appoint a successor to Professor Dooge and to consider expanding the membership to increase the range of expertise represented on SAC. All members welcomed the presence of observers from interested UN organizations and other bodies and committees and asked that invitations to future meetings be extended to the Chairman of the Joint Scientific Committee of the WCRP and that IGBP be asked to send a representative.

18. Date and venue of the ninth session of SAC

SAC expressed its pleasure at being in Budapest and the opportunity it gave the Committee to obtain information on national climate impact networking in Hungary and to interact with Hungarian scientists. It reiterated its view that venues for SAC meetings should be selected to ensure that such interactions were a regular feature of committee meetings and proposed that the ninth session should be held at the National Center for Atmospheric Research, Boulder, USA in the latter part of 1992 (possibly September). At that session, SAC would seek information from NCAR scientists on the present state of climate impact related research and other related research programmes undertaken at NCAR.

19. Closure of the meeting

The SAC adopted its report as a true record of the meeting. The chairman, on behalf of the committee, thanked the Hungarian Meteorological Service for the excellent arrangements for the meeting which has contributed significantly to its success. Professor Dooge also thanked participants for their work and wished them a safe return home. The meeting closed at 12 noon on 4 October 1991.

UNITED NATIONS ENVIRONMENT PROGRAMME
WCIRP/WORLD CLIMATE PROGRAMME
SCIENTIFIC ADVISORY COMMITTEE

SAC members

PROF. J.C.I. DOOGE CENTRE FOR WATER RESOURCES RESEARCH
University College
Earlsfort Terrace
Dublin 2, IRELAND
Fax: 353-1-754568 Tel: 353-1-7067499

DR. M. EL-KASSAS CAIRO UNIVERSITY
FACULTY OF SCIENCE, Giza 12613, Egypt
Tel: Cairo 3485742 Telex: Cairo 94372
Fax: Cairo 628884

DR. MICHAEL GLANTZ ENVIRONMENTAL & SOCIETAL IMPACTS GROUP
NCAR, Box 3000
Boulder, Colorado, USA
Fax: 303-497-1137 Tel: 303-497-1619

DR. W.J. MAUNDER CANADIAN CLIMATE CENTRE
4905 Dufferin Street
Downsview, Ontario, M3H 5T4, Canada
Fax: 1-416-739-4380 Tel: 1-416-739-5710

PROF. MARTIN PARRY ENVIRONMENTAL CHANGE UNIT
UNIVERSITY OF OXFORD,
1a Mansfield Rd, Oxford OX1 3TB, U.K
Tel: 44-865-281180 Fax: 44-865-281181

DR. C.C. WALLEN WMO
Case Postale No. 2300
CH-1211 Geneva 2, Switzerland

DR. WANG SHAO WU DEPARTMENT OF GEOPHYSICS
PEKING UNIVERSITY
Beijing 100871, China
Telex: 22239 PKUNI CN
Fax: 011-86-1-256 4095

Representatives of International Bodies:

MR. A. BECKER UNESCO
Division of Water Sciences,
7 Place de Fontenoy 75700, Paris, France
Tel: 331-45684002 Fax: 331-4565869

Annex (cont'd)

DR. V.G. BOLDIREV WMO
Case Postale No. 2300, CH-1211
Geneve 2, Switzerland
Tel: +41 22 7308269/452
Fax: +41 22 7342326

MR. S. CORNFORD INTERGOVERNMENTAL NEGOTIATING COMMITTEE
United Nations, CH-1211 Geneve 10
Switzerland
Tel: 022-798 84 00 Ext.399/398
Fax: 022-788 38 23

MR. D. NORSE Overseas Development Institute
Regent's College
Inner Circle
Regent's Park
London NW1 4NS
UK

DR. N.SUNDARARAMAN IPCC
c/o WMO P.O. Box 2300, CH-1211 Geneva 2
Switzerland
Tel: +41 22 7308215/284
Fax: +41 22 733 1270
Telex: 414199 OMM CH

K. VOIGT INTERGOV.OCEANOGRAPHIC COMMITTEE
Paris (UNESCO)

Secretariat

MR. PETER USHER GEMS,
UNITED NATIONS ENVIRONMENT PROGRAMME
P.O. Box 30552, Nairobi, Kenya
Tel: 254-2 520600 OR 230800 Ext.4162
UNEP Fax: 254-2 226890
GEMS Direct Fax: 254-2 226491

PU/jo
6 February 1992