

Climate Change 1992

The supplementary report to the IPCC Impacts Assessment

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Edited by W J McG Tegart and G W Sheldon

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Intergovernmental Panel on Climate Change

Climate Change 1992

The Supplementary Report to the IPCC Impacts Assessment

Report prepared for IPCC by Working Group II

Chairman: Professor Yu A Izrael (Russia)

Co-Vice-chairmen: Professor O Canziani (Argentina), Dr Hashimoto (Japan),
Professor O S Odingo (Kenya), Dr W J McG Tegart (Australia)



WMO



UNEP

Contents

	Preface by Professor G O P Obasi (WMO) and Dr M K Tolba (UNEP)	ix
	Preface by Professor Bert Bolin, Chairman, IPCC	x
	Preface by Professor Yu A Izrael, Chairman, Working Group II	xi
	Executive summary	1
Task A	Prediction of the regional distribution of climate change, including model validation studies	9
I	Systematic observations to identify climate change consequences	10
	Introduction	11
	Potential impacts of climate change	11
	Existing systemic observation programs	11
	Recommendations	12
II	Preliminary guidelines for assessing impacts of climate change	16
	Objectives	17
	Definition of the problem	17
	Selection of the method	18
	Testing the method	20
	Selection of the scenarios	20
	Assessment of the impacts	26
	Evaluation of adjustments	27
	Consideration of policy options	27
Task B	Energy and industry-related issues	29
III	Energy; human settlement; transport and industrial sectors; human health; air quality; effects of ultraviolet-B radiation	30
	Energy	31
	Human settlement	33
	Industry and transport	34
	Health	35
	Ultraviolet radiation and health	36
	Air quality	36
	Effects of ultraviolet-B radiation	37
Task C	Agriculture and forest-related issues	43
IV	Agriculture and forestry	44
I	Agriculture	45
	Climatic scenarios	45
	Assumptions concerning technology and management	45
	Potential impacts on agriculture and land use	46
	Direct effects of elevated CO ₂ and other greenhouse gases	46
	Multiple stresses	47
	Effects of climate change on soil properties	47
	Effects of climate change on the distribution of agricultural pests and diseases	48
	Research on regional impacts	48

	Europe	49
	Africa	51
	Asia	51
	Australia/Oceania	51
	Global assessments	51
	Adaptation	52
	Gaps in research and monitoring	53
	Recommendations and conclusions	53
II	The managed forest and the forest sector	58
	Scope of the issue	58
	Progress since the IPCC Impacts Assessment in 1990	58
	Socioeconomic importance of forests	58
	Reforestation/afforestation and more managed forests	58
	Tropical deforestation	58
	Research and monitoring gaps	59
	Recommendations and conclusions	60
V	Natural terrestrial ecosystems	63
	Background	64
	Progress since the IPCC Impacts Assessment	64
	Uncertainties and knowledge gaps	65
	Addressing the uncertainties and knowledge gaps	66
	Fundamental ecological processes	67
	Identifying the linkages with climate change and greenhouse gas concentrations	68
	Identifying social and economic consequences	68
	Conclusions	69
VI	Hydrology and water resources	71
	Introduction	72
	Overview of new information	73
	Case study summaries	75
	Water resources management impacts	79
	Conclusions	80
Task D	Vulnerability to sea-level rise	85
VII	World oceans and coastal zones: ecological effects	86
	Regional ecological impacts of climate change	87
	Impacts of rises in temperature	87
	Impacts of sea-level rise	89
	Case study areas in progress	90
	Recent findings and updates	90
	Research and monitoring needs	91
	Recommendations	92
VIII	Terrestrial component of the cryosphere	94
	Background	95
	Progress since the IPCC Impacts Assessment in 1990	95
	Information and data gaps	97
	Responses to close information and data gaps	98
Appendix A:	Analysis of current activity on regional impacts of climate change	103
Appendix B:	Organisation of IPCC and Working Group II	113
Glossary of acronyms		115

Preface by Professor G O P Obasi (WMO) and Dr M K Tolba (UNEP)

The Intergovernmental Panel on Climate Change (IPCC) was jointly established by the World Meteorological Organization and the United Nations Environment Programme in 1988 under the Chairmanship of Professor Bert Bolin. The Panel formed three Working Groups:

- to assess the available scientific evidence on climate change (Working Group I);
- to assess the environmental and socioeconomic impacts of climate change (Working Group II); and
- to formulate response strategies (Working Group III),

and a Special Committee on the Participation of Developing Countries to promote the participation of those countries in its activities.

The IPCC First Assessment Report was completed in August 1990 and consists of the Overview, IPCC Scientific Assessment, the IPCC Impacts Assessment, the IPCC Response Strategies (the last three including the respective Policymakers' Summary) and the Policymakers' Summary of the IPCC Special Committee. The Report has now become a standard work of reference, widely used by

policymakers, scientists and other experts, and encompasses a remarkable coordinated effort by hundreds of specialists from all over the world.

In March 1991, anticipating a continuing need for the most up-to-date information on climate change and the United Nations Conference on Environment and Development (Rio de Janeiro, June 1992), the Panel requested its three Working Groups to produce updates to their 1990 Reports. The result is the 1992 IPCC Supplement which was completed in February 1992. This volume contains the contribution of Working Group II to support the conclusions in its update of the IPCC Impacts Assessment.

As in 1990, success in producing this Supplement has depended upon the enthusiasm and cooperation of scientists and other experts worldwide. We are grateful for their commitment. We express especial gratitude to Professor Bolin for his very able leadership of the IPCC and once again congratulate Professor Yu A Izrael, Chairman of the Working Group, and his Co-Vice Chairmen (Dr W J McG Tegart, Dr S Nishioka, Professor R S Odingo and Professor O Canziani) for another job well done.

Preface by Professor Bert Bolin, Chairman, IPCC

IPCC Working Group II, charged with the assessment of the environmental and socioeconomic impacts of climate change, completed its first report, the IPCC Impacts Assessment, in August 1990. Based on that report and the corresponding reports from Working Groups I and III and its Special Committee on the Participation of Developing Countries, the IPCC last that year agreed on a set of conclusions (Fourth Session, Sundsvall, Sweden, 27-31 August 1990) which were forwarded to the UN General Assembly. Subsequently, an Intergovernmental Negotiating Committee (INC) was established by the General Assembly with the specific charge to negotiate a climate convention to be ready for signature at the United Nations Conference on Environment and Development (UNCED) at Rio de Janeiro in June 1992. In March 1991, the IPCC agreed that a supplement to its 1990 report be prepared to assist the INC further in its task.

Analyses of the impacts of climate change are obviously needed as a basis for negotiating measures for prevention or mitigation of the effects of climate change. However, such analyses cannot be successfully carried out until more precise climate change scenarios become available. The prevailing uncertainties in the prediction of likely future changes of climate, particularly on regional scales, therefore represent a major difficulty in pursuit of the task given to Working Group II.

The wide-ranging work done so far by the scientists and other specialists was brought together in the form of detailed analyses by key researchers in the field. On the basis of these analyses, Working Group II prepared its contribution to the 1992 IPCC Supplement which is being presented in this volume together with the underlying supporting material. The latter, however, has undergone full peer review. Even though the findings and conclusions presented in the volume remain qualitative in most in-

stances, they nevertheless provide an important basis for the further scientific work that is required.

The Working Group has also initiated methodological studies which should assist in the further pursuit of its task. The development of methods for sensitivity analysis is of particular importance in this context. This volume also reports on the methodological work.

As Chairman of the IPCC, I am pleased to acknowledge the large amount of work that has gone into the production of the present volume. My particular thanks go to the Chairman of the Working Group, Professor Yu A Izrael, and his Co-Vice-Chairmen (Dr W J McG Tegart, Dr S Nishioka representing Dr M Hashimoto, Dr O Canziani and Professor R S Odingo). The report is the result of the work of a large group of scientists and other experts who have devoted much of their professional time to make this assessment possible. I am very grateful for their efforts and contributions. My thanks are also extended to the IPCC central secretariat at the World Meteorological Organization in Geneva under the direction of Dr N Sundararaman, who has carried out the important function of coordinating the parallel efforts of the three working groups under the constraints of a very tight schedule.

It is most important that the kind of cooperative efforts represented by the work of the IPCC be continued in order to provide the basic information needed to transform the United Nations Framework Convention on Climate Change signed at the UNCED into an effective international instrument for the protection of the global climate for the coming generations of humankind.

Stockholm
July 1992

Preface by Professor Yu A Izrael, Chairman, IPCC Working Group II

The first IPCC Impacts Assessment prepared by Working Group II (WGII) of the IPCC¹ was published in 1990². The report was a comprehensive statement of the state of knowledge concerning impacts of climate change and resulted from almost two years' work by over two hundred scientists worldwide. The report was prepared under the leadership of the WGII Chairman, Professor Yu A Izrael (Russia) and Vice-Chairmen, Dr W J McG Tegart (Australia) and Dr M Hashimoto (Japan).

In the eighteen months since then, scientific activity has continued to focus on the impacts of climate change and progress has been made in a number of important areas. The purpose of this Supplement is to update the 1990 Report, paying particular attention to its key conclusions and to new issues which have appeared in the scientific debate. The Supplement should be read in conjunction with the earlier report.

The conclusions presented in the Supplement are based on the supporting scientific material published here, which has been prepared by leading scientists and exposed to a widespread peer review. It can therefore be considered as a statement of the contemporary views of the international scientific community.

It is clear from the Supplement that comprehensive estimates of the physical and biological effects at the regional level are still difficult to make. Confidence in regional estimates of critical climate factors presented by Working Group I is still low, particularly precipitation and soil moisture. Continued research is necessary to refine the estimates of potential impacts.

The estimates already available suggest that if continued emission of greenhouse gases persisted through

the next century and, in particular, if CO₂ in the atmosphere doubled, there would not be a global catastrophe due to climate change. However, there would be severe impacts in those regions of the world least able to adapt and substantial response measures would need to be taken.

I am pleased to acknowledge the contributions of so many, in particular the Lead Authors who have given so freely of their expertise and time in the preparation of this Report. I am grateful to my Co-Vice-Chairmen, Dr W J McG Tegart (Australia), Dr S Nishioka (Japan), Professor R S Odingo (Kenya) and Professor O Canziani (Argentina) for overseeing the reviewing and publication of the Supplement. Financial support for editing and publication was provided by the Department of the Arts, Sport, the Environment and Territories, Australia, and thanks are due to the staff of that Department for their assistance in compilation and editing of the Supplement, in particular, Ms J Hellyer and Ms M Kimber.

Thanks are also due to all the members of the IPCC central secretariat at WMO, Geneva, under the direction of Dr N Sundararaman, for their friendly and tireless assistance and coordination with the other IPCC Working Groups.

I am confident that this 1992 Supplement will assist further in building the firm scientific foundation necessary for the formulation of a rational and comprehensive response by humankind to the impacts of climate change.

Moscow
June 1992

1. Organisational details of IPCC and Working Group II are shown in Appendix B.

2. *Climate Change. The IPCC Impacts Assessment*. WJ McG Tegart, GW Sheldon and DC Griffiths (Eds), Australian Government Publishing Service, Canberra, Australia, 1990.

