



***J.C. Pernetta and P.J. Hughes (Eds.):
Implications of expected climate changes
in the South Pacific region: an overview***

UNEP Regional Seas Reports and Studies No. 128

Prepared in co-operation with



ASPEI



SPREP

PREFACE

In spite of uncertainties surrounding the predicted climate changes, greenhouse gases seem to have accumulated in the atmosphere to such a level that the changes may have started already and their continuation may now be inevitable.

The environmental problems associated with the potential impact of expected climate changes may prove to be among the major environmental problems facing the marine environment and adjacent coastal areas in the near future. Therefore, in line with the Decision of the Fourteenth Session of the UNEP Governing Council on "Global climate change"¹, the Oceans and Coastal Areas Programme Activity Centre (OCA/PAC) of UNEP launched and supported a number of activities designed to assess the potential impact of climate changes and to assist the Governments in identification and implementation of suitable response measures which may mitigate the negative consequences of the impact.

In 1987, Task Teams on Implications of Climate Change were established for six regions covered by the UNEP Regional Seas Programme (Mediterranean, Wider Caribbean, South Pacific, East Asian Seas, South Asian Seas and South-East Pacific). The Task Team for the South Pacific region was jointly sponsored by UNEP, the Association of South Pacific Environmental Institutions (ASPEI) and by the South Pacific Regional Environment Programme (SPREP), with ASPEI co-ordinating the work of the Task Team.

The initial objective of the Task Teams was to prepare regional overviews and site specific case studies on the possible impact of predicted climate changes on the ecological systems, as well as on the socio-economic structures and activities of their respective regions. The overviews and case studies were expected:

- to examine the possible effects of the sea level changes on the coastal ecosystems (deltas, estuaries, wetlands, coastal plains, coral reefs, mangroves, lagoons, etc.);
- to examine the possible effects of temperature elevations on the terrestrial and aquatic ecosystems, including the possible effects on economically important species;
- to examine the possible effects of climatic, physiographic and ecological changes on the socio-economic structures and activities; and
- to determine areas or systems which appear to be most vulnerable to the above changes.

The regional studies were intended to cover the marine environment and adjacent coastal areas influenced by or influencing the marine environment.

The regional studies prepared by the Task Teams were planned to be presented to the intergovernmental meetings convened in the framework of the relevant Regional Seas Action Plans in order to draw the countries' attention to the problems associated with expected climate change and to prompt their involvement in development of policy options and response measures suitable for their region.

The site specific case studies developed by the Task Teams were planned to be presented to national seminars.

Once the initial objective of the Task Teams (impact studies) is achieved, they concentrate on providing assistance to national authorities in defining specific policy options and suitable response measures.

A preliminary version of this publication was the basic working document of a special intergovernmental meeting convened by SPREP, ASPEI and UNEP in mid-1989 in Marshall islands for the 19 island States of the South Pacific to consider their policy options, suitable response mechanisms and additional site specific case studies to be developed².

¹ UNEP/GC/DEC/14/20.

² Report of the SPC/UNEP/ASPEI Intergovernmental meeting on climatic change and sea level rise in the South Pacific (Majuro, 17-20 July 1989), SPC, 1989.

This publication was prepared by Messrs. J.C. Pernetta and P.J. Hughes on the basis of the work carried out by the UNEP/ASPEI/SPREP Task Team on Implications of Climate Change in the South Pacific region. The Task Team comprised J.C. Pernetta (Team Coordinator), G. McGregor, P. Hughes, M. Sullivan, P. Nunn, L. Bualia, and M. O'Collins. The report was edited and prepared for publication by Philip Tortell of Environmental Management Limited, New Zealand.

EDITORIAL FOREWORD

In late 1986 the Oceans and Coastal Areas Programme Activity Centre (OCA/PCA) of the United Nations Environment Programme (UNEP) proposed to the Association of South Pacific Environmental Institutions (ASPEI) the formation of a regional task team to investigate the potential impacts of global warming on the island countries of the South Pacific. A task team was formed, and over the last two years 19 individuals from nine Institutions and five different countries have contributed the reviews of available data, and individual site-specific case studies relevant to the region, which are contained in this volume.

In mid-1988 at the Intergovernmental Meeting held in Noumea, New Caledonia to consider the work programme of the South Pacific Regional Environmental Programme (SPREP) a preliminary report of the team's work was presented. At this meeting the suggestion was made that following completion of the work a special Intergovernmental Meeting should be held of representatives of the SPREP member countries to review the likely impacts of global warming and to plan future courses of action.

The preliminary report was expanded, revised and presented to the Joint Meeting of the Task Team on Implications of Climatic Changes in the Mediterranean and the Co-ordinators of Task Teams for the Caribbean, South-East Pacific, South Pacific, East Asian Seas and South Asian Seas Regions held in Split, Yugoslavia, in October 1988. Subsequently additional studies were completed and a popular booklet, entitled 'A Climate of Crisis', on the potential impacts was produced. These documents were then presented to an Intergovernmental Meeting of SPREP member countries held in Majuro, Republic of the Marshall Islands, in July 1989. This meeting recommended various courses of action including the preparation of eight country studies. The meeting also passed a strong resolution calling on the industrialised nations to provide technical and financial assistance to countries such as the smaller island nations of the Pacific, which have contributed little to the greenhouse problem but which are likely to be severely impacted.

To date no other region has held such a meeting of high level government officials and scientific advisors and the SPREP region therefore provides a model which may be followed in other Regional Seas Programme Areas. Several of the larger developed countries in the region already have in place national programmes of awareness raising, impact prediction, planning and policy-making. For the smaller developing countries of the Pacific basin, such national programmes may place too great a strain on their limited manpower and financial resources. The task team therefore has a role to play in assisting the implementation of the recommendations of the Majuro meeting, since through its work the team makes available to smaller countries lacking scientific manpower the skills and expertise necessary to conduct an appraisal of individual country policy and planning needs.

In line with UNEP's desire to foster inter-regional co-operation and linkages, representatives of the South Asian and Caribbean task teams participated as observers in the Majuro meeting, sharing their similar concerns and experiences with the Pacific islands representatives. In December 1988 the co-ordinator of the task team for the Pacific region was asked, together with a member of the Mediterranean task team, to visit the Republic of the Maldives and prepare a report on proposed assistance from UNEP to the Government of the Maldives in planning for climatic change. The Maldivian islands and the atoll states of the Pacific are physically very similar, and face similar impacts resulting from global warming. The need for inter-linkage and sharing of experiences is therefore obvious.

The present volume contains the results of the South Pacific task team's work between March 1987 and March 1989; it represents a first attempt at identifying the potential impacts of global warming and sea level rise which might be expected to affect the countries of the Pacific Basin. Not all impacts will be evenly felt throughout the region, with those impacts of importance to small atolls being quite different from those which can be expected on the higher islands of Melanesia. Nevertheless, no country within the region can expect to emerge unscathed from the changes which face the region over the coming decades. It is timely therefore that national appraisals should be undertaken to more specifically identify those impacts which are applicable to particular areas and

countries and determine the likely economic and social costs of those impacts. Equally important will be the development of policy and planning alternatives to assist the governments of the region in mitigating the expected impacts. The next phase of the task team's work aims to address these issues at a national level.

The first two papers in this report provide an overview of the potential impacts of climatic change in the region as a whole, and the first paper concludes with recommendations for future investigations, many of which are already being implemented. The next seven papers examine at a regional or sub-regional level likely impacts on specific, often inter-related, aspects of the physical, biological, social and economic environment: these are climate, the physical environments of atolls and tropical riverine lowlands, island groundwater resources, agricultural crops and Pacific islands social, cultural and economic systems. The remaining papers are site-specific case studies which concentrate on the likely impacts of sea level rise on a diverse range of coastal locations throughout the region. The concluding paper addresses the likely effects that climatic change will have on agricultural production in the highlands of Papua New Guinea.

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August 1989

ACKNOWLEDGEMENTS

The task team members wish to place on record their appreciation of the financial support accorded this work by OCA/PAC and the contributions of many individuals to the provision of information and personal experiences which have been utilised in the preparation of many of the papers contained in this report.

Typing of the many drafts was undertaken without complaint by Mary George and Kwani Kego; their patience and accuracy is gratefully acknowledged by the editors, as is the sub-editorial assistance of Pam Flannery and the cartographic services of Vagoli Bouauka.

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