

COUNTRY STUDY REPORT

**PREPARED BY
THE UNITED NATIONS ENVIRONMENT PROGRAMME**

**FOR THE
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE**

June 1, 1993

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I. EXECUTIVE SUMMARY

This report summarizes information on climate change country studies received by the United Nations Environment Programme (UNEP) Secretariat, supplemented with information from other sources. The term "climate change country study" is used here to mean any official national study on climate change, including greenhouse gas emissions inventories, impacts assessments, and emissions mitigation analyses. Numerous other studies, undertaken by institutions in various countries, are not listed here since either they have not been endorsed as official national studies or they are global or sub-national in coverage.

Based on the information collected as of 1 June 1993, 75 countries had undertaken, or planned to undertake, some form of a country study through internal, bilateral, or multilateral support. In addition, several countries have indicated a wish to participate in country studies, but lack the financial and technical resources to do so. The country studies that have been completed or are in progress are fairly evenly split among emissions inventories, impacts assessments, and mitigation analyses. This draft report, however, should not be interpreted as a complete list of country studies nor of countries requiring assistance to undertake such studies, as numerous countries have not yet responded to requests for information.

As yet, a comprehensive methodology for country studies has not been developed, although work is underway in several IPCC working groups and elsewhere to partially address this need. Current efforts include the work by the IPCC and the OECD on developing an internationally-accepted methodology for compiling national inventories of greenhouse gas emissions and sinks, and a project supported by UNEP to establish a consistent methodological framework for undertaking cost assessments of greenhouse gas abatement options. The IPCC expert group on guidelines has presented "Preliminary Guidelines for Assessing Impacts of Climate Change. These guidelines will be further elaborated by the expert group. In conjunction with these activities methodologies for the testing of adaptation options will be developed. UNEP is planning these activities by through testing these guidelines and methodologies through a set of country studies. In addition, draft guidelines for national emissions inventories and emissions reduction strategies have been prepared by Finland, and a framework for national assessments of emissions, impacts, and emissions reductions options have been proposed by the United States. All these activities may assist countries in preparing future studies, but there is an urgent need to give a higher priority to these activities.

The list below summarizes the information received to date regarding country studies. "Internal" is used to mean studies on the country under discussion; "external" applies to studies on other countries that are supported by the country under discussion. Following this Executive Summary are more detailed discussions of the genesis of this report, country study methodologies, country studies completed or in progress, and recommendations for further work on country studies.

COUNTRY STUDY SUMMARY

<u>COUNTRY</u>	<u>STUDIES</u>
Algeria	No studies
Argentina	Internal: 1) Potential participant in impacts and mitigation study under Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from GEF
Australia	Internal: 1) Prepared "National Greenhouse Response Strategy". 2) Developing an updated draft of the National Greenhouse Gas Emissions Inventory of emissions and sinks - the earlier draft was completed in 1991. 3) Completed the Ecologically Sustainable Development (ESD) Working Group Chairs' report on the Greenhouse issue. 4) Completed study on the costs of emissions and reductions. 5) Submitted National Report to the INC for the UN Framework Convention on Climate Change. 6) A number of studies of Australian regional climate change impacts are underway. 7) Review underway of Intergovernmental Panel on Climate Change Common Methodology on sea-level rise. 8) Sea-level rise vulnerability studies being undertaken. 9) Completion of Industry Commission study of Costs and Benefits of Reducing Greenhouse Gas Emissions. 10) Completion of a number of consultancies concerning energy efficiency and renewable energy options. External: 1) Co-sponsorship of Asia Development Bank Program of technical assistance to Asian countries to develop national response strategies. 2) Provided funding for a sea-level rise vulnerability study in the South Pacific. 3) Provided financial contribution to UNEP Climate Change Impacts Research in the South Pacific. 4) Funding for the South Pacific Regional Environment Program.

		5)Establishment of the South Pacific Sea-level and Climate Monitoring Project.
		6)Completion of a study into enhancing climate monitoring capacity in the Pacific.
		7)Provision of training assistance to developing countries.
Austria	Internal:	1)Completed inventory of greenhouse gas sources and sinks 2)Completed impacts study 3)Analysis of emissions reduction technologies and development of a national response strategy are in progress
Bahamas	No studies	
Bangladesh	Internal:	1)Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and to adapt to climate change, and national response strategies) 2)Participant country in proposed UNDP/GEF project on least cost emissions reduction 3)Possible study on sea level rise vulnerability to be undertaken with assistance from the Netherlands, other studies in coastal areas are being planned under IGBP 4)Preliminary studies were undertaken on methane emissions from rice paddies 5)UNEP/FAO case study on agroecological potential and climate change under way
Barbados	No studies	
Belgium	Internal:	1)Compiled a national emissions and sinks inventory 2)Performing an optimization exercise of greenhouse gas reduction strategies in conjunction with ETSAP 3)Funding a number of research projects related to climate change impacts through the Global Change Impulse Programme
Benin	No studies	
Bolivia	Internal:	1)Effects study completed
Brazil	Internal:	1)Completed cooperative study with UNEP on potential socio-economic effects of climate change in Brazil 2)Completed cooperative emissions inventory study with the U.S. 3)Study in progress on greenhouse gas emissions inventory and costs of abatement strategies, coordinated and funded by France (with possible further funding from UNEP under the coordination of Risø National Laboratory) and carried out by the

Brunei	No studies	
Bulgaria	Internal:	1)Preliminary assessment of greenhouse gas emissions and sinks underway
Burkina Faso	No studies	
Burundi	No studies	
Canada	Internal:	<p>1)Prepared "National Action Strategy on Global Warming"</p> <p>2)National emissions inventory and reporting programme</p> <p>3)Revised report on Greenhouse Gas Emissions Estimates released in December 1992</p> <p>4)Two major regional climate impact assessments underway</p> <p>5)National Report to the Conference of the Parties of the UN Framework Convention on Climate Change expected by June 1993</p> <p>6)National study on the economic effects of emissions control measures to be completed in summer 1993</p> <p>7)Additional related climate change activities have been undertaken, including preparing research monographs; producing a report for UNCED that reviews the potential impacts of climate change on Canada, Canada's National Action Strategy, and initial response strategies; producing a discussion paper on the use of economic instruments to achieve environmental objectives; launching a research program to reduce the uncertainties associated with climate change; preliminary carbon budget modelling to assess forest vulnerability and to facilitate forest management; producing a series of reports on the state of Canada's climate; beginning a series of environmental programs for citizens; and preparing regional climate change reports.</p>
	External:	<p>1)Undertaking pilot study on emissions and control strategy in China</p> <p>2)Assisting Mexico in development of emissions inventory</p> <p>3)Assisting Tanzania and Zimbabwe in joint study on emissions and emissions reductions options</p> <p>4)Exploring possibilities for assisting one country with an economy in transition</p>
Cape Verde	No studies	
Chile	Internal:	1)Potential ecosystem and socio-economic effects of climate change on coastal regions were assessed
China	Internal:	1)Participant country in UNEP/GEF project on greenhouse gas sources and sinks

- 2) Completed a paper assessing the impacts of climate change on China using Global Circulation Model results
- 3) Assistance from the ADB is expected for a detailed effects study
- 4) Pilot study on emissions and control strategy underway with Canada
- 5) Participant country in proposed UNDP/GEF project on least cost emissions reduction
- 6) Potential participant in separate GEF Regional Asia least cost emissions reduction project
- 7) Based on studies undertaken by Chinese scientists a report was published by WWF in 1992 on 'Climate Change due to the Greenhouse Effect and its implications for China'.

Colombia	No studies	
Congo	No studies	
Costa Rica	Internal:	1) Participant country in UNEP/GEF project on greenhouse gas sources and sinks
Côte d'Ivoire	Internal:	1) Study on inventory of greenhouse gas emissions sources undertaken, coordinated, and funded by France
Croatia	Internal	1) Participant in UNEP/MAP project on implications of climatic changes on mediterranean coasts 2) Inventories of sources and sinks of greenhouse gases and studies on climate change impacts on continental areas planned.
Cuba	Internal	1) Completed impacts assessment and study on sea level vulnerability 2) Preliminary inventory of CO ₂ and CH ₄ emissions 3) Preliminary report on national response options and studies on national emissions mitigation options
Cyprus	No studies	
*Czechoslovakia	Internal:	1) Joint project with Austria on possibilities for enhancing efficiency in energy sector 2) Preliminary study on socio-economic impacts * updated information please find under Slovak Republic.
Denmark	Internal:	1) National inventory of sources and sinks of greenhouse gases is completed 2) National impacts and adaptation study is completed 3) Action Plan for limiting the emissions from the Energy Sector and the Transport Sector including reduction technologies and national response strategies is completed 4) Ongoing national greenhouse gas abatement costing study through UNEP/Risø program

	External:	1)Funding national greenhouse gas abatement costing study in Zimbabwe through UNEP/Risø program
Dominica	No studies	
Ecuador	No studies	
Egypt	Internal:	1)Planning to establish a "National Climate Impacts Assessment and Response Strategies Programme" 2)Possible study on sea level rise vulnerability to be undertaken with the Netherlands
Equatorial Guinea	No studies	
Federated States of Micronesia	Internal:	1)Study of vulnerability of Yap Island to sea level rise 2)Strategy for measures to adapt to sea level rise and other effects of climate change 3)Application made to the US government to get assistance in the development of an appropriate database on which a national action plan can be based.
Finland	Internal:	1)Emissions inventory and emissions reduction options report completed 2)Assessing the feasibility of committing to greenhouse gas emissions reduction targets proposed during negotiations for the Climate Convention 3)Developing a sustainable forest economy programme 4)Has begun 6-year assessment of climate change (past and anticipated change, impacts assessment, and emissions reduction strategies)
	External:	1)Pledged up to US\$200,000 to UNEP to finance cost/benefit studies in developing or transition countries
France	External:	1)Studies in progress (with possible funding from UNEP, under the coordination of Risø National Laboratory) on emissions inventory and costs of abatement strategies for Brazil, with Universidade Federal do Rio de Janeiro 2)Studies in progress on greenhouse gas emissions inventories for Côte d'Ivoire, Mali, and Senegal. 3)Studies in progress (with possible funding from UNEP, under the coordination of Risø National Laboratory) for continental South-East Asia, with the Asian Institute of Technology, Bangkok
Gambia	Internal:	1)Draft emissions inventory prepared 2)Participant country in UNEP/GEF project on greenhouse gas sources and sinks

Germany	Internal:	<ul style="list-style-type: none"> 1) Publishes national CO₂ emissions data regularly 2) Conducting a national research programme on climate change effects 3) Published a report entitled "Protecting the Earth" which includes proposals for national measures to reduce energy-related emissions of trace gases and reduction targets
Ghana	Internal:	<ul style="list-style-type: none"> 1) Undertaking an impacts study in cooperation with the United Kingdom
Grenada	No studies	
Guatemala	No studies	
Honduras	No studies	
Iceland	Internal:	<ul style="list-style-type: none"> 1) Completed report on national greenhouse gas emissions for 1990 2) Evaluating measures and assessing strategies to limit and reduce greenhouse gas emissions and increase fixation
India	Internal:	<ul style="list-style-type: none"> 1) Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce emissions and to adapt to climate change, and national response strategies) 2) Participant country in proposed UNDP/GEF project on least cost emissions reduction 3) Possible impacts study, to be funded by the United Kingdom, under discussion
Indonesia	Internal:	<ul style="list-style-type: none"> 1) Completed National Strategy on the Anticipation of Climate Change Caused by the Greenhouse Effect 2) Completed cooperative study with UNEP on potential socio-economic effects of climate change in Indonesia, Malaysia, and Thailand 3) A study on impacts and response strategies has been initiated with the support of Japan 4) Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and to adapt to climate change, and national response strategies) 5) Possible study on sea level rise vulnerability to be undertaken with the Netherlands 6) Participant country in proposed UNDP/GEF project on least cost emissions reduction 7) Possible national greenhouse gas abatement costing study through UNEP/Risø program funded by the Netherlands

8)Signed MOU with Norway on environmental cooperation; will include assessment of ecostrategies for carbon fixation such as forest management, development of greenhouse gas emissions inventories and emissions reduction scenarios
 9)Has been offered assistance by the United Kingdom for impacts studies
 10)Climate change study with the Environment Agency of Japan planned for FY 1992

Ireland	Internal:	1)Developing greenhouse gas emissions inventory 2)Series of studies on impacts and response strategies completed 3)Ongoing evaluation of emissions control measures
Israel	Internal:	1)A Workshop on "Regional Implications of Future Climate Change" was held in 1991 2)Inventory of CO ₂ emissions for the years 1980 - 1992 completed 3) A multi disciplinary investigation of climate change in Israel is being considered
Italy	Internal:	1)Prepared report on energy-related CO ₂ emissions reduction options for the Commission of the European Communities
Japan	Internal:	1)Completed emissions inventories 2)Completed impacts assessments 3)Completing assessments of emissions mitigation technologies
	External:	1)Completed joint study on assessment of climate change impacts and response strategies in Indonesia 2)Ongoing joint study on coastal zone management planning in South Pacific countries 3)Participated in, and provided financial assistance for, numerous international climate change programmes
Kenya	Internal:	1)An impacts study underway, funded by the United Kingdom's Overseas Development Administration 2)Potential participant in impacts and mitigation study under Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from GEF
Korea, DPR	Internal:	1)Participant country in proposed UNDP/GEF project on least cost emissions reduction
Korea, R	Internal:	1)Participant country in proposed UNDP/GEF project on least cost emissions reduction
Madagascar	Internal:	1)Produced preliminary report on national sources of greenhouse gases and the impacts of climate change

Malaysia	Internal:	<ul style="list-style-type: none"> 1)Completed cooperative study with UNEP on potential socio-economic effects of climate change in Indonesia, Malaysia, and Thailand 2)Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and adapt to climate change, and national response strategies) 3)Under the IGBP, collecting information on climate research
Mali	Internal:	<ul style="list-style-type: none"> 1)Study on inventory of greenhouse gas emissions sources undertaken, coordinated, and funded by France
Marshall Islands	Internal:	<ul style="list-style-type: none"> 1)Assessed the vulnerability of the Islands Majuro Atoll to accelerated sea level rise and evaluated possible response options
Mauritius	Internal	<ul style="list-style-type: none"> 1)Climate Action Plan submitted for approval by government 2)Vulnerability assessment of the coastal zones 3)Microclimate study of the City of Port Louis
Mexico	Internal:	<ul style="list-style-type: none"> 1)Participant country in UNEP/GEF project on greenhouse gas sources and sinks 2)Emissions inventory study with the U.S. 3)Emissions inventory project through technical assistance from Canada
Monaco	No studies	
Mongolia	Internal:	<ul style="list-style-type: none"> 1)Participant country in proposed UNDP/GEF project on least cost emissions reduction
Morocco	Internal:	<ul style="list-style-type: none"> 1)Participant country in UNEP/GEF project on greenhouse gas sources and sinks
Myanmar	Internal:	<ul style="list-style-type: none"> 1)Participant country in proposed UNDP/GEF project on least cost emissions reduction
Namibia	No studies	
Netherlands	Internal:	<ul style="list-style-type: none"> 1)National Programme on Climate Change containing measures to be taken to achieve national targets 2)Completed cost/benefit studies on sea level rise responses 3)Expects to complete comprehensive cost/benefit analysis of all sectors 4)Completed a cost analysis of technologies to reduce CO₂ emissions from the energy sector 5)Ongoing national greenhouse gas abatement costing study through UNEP/RISO program 6)Preliminary national greenhouse gas inventory

	External:	1)Planning to undertake sea level rise studies in Bangladesh, Egypt, and possibly Indonesia in cooperation with those governments
New Zealand	Internal:	1)Completed sources and sinks inventory 2)Completed impacts studies 3)Completed response strategies studies 4)Completed strategy on first steps to tackle CO ₂ emissions
	External:	1)Assists developing countries with studies through contributions to SPREP and UNEP 2)Participated in WMO study to assess climate monitoring capacity in the South West Pacific and to identify critical impacts issues
Nigeria	Internal:	1)Participant country in UNEP/GEF study on greenhouse gas sources and sinks 2)Plans to establish a national task force to develop a climate impacts assessment and response strategies programme, but requires assistance 3)Potential participant in impacts and mitigation study under Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from GEF
Norway	Internal:	1)Finalized a study on global climate change (subject overview, national inventory of green house gas emissions, potential impacts, policy strategies including the economic effects of limiting CO ₂ emissions and increasing fixation); considering follow-up analysis 2)Green Tax Commission has made proposals for economic incentives to reduce greenhouse gas emissions 3)National action plan to be developed before the end of 1993
	External:	1)Signed MOU with Indonesia on environmental cooperation; will include assessment of ecostrategies for carbon fixation such as forest management, development of greenhouse gas emissions inventories and emissions reduction scenarios
Pakistan	Internal:	1)Plans to prepare a study on climate change and its impacts on Pakistan 2)Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and to adapt to climate change, and national response strategies) 3)Participant country in proposed UNDP/GEF project on least cost emissions reduction
Panama	No studies	

Philippines	Internal:	<p>1) Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and to adapt to climate change, and national response strategies)</p> <p>2) Participant country in proposed UNDP/GEF project on least cost emissions reduction</p>
Poland	Internal:	<p>1) Completed two preliminary emissions inventories</p> <p>2) Cooperative study in progress with the U.S. on emissions inventory and emissions reduction options</p> <p>3) Participant country in UNEP/GEF project on greenhouse gas sources and sinks</p> <p>4) Several preliminary impacts studies completed or underway</p> <p>5) National studies on response strategies in fuel producing and consuming sectors being conducted</p>
Romania	Internal:	<p>1) Completed several modest studies on impacts, and plans to continue studies</p> <p>2) Completed initial inventory of greenhouse gas emissions, and preliminary assessment of policy options for emissions reductions, financed by the United Kingdom</p>
Russian Federation	Internal:	<p>1) Completed preliminary inventory of CO₂ and CH₄ emissions</p>
Saint Lucia	Internal:	<p>A request was made to the US government for financing a comprehensive national climate change study</p>
Saudi Arabia	Internal:	<p>1) Emissions inventory underway</p> <p>2) Limited studies under development concerning climate impacts assessment and response strategies</p>
Senegal	Internal:	<p>1) Participant country in UNEP/GEF study on greenhouse gas sources and sinks</p> <p>2) Study on inventory of greenhouse gas emissions sources being undertaken, coordinated, and funded by France</p>
Seychelles	Internal:	<p>1) Completed impacts assessment</p>
Slovak Republic	Internal:	<p>1) Studies on socio-economic impacts of climate change completed for former Czecho-Slovak Federal Republic</p> <p>2) Inventory of greenhouse gas emissions will begin in 1993</p> <p>3) A national programme of reduction of greenhouse gas emissions and a climate change impact analysis are being prepared.</p>
South Africa	Internal:	<p>1) South African Global Change Programme established to coordinate research on global climate change in southern Africa</p>

		2)Interdepartmental Coordinating Committee for Global Environmental Change has studied local impacts of global climate change and has presented a draft policy document in March 1993
Spain	Internal:	1)Preparation of a National Climate Programme initiated
Sri Lanka	Internal:	1)Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and to adapt to climate change, and national response strategies) 2)Preliminary Emission Inventory completed 3)Participating in UNDP/GEF Least Cost Emissions Reduction Project
Sweden	Internal:	1)Completed emissions inventory for 1988/89 2)Completed emissions inventory for 1990, as well as an impacts analysis and a preliminary assessment of emissions reduction measures 3)Conducting analysis of emissions reductions and associated costs 4)Completed a survey on future climate change in the Nordic region
Switzerland	Internal:	1)Preparing a national strategy on measures to stabilize and reduce greenhouse gas emissions from key sectors, including emissions inventory and impacts assessments
	External:	1)Financial assistance has been made available to assist developing countries to address global environmental problems 2)Contributed 120,000 Swiss francs in 1991/1992 to support IPCC country study activities 3)Impacts and mitigation studies for developing countries with the assistance of the government-sponsored Proclim Institute, and Ecosphere, a Swiss company, are under consideration
Tanzania	Internal:	1)Preparing to start a collaborative study with Zimbabwe, with financial assistance from Canada, on emissions, development strategies, and policy options in Tanzania and Zimbabwe 2)Participant country in UNEP/GEF project on greenhouse gas sources and sinks
Thailand	Internal:	1)Has begun a national study on emissions, emissions control measures and alternative energy scenarios, and international interaction 2)Completed cooperative study with UNEP on potential socio-economic effects of climate change in Indonesia, Malaysia, and Thailand

		3)Assistance from the ADB is expected for a detailed effects study 4)Participant country in proposed UNDP/GEF project on least cost emissions reduction
Togo	No studies	
Tonga	Internal:	1)Study on effects of sea level rise completed with technical and financial assistance from Japan
Tunisia	Internal:	1)Preliminary study on sector impacts and response strategies
Turkey	Internal:	1)Climate change studies underway through "National Climate Coordination Group" (NCCG) 2)National reports by two subgroups of NCCG completed
Turkmenistan	No studies	
Tuvalu	Internal:	1)Preliminary study underway to design and implement comprehensive climate change study through ASPEI, UNEP, and SPREP
Uganda	Internal:	1)Prepared proposal for sector studies on emissions, impacts, and cost/benefits of response options; project requires external funding 2)Participant country in UNEP/GEF project on greenhouse gas sources and sinks
United Kingdom	Internal:	1)Produced or commissioned a number of national studies on emissions, effects, and emissions reduction options and costs
	External:	1)Undertaking impacts studies in cooperation with Kenya, Ghana, and the Organization of Eastern Caribbean States 2)Has offered assistance to Indonesia and Zimbabwe for impacts studies 3)Discussing funding of an impacts study in India with World Bank 4)Discussing with UNEP possible involvement in UNEP/Risø programme on emissions abatement costs 5)Funded initial inventory of greenhouse gas emissions in Romania
United States	Internal:	1)Produced or supported numerous national studies on emissions, impacts, emissions reduction options, and costs and benefits of response strategies, to provide the foundation for the U.S. Climate Action Plan 2)US Action Plan for Global Climate Change issued in December 1992 presently being revised

	External:	<p>1)Has supported numerous cooperative studies in developing countries and European countries in transition on impacts, emissions inventories, technology assessments, and emissions reduction cost assessments</p> <p>2)Has offered technical support to Brazil, Mexico, and Poland for development of inventories of greenhouse gas sources and sinks, and additional support to Poland for assessment of technical options and strategies to limit emissions</p> <p>3)Started an initiative to provide \$25 million over a two-year period to support climate change country studies by developing countries and countries in transition</p>
Uruguay	Internal:	<p>1)No national studies</p> <p>2)Few studies at the sub regional level on climate change and socio-economic impacts on the coast, protected areas, as well as wetlands</p>
Venezuela	Internal:	<p>1)Preliminary inventory of greenhouse gas sources and sinks completed</p> <p>2)Participant country in UNEP/GEF project on sources and sinks of greenhouse gases</p> <p>3)Potential participant in impacts and mitigation study under Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program, through financing from GEF</p> <p>4) A preliminary study on possible impacts of climate change as well as studies on GHG emission from soils and savannas completed.</p>
Viet Nam	Internal:	<p>1)Study on vulnerability to climate change and sea level rise completed through UNEP</p> <p>2)Completed cooperative study with UNEP on potential socio-economic effects of climate change in Viet Nam</p> <p>3)Participating in ADB project to develop regional strategy to address the effects of climate change (includes country studies on potential effects, possible policy options to reduce net emissions and to adapt to climate change, and national response strategies)</p> <p>4)Participant country in proposed UNDP/GEF project on least cost emissions reduction</p>
Yugoslavia	Internal:	<p>1)Preliminary assessment of greenhouse gas emissions and sinks underway</p>
Zaire	No studies	
Zimbabwe	Internal:	<p>1)Preparing to start a collaborative study with Tanzania with financial assistance from Canada, on emissions, development strategies, and policy options in Tanzania and Zimbabwe</p> <p>2)Developing proposal for sectorial climate change impacts assessments</p>

- 3)United Kingdom has offered assistance in the preparation of impacts studies, including cost issues
- 4)Denmark has funded national greenhouse gas abatement costing study through UNEP/Risø program
- 5)Study on economic implications of limiting CO2 emissions completed, funded through UK ODA

II. INTRODUCTION

This report evolved from parallel activities within the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Environment Programme (UNEP) regarding country studies related to climate change. At the Fifth Session of the IPCC (Geneva, 13-15 March 1991), the Energy and Industries Subgroup (EIS) of Working Group III was charged with, *inter alia*, synthesizing information on country studies related to climate change, especially in the context of the energy sector. EIS was also asked to begin developing guidelines for comparable national studies of energy-sector greenhouse gas reduction costs. The full text of this task ("Subtask 3: Country Studies") is attached as Annex 1.

Shortly thereafter, at the Sixteenth Session of the Governing Council of UNEP (Nairobi, 20-31 May 1991), the Council adopted Decision 16/41 Climate Change which *inter alia*, requested the Executive Director:

To make available to the Secretariat of the International Negotiating Committee for a Framework Convention on Climate Change (INC) all relevant information and data collected by the Programme, including the results of its work on climate change impacts assessments and response strategies and on the costs and benefits of dealing with climate change;

To intensify cooperation between UNEP and the IPCC in the area of climate change impacts assessments, including case studies on the vulnerability to sea level rise of small island countries and low-lying coastal areas and studies to assess response options and their cost implications;

To support expert consultations on the costs and benefits of dealing with climate change in cooperation with other relevant international organizations, in particular the United Nations Development Programme and the World Bank; and

To assist Governments, particularly those of developing countries and small island countries, in country-specific studies to estimate the costs and benefits of dealing with climate change and identifying the available technology needs on a country-by-country basis.

The full text of the Decision is attached as Annex 2.

In line with the above decision and in an effort to determine the extent to which countries had undertaken, were undertaking, or were contemplating undertaking relevant country studies on climate change impacts or on cost/benefits of responding to climate change, a letter was sent to all countries from Mr. Sven Evtsev, Assistant Executive Director, Office of the Environment Programme, UNEP, on 9 August 1991 requesting relevant information. The letter is attached as Annex 3.

At the fourth session of IPCC Working Group III (Geneva, 5-8 August 1991), EIS noted the urgent need for country studies on the costs and benefits of addressing climate change, and recognized the ongoing work at UNEP on the collection of information on country studies related to climate change. Therefore, EIS charged UNEP to expand its ongoing country study data collection and, with the assistance of the U.S. Environmental Protection Agency, prepare a summary report that would synthesize information on all country studies related to climate change, including

emissions inventories, impacts assessments, and response strategies. The report would also identify key elements of a country study, and recommend future studies and options to improve coordination of country studies.

The purpose of this report is to summarize the information on climate change country studies received by the UNEP secretariat, and other sources, to date. Following a brief discussion of country study methodologies, an overview of country studies that are completed, in progress, or under consideration is presented. The country study information is organized by funding source (i.e., a country or an organization). Countries are listed first, in alphabetical order, and then organizations are listed. Studies are cross-referenced as well, so, for example, if country A is funding a study in country B, then the study is described in full under country A but is also referenced in the description under country B. A summary table is presented at the end of this section. The report concludes with recommendations for further work on compiling a complete inventory of country studies.

It should be noted that a number of parallel activities are underway within the IPCC. Working Group III commissioned Working Group II to identify country studies on impacts, and a report summarizing available information was prepared by Australia in October 1991. Also, the coastal zone management subgroup of Working Group III is surveying studies on the coastal zone. This report should supplement these ongoing IPCC activities.

The second draft of this Country Study Report, containing information received as of 26 October 1992 was presented to the Eighth Plenary Session of the IPCC in Harare, 11-13 November 1992. Since then UNEP received updated information from several countries and therefore another official request for updated information on climate related country studies was sent to governments through the official channels on 8 April, 1993. Information received by 8 June, 1993 was incorporated in this final version of the 'Country Study Report'.

III. METHODOLOGIES FOR COUNTRY STUDIES

The term "country studies related to climate change" is used in this report to mean any national studies on climate change issues. These would include national inventories of greenhouse gas emissions and sinks, analyses of the impacts of climate change on one or many "sectors" of a country (e.g., agriculture, energy, the coastal zone, human health) and possible impacts adaptation and reduction measures (including economic analyses), and assessments of national emissions mitigation strategies including cost/benefit studies.

There are obvious advantages for adopting a common methodology for conducting any particular class of country study, particularly with regard to facilitating comparability and enhancing transparency of results. This applies particularly to compiling an inventory of greenhouse gas emissions and sinks. However, with respect to other assessments such as impacts and response options, the vast array of elements to be considered in a fully integrated study, the many uncertainties related to the future in general, and the different characteristics and capabilities of countries suggest that a common analytical approach in which one can have confidence may be difficult to achieve. The approach taken by UNEP for impacts studies, therefore, has been to formulate and test several analytical methods which differ significantly in cost and time but not necessarily in reliability of results. It is appropriate that countries examine and adopt study methods taking due account of their own circumstances.

Guidelines for country studies, however, should be formulated and adopted by the IPCC. A number of guideline development activities are underway. The IPCC is currently revising a methodology for developing national inventories of greenhouse gas emissions and sinks that was originally submitted by the OECD, and plans to have established an internationally-accepted methodology by mid-1993. UNEP has established a project which will, *inter alia*, establish a consistent methodological framework for undertaking cost assessments of greenhouse gas abatement. This project, discussed in more detail below, is being coordinated by Risø National Laboratory in Denmark. Also, Finland and the United States have each submitted to the IPCC draft guidelines for a comprehensive set of country studies that should provide a starting point for the development and adoption of additional methodologies.

"Draft Guidelines for Country Studies", a non-paper dated 12 September 1991, was proposed by Finland at a meeting on country studies organized by Finland in connection with the 18 September 1991 preparatory Climate Convention meeting in Nairobi. The paper contains guidelines for country studies on trends in emissions and sinks and on net emissions reduction strategies. These guidelines recommend that such studies be organized into three sections: national inventories, national options, and national policies. The national inventory section would include inventories of basic country data, data on vulnerability to climate change, anthropogenic emissions of greenhouse gases, and greenhouse gas sources and reservoirs. Under national options, issues that would affect options to reduce emissions and enhance sinks would be discussed, as well as possible technical, legal, economic, and administrative options to reduce emissions and enhance sinks. The national policies section would include discussions of policy options and targets, possible measures by sector, potential impacts of national policies on emissions and sinks, socio-economic impacts, and international cooperation.

The United States draft guidelines, entitled "Proposed Country Study Progress (Elements of a Methodology)", issued 13 September 1991, were discussed by EIS at the Fourth Session of IPCC Working Group III, where it was agreed that comments should be forwarded to the U.S. and a revised draft mailed to all delegations. The current draft document outlines a conceptual framework for carrying out a comprehensive country and regional study process. This framework contains three sequential elements, within each of which both mitigation and adaptation strategies would be evaluated simultaneously:

- I. Analyze greenhouse gas emissions sources and sinks and vulnerabilities to climate change,
- II. Assess technological options to reduce greenhouse gas emissions or to adapt to climate change, and
- III. Evaluate instruments to facilitate implementation.

Element I. includes the assessment of impacts and possible adaptive responses, and the development of an emissions and sinks inventory and future emissions and sinks scenarios. Element II. includes the assessment of alternative technical options for adaptation to potential impacts, and of alternative technical options for emissions reduction and sink enhancement. Element III. includes the selection and evaluation of policy instruments to promote adaptation and mitigation, and an assessment of the implications of these policy instruments within the context of the development of a national response plan.

Both the Finnish and U.S. guideline documents are attached as Annex 4.

At the Seventh Session of the IPCC (Geneva, 10-12 February 1992), the IPCC recognized the valuable work on country study methodologies that is being done in the Working Groups and elsewhere. It acknowledged that this is a cross-cutting issue, and recognized the utility of further work on methodologies for both adaptation and mitigation, and in particular, their integration into a broader framework. There was a consensus that priority should be given to further assessing work underway and to the development of coherent guidelines for country studies, keeping in mind the circumstances of different countries. It was recommended that the first step in this process be the convening of a country study workshop prior to the Eighth Session of the IPCC.

The IPCC Country Study Workshop was held in Berkeley, California, 14-16 September 1992. The purpose of the workshop was to encourage consideration of the climate change country study process as it relates to developing countries and countries with economies in transition. In particular, the workshop sought to identify how such studies might be organized, what steps are involved, the problems that are likely to be encountered, ways and means of overcoming obstacles, and the kinds of support that may be available from various sources. It also sought to draw upon the experience of countries and international organizations that have supported or are supporting such studies.

The major activity of the workshop consisted of expert group discussions on:

- assessing vulnerability to climate change;
- inventorying sources of greenhouse gas emissions;
- inventorying sinks and reservoirs of greenhouse gases;
- identifying and analyzing technological options;
- analyzing project feasibility and costs; and
- integrating sociocultural factors.

A final report from the workshop was submitted to the Eighth Session of the IPCC (Harare, 11-13 November 1992).

After completion of the first IPCC assessment report it became clear that a more credible picture is needed on potential effects of climate change. Working Group II of the IPCC therefore established an expert group to develop some guidelines for the assessment of the impacts of climate change. In 1992 "Preliminary Guidelines for Assessing the Impacts of Climate Change" were presented by the expert group to the IPCC. The IPCC asked the expert group to further refine these guidelines and to develop further methodologies for testing adaptation options. The expert group has developed a workplan which includes, further refinement of common guidelines for climate change impact assessment, the development of sectional guidelines for in depth studies in areas particularly vulnerable to climate change, and methodologies for testing adaptation options. UNEP is planning to support these activities through testing the guidelines through a set of country studies. Funds for these studies will be sought from external sources such as GEF.

IV. COUNTRY STUDY OVERVIEW

A. COUNTRIES

Algeria

Internal Country Studies

No national cost/benefit studies related to climate change have been undertaken nationally, and there are no plans to undertake such studies. The Center on Hydrocarbon Research, under the Energy Ministry, is considering undertaking modelling studies of atmospheric pollutant transport, and studies on atmospheric concentrations of CO₂, CH₄, CO, and other gases are being undertaken. Further information can be obtained from:

Mr. Aoudia Tayeb
Centre de Recherche pour la Valorisation des Hydrocarbures et leurs Dérivés
(CERHYD) BP.131 Bar El Beida
Alger

Mr. Kadi Mohamed
Directeur du Centre Climatologique National
Alger

Argentina

Internal Country Studies

Switzerland/GEF Impacts and Mitigation Study

Argentina is a potential participant in an impacts and mitigation study under the Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from the GEF. The programme would offer Argentina the means to accurately monitor climate changes due to greenhouse gases, devise policies aimed at reducing their production, better identify related problems Argentina will face in the future, and elaborate possible solutions/answers. Argentina has applied to the UNDP for funding for this project.

Australia

Internal Country Studies

The first phase of the National Greenhouse Response Strategy (NGRS) was endorsed by the Council of Australian Governments in December 1992. It comprises measures, largely of a 'no regrets' nature, which will aid in achieving Australia's Interim Planning Target. The measures to be implemented cover a range of sectors including energy use, urban and transport planning, agriculture and natural environment.

An updated draft of the National Greenhouse Gas Emissions Inventory of emissions and sinks is being developed. It will facilitate monitoring and evaluation of progress in implementing the National Greenhouse Response Strategy.

In January 1992, the Greenhouse Report of the Ecologically Sustainable Development Working Group Chairs was released. It discussed options for reduction of greenhouse gas emissions from a number of sectors (e.g. agriculture, manufacturing) and contained recommendations for approaches to reducing emissions. It noted that it was not possible to predict with certainty the effect of response measures of emission levels, however, the level of government intervention was one factor that would affect the reductions achievable.

A major study was completed in 1992 by the Australian Bureau of Agricultural and Resource Economics (ABARE) into the impact on greenhouse gas emission reduction of different scenarios comprising various combinations of response measures.

A National Report documenting the means by which Australia will meet its obligations under the Framework Convention on Climate Change, was submitted to the Intergovernmental Negotiating Committee meeting (INC 7) in 1993.

Several States have undertaken State-specific regional climate change impacts research, covering the development of climate change scenarios and the impacts associated with those scenarios.

Two studies have been completed using the IPCC (Intergovernmental Panel on Climate Change) Common Methodology for assessing vulnerability to sea-level rise, one in Geographe Bay, Western Australia and one on the Cocos (Keeling) Islands.

A review of the Common Methodology is being undertaken for presentation at the World Coast '93 conference.

In late 1991, the Industry Commission Report into the Costs and Benefits of Reducing Greenhouse Gas Emissions was released. It concluded that the available evidence on costs, and lack of it on benefits, does not permit any reliable assessment of their relative magnitudes.

The Australian Government undertook a series of consultancies in 1991 and 1992 The focussed on research into energy efficiency and renewables such as solar and wind power.

External Country and Regional Studies

Technical Assistance to Developing Countries.

Australia co-sponsors an Asian Development Bank program of technical assistance to eight developing Asian countries to assess the potential effects of global climate change, identify appropriate policy options and thereby enable countries to develop national response strategies. A regional response strategy for the Asian and Pacific region will also be developed.

Kiribati

An Australian Government funded study assessing vulnerability to sea-level rise in Kiribati was completed in 1992. The results of this study were made available to the Government of Kiribati.

UNEP Studies in the Asia Pacific Region.

Australia made a contribution of \$50,000 to UNEP to be used for climate change impacts research in the Asia/Pacific region.

South Pacific Regional Environmental Program (SPREP)

Australia, through the Australian International Development and Aid Bureau, funds the Climate Change Officer (CCO) position within SPREP which is closely linked with the South Pacific Sea-level and Climate Monitoring Project. In addition, Australia provides funding for SPREP's environment awareness program (\$363,700 in 1992/93) which, *inter alia*, aims to enhance regional knowledge of climate change processes.

South Pacific Sea Level and Climate Monitoring Project

The South Pacific Sea-level and Climate Monitoring Project is now well established. It resulted from an initiative announced by the Prime Minister of Australia at the 1989 Forum, that Australia would support the establishment of a system to monitor variations in sea-level and climate change in the Pacific region. The eleven countries participating in the project are Cook Islands, Fiji, Kiribati, the Marshall Islands, Nauru, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu and Western Samoa. It is probable that significant trends may only become evident after many years of monitoring and the project may well span more than 20 years.

To date, eight of the eleven monitoring stations have been commissioned, with the remaining three, Nauru, Solomons and PNG expected to be operational during 1993.

The project is implemented by the National Tidal Facility (NTF) of the Flinders University of South Australia. A Project Coordinating Committee which includes representatives from Forum Island countries and Australian specialists, provides advisory support to the project. Data flows are currently being established through the NTF, SPREP and Climate Change Officer, Chalapan Kaluwin, to disseminate timely information products to participating governments.

Enhanced Climate Monitoring Capacity in the Pacific

As a second initiative following from the 1989 Forum, the Australian Government funded WMO to undertake a feasibility study in countries in the SW Pacific aimed at:

- 0 determining the requirements for strengthening the capacity of countries in the region to monitor climate;
- 0 assessing the needs of, and initiatives in, climate impact assessment and response on a regional basis;
- 0 assessing the capacity and role of aid donors interested in the region to contribute to the development of climate monitoring and assessment activities and to the formulation of response strategies and methods; and
- 0 identifying, designing and costing initiatives for project funding.

The study was completed in December 1991 and reported in "The Changing Climate in Paradise" (Australian Bureau of Meteorology, Melbourne 1991). This report outlines initiatives that can be undertaken to enhance monitoring of climate change in the Pacific region. Projects of the order of US\$14 million were recommended. Significant progress has been made in finding sponsors for a number of projects. In addition, the report itself has raised awareness of the issues in a number of fora and has been a helpful tool in developing strategies in the region.

The Australian Government has committed \$A1.3 million towards strengthening existing activities, particularly those that would enhance meteorological observation capacity. Proposals for a 3 year program to this end are now being developed by the Australian International Development and Aid Bureau and the Bureau of Meteorology.

Effects Studies

Australia provides training assistance to Commonwealth developing countries through the COMCIAM training program to assist them to assess and understand the effects/impacts of climate change.

Austria

Internal Country Studies

An inventory of greenhouse gas sources and sinks, and an impacts study, have been completed. An analysis of emissions reduction technologies and a national response strategy are in progress.

In May 1990, the "Austrian CO₂ Commission" was established by the Federal Ministry of Environment, Youth, and Family Affairs. The Commission's task is to assess scientific-technical options for emissions reductions and to recommend measures and strategies to achieve a 20% reduction in CO₂ emissions and to limit emissions of other gases.

In mid-1992, the Austrian CO₂ Commission published a short version of its annual report for 1991 in both English and German in preparation for UNCED. The report, entitled *Recommendations of the Austrian CO₂ Commission for a Programme of Activities in Order to Achieve the Toronto-Recommendations and Annual Report 1991 (Short Version)* contains conclusions and recommendations of the Commission as well as summaries of research projects undertaken under the auspices of the Commission. These research projects included studies on methane emissions from natural gas distribution systems, CO₂ emissions from the energy, forestry, and industry sectors, and potential contributions of the use of cogeneration plants, solar energy, and biomass to the reduction of CO₂ emissions. Full reports on these studies were published in German in the summer of 1992.

An "Interministerial Committee to Coordinate Measures to Protect Global Climate", within the Ministry of Environment, Youth, and Family Affairs, is developing comprehensive national strategies and policies to reduce greenhouse gas emissions and protect sinks of greenhouse gases. The Committee is also formulating legal and economic instruments for the implementation of these programmes.

A broad analysis about "Anthropogenic climate change -- Impacts on Austria -- Measures in Austria", elaborated by the Austrian Academy of Sciences, was published in February 1992. This document includes a status report on the scientific knowledge concerning expected climate change in the alpine region, its effects on hydrology, limnology, vegetation, and human beings, an inventory of greenhouse gas emissions in Austria, and a catalogue of possible limitation and adaptation measures.

A January 1992 report by the Umweltbundesamt on changes in Austrian CO₂ emissions ("Entwicklung der CO₂-Emissionen in Osterreich") predicts the country's CO₂ emissions until the year 2005 based on an energy consumption forecast made by the economic research institute WIFO in December of 1991.

External Country Studies

Austria and Czechoslovakia are cooperating on a study on possibilities for enhancing efficiency in the energy sector. The study receives 1 Mio US\$ in financial assistance from the Austrian Government.

Bahamas

Internal Country Studies

- There are no plans to establish an official national climate impact assessment and response strategies programme. The Bahamas needs assistance for such a programme.
- Presently, the only institution which contributes to WCIRP is the Meteorological Department, P.O. Box N-8330, Nassau, Bahamas.
- Mr. Trevor M. Basden and Mr. Michael A. Stubbs act as the focal point for communications for information from WCIRP and Climate Impact Research in the Meteorological Department.

Bangladesh

Internal Country Studies

ADB Regional Impacts Strategy Project

Bangladesh is participating in an Asian Development Bank (ADB) project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Ministry of Forests and Environment will be the in-country implementing agency for the Bangladesh study. (See description of ADB activities below for more detail.)

UNDP/GEF Least Cost Emissions Reduction Project

Bangladesh is a participant country in the United Nations Development Programmes's (UNDP's) proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Sea level Rise Study with the Netherlands Government

The Netherlands government is planning to undertake a case study on the "Vulnerability of Coastal Areas to Sea Level Rise" in cooperation with the government of Bangladesh. This case study will be carried out within the context of the Coastal Zone Management Subgroup (CSMS) of Working Group III of the IPCC.

UNEP/FAO study on climate change and global agroecological potential

The case study for the above mentioned UNEP/FAO project is being carried out in Bangladesh

Other Climate Related Studies

Currently limited studies are being undertaken e.g. on Methane emissions from wet land paddy fields. Some more studies in coastal areas are being planned under IGBP Core Programme.

Further information on ongoing activities related to greenhouse gas emissions can be obtained from

Prof. S. Z. Haider
Department of Chemistry
Dhaka University

Overall information can be obtained from
Secretary of the IGBP National Committee
Bangladesh Academy of Sciences
3/8 Asad Avenue
Dhaka

Barbados

Internal Country Studies

There are no climate related country studies being undertaken in Barbados at this time. There are no programmes at present or scheduled for the near future for climate impacts assessments.

Barbados is in need of assistance in the development and implementation of a programme, especially in the areas of climate impacts and response strategies, and economic studies and technology needs.

External Country Studies

Barbados is not in a position to be of any help to other countries.

Belgium

Internal Country Studies

A national emissions and sinks inventory has been compiled by the Flemish Institute for Technological Development to support the IPCC/OECD progress for development of an emissions inventory methodology.

In the framework of the Global Change Impulse Programme of the National Science Policy Office, the University of Leuven and the Flemish Institute of Technological Development are performing an optimization exercise of greenhouse gas reduction strategies. This exercise is being carried out in conjunction with the ETSAP agreement of the International Energy Agency, through which ETSAP is preparing integrated country studies on CO₂ emissions reduction strategies using a dynamic energy model (Markal). ETSAP results are expected at the end of 1992.

The Global Change Impulse Programme is also funding a number of research projects related to climate change and climate change impacts and aims to contribute to international research programmes such as IGBP. Further information on the impulse programme can be obtained from the Science Policy Office through:

Mrs. Martine Vanderstraeten
Science Policy Office
Rue de la Science B
1040 Bruxelles, Belgium
tel: +32-2-238.34.11
fax: +32-2-230.59.12

Further information on the Belgian IGBP activities can be obtained through:

Koning Boudewijnstichting
Mevrouw Joris
Brederodestraat 21
1000 Bruxelles, Belgium
tel: +32-2-511.18.40

Bureau du Plan
Madame Gouzée
Chargée de Mission
Services du Premier Ministre
Ministère des Affaires économiques
Avenue des Arts 47-49
1040 Bruxelles, Belgium
tel: +32-2-507.74.72
fax: +32-2-507.73.73

Benin

Internal Country Studies

There is no national programme on climate change and no studies on climate change impacts and adaptation have been undertaken. Benin would seek assistance for such studies. Some studies and data are available on climate impact on agriculture, fishery and animal breeding.

Bolivia

Internal Country Studies

A national committee on global change has been formed by the Secretary of the Environment with the purpose of executing a global change program in the framework of the IGBP. The committee is composed of a group of scientific investigators, and will focus on 1) interactions between the terrestrial biosphere and the chemistry of the atmosphere, 2) biological aspects of the hydrological cycle, 3) effects of climate change on terrestrial ecosystems, and 4) past climate change.

Under this national committee, the National Academy of Sciences completed a study on the effects of climate change, and other environmental change, on Bolivia. This study addresses the effects of climate change on agriculture and forestry, the effects of atmospheric pollution and global changes on the climate of La Paz, and expected changes in hydrology and in vegetation cover in selected areas.

External Country Studies

Bolivia is not in a position to assist other developing or small island countries in climate change country studies.

Brazil

Internal Country Studies

UNEP Socio-Economic Effects Study

Brazil has completed a cooperative project with UNEP on the potential socio-economic effects of climate change in Brazil. The report was published in 1992. (See description of UNEP activities below for more detail.)

U.S./Brazil Cooperative Emissions Inventory Project

Brazil participated in a project with the U.S. government on the development of a national greenhouse gas emissions inventory. (See description of external U.S. activities below for more detail.)

France/Brazil Cooperative Emissions Inventory and Abatement Strategies Study

A study on greenhouse gas emissions and costs of abatement strategies undertaken, coordinated, and funded by France, with Universidade Federal do Rio de Janeiro, is in progress. Possible additional funding may be provided by UNEP, under the coordination of Risø National Laboratory.

Brunei

Internal Country Studies

Brunei currently does not have an official climate impacts assessment and response strategies programme, and no climate impacts studies or work on response strategies have been undertaken for Brunei.

Experts from Brunei participated in an Australian International Development Assistance (AIDAB) workshop on 'climate impact on the coastal zone - climate impact assessment and management programme for Commonwealth Countries (COMCIAM), in 1992.

External Country Studies

Brunei's expertise in climate change research is limited, and the country is therefore not able to assist other countries in developing and undertaking such research.

Bulgaria

Internal Country Studies

Bulgaria has begun an assessment of national greenhouse gas emissions and sinks in support of the ongoing IPCC/OECD work on establishing emissions inventory methodologies. A preliminary inventory is expected by mid-1992.

Burkina Faso

Internal Country Studies

Burkina Faso recognizes the need for climate change country studies and applauds efforts to undertake such studies. Although Burkina Faso is quite familiar with the destructive impacts of changing climate and has created local, regional, and national organizations through which activities are undertaken to mitigate the effects of drought and desertification, no country studies on climate change have been undertaken, nor have national mitigation or adaptation strategies been designed. Burkina Faso requires technical and financial assistance to complete such studies, and would welcome this assistance but would request that national technical capabilities be utilized in these efforts.

Burundi

Internal Country Studies

Burundi has not undertaken any national cost/benefit climate change studies as it has neither the technical nor the financial means to do so. Burundi would require assistance to carry out such studies.

Canada

Internal Country Studies

National Action Strategy on Global Warming

The National Action Strategy on Global Warming is a framework to guide the actions taken by federal, provincial, and territorial governments and all sectors of the Canadian economy.

National Greenhouse Emissions Inventory and Reporting Program

Federal, provincial, and territorial governments have agreed to develop a National Greenhouse Emissions Inventory and Reporting System. As a first step, national workshops on Greenhouse Gas Emissions Inventories and Forecasts were held in April 1992. Environment Canada has prepared a draft report on Canada's Greenhouse Gas Emissions Estimates for 1990, and a 1990 greenhouse gas emissions inventory and a national greenhouse gas base case forecast will be prepared for Energy and Environment Ministers in the fall of 1992.

Assessment of Specific Policies and Programs to Reduce Greenhouse Gas Emissions

A status report will be prepared in the fall of 1992 for Energy and Environment Ministers on the effects of actions being taken or planned to reduce greenhouse gas emissions.

Regional Studies

The federal government, through Canada's Green Plan, is funding two major regional climate impacts assessments in areas considered particularly sensitive to climate change: the Mackenzie Basin; the Prairies; and the Great Lakes/St. Lawrence Basin. The studies will identify social and economic implications of climate change for those regions and evaluate alternative mitigative and adaptive strategies. Preliminary reports on these activities have been prepared. A third study will be carried out in the Prairies.

Canada's National Report to the Conference of the Parties of the United Nations Framework Convention on Climate Change

The Government of Canada will produce its first National Report by the end of June, 1993. The report will highlight the progress made through Canada's National Action Strategy, including the specific initiatives noted below and many other. The report will be finalized by the end of 1993.

Canadian Competitiveness and the Control of Greenhouse Gas Emissions

The federal government has commissioned a major study of the effects of different greenhouse gas emissions control measures on costs and prices in the Canadian economy to be completed in the summer of 1993.

Climate Change Digest

Since 1987, the Canadian Climate Change Program has used the Climate Change Digest series of research monographs to summarize the results of climate change impacts studies and related issues for the benefit of a broader audience. There are now more than 25 titles in this series.

"Canada and Global Warming"

This publication, prepared for UNCED, provides an overview of the potential impacts of global warming on Canada and describes Canada's National Action Strategy on Global Warming and initial actions that federal, provincial, and territorial governments have announced to address the challenge of global warming.

Economic Instruments

The Canadian government has prepared a discussion paper on the use of economic instruments to achieve environmental objectives. The discussion paper will form a basis for consultations with a broad cross-section of Canadian stakeholders, on the possible use of economic instruments to respond to various environmental issues, including climate change.

Science

The federal government has launched a significant program to reduce the uncertainties related to global warming. Included are several large scale projects to enhance understanding of important processes that affect climate. There is also an effort, involving government and university researchers, to develop a climate research network to provide improved estimates of the magnitude, rate, and regional distribution of global warming.

Carbon Budget of Canadian Forests

During 1992, Forestry Canada undertook preliminary carbon budget modelling, based on existing forest inventory, soils and forest sector databases and including natural and anthropogenic disturbances, to facilitate analysis of vulnerability of the boreal

forest ecosystem to effects of changes in climate and various forest management options. The model assessed the net sink value of Canadian forests and forested wetlands, as well as tonnes of carbon stored in forest biomass, soils, and forested peatlands.

Climate Change Detection

"The State of Canada's Climate: Temperature Change in Canada 1895-1991" was released July 1992, and is the first in a series of annual reports that are designed to provide decision makers and the general public with information on Canada's climate. This series of reports will contain the results of analyses of climatic variations, trends, and patterns across the country, including their relationships with global climate. The second annual report will become available in the fall of 1993.

Environmental Citizenship and Education

Under the Green Plan's Environmental Citizenship Learning Program, a series of national learning resources, including a "Global Warming Primer" and issue snapshots about Canada's climate and the Greenhouse Effect, have been prepared and are being provided to communities, educators and organizations in order that they can develop specialized learning programs for their clients and communities. Canada's national weather service has also been key in developing a new educational messaging program, the Environmental Citizenship Messages Program. To date, over 160 radio stations, 24 daily newspapers and 61 weekly newspapers carry the messages.

Province of British Columbia Activities

The Ministry of Environment, Lands and Parks of the Province of British Columbia has completed reports including an inventory of CO₂ emissions, an inventory and analysis of control measures for methane, an emissions inventory of nitrogen oxides, volatile organic compounds, and ozone as greenhouse gases, a report on ozone depleting greenhouse gases, an evaluation of CO₂ management measures, and a summary report of greenhouse gas inventories and management options.

The Minister of Environment, Lands, and Parks announced support for the Canadian goal of stabilization of greenhouse gases as a minimum and suggested adoption of a provincial goal to reduce CO₂ emissions by 20 percent over the next 15 years. During the next year the Ministry will be producing an action plan to address this goal.

External Country Studies

Canada has provided assistance for the development of Mexico's preliminary GHG inventory. A Canadian consultant has worked with the Mexican team responsible for the inventory, and, in March 1993, five Mexicans visited Canada to learn about how various Canadian government levels are dealing with climate change. Canada and Mexico are jointly exploring possibilities for follow-up.

Canada is providing assistance to China to carry out a study on GHG emissions and a control strategy for the city-province of Beijing. The study will assist China to develop a methodology for preparing various components of their national report.

Three Canadian experts are working with Chinese officials to develop the frameworks for preparing the emissions inventory, forecasting future emissions and identifying cost-effective emissions control options for Beijing, including a chapter on Eight Chinese are visiting Canada on two separate training missions during the first half of 1993. A national seminar on climate change, to be co-sponsored by Canada, will be held in Beijing in September, 1993, and a report, with recommendations on possible next steps, will be prepared by December, 1993.

Assistance to Tanzania (University of Dar es Salaam) and Zimbabwe (Southern Centre for Energy and Environment) is being provided for a joint country study on climate change. Once research and data collection has been carried out, the study team will prepare an inventory of sources and sinks of GHGs, and identify a range of options for limiting future emissions and priorities change response in both countries. The study will be completed in 1994.

Cape Verde

Internal Country Studies

Cape Verde has not undertaken a national cost/benefit climate change study, but has been thinking of such a study. However, since Cape Verde has neither technical and financial means to do so, assistance would be desirable and useful.

External Country Studies

Cape Verde is not in a position to assist other developing or small island countries in climate change country studies.

Chile

Internal Country Studies

Ecosystem and Socio-Economic Effects Study

The potential ecosystem and socio-economic effects of climate change on coastal and marine ecosystems in Chile were assessed and published in a report in April 1992, entitled *Efectos de Los Cambios Climaticos en Los Ecosistemas Costeros y Marinos de Chile*.

Other climate change studies have not been undertaken by Chile. The Government of Chile recognizes that such studies ought to be carried out in view of the importance of climate change to Chile, particularly concerning coastal areas. Chile must count on technical and financial assistance in order to carry out these studies.

External Country Studies

Chile has no plans to give aid to one or more developing countries or to small island countries for carrying out climate change studies.

China

Internal Country Studies

UNEP/GEF Sources and Sinks Project

China is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

National Study of Climate Change Impacts

The National Environmental Protection Agency completed a paper assessing the impacts of climate change on China.

A working group on the study of the impacts of climate change has formed. It consists of 8 government departments with the National Environmental Protection Agency as the chairman, and it is the second working group under the National Climate Change Coordinating Group.

The Agency predicts climate change in major sectors of China by considering the results of Global Circulation Model (GCM) calculations and comments at international conferences relating to China.

The Agency's paper addressed the following impacts of climate change: positive and negative potential impacts of climate change on agricultural output, including an estimate that the comprehensive effects of climate change will reduce the agricultural production potential in China by at least 5 percent; regional impacts of climate warming on water resources, predicted with the use of various climate models and hydrologic models; effects of climate warming and increased atmospheric concentration of CO₂ on tree growth; potential adverse impacts of sea level rise in coastal areas; impacts of a temperature rise on permafrost and consequent desertification, decreases in pasture land areas, and destruction of permafrost engineering structures.

Government departments have started to address the issue of climate change by implementing policies of energy conservation and environmental management. The National Environmental Protection Agency identified specific measures to increase energy efficiency and conserve energy resources, and thereby reduce greenhouse gas emissions.

The National Environmental Protection Agency has developed five systematic measures of environmental protection and environmental management standards for industrial cities and economic development zones. These measures and standards for improving the environment and controlling greenhouse gas emissions have been approved by the central government for strict implementation.

ADB Impacts Study

The ADB is planning to provide assistance to China for a detailed assessment of potential climate change impacts and appropriate response measures. (See description of ADB activities below for more detail.)

Greenhouse Gas Emissions and Control Strategy with the Canadian Government

With the support of the Canadian government, China will undertake a pilot study on Greenhouse Gas Emissions and Control Strategy focusing on Beijing. The terms of reference will be finalized in October 1992, and the study should be completed by November 1993.

UNDP/GEF Least Cost Emissions Reduction Project

China is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

The World Bank is the executing institution for the project, which is conceived ultimately to lead to the development of investment projects that would be eligible for funding either by the World Bank itself or under the GEF. The implementing agencies are NEPA, the State Planning Commission, the Shanxi Provincial Government, and the Ministry of Machine Building and Electronics Industries.

The project, scheduled to have begun in January 1992, will assess greenhouse gas emissions, formulate overall reduction strategies, and address two case study applications already identified as having a very large potential for CO₂ reduction, namely: improving the quantity and form of supplied coal and upgrading boiler efficiency. The resulting approach will serve as inputs into Government policy making in dealing with issues of the global environment in relation to economic development and environmental planning. The project is expected to last 24 months.

GEF Regional Asia Least Cost Emissions Reduction Project

China's participation in a separate GEF regional Asia project, Development of Least-Cost Greenhouse Gas Emissions Reduction Plans in Asia, has been requested. The project is expected to provide funds for the preparation of a current and historical emissions inventory and for the measurement of emissions factors. Participation of the Chinese Government in that project will provide resources for more complete work on this topic. If China should decide to participate in the regional Asia project, \$60,000 allocated for estimating sources and sinks of greenhouse gases in the China project would be reallocated to the part of that project assessing the potential for improving energy efficiency, in order to avoid duplication of effort.

WWF report on 'Climate Change due to the Greenhouse Effect and its implications for China'

This report is based on a cooperative programme of research and consultation between the State Meteorological Administration and WWF International and uses

substantial work completed by Chinese scientists. It is aimed at informing about the current understanding of climate change and of its possible impacts on China. The report deals with impacts on natural ecosystems, agriculture, on potential energy demand, impacts of sea level rise and addresses some policy implications.

Colombia

Internal Country Studies

Colombia started a study on climate change with the objectives of studying changes in air temperature and rainfall and developing accurate data and good statistical methods for the measurement of climate change. This study has not been completed because of insufficient funds. The Government has requested financial assistance to complete this study.

Colombia has not performed a cost/benefits study of climate change but would like to do so if financial assistance were available.

Colombia has submitted a proposal to UNEP for a Country Programme on Climate Change and requested funding from UNEP. The proposed programme includes an inventory and characterization of greenhouse gas emissions, an analysis of technical options for reducing greenhouse gas emissions, an economic impacts assessment, an evaluation of economic costs of adaptation and mitigation, and the development of national policies related to climate change. The person in charge of the programme is:

Nelson Antonio Sabogal Torres
Carrera 5 No. 15-80 Piso 18
Santafe de Bogota, D.C. Colombia
Tel: 2-816415
FAX: 2860658

Congo

Internal Country Studies

Despite the fact that the Congo has a General Directorate for the Environment and other related departments, no cost/benefit climate change studies have been undertaken. Such studies would require technical and financial assistance. Nevertheless, some work on atmospheric trace gases is carried out by the Laboratory for the Physics of the Atmosphere at the University Marien Ngouabi.

Costa Rica

Internal Country Studies

UNEP/GEF Sources and Sinks Project

Costa Rica is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

The Ministry for Natural Resources, Energy, and Mines is the national institution in charge of this study, and Eric Ulloa Murillo has been nominated as the national coordinator. All questions related to the project should be directed to:

Ing. Eric Ulloa Murillo
MIRENEM
Apartado 10104-1000
San José, Costa Rica
Telef: (506) 23-21-24
FAX: (506) 57-06-97

Côte d'Ivoire

Internal Country Studies

Côte d'Ivoire has not undertaken any national studies on impacts adaptation measures because it is lacking the means to do so. They would appreciate technical and financial assistance to undertake such studies.

Inventory Study with France

A study on greenhouse gas emissions inventories is being coordinated and funded by France, with possible additional funding from UNEP and under the coordination of Risø National Laboratory.

Croatia

Internal Country Studies

Under the framework of the UNEP/MAP project on "Implications of Climatic Changes on Mediterranean Coastal Areas" in 1992/93 studies on the islands of Cres and Losinj are undertaken.

Croatia is planning to develop a national emissions inventory and reporting system and an assessment of greenhouse gas emissions and sinks. The focal point for national inventories on sources and sinks of greenhouse gases is

Miss Sonja Vidic
Meteorological and Hydrological Institute
of Republic of Croatia

A possible study on implications of climatic changes in continental areas of Croatia is under consideration.

The Coordinator of the Croatian Climate Programme is

Mr. Zvonimir Katusin
Assistant Director for Climatological Branche
Meteorological and Hydrological Service
41000 ZAGREB, Gric 3

Cuba

Internal Country Studies

- A comprehensive assessment of climate change impacts was carried out by the National Commission for Climate Change in 1991 and updated in 1992 for UNCED.
- A study on vulnerability to sea level rise was completed in 1992 and a study on coastal zone management planning is underway by the subgroup B: "Coastal Zone Management" of the reorganized Working Group No.2 of the National Commission.
- A preliminary inventory of CO₂ and CH₄ emissions was done by the National Commission for Environmental Protection in 1992. A national emissions and sinks inventory and reporting systems is being developed by Working Group No.1 of the National Commission for Climate Change.
- A preliminary report about national response actions to mitigate global warming by title: "Cuban actions for mitigate Climate Change" was prepared for UNCED on June 1992. An updated abstract of this paper was presented to the 6th INC Session on December 1992".
- Preparations to carry out a country study on national emissions mitigation analysis by the reorganized Working Groups No.2 and 3 of the National Commission for Climate Change are ongoing.
- The National Report to the Conference of the Parties of the UN Framework Convention is expected by November 1993 by the National Commission for Climate Change.

For further information please contact:

Dr. Fabio Fajardo
President
National Commission for Environmental Protection
Officer-in-charge for IPCC Affairs

Cyprus

Internal Country Studies

National studies on climate change have not been conducted in Cyprus. The Government of Cyprus suggested that the Environmental Service, Ministry of Agriculture and Natural Resources, be a focal point for communication with climate impacts researchers.

External Country Studies

Cyprus is not able to assist other countries in developing this kind of climate research.

*Czechoslovakia

Internal Country Studies

Czechoslovakia and Austria are cooperating on a study on possibilities for enhancing efficiency in the energy sector. The study receives 1 Mio US\$ in financial assistance from the Austrian Government.

On April 1, 1991, the National Climate Programme of the Czecho-Slovak Federal Republic was developed. On April 1, 1993, the National Climate Programme has been divided into two parts, one for the Czech Republic and the other for the Slovak Republic (NCP CZR, NCP SR).

Within the framework of the NCP CSFR a project dealt with the analysis of an alternative scenarios of the Climate Change in the region of the CSFR as well as aimed to the impact estimations of the Climate Change in the social-economic sphere was finished in 1992.

The results from the NCP of the CSFR have been published in the NCP-edition and presented at the seminars and conferences. The NCP reports have been provided to the Ministries of Environment of both the Czech Republic and Slovak Republic for further utilization.

* updated information please find under Slovak Republic

Denmark

Internal Country Studies

Sources and Sinks Study

The Nordic Council of Ministers and the Ministry of the Environment jointly financed a throughput report *Danish Budget for Greenhouse Gases*, issued 1990, on sources and sinks of greenhouse gases.

Impacts of Climate Change Report

In 1992, the Ministry of the Environment published a report on the potential impacts of climate change and the possibility of adaptation. A summary has been published in English.

Action Plans for Mitigation of Greenhouse Gas Emissions

In 1990 the Ministry of Energy published "Energy 2000," which presents an Action Plan for mitigating the emission of CO₂ gases. The plan contains very detailed descriptions of the possibilities for limiting CO₂ emissions from the energy sector. Included in the plan is the official Danish target on CO₂: 20 percent reduction by the year 2005 with respect to 1988. Likewise, in 1990 the Ministry of Transport published an Action Plan to mitigate CO₂ emissions and ozone precursors from the transport sector.

UNEP/Risø Greenhouse Gas Abatement Costing Study

The Ministry of Foreign Affairs has financed a national greenhouse gas abatement costing study within the UNEP/Risø program. (See description under UNEP below for more detail.)

External Country Studies

UNEP/Risø Greenhouse Gas Abatement Costing Study

The Ministry of Energy has financed a national greenhouse gas abatement costing study in Zimbabwe, and is discussing supporting a similar program in Indonesia, within the UNEP/Risø program. (See description under UNEP below for more detail.)

Dominica

Internal Country Studies

No studies on climate change have taken place. Such studies would require financial and technical assistance.

Ecuador

Internal Country Studies

Ecuador has no national program evaluating greenhouse gas emissions, or impacts of climate change and response strategies. Such studies would require technical and financial assistance. The National Council of Development, however, ratified approval of a project to detect and predict climate change in the subregion of the South Pacific.

Ecuador requires urgent international assistance in defining a program in the long-term to evaluate climate change and impacts it will have on the country. The National Institute of Meteorology and Hydrology, which monitors climate and has performed an analysis of floods and droughts that have occurred in the country, is the representative of Ecuador in the World Meteorological Organization. This institution should be the national coordinating body within the WCIRP and other international programs on climate change.

External Country Studies

Ecuador is not in a position to assist other developing or small island countries in climate change country studies.

Egypt

Internal Country Studies

Egypt is planning to establish a "National Climate Impacts Assessment and Response Strategy Programme" and steps are being taken to form an ad-hoc committee under the Egyptian Environment Affairs Agency.

Sea level Rise Study with the Netherlands Government

The Netherlands government is planning to undertake a case study on the "Vulnerability of Coastal Areas to Sea Level Rise" in cooperation with the government of Egypt. This case study will be carried out within the context of the Coastal Zone Management Subgroup (CSMS) of Working Group III of the IPCC.

External Country Studies

Egypt is able to assist other countries in specific fields.

Equatorial Guinea

Internal Country Studies

No cost-benefit studies on climate change have been initiated or completed. However, such a study could be undertaken should the necessary financial and technical assistance become available.

Federated States of Micronesia

Internal Country Studies

During 1992, a study of the vulnerability of Yap Island to sea level rise was conducted through the sponsorship of the US National Oceanic and Atmospheric Administration (NOAA) on behalf of the Coastal Zone Management subgroup of the IPCC.

The Nationwide Environmental Management Strategy, a comprehensive study and proposals for institutional capacity building as well as specific projects through 1998, was officially endorsed by the government during March, 1993. Among other things the Strategy addresses measures for adaptation to sea level rise and other effects of climate change, together with the promotion of sustainable development. It was produced over a period of years by a team of experts from Australia, the United States of America and the Federated States of Micronesia (FSM), with support from the Asian Development Bank.

The FSM Government has made application to the government of the U.S. to receive assistance through its "Country Study Initiative" in the development of an appropriate database on which a national action plan can be based, pursuant to the requirements of the UN Framework Convention on Climate Change.

Finland

Internal Country Studies

The Carbon Dioxide Commission of the Ministry of the Environment completed a report in 1991 which estimates national greenhouse gas emissions and assesses strategies for limiting and reducing emissions.

A new Carbon Dioxide Commission was established by the Ministry of the Environment at the end of 1991 to continue the work of the earlier Commission. The new Commission's

tasks are to investigate, with a view to negotiations on the Climate Convention, the required steps and their impact, if Finland commits to the emissions reductions proposed during negotiations for the Climate Convention. The Commission is to propose a programme for reduction of greenhouse gas emissions and preservation of sinks. The programme would be based on Finland's international commitments and the global need to reduce emissions of greenhouse gases as well as to increase carbon sinks in the biosphere. The Commission is expected to issue a report by the end of 1993.

A programme for a sustainable forest economy, called Forest 2000, is currently under development. The programme was updated in 1991.

An extensive, six-year research programme on climate change (SILMU) was initiated in 1990 which will focus, *inter alia*, on quantifying past and anticipated changes in climate, especially in Northern Europe. Many individual research projects within SILMU work in cooperation with research groups in other countries and with international research programmes on global change, especially the World Climate Research Programme and the International Geosphere-Biosphere Programme. The programme consists of four interdisciplinary subprogrammes: atmosphere, waters, terrestrial ecosystems, and human interactions. The research includes predictions of climate change, assessments of impacts of climate change on water resources and terrestrial ecosystems, and studies on the assessment of response strategies and of the economic impacts of greenhouse gas emissions. In addition, various methodological studies are included. A progress report, *The Finnish Research Programme on Climate Change*, was published in February 1992. The contact person for the Finnish Research Programme on Climate Change is:

Mr. Markku Kanninen
Project Coordinator, Finnish Academy
Hämeentie 68
SF-00550 Helsinki
FINLAND
Tel: 358-0-77 581
FAX: 358-0-775 8299
Telex: 100 4125 acad sf

External Country Studies

Finland has declared that it is prepared to assist 1-3 developing countries, or countries in transition, in climate change country studies. The Ministry of the Environment has pledged up to US\$200,000 to UNEP to finance such cost/benefit studies. The subject countries have not yet been determined. Also, negotiations on financial support are underway.

France

External Country Studies

France is coordinating and funding a study on greenhouse gas emissions and costs of abatement strategies for Brazil with Universidade Federal do Rio de Janeiro. There may be additional funding provided by UNEP, under the coordination of Risø National Laboratory.

France is coordinating and funding Environmental Development Action in the Third World, which includes studies on greenhouse gas emissions inventories for Côte d'Ivoire, Mali, and Senegal. There may be additional funding provided by UNEP, under the coordination of Risø National Laboratory.

France is coordinating and funding a project in continental South-East Asia with the Asian Institute of Technology, Bangkok. There may be additional funding provided by UNEP, under the coordination of Risø National Laboratory.

Gambia

Internal Country Studies

Draft Emissions Inventory

The Government of The Gambia prepared a draft report entitled "Inventory of Greenhouse Gas Emissions and Sinks" and submitted it to the IPCC early in 1991. The inventory was intended to represent 1988. It was conducted by a non-expert using methodologies in the OECD Background Report, and a lack of much country-specific data was noted as a problem.

UNEP/GEF Sources and Sinks Project

The Gambia is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

The Gambia has expressed concern about sea level rise resulting from climate change and requested registration as one of the countries that merit IPCC-CZMS support to enhance the assessment process and combat measures. In the long term, The Gambia envisages carrying out the impacts assessment of climate change on all socio-economic sectors of the country. The Government noted that case studies and general assessment progresses are mostly constrained by factors such as limited human resources, institutional deficiencies, and limited technical and financial resources.

Germany

Internal Country Studies

As part of its regular reports on the state of the environment, the German government publishes national CO₂ emissions data. These reports are based, in part, on background material gathered by the Federal Environmental Agency ("Daten zur Umwelt"). The Agency is also involved in the ongoing IPCC/OECD work on establishing emissions inventory methodologies.

The Federal Ministry for Research and Technology (BMFT) is conducting a national research programme on the effects of climate change. And the German Bundestag's Enquete Commission on "Preventative Measures to Protect the Earth's Atmosphere" has published a report entitled "Protecting the Earth" which includes proposals for national measures to reduce energy-related emissions of trace gases and reduction targets.

Ghana

Internal Country Studies

A study on the impacts of climate change on Ghana has been funded by the United Kingdom through the Overseas Development Administration. (See description of external country studies under the United Kingdom for more detail.)

Grenada

Internal Country Studies

Grenada has not yet undertaken any cost/benefit analyses because of monetary constraints and a lack of technical expertise. Grenada would welcome financial and technical assistance to undertake such a study.

Guatemala

Internal Country Studies

Guatemala has not yet undertaken any cost/benefit analyses because there are no funds to undertake such a study. A potential project has been outlined that would develop an environmental monitoring network to determine pollution, including greenhouse gas emissions and climate change effects. This study would have a duration of 3-5 years and have an estimated cost of US\$300,000. Guatemala requires financial and technical assistance for this, and other climate change related, studies.

External Country Studies

Guatemala is not in a position to assist other developing or small island countries in climate change country studies.

Honduras

Internal Country Studies

Honduras has not yet undertaken any cost/benefit analyses because of monetary constraints and a lack of technical expertise. Honduras would welcome financial and technical assistance to undertake such a study.

Iceland

Internal Country Studies

No cost/benefit climate change studies are being undertaken. The Carbon Dioxide Commission of the Ministry for the Environment completed a report in May 1992 on national greenhouse gas emissions in 1990. Work is underway to evaluate measures and assess strategies to limit and reduce emissions and increase fixation of greenhouse gases in Iceland. More detailed information on the Commission and its reports can be obtained from:

Dr. Jón Gunnar Ottosson
Chairman
Carbon Dioxide Commission
Ministry of the Environment
Vonstræti 4
IS-150 Reykjavík, Iceland

External Country Studies

Iceland is not in a position to assist other countries in climate change country studies.

India

Internal Country Studies

ADB Regional Impacts Strategy Project

India is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Ministry of Environment and Forests, assisted by the Council of Scientific and Industrial Research and other institutions, will be the in-country implementing agency for the India study. (See description of ADB activities below for more detail.)

UNDP/GEF Least Cost Emissions Reduction Project

India is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Impacts Study with the United Kingdom

Discussions have been held with the World Bank on a possible impacts study in India to be financed by the United Kingdom.

Indonesia

Internal Country Studies

Indonesia plans to establish an official national climate impacts assessment and response strategies programme. Indonesia requests further assistance in developing and understanding climate impacts research and response determination.

National Strategy

Indonesia's National Committee of Climate and Environment has prepared a "National Strategy on the Anticipation of Climate Change Caused by the Greenhouse Effect".

UNEP Project on Impacts

Indonesia has completed a cooperative project with UNEP on the socio-economic impacts of climate change in Indonesia, Malaysia, and Thailand. (See description of UNEP activities below for more detail.)

Basic Study on Strategic Response Against Global Warming in Indonesia

With the support of the Environment Agency of Japan, the Indonesian State Ministry of Population and Environment is undertaking a "Basic Study on Strategic Response Against Global Warming, Climate Change, and Their Adverse Effects in Indonesia". (See description of external country studies under Japan for more detail.)

ADB Regional Impacts Strategy Project

Indonesia is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Ministry of Population and Environment will be the in-country implementing agency for the Indonesia study. (See description of ADB activities below for more detail.)

Sea level Rise Study with the Netherlands Government

The Netherlands government may undertake a case study on the "Vulnerability of Coastal Areas to Sea Level Rise" in cooperation with the government of Indonesia. This case study will be carried out within the context of the Coastal Zone Management Subgroup (CSMS) of Working Group III of the IPCC.

UNDP/GEF Least Cost Emissions Reduction Project

Indonesia is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

UNEP/Risø Greenhouse Gas Abatement Costing Study

Indonesia is a potential participant country in UNEP's project, to be implemented by Risø National Laboratory, on the costs of greenhouse gas abatement. (See description of UNEP activities below for more detail.)

Environmental Cooperation MOU with Norway

Indonesia and Norway have signed a "Memorandum of Understanding" (MOU) on cooperation in the field of the environment. Associated programmes will include emissions inventories and emissions reduction strategies. "Ecostrategies for Terrestrial CO₂ Fixation in Indonesia" is one cooperative research programme between Indonesia and Norway. (See description of Norway activities below for more detail.)

Impacts Study with the United Kingdom

The United Kingdom has offered assistance to Indonesia in the preparation of impacts studies, including cost issues.

Climate Change Study with Japan

The Environment Agency of Japan plans to undertake a climate change study on Indonesia in FY 1992.

Ireland

Internal Country Studies

Research is underway in the Department of the Environment on the development of an inventory of emissions of greenhouse gases.

The Department of the Environment has commissioned various research institutes and other expert bodies to undertake a series of studies on the impacts of climate change on agriculture, forestry, green mantle and native fauna, hydrology and freshwater resources, sea level, and fisheries and shell fisheries. The studies assess impacts of possible climate change scenarios and consider response strategies. These studies were published in November 1991.

Work is also underway to evaluate measures to control national emissions of greenhouse gases.

External Country Studies

Ireland is unable at present to assist other countries wishing to undertake climate change studies.

Israel

Internal Country Studies

Israel has not undertaken, nor is it planning to undertake, a cost/benefit climate change study. Israel would welcome financial assistance to undertake such a study.

In 1991 the Ministry of the Environment and the Israel National Academy of Sciences jointly organized an international workshop which took place in Israel entitled, 'Regional Implications of Future Climate Change'. It dealt with climate variability and changes in the past 10 000 years, and addressed expected regional climate changes, their socio-economic impacts, such as implications on water management and land use.

As a follow up Israel is considering to conduct a multi-disciplinary investigation of climate change in Israel. One of the tasks is to closely monitor the desert line in Israel, using various scientific disciplines. Available data shall be organized into a Geographic (Geophysical) Information System (GIS) and developed into a National Computerized Inter-disciplinary Climatic Change Dataset (NCCD) to serve as a firm basis for further climate research.

Atmospheric modelling of past and future climates shall be done in order to isolate man-made effects from natural variability. The study should be carried out in cooperation with investigators from Greece, Turkey, Cyprus and Egypt.

The Air Quality Division of the Israel Ministry of the Environment has carried out a national air pollutant emission inventory for the years 1980-1992 which includes emissions of CO₂.

For further information contact

Dr. Michael Graber
Head of Air Quality Division
Ministry of the Environment
P.O. Box 6234
Jerusalem 91061

External Country Studies

Israel is not in a position to assist other countries wishing to undertake climate change studies.

Italy

Internal Country Studies

Italy has prepared a country report on "Cost-Effectiveness Analysis of CO₂ Reduction Options" for the Commission of the European Communities Joule Program report on the same subject. Italy's country study, prepared by ENEA (National Committee for Research and Development of Nuclear Energy and Alternative Energy Sources), assesses possible options for reducing energy-related CO₂ emissions, and evaluates their reduction potential from both a technical and an economic perspective.

Japan

Internal Country Studies

Japan has completed, or is in the progress of completing, numerous national climate change studies, including emissions inventory assessments, analyses of mitigation technologies, and impacts studies.

Various CO₂ emissions inventory methodologies have been developed, and on May 22, 1992, the relevant Japanese Ministries and Agencies defined calculation methods for emission volume of carbon dioxide and calculated the emission volume of carbon dioxide in Japan in fiscal year 1990. A number of studies have been undertaken on emissions of other trace gases from individual sources, including solid wastes, biomass burning, agricultural lands, ruminants, grasslands, industrial facilities, inland waters, and waste treatment plants.

Various mitigation technologies are under development and/or evaluation by both public and private sectors. The Government of Japan is examining the implementation of CO₂ emissions mitigation technologies in various energy sectors, and is preparing a methane emissions mitigation report with the U.S. Environmental Protection Agency for presentation to the

IPCC. Also, various national institutes and organizations are conducting emissions mitigation measures in different sectors.

Numerous studies have been made on the impacts of climate change, including the impacts on vegetation, sea level, coastal infrastructure, hydrology, the urban environment, and human health. By summarizing these studies, the Government of Japan will publish the comprehensive report on the impacts of climate change in the summer of 1993. Concerning the coastal zone management, a study assessing the impacts of sea level rise on Japanese coastal zones and response strategies was conducted, and submitted in March 1992, as a contribution to the Coastal Zone Management Subgroup of IPCC Working Group III. The report is available from:

Dr. Nobuo Mimura
Assistant Professor, Ibaraki University
4-12-1, Nakanarisawacho
Hitachi-shi, Ibaraki, Japan
Tel: 81-294-35-6101
FAX: 81-294-35-8146

External Country Studies

Basic Study on Strategic Response Against Global Warming in Indonesia

The Environment Agency of Japan (EAJ) has conducted a "Basic Study on Strategic Response Against Global Warming, Climate Change, and their Adverse Effects in Indonesia" in cooperation with the Ministry of Population and Environment (KLH) of Indonesia. Overall, objectives of the programme include increasing awareness of climate change in Indonesia, determining the socio-economic impacts of climate change, and assisting in the development of a comprehensive national response strategy. Four studies were undertaken: 1) estimation of the sources and quantities of greenhouse gas emissions, 2) estimation of reservoirs and quantities of greenhouse gas sinks, 3) evaluation of damages of sea level rise due to climate change and global warming, and 4) recommendations to develop a comprehensive national response strategy against climate change and global warming.

The first year study was completed by EAJ in cooperation with KLH. EAJ was responsible for implementation of the project and the Overseas Environment Cooperation Centre (OECC) conducted the study under the supervision of EAJ.

The final report as well as the summary report of the first year were published in March 1992. A limited number of copies are available from:

Mr. Kentaro Doi
Control and Cooperation Division
Global Environment Department
Environment Agency
1-2-2 Kasumigaseki
Chiyoda-ku, Tokyo, Japan
Tel: 81-3-3581-7244
FAX: 81-3-3504-1634

In the second year of the study, more detailed emissions inventories for specific sectors (e.g., industry, energy production, transport) will be undertaken, and more concrete action plans will be developed. The outline of the study will be decided after consultation with the Ministry of Environment and Population of Indonesia.

Study on Coastal Zone Management Planning in South Pacific Countries

The study is conducted by the Environment Agency of Japan, jointly with SPREP, in order to develop integrated coastal zone management programme applicable for South Pacific island countries, through case studies of Fiji and Western Samoa. The duration of this study is FY 1992-1993.

These final reports are available from:

Mr. Kentaro Doi
Control and Cooperation Division
Global Environment Department
Environment Agency
1-2-2 Kasumigaseki
Chiyoda-ku, Tokyo, Japan
Tel: 81-3-3581-7244
Fax: 81-3-3504-1634

Other International Climate Change Activities

Japan has also contributed financial and technical support to a number of international climate change programmes, especially in association with the ADB and IPCC. These activities include:

Japan participated in the Asian Pacific Seminar on Climate Change, held in Nagoya from 23-26 January, 1991, organized by the Environment Agency of Japan, Aichi Prefectural Govt., the Nagoya Municipal Govt. and the Overseas Environmental Cooperation Center (OECC), incorporated with ADB, UNCRD, and UNEP.

The seminar was conducted to support the effort on global environmental issues, with special attention to the greenhouse effect, and to enhance awareness of the implications of climate change in the Asian Pacific region.

The follow-up Asian Pacific Seminar on Climate Change was held in Bangkok from 29-31 March 1993. This conference/symposium is one of the activities of the ADB Regional Study on Global Environmental Issues.

A study of the environmental and socio-economic impacts of climate change in East and South East Asia was conducted from September to December 1991 to collect and summarize all existing studies of potential impacts of climate change in the regions, as a contribution to IPCC Working Group II. The implementation agency was the National Institute for Environmental Studies of the Environment Agency in Japan.

A special team for the impacts of sea level rise conducted a study, submitted to IPCC/Working Group III (CZMS) in March 1992, which assessed the vulnerability to sea level rise for Tonga, identified problems specific and important for small coral islands, and provided a basis for the future study of response strategies.

Kenya

Internal Country Studies

Collaborative Impacts Study with United Kingdom

A study on the impacts of climate change on Kenya, funded by the United Kingdom through the Overseas Development Administration, is underway. (See description of external country studies under the United Kingdom for more detail.)

Switzerland/GEF Impacts and Mitigation Study

Kenya is a potential participant in an impacts and mitigation study under the Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from GEF. The programme would offer Kenya the means to accurately monitor climate changes due to greenhouse gases, devise policies aimed at reducing their production, better identify related problems Kenya will face in the future, and elaborate possible solutions/answers.

Korea, Democratic People's Republic

Internal Country Studies

UNDP/GEF Least Cost Emissions Reduction Project

The Democratic People's Republic of Korea is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Korea, Republic of

Internal Country Studies

UNDP/GEF Least Cost Emissions Reduction Project

The Republic of Korea is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Madagascar

Internal Country Studies

A national report on climate has been prepared. The report presents an overview of the activities in Madagascar which contribute to global climate change and that are likely to be impacted by climate change.

Madagascar would welcome both technical and financial assistance to undertake additional studies related to climate change.

External Country Studies

Madagascar is not assisting nor is in a position to assist developing or small island countries to undertake a cost/benefit study related to climate change.

Malaysia

Internal Country Studies

UNEP Socio-Economic Impacts Study

Malaysia has completed a cooperative project with UNEP on the potential socio-economic impacts of climate change in Indonesia, Malaysia, and Thailand. (See description of UNEP activities below for more detail.)

ADB Regional Impacts Strategy Project

Malaysia is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will cover a broad range of impacts (including socio-economic impact), strategy options and appropriate national response to climate change. Some suggestions for a regional response to climate change will be suggested from the point of view of Malaysia whereby five focus areas are identified for detailed study, namely agriculture, water resources, coastal resources and sea level rise, natural disaster, and human health. The Ministry of Science, Technology and the Environment is the in-country implementing agency for the Malaysia Study, which will be carried out by the Malaysian Institute of Economic Research (MIER). Detailed information on this study can be obtained from:

Dr. Chan Huang Chiang
Malaysian Institute of Economic Research
9th Floor, Block C, Bangunan Bank Negara
P.O. Box 12160
50768 Kuala Lumpur
Tel: 603 - 2926188
FAX: 603 - 2926163

Collection of Information on Studies Related to Climate from Local Research Institutions

Malaysia, under the International Geosphere-Biosphere Programme (IGBP) is in the progress of collecting information on climate related research/studies from local research institutions including universities. The Ministry of Science, Technology and the Environment is the coordinating agency for this programme.

Mali

Internal Country Studies

Inventory Study with France

A study on greenhouse gas emissions inventories is being coordinated and funded by France, with possible additional funding from UNEP and under the coordination of Risø National Laboratory.

Marshall Islands

Internal Country Studies

A 6-month case study (Executive Summary dated June 1992) was conducted to assess the vulnerability of the Majuro Atoll to accelerated sea level rise (SLR) and to suggest a preliminary view of possible adaptive response options should selected future accelerated SLR scenarios become reality. The purpose of the study was to provide information that can be used by the Government of the Marshall Islands for conceptual planning purposes only with respect to future sea level rise scenarios, and to provide information to the IPCC in their assessments of global climate change impacts. The study was sponsored by the U.S. National Oceanic and Atmospheric Administration (NOAA) on behalf of the Coastal Zone Management Subgroup of the IPCC and was conducted with the cooperation of the Government of the Marshall Islands. The South Pacific Regional Environment Programme (SPREP) served as coordinator and conducted parts of the study.

All inquiries regarding climate studies in Republic of the Marshall Islands should be directed to the following individuals:

Mr. Kazuo Helgenberger
General Manager of the Marshall Islands Environmental Protection Authority
P.O. Box 1322
Majuro, Marshall Islands 96960
Tel: (692) 625-5203
FAX: (692) 625-5202

Mr. Clary Makroro
Marshall Islands Office of Planning and Statistics
Majuro, Marshall Islands 96960
Tel: (692) 625-3801
FAX: (692) 625-3805

Mauritius

Internal Country Studies

National Climate Committee

The Government has established a National Climate Committee in June 1991 to propose a program of climate and climate change monitoring in Mauritius, and to study climate change impacts and appropriate response strategies. This Committee has elaborated an Action Plan which has been submitted for approval by the Government. The Meteorological Services coordinates these activities and represents Mauritius on the IPCC.

Assessment of vulnerability of climate change and sea level rise

Mauritius is one of the seven countries identified for site-specific case studies funded by UNEP for the assessment of vulnerability of climate change and sea-level rise.

Much progress has been achieved since the implementation of the studies in Mauritius. Countour maps at 1 m interval of two vulnerable sites have been constructed using equipment purchased under the project. A study on sea-level changes with available data from a tide-gauge station installed within the framework of the TOGA programme has been conducted. A national seminar with UNEP participation to discuss preliminary results will be held shortly.

IOC-UNEP-WMO Pilot activity on sea-level changes and associated coastal impacts in the Indian Ocean

Mauritius has informed WMO, in response to a circular letter, of its interest to participate in this pilot project as one of the small island sites in the South Indian Ocean. Support for equipment and maintenance will be required.

A micro-climate study of the City of Port Louis and its suburbs started in June 1991 and is expected to span over three years.

Mauritius would welcome technical and financial assistance to carry out more detailed climate impact studies and response strategies development.

Mexico

Internal Country Studies

UNEP/GEF Sources and Sinks Project

Mexico is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

U.S./Mexico Cooperative Emissions Inventory Project

Mexico is developing a national greenhouse gas emissions inventory with technical support from the U.S. government. (See description of external U.S. activities below for more detail.)

Emissions Inventory Project with the Canadian Government

Mexico is working with the Canadian government to develop its preliminary greenhouse gas emissions inventory. Under a current project, Canada is providing technical assistance, equipment, and data base testing. In March 1992, five Mexican experts travelled to Canada to participate in meetings with the public and private sectors on greenhouse gas emissions inventories.

Mongolia

Internal Country Studies

UNDP/GEF Least Cost Emissions Reduction Project

Mongolia is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Morocco

Internal Country Studies

UNEP/GEF Sources and Sinks Project

Morocco is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

Morocco has appointed the Ministry of Energy and Mines to handle the energy and mining sector for this project and Mr. Mohamed Bennani, State Engineer and departmental manager for the environmental section of this Ministry, as the national coordinator. His telephone number is 774827.

Myanmar

Internal Country Studies

UNDP/GEF Least Cost Emissions Reduction Project

Myanmar is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Namibia

Internal Country Studies

No national studies on climate change have been undertaken by Namibia, and there is no official plan to establish a national climate impacts assessment and response strategies programme.

Netherlands

Internal Country Studies

In 1991, a report was published on the emissions of greenhouse gases in the Netherlands. In the same year, the Ministry of Housing, Physical Planning and Environment published its policy document on climate change. Also documents have been published on climate change and transport as on climate change and waste. Furthermore, the Ministry of Economic Affairs published a policy document on energy saving. The Netherlands has also undertaken a cost/benefit study on responses to potential sea-level rise. In 1993, the Ministry of Housing, Physical Planning and Environment will publish a background document on methane. More detailed information on the Netherlands climate change policy can be obtained from:

Dr. Bert Metz, Director Climate Change Programme,
Ministry of Housing, Physical Planning and Environment,
Directorate-General for Environmental Protection,
Directorate Air & Energy,
P.O. Box 30945,
2500 GX The Hague.
Tel: +31-70 339 43 83
Fax: +31-70 339 13 11

Furthermore, the Ministry of Housing, Physical Planning and Environment finances a Research Programme on Global Air Pollution and Climate Change, in which research is done a.o. on how the climate system works, effects of climate change and also on response strategies. More information on this programme can be obtained from:

Mr. S. Zwerver
National Institute of Public Health and Environmental Protection (RIVM)
P.O. Box 1
3720 BA Bilthoven
Netherlands
tel: +31 30 749 111
fax: +31 30 742 971

The Netherlands has undertaken a programme 'The challenge of drastic CO₂ reduction-opportunities for new energy technologies to reduce CO₂ emissions in the Netherlands energy system up to 2020'. The report summarizes the costs of emissions trade-offs and ranks energy technology options for CO₂ reduction. This is a multitask study to be conducted between 1990 and 1999.

UNEP/Risø Greenhouse Gas Abatement Costing Study

The Government has financed a national greenhouse gas abatement costing study within the UNEP/Risø program, to be executed by Free University Amsterdam and ECN Petten. (See description under UNEP below for more detail.)

External Country Studies

The Environment Programme of the Ministry of Foreign Affairs/Directorate-General for International Co-operation has initiated a programme to assist developing countries in the compilation of climate-change related country studies within the framework of the IPCC and the INC for the climate convention. The programme covers the three types of country studies:

- inventories of net-emissions of greenhouse gases;
- assessments of effects, such as vulnerability to sea-level rise;
- assessments of technological options and policy instruments to mitigate or adapt to climate change (and feasibility analysis).

Contacts have been established with the following countries for possible cooperation and assistance in one or more types of country study, as appropriate: Bangladesh, Bolivia, Costa Rica, Ecuador, Egypt, Ghana, Senegal, Surinam, Tanzania, Vietnam, Yemen.

A vulnerability assessment to accelerated sea-level rise and other possible effects of climate change is being carried out in Bangladesh and has been completed in Egypt.

New Zealand

Internal Country Studies

Under the auspices of the New Zealand Climate Change Programme (established in 1988), the following national emissions inventory, impacts assessment, and response strategy studies have been completed:

"New Zealand Inventory of Sources and Sinks of Greenhouse Gases" (New Zealand Ministry for the Environment, 1991)

"Climate Change: A Review of Impacts on New Zealand" (New Zealand Climate Change Programme, April 1990)

"Climate Change: Impacts on New Zealand" (New Zealand Climate Change Programme, May 1990), published by the Ministry for the Environment. Based on two scenarios of climatic change, this multidisciplinary study covers the biophysical, economic, and social impacts.

"Responding to Climate Change: A Discussion of Options for New Zealand" (New Zealand Climate Change Programme, May 1990)

"The Enhanced Greenhouse Effect: The Issues and What We Can Do About It" (Energy Management Group, New Zealand Ministry of Commerce)

New Zealand has also completed and is implementing a strategy for reducing CO₂ emissions. The strategy is a first steps approach, the purpose of which is to undertake measures to reduce or absorb CO₂ emissions that can be implemented at low economic costs or with net economic benefits, and to undertake investigations that are necessary to ensure that New Zealand achieves any further reductions in the least cost way possible.

External Country Studies

New Zealand assists developing countries with country studies through its contributions to the South Pacific Regional Environment Programme (SPREP) and UNEP. In particular, a country study has been completed in Kiribati and another is underway in Tuvalu. New Zealand has provided information on climate change to SPREP members and has funded climate change research in the Tokelau.

New Zealand has also participated in an Australian-funded WMO study to assess climate monitoring capacity in the South West Pacific and to identify critical impacts issues, leading to the report "The Changing Climate in Paradise" (Australian Bureau of Meteorology, 1991).

Nigeria

Internal Country Studies

UNEP/GEF Sources and Sinks Project

Nigeria is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

National Task Force on Impacts and Response Strategies

The Federal Environmental Protection Agency (FEPA) plans to establish a national task force (NTF) on climate impacts assessment and response strategies programme. The NTF will comprise of all relevant government ministries/agencies and experts from the research institutes/universities and private sector with the agency as the coordinating body.

Nigeria is in need of financial and technical assistance to establish the NTF.

Switzerland/GEF Impacts and Mitigation Study

Nigeria is a potential participant in an impacts and mitigation study under the Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from GEF. The programme would offer Nigeria the means to accurately monitor climate changes due to greenhouse gases, devise policies aimed at reducing their production, better identify related problems Nigeria will face in the future, and elaborate possible solutions/answers. Nigeria has applied to the UNDP and UNEP for financing by the GEF for participation in this programme.

Norway

Internal Country Studies

In March 1991, the Norwegian Interministerial Climate Group finalized a study on global climate change, *The Greenhouse Effect, Impacts, and Response Strategies*, which presented an overview of the subject, gave an inventory of national green house gas emissions, described potential impacts on Norway, and discussed possible strategies for Norwegian climate policy including the economic effects of limiting CO₂ emissions and possible measures to reduce emissions and increase fixation of greenhouse gases. About 40 substudies were carried out by Norwegian research institutes in connection with this work. An English translation of the study report was published by the Ministry of Environment in February 1992.

The Green Tax Commission, consisting of Government officials for the Ministries of the Environment, Transport, Industry, Oil- and Energy, and Finance, and outside experts, was established by the Government in December 1989. The Commission has made proposals for various economic incentives to reduce greenhouse gas emissions and presented these proposals, and other environmental policy proposals, in a final report that was presented to the Ministry of Finance in February 1992. An English translation of the Overview and Summary of the final report was published in March 1992.

Follow-up analysis of these studies are now carried out to form a basis for a national action plan to be developed before the end of 1993.

External Country Studies

On 14 May 1990, the Republic of Indonesia and the Kingdom of Norway signed a "Memorandum of Understanding" (MOU) on cooperation in the field of the environment. One of the programmes in the workplan connected to the MOU, called "Sources and Sinks of Greenhouse Gases", will, *inter alia*, develop and assess ecostrategies for carbon fixation such as forest management. This programme is to be administered by the Norwegian Directorate for Nature Management. Development of greenhouse gas emissions inventories and emissions reduction scenarios will be part of another project, called "Natural Resources Management in Indonesia", and will be carried out by the Norwegian Central Bureau of Statistics.

Pakistan

Internal Country Studies

Pakistan has a programme to prepare a National Study on the Greenhouse Effect and Its Impacts on the Region in pursuance of a decision by SAARC member countries.

Pakistan also notes its willingness to undertake a cost\benefit study related to climate change but will require technical and financial assistance to do so.

ADB Regional Impacts Strategy Project

Pakistan is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Environment and Urban Affairs Division will be the in-country implementing agency for the Pakistan study. (See description of ADB activities below for more detail.)

UNDP/GEF Least Cost Emissions Reduction Project

Pakistan is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Panama

Internal Country Studies

Panama has not undertaken cost/benefit climate change studies, but is planning to conduct such studies in the near future. However, technical and financial assistance are required to begin these studies.

Philippines

Internal Country Studies

ADB Regional Impacts Strategy Project

The Philippines is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Department of Environment and Natural Resources will be the in-country implementing agency for the Philippines study. (See description of ADB activities below for more detail.)

UNDP/GEF Least Cost Emissions Reduction Project

The Philippines is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Poland

Internal Country Studies

Preliminary Emissions Inventories

Poland has completed two preliminary greenhouse gas emissions inventories, both of which have been submitted to the IPCC.

U.S./Poland Cooperative Emissions Project

The Polish Foundation for Energy Efficiency, in cooperation with the U.S. Environmental Protection Agency, is undertaking a "Case Study on Greenhouse Gas Emissions and Reduction Options in Poland". A draft final report, *Greenhouse Gas Emissions Inventory for Poland, 1988*, was published in August 1992. (See description of external country studies under the United States for more detail.)

UNEP/GEF Sources and Sinks Project

Poland is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. The national institution responsible for the preparation of the study is the National Foundation for Environmental Protection (NFEP). Further information can be obtained from: (See description of UNEP activities below for more detail.)

Mr. Mieczyslaw Metler
Director of International Activities
National Foundation for Environmental Protection
02-078 Warsaw
9 Krzywickiego Street
Poland
Tel: (48 22) 25 44 81
(48 22) 25 32 71 ext. 681
Fax: (48 22) 694 2464

Preliminary Impacts Assessments

Several impacts studies have been completed (e.g., coastal zone management and agriculture) or are underway (e.g., water resources).

National Response Strategies

National studies on response strategies in the fuel producing and consuming sector are underway.

Further information regarding Poland's climate change activities can be obtained from Professor Sadowski, who coordinates IPCC activities in Poland:

Professor Maciej Sadowski
Institute of Environmental Protection
5/11 Krucza Str.
00-548 Warsaw, Poland
FAX: (48 22) 29 52 63

External Country Studies

At least in a few fields, Poland has well-prepared and experienced staff who can provide assistance to other countries in developing and undertaking climate change projects. These

fields are greenhouse gas inventories, and response strategies in the energy and industry sectors, forestry, and water resources.

Romania

Internal Country Studies

Under the initiative of the Ministry of the Environment, the National Committee on Climate Change (NCCC) was established at the end of 1990. In May 1992, the NCCC was designated as the national interdepartmental and interdisciplinary body for coordinating activities in the climate change area. The NCCC has been organized into the following working groups:

- Assessment of national emissions of greenhouse gases;
- Situation analysis and forecasting of the distribution of climate changes in south-east Europe and associated impacts studies;
- National climate change issues in the energy, industrial, and transport sectors;
- National climate change issues in agriculture and forestry;
- Vulnerability of the Black Sea coastline and the Danube Delta to the possible increase in the average level of seas and oceans; and
- Scenarios for national emissions of greenhouse gases, taking into account the economic development scenarios, as well as progress in scientific knowledge and future political developments.

Romania, through the NCCC, has initiated several modest studies on climate change impacts, and intends to continue such studies. Romania would welcome technical assistance for this work. Further information on the NCCC and its activities can be obtained from:

Dr. Ion Draghici
National Institute for Meteorology and Hydrology
97, Soseaua Bucuresti - Ploieti, Sector 1
Bucharest, Romania

Romania is also preparing an assessment of national greenhouse gas emissions and sinks in support of the ongoing IPCC/OECD work on establishing emissions inventory methodologies. A preliminary inventory, prepared with the financial assistance of the United Kingdom, was published in May 1992. The report also includes emissions forecasts and technical and policy options for greenhouse gas emissions reductions.

External Country Studies

Romania is not in a position to offer technical assistance to developing countries or island nations for climate change country studies.

Russian Federation

Internal Country Studies

The Russian Federation has completed a preliminary inventory of CO₂ and CH₄ emissions in support of the ongoing IPCC/OECD work on establishing emissions inventory methodologies.

Saint Lucia

Internal Country Studies

Currently there is no national climate change programme on the island of Saint Lucia. Technical and financial assistance are required in order to undertake inventory, impacts, and mitigation studies.

A recent request was made to the US government for a national climate change study. The scope of the study shall include an inventory of sources and sinks of greenhouse gases, assessment of vulnerabilities to impacts of climate change, an evaluation of technical options to reduce the vulnerability to climate change and of technical option to reduce greenhouse gas emissions, the identification of alternative programmes and measures to mitigate and/or adapt to climate change and an analysis of the feasibility, costs and benefits of alternative programmes and measures.

Saudi Arabia

Internal Country Studies

Limited studies are under development concerning climate impacts assessment and response strategies programmes within the Meteorology and Environmental Protection Administration (MEPA) and some other scientific institutions. A nationally coordinated programme will be developed. Development of a national emissions inventory is underway. Technical assistance to facilitate development of these programmes would be welcomed.

External Country Studies

At present, support is not provided to other developing nations for this work.

Senegal

Internal Country Studies

No evaluation programme on climate impacts and response strategies has been established. The Director of the Environment or the Minister of Tourisme and the Environment could coordinate such a programme.

UNEP/GEF Sources and Sinks Project

Senegal is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for

more detail.) The programme will be coordinated at the national level by the Directorate of the Environment. The appointed coordinator is:

M. Ndiaye Cheikj Syalla
Chief of the Division of Prevention against Pollution
23 rue Calmette
Dakar, Senegal
Tel: 21.11.26/21.86.89, BP 4049

Inventory Study with France

A study on greenhouse gas emissions inventories is being coordinated and funded by France, with possible additional funding from UNEP and under the coordination of Risø National Laboratory.

Seychelles

Internal Country Studies

The Seychelles has not yet undertaken a cost/benefit study related to climate change, and would require technical and financial assistance to do so. The Seychelles has, however, completed an "Impacts Assessment of Climate Warming and Sea Level Rise (Project A5, EMPS90).

External Country Studies

The Seychelles is not in a position to assist other developing countries in cost/benefit studies related to climate change. However, the Seychelles proposes to join other countries in the region in order to implement such a project.

Slovak Republic

Internal Country Studies

The National Climate Programme of the Czecho-Slovak Federal Republic (NCP CSFR) on April 1, 1993 was divided into two parts, one for the Czech Republic and one for the Slovak Republic.

There is preparation (1993) within the framework of the NCP of the Slovak Republic: Two projects, being financed by the Ministry of the Environment of the Slovak Republic are oriented to the National Programme of Reduction of the greenhouse gases emissions, the Climate Change analysis as well as their impacts to various sectors. The works on the inventory of the greenhouse gases emissions sources into the atmosphere will begin in the year 1993. The formulation of principles for the national strategy of the greenhouse gases emissions reduction will be prepared, too.

Within the framework of the NCP CSFR a project was completed in 1992, which dealt with the analysis of alternative scenarios of climate change as well as possible climate change impacts on the region of the CSFR.

Within the framework of the NCP of the Slovak Republic projects on the development of a national programme of reduction of greenhouse gas emissions as well as on climate change impacts are being conducted.

The development of an inventory of greenhouse gas emissions will begin in the course of 1993.

Further information can be obtained from the experts of the Slovak Hydrometeorological Institute

Mr. Dr. M. Lapin
Ms. Dr. K. Mareckova
Ms. Dr. O. Majercakova

South Africa

Internal Country Studies

Global Change Programme

The South African Global Change Programme was established in 1987 as a National Committee for the IGBP to coordinate research into global climate change, with a special emphasis on the effects of such change on Southern Africa. An inventory of South African projects on global climate change has been compiled. Contact addressee:

SA Global Change Programme
Foundation for Research Development
P.O. Box 2600
PRETORIA 0001
SOUTH AFRICA
Tel: +27 12 841-4076
Fax: +27 12 804-2679

Interdepartmental Coordinating Committee for Global Environmental Change

In 1991 the Department of Environmental Affairs established an Interdepartmental Coordinating Committee for Global Environmental Change (ICC). The function of the ICC is to facilitate interdepartmental cooperation and coordinate the action required for formulating broad national policy and strategy on global environmental change. The ICC is operating through six Task Groups who have been charged with assessing the local impacts of global environmental change on South Africa, assessing the implications of these changes, and suggesting actions to reduce/avoid/take advantage of the identified impacts. The six Task Groups are: "Water Resources and Catchments", "Air Quality", "Energy Use", "Terrestrial Environment", and "Marine and Coastal Environments". Based on Task Group reports, ICC has completed a draft policy document which has recently been published (May 1993) for comment. A final report on the impacts and implications of global environmental change on Southern Africa summarizing the investigations of the ICC is expected to be available in 1994. Contact address:

Chairman of ICC
Department of Environmental Affairs
Private Bag X447
PRETORIA
0001 (South Africa)
Tel: +27 12 322-3911
FAX: +27 12 322-2682

Spain

Internal Country Studies

A National Climate Commission was established in May 1992 in order to facilitate collaboration in preparing the National Climate Programme and coordinate the activities carried out in this area with those of international organizations. The Commission shall also advise the Government on policies related to climate change impacts, adaptive measures, and emissions mitigation and response strategies, as well as on mechanisms for implementation of the adopted policies. The address for the commission is:

Secretaria de la Comision Nacional del Clima
Instituto Nacional de Meteorologia
C° De Las Moreras S/N
C. Universitaria. 28040 Madrid

Sri Lanka

Internal Country Studies

ADB Regional Impacts Strategy Project

Sri Lanka is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Ministry of Environment and Parliamentary Affairs will be the in-country implementing agency for the Sri Lanka study, which is carried out by the Manga Institute, Colombo. (See description of ADB activities below for more detail.)

Preliminary Emission Inventory

Sri Lanka has completed a preliminary greenhouse gas inventory for 1990, using the IPCC guidelines.

UNDP/GEF Least Cost Emissions Reduction Project

Sri Lanka is a participating country in UNDP's proposed project to be supported by the GEF on least cost emissions reduction.

Sweden

Internal Country Studies

An emissions inventory for 1988/89, "Swedish Budget for Greenhouse Gases", was published 17 June 1991 by the Swedish Environmental Protection Agency. An English translation is available.

A study containing an emissions inventory for 1990, as well as an impacts analysis and a preliminary assessment of measures to reduce emissions of greenhouse gases, entitled "The Greenhouse Gases, emissions and countermeasures in an international perspective", was published 1 December 1991. An English version is available.

Based on the December 1991 study, the Swedish Environmental Protection Agency is conducting an analysis of proposals for reductions of emissions of greenhouse gases and associated costs. The study is to be completed 1 November 1992. An English version will be available.

A survey on "Future Climate in the Nordic Region" was published in March 1992 by the Swedish Meteorological and Hydrological Institute.

Switzerland

Internal Country Studies

Following a decision reached on 22 November 1989, the Swiss government formed an Interdepartmental Working Group on the Evolution of the Climate System, which is preparing a national strategy containing measures to stabilize and reduce emissions of CO₂ and other greenhouse gases from key sectors (e.g., energy, transport, industry, residential heating, agriculture, forestry). The working group will present a report to the government by the end of 1992, which will contain an assessment of possible environmental and socio-economic impacts of climate change in Switzerland, focussing in particular on tourism, a national inventory of greenhouse gas emissions, and recommendations on measures to implement in different sectors, as well as in the areas of information, education, and research and development.

Additional information can be obtained from:

Dr. Pascale D. Morand Francis
Head, International Treaties Section
International Affairs Division
Federal Office of Environment, Forests and Landscape
Hallwylstrasse 4
CH-3003 Bern, Switzerland

Tel: +41 31 61 68 62
Fax: +41 31 43 31 87

External Country Studies

The Swiss government established in 1991 a credit line of SFr. 300 million over 5 years to assist developing countries with the implementation of measures and projects of global environmental relevance. Part of these funds will be channeled through the Global Environmental Facility (GEF), while another part will be used for bilateral projects. Switzerland contributed SFr. 100,000 in 1991 to support the IPCC/OECD country studies aimed at developing a methodology for greenhouse gas emissions inventories, and contributed another SFr. 20,000 in 1992 for the Berkeley IPCC Country Studies Workshop.

Switzerland/GEF Impacts and Mitigation Study

The Swiss Proclim-Ecosphere Greenhouse Gases Reduction Programme is an impacts and mitigation programme under consideration that is designed to offer developing countries the means to accurately monitor climate changes due to greenhouse gases, devise policies aimed at reducing their production, better identify related problems the country will face in the future, and elaborate possible solutions/answers. The program is a result of cooperation between Dr. Martin Beniston, a scientist associated with the Swiss Government sponsored Proclim Institute, and the Swiss company Ecosphere. Argentina, Kenya, Nigeria, and Venezuela have taken steps toward seeking GEF financing through the UNDP and UNEP for participation in this programme.

Tanzania

Internal Country Studies

Joint Study on Greenhouse Gas Emissions in Tanzania and Zimbabwe

The Ministry of Water, Energy and Minerals of Tanzania and the University of Dar es Salaam, in collaboration with the Southern Centre for Energy and the Environment in Zimbabwe and the Canadian government (which is providing financial assistance), are preparing to carry out "Greenhouse Gas Emissions, Levels of Sources, Policy Options and Longer Term Scenarios: A Case Study in Tanzania and Zimbabwe". The study will evaluate emissions, assess development strategy options with low emissions impacts, and increase climate change awareness among policy makers and academic and research institutions. The project, which will be initiated in the fall of 1992, will be completed in two years. Subject to the results of the project, the collaborators plan to facilitate the formation of a Southern African Regional Research Network on selected aspects of greenhouse gas emissions and climate change. Principal researchers on the project are listed below in the description of this project in the Internal Country Studies section under Zimbabwe.

UNEP/GEF Sources and Sinks Project

Tanzania is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

Thailand

Internal Country Studies

The National Strategy on Global Climate Change

The National Environment Board of Thailand has initiated the development of a national strategy on global climate change through the establishment of a Sub-Committee on Global Warming under a National Committee on Long-term Global Environmental Issues. The Sub-Committee, chaired by the Director of Natural Resources and Environment Programme of the Thailand Development Research Institute (TDRI), has begun work on a national strategy report that is expected to be completed at the end of 1992.

The primary objectives of this report are to assess the potential local/national effects of global climate change and their socio-economic implications, assess Thailand's status as a greenhouse gas producer and as a third world country facing the risk of effects, and identify ways and initiate activities through which Thailand can contribute to international efforts to control/reduce greenhouse gas emissions. Activities will include the identification and evaluation of greenhouse gas sources and emissions control measures, an examination of emissions mitigation options under alternative energy scenarios, an analysis of the linkage between industrial emissions and emissions from land-use change, and ongoing interaction with international climate change discussions.

UNEP Project on Impacts

Thailand has completed a cooperative project with UNEP on the socio-economic impacts of climate change in Indonesia, Malaysia, and Thailand. (See description of UNEP activities below for more detail.)

ADB Impacts Study

The ADB is planning to provide assistance to Thailand for a detailed assessment of potential climate change impacts and appropriate response measures. (See description of ADB activities below for more detail.)

UNDP/GEF Least Cost Emissions Reduction Project

Thailand is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

External Country Studies

Thailand may be in a position to technically assist other developing countries in Southeast Asia with climate change studies, once a cost/benefit study is carried out in Thailand.

Togo

Internal Country Studies

Togo has not undertaken a cost/benefit climate change study, and seeks financial and technical assistance to undertake such a study.

Tonga

Internal Country Studies

Through technical and financial support from Japan, an assessment of the vulnerability to sea level rise was conducted. The study report was submitted to the CZMS of IPCC/Working Group III in March 1992.

Tunisia

Internal Country Studies

At present no official national programme on Climate Change Impact Assessment and Response Strategies is established. A study on basic data on climate change was presented in September 1992. The study addresses the status of and possible effects of climate change on agriculture, water resources and coastal zones as well as with the role of the energy sector and lists elements for response strategies.

The task team on Implications of Climate Change in the Mediterranean Basin carried out case studies in Tunisia.

Turkey

Internal Country Studies

A "National Climate Coordination Group" (NCCG) was established in 1991 under the coordinatorship of the General Directorate of the State Meteorological Service. Studies in the field of climate change are conducted by the following four sub-commissions within the Group through the participation of all the Ministries concerned and other relevant institutions (mostly governmental) and universities:

- Sub-group on Protection of the Atmosphere and Climate Change
- Sub-group on Energy and Technology
- Sub-group on Forestry and Agriculture
- Sub-group on Legal Dimensions and Economic Options

Due to the lack of enough knowledge on greenhouse gas emissions by the various sectors and on sources, reservoirs, and sinks of greenhouse gases, subgroups of the NCCG had difficulties in preparing their national reports. Only energy-related anthropogenic emissions of CO₂ have been able to be studied in detail. The subgroup on Protection of the

Atmosphere and Climate Change and the subgroup on Energy and Technology completed their national reports in Turkish just before the Rio Conference in May 1992.

Turkey does not operate any official national climate impacts assessment and response strategies programme; however, the Government is planning to establish such a programme in the near future under the State Meteorological Service. The secretariat of the NCCG consists of Mr. Dr. Murat TURKES, Mr. Utku M. SUMER, Miss Gonul KILIC. The address is:

State Meteorological Service
Department of Weather Forecasts
06120 Kalaba-ANKARA, TURKEY

External Country Studies

Turkey is not assisting or in a position to assist any developing or small island countries in climate effects, cost/benefit, and response determination studies related to climate change.

Turkmenistan

Internal Country Studies

National studies on climate change have not yet been undertaken in Turkmenistan, although a national climate programme is under development.

External Country Studies

Turkmenistan is in a position to assist other countries in developing and conducting climate studies.

Tuvalu

Internal Country Studies

Through the auspices of the Association of South Pacific Environmental Institutions (ASPEI), UNEP, and the South Pacific Regional Environmental Programme (SPREP), a Task Team on climate change began a study in Tuvalu in late 1991. This study will, *inter alia*, evaluate data availability, national capabilities, and national needs in the climate change context in order to design and implement an in-depth climate change study.

Uganda

Internal Country Studies

Uganda has mobilized certain ministries and institutions in order to study greenhouse gas inventories, climate change impacts, and cost/benefits of response options. An initial planning meeting of Makerere University researchers and Ministry scientists has been held, and a scope of work that covers nine sectors has been outlined:

<u>Sector</u>	<u>Responsible Institution/Ministry</u>
Agriculture (crops)	Kawanda Agricultural Research Station, and Department of Agriculture at MUK
Agriculture (livestock)	UTRO, and Department of Geography at MUK
Forestry & Wetlands	Department of Forestry at MUK, and Forestry Department at Nakawa
Hydrology & Water Development	Department of Water Development, and Department of Meteorology
Air Quality and Health	Ministry of Health UVRI, and Department of Meteorology
Energy, Industry, and Transport	Department of Physics at MUK, and Departments of Energy and Meteorology
Human Settlements	Department of Housing and Urban Development
Terrestrial Ecosystems	Department of the Environment, and Institute of Environmental Studies MUK
Cost/Benefit	Ministry of Planning and Economic Development

 UTRO = Uganda Trapanimiasis Research Organization - Tororo
 UVRI = Uganda Virus Research Institute Entebbe
 MUK = Makerere University Kampala

Financial assistance (approximately US\$7420) is necessary in order to undertake the initial preparatory phase of this project.

Uganda has requested financial support to carry out studies in inventory of greenhouse gases, impacts assessment of climate change, and cost/benefit of response options.

UNEP/GEF Sources and Sinks Project

Uganda is a participant in a UNEP project, to be supported by the GEF, on national greenhouse gas sources and sinks. (See description of UNEP activities below for more detail.)

The Department of Meteorology, in collaboration with the Department of Forestry, has been identified as the lead agency for this programme, and Dr. Eliphaz Bazira has been nominated to work as the National Liaison person. His address is:

Department of Meteorology
P.O. Box 7025
KAMPALA, UGANDA
Tel.: 233559
Telex.: 61061 COMMUNITO
FAX: 002541 256166

United Kingdom

Internal Country Studies

The British government has produced or commissioned a number of reports concerning the impacts and likely costs in the United Kingdom of climate change.

"An Evaluation of Energy Related Greenhouse Gas Emissions and Measures to Ameliorate Them" by the Department of Energy evaluates possible options, and associated costs, for limiting greenhouse gas emissions. The first report of the Department of the Environment's Climate Change Impacts Review group (CCIRG), published January 1991, examines the impacts of climate change on a variety of environmental and socio-economic sectors. Other reports commissioned by the Department of Trade and Industry evaluate linkages between measures to control greenhouse gas emissions and international trade.

External Country Studies

Through the Overseas Development Administration, the United Kingdom is undertaking impacts studies in cooperation with Kenya, Ghana and the Organization of Eastern Caribbean States. The cost of the Kenya and Ghana studies are estimated at £160,000 each, and the reports were due to be ready by the end of 1991. The British government's consultant on these two studies is:

Mr. L. Zurich
KPMG Management Consultants
P.O. Box 695
8 Salisbury Square
London, United Kingdom

The United Kingdom has also offered assistance in the preparation of impacts studies, including cost issues, to Indonesia and Zimbabwe. Discussions have also been held with the World Bank on a possible study in India to be financed by the United Kingdom, and with UNEP on involvement in UNEP's programme on national emissions abatement costs with Risø National Laboratory.

The United Kingdom, through its Government Know How Fund, financed an initial inventory of greenhouse gas emissions in Romania.

United States

Internal Country Studies

The United States government has produced or supported numerous regional and national studies concerning emissions of greenhouse gases, the impacts of climate change, emissions reduction options, and costs and benefits of response strategies in the United States. These include reports produced by the National Academy of Sciences, the Office of Technology Assessment, the U.S. Environmental Protection Agency, the U.S. Department of Energy, the U.S. Department of Commerce, and universities and research organizations. Those studies provide the foundation for the U.S. Climate Action Plan, containing those policies and measures adopted by the United States to limit greenhouse gas emissions and to reduce vulnerabilities to climate change.

The US Climate Action Plan, which was presented to the 6th meeting of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change in December 1992, is presently being revised and an updated version should be ready by June 1993.

External Country Studies

The United States has supported independent institutions to conduct cooperative studies with investigators and institutions in developing countries and European countries in transition. Over thirty institutions have participated in studies of impacts on water resources, agriculture, the coastal zone, forests, and health, and in emissions inventories, technology assessments, and emissions reduction cost assessments. For further information on these studies or the "internal" studies mentioned above, interested parties may wish to contact:

Office of Global Change
OES/EGC, Room 4329-A
U.S. Department of State
Washington, D.C. 20520-7818
Tel: 202-647-4069
Fax: 202-647-0191

In addition, the U.S. has provided support to Brazil, Mexico, and Poland in the development of their inventories of greenhouse gas sources and sinks. The U.S. supports Poland in analyzing technical options and strategies to limit emissions as well.

The United States committed in February 1992 to provide \$25 million over a two-year period to support climate country studies by developing countries and countries in transition. These funds and related technical assistance would help recipient countries to enhance institutions and improve the information base for development of national action plans under the Framework Convention on Climate Change. The U.S. will make public in December 1992 the criteria to be used to select projects and the process by which proposals may be submitted.

Uruguay

Internal Country Studies

Uruguay has not yet undertaken national studies on climate change. The National Meteorological Service in co-operation with the University carried out few studies on the sub-regional level on climate change and socio-economic impacts on the coast, protected areas, as well as wetlands

Uruguay seeks financial assistance for a climate change country study.

Venezuela

Internal Country Studies

Venezuela has established a national working team from the Ministry of Energy, Mining and Petroleum, the Venezuela Institute of Scientific Research, the Central University of Venezuela, the Simon Bolivar University, the Commission on Oceanography, and the Ministry of the Environment.

Preliminary Inventory

A preliminary inventory of sources and sinks of greenhouse gases has been made through the technique recommended by IPCC/OECD.

UNEP/GEF Sources and Sinks Project

Venezuela is a participant in the UNEP/GEF project on sources and sinks of greenhouse gases. (See description of UNEP activities below for more detail.)

The national agency responsible for conducting this programme is the "Ministerio del Ambiente y de los Recursos Naturales Renovables" through "ODEPRI". The direct liaison will be the Ing. Anibal Rosales, Director of that Sectorial General Direction. The address is:

Torre Sur
Piso 18. Ofc. 1805
El Silencio, Apartado Postal 6623
Caracas 1010A
Tels.: 483-4638, 308-1230 y 31
Telex.: 24305
Fax: 582-483-2445

A preliminary study on possible climate change impacts on the agricultural sector, terrestrial ecosystems and water resources was published in 1991.

Several studies have been undertaken on the release of greenhouse gases from tropical savannas as well as on terrestrial biogeochemical feedbacks in global warming.

Switzerland/GEF Impacts and Mitigation Study

Venezuela is a potential participant in an impacts and mitigation study under the Swiss Proclim-Ecosphere Greenhouse Gases Reduction Program through financing from GEF. The programme would offer Venezuela the means to accurately monitor climate changes due to greenhouse gases, devise policies aimed at reducing their production, better identify related problems Venezuela will face in the future, and elaborate possible solutions/answers.

Viet Nam

Internal Country Studies

Vulnerability to Climate Change and Sea Level Rise

An assessment of vulnerability to climate change and sea level rise in Viet Nam was completed and published by UNEP.

Socio-Economic Impacts of Climate Change

Viet Nam has completed a cooperative project with UNEP on the socio-economic impacts of climate change in Viet Nam (see description of UNEP activities below for more detail).

ADB Regional Impacts Strategy Project

Viet Nam is participating in an ADB project to develop an Asia/Pacific regional strategy to address the potential effects of climate change through eight country studies, each of which will assess socio-economic impacts and policy options, and develop a national response strategy. The Ministry of Water Resources will be the in-country implementing agency for the Viet Nam study. (See description of ADB activities below for more detail.)

UNDP/GEF Least Cost Emissions Reduction Project

Viet Nam is a participant country in UNDP's proposed project, to be supported by the GEF, on least cost emissions reduction. (See description of UNDP activities below for more detail.)

Yugoslavia

Internal Country Studies

Yugoslavia has begun an assessment of national greenhouse gas emissions and sinks in support of the ongoing IPCC/OECD work on establishing emissions inventory methodologies. A preliminary inventory is expected by mid-1992.

Zaire

Internal Country Studies

Zaire has not undertaken a cost/benefit climate change study or implemented measures for adapting to climate change. Zaire seeks financial and technical assistance for an evaluation study.

Zimbabwe

Internal Country Studies

Joint Study on Greenhouse Gas Emissions in Tanzania and Zimbabwe

The Southern Centre for Energy and the Environment in Zimbabwe, in collaboration with the Ministry of Water, Energy and Mineral of Tanzania, the University of Dar es Salaam in Tanzania, and the Canadian government (which is providing financial assistance), are preparing to carry out "Greenhouse Gas Emissions, Levels of Sources, Policy Options and Longer Term Scenarios: A Case Study in Tanzania and Zimbabwe". The study will evaluate emissions, assess development strategy options with low emissions impacts, and increase climate change awareness among policy makers and academic and research institutions. The project, which was due to be initiated in the fall of 1992, will be completed in two years. Subject to the results of the project, the Southern Centre and its collaborators in Tanzania plan to facilitate the formation of a Southern African Regional Research Network on selected aspects of greenhouse gas emissions and climate change. Principal researchers on the project are:

Dr. R.S. Maya, Director
Southern Centre for Energy and the Environment

Professor M.J. Mwandosya
Principal Secretary
Ministry of Water, Energy, and Minerals
Dar es Salaam, Tanzania

Professor M.L. Luhanga
Vice Chancellor
University of Dar es Salaam
Dar es Salaam, Tanzania

Sectorial Climate Change Impacts Assessments

A proposal is being worked out with the University Lake Kariba Research Station and Meteorological Department to conduct sectorial climate change impacts assessments. It is hoped that funds can be obtained for these studies. Principal researchers will be:

Professor C. Magadza
University Lake Kariba Research Station
Kariba
Zimbabwe

Mrs. R.P. Karimanzira
Department of Meteorology
Box BE 150
Belvedere

Impacts Studies with the United Kingdom

The United Kingdom has offered assistance to Zimbabwe in the preparation of impacts studies, including cost issues.

UNEP/Risø Greenhouse Gas Abatement Costing Study

The Danish Government funded a national greenhouse gas abatement costing study in Zimbabwe through the UNEP/Risø program. (See description of UNEP activities below for more detail.)

UK Government's ODA economic study

A Study on 'The Economic implications of limiting CO₂ Emission in Zimbabwe has been prepared by Touch Ross and Co for the Government of Zimbabwe, funded by the UK Overseas Development Administration. The purpose of this study was to provide an indication of the order of magnitude of the economic costs involved in achieving alternative levels of limitation of emissions. The study is not a statement of Government of Zimbabwe's policies.

External Country Studies

Zimbabwe would be willing to assist other countries in climate change studies if provided with the necessary means to do so.

B. INSTITUTIONS/ORGANIZATIONS

Asian Development Bank

The Asian Development Bank (ADB) has initiated a program of technical assistance to eight developing Asian countries to assess the potential effects of global climate change, identify appropriate policy options to deal with these effects, and thereby enable countries to develop national response strategies. In addition, a regional response strategy to cope with climate change will be developed in an attempt to address issues and constraints common to countries in the Asian and Pacific region.

The countries to be covered by the study are Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, and Viet Nam. The technical assistance will consist of three components:

- 1) Establishment of a common framework for country studies,
- 2) Eight country studies, each of which will include the socio-economic impacts of climate change, policy options for limiting net emissions and for adapting to climate change, and a national response strategy; and
- 3) Preparation of a regional strategy to cope with climate change.

The project is co-sponsored by ADB, the Government of Australia, the Government of Norway, and the Environment Agency of Japan. Technical assistance is sponsored by ADB. In each of the eight countries to be studied, the government has nominated a national agency as the implementing agency. The project, estimated to cost US\$1,690,000, was expected to have begun in late 1991 and to have been completed within 14 months.

The ADB will also provide assistance to China and Thailand for more detailed assessments of potential climate change effects and appropriate response measures. These two countries were not included in the eight-country program outlined above because China and Thailand are in more advanced stages of effects assessment, and because the responses taken by China and Thailand will have significant implications for similar measures to be taken by other developing countries.

International Energy Agency

Of relevance to country studies on emissions mitigation is the International Energy Agency (IEA) publication entitled "Climate Change Policy Initiatives: Update". This loose-leaf binder, periodically updated through 1991 and 1992 contains an assessment of the background and status of OECD energy-sector country commitments to policies responding to global climate change. It also includes key comparative indicators. As of 20 June 1991, the volume described policy initiatives in 24 OECD and European Community nations. Country profiles include information on measures taken or contemplated, such as carbon taxes, regulations, and greenhouse gas emissions targets. These profiles have been reviewed for accuracy by individual country governments. Information from major non-OECD emitters of greenhouse gases may be added in a future edition.

United Nations Development Programme

The UNDP has submitted a proposal to the GEF for a project on "Development of Least Cost Greenhouse Gas Emissions Reduction Plans" for implementation in 12 Asian countries (Bangladesh, China, Democratic People's Republic of Korea, India, Indonesia, Mongolia, Myanmar, Pakistan, Philippines, Republic of Korea, Thailand and Viet Nam). Its estimated cost is US\$9.5 million. Project objectives are to assist countries in the region to:

(Over the short-term)

- 1) Prepare and present a baseline inventory of man-made emissions and sinks of greenhouse gases and a historical mini-inventory dating back 20 years, and develop indicators which link human activity to these emissions;
- 2) Make measurements of emitting or absorbing progresses for which there are reasons to believe that emissions or absorption factors may be different;
- 3) Analyze measures available to reduce emissions or enhance sinks by estimating the costs and effectiveness of these measures;

- 4) Develop scenarios of emissions from energy, forestry, and other sources;
- 5) Prepare emission-limiting national and regional plans and policy responses that may be required to implement mitigation measures identified; and
- 6) Identify and satisfy training needs to prepare inventories and plans.

(Over the long-term)

- 1) Identify and develop training programmes, develop human resources, enhance in-country institutional capabilities to conduct analyses of the type identified above; and
- 2) Enable the reduction of the growth in net greenhouse gas emissions in the region.

Project approval was expected January 1992.

United Nations Environment Programme

UNEP implements the World Climate Impact Assessment and Response Strategies Programme (WCIRP) as part of the World Climate Programme. Climate-related country and regional studies have been accorded high priority within the WCIRP. Three types of study are encouraged: 1) emissions inventories, 2) impacts assessment and response options determination, and 3) economic assessments of limiting greenhouse gas emissions. These three study types correspond to the needs of IPCC Working Groups I, II and III respectively, but are implemented primarily to respond to UNEP Governing Council Decisions and recommendations for priority programming by the UNEP Scientific Advisory Committee for the WCIRP.

Current programmes are described below:

Country Case Studies on the Sources and Sinks of Greenhouse Gases

UNEP has proposed a pilot study for support by the GEF to be conducted over two years, beginning in 1992. The request to GEF is for \$3.2 to \$4.5 million. As a preliminary step UNEP provided \$125,000 for a workshop to define the study methodology (5-6 December 1991, Geneva) and to support a developing country expert who will establish the inventory database under the supervision of Dr. John Houghton, U.K. Coordinator of IPCC Working Group I. Countries which expressed interest in taking part in the pilot phase are Argentina, Brazil, China, Congo, Costa Rica, Czechoslovakia, Gambia, India, Mexico, Morocco, Nigeria, Poland, Senegal, Tanzania, Uganda, and Venezuela. A letter seeking confirmation of this interest was sent to all the countries named above and is attached as Annex 5. China, Costa Rica, Gambia, Mexico, Morocco, Nigeria, Poland, Senegal, Tanzania, Uganda, and Venezuela have expressed interest and will be participating in the programme.

The immediate objective of the study is to develop a comprehensive inventory of greenhouse gas emissions and sinks in a set of representative studies using a common assessment methodology. Transparency studies to check the robustness and applicability of the methods in a wide range of national contexts will be undertaken. This study will contribute to the ongoing work in the IPCC on the development of a comprehensive and consistent emissions inventory methodology. The project will also seek to identify opportunities for strategic investments in alternative technologies and practices to reduce greenhouse gas emissions

and to identify and rank a wide range of cost-effective technical options for reducing emissions.

In a subproject, advantage will be taken of an on-going bilateral project between the United States and Brazil to estimate the extent and rate of deforestation in the Brazilian Amazon, by extending the investigations into neighboring Amazonian countries and thus determine the capacity of the Amazon rain forest as a sink of CO₂.

National and Regional Effects Studies

The Potential Socio-Economic Effects of Climate Change

UNEP initiated and supported three studies on the potential socio-economic effects of climate change that were undertaken by national research teams. The three studies were in Brazil, in Viet Nam, and jointly in Indonesia, Malaysia, and Thailand.

A variety of study methodologies were explored in these projects. In Brazil, the project identified the effects of current climate variability from year-to-year and season-to-season as an analogue of potential future effects of longer term climate change. The Indonesia/Malaysia/Thailand study used the current best estimate of possible future climate using GCM results as input to agricultural and economic models to estimate future yields of agricultural crops, etc. In Viet Nam, assumptions of likely long-term climate change were used to describe potential effects. A summary of these projects, *The Potential Socio-Economic Effects of Climate Change*, was published by UNEP in 1991. The report on the Brazil project, *Socioeconomic Impacts of Climate Variations and Policy Responses in Brazil*, and the report on the South-East Asia study, *The Potential Socio-Economic Effects of Climate Change in South-East Asia*, were published by UNEP in 1992.

Assessment of Vulnerability to Climate Change and Sea Level Rise

In accordance with UN General Assembly Resolution 44\206 which, *inter alia*, "requests the Regional Seas Programme of UNEP to facilitate developing countries in building their own capability to assess their vulnerability to sea level rise, identify appropriate response strategies, and develop integrated coastal management plans", an expert group meeting was convened in Geneva in August 1991 to discuss vulnerability and the methodology for its assessment. A common methodology has been developed and the Oceans and Coastal Areas Programme Activity Centre (OCA\PAC) of UNEP has identified sites for vulnerability case studies to be undertaken in eleven regions.

OCA\PAC supported and conducted these case studies using the common methodology. It will participate in IPCC workshops and assist in the drafting and review of the Coastal Zone Management Sub-Group report to the IPCC assessing the vulnerability to sea level rise.

Based on the findings of eleven overviews by Task Teams and the recommendations of the relevant Task Teams, the development of seven site-specific case studies for selected areas in Kenya, Mauritius, Nigeria, South-East Pacific, Wider-Caribbean, Singapore and Qatar was

initiated and is being supported by UNEP. In the selection of these case studies, due consideration was given to its scientific merits and to the socio-economic importance of each study to the region in question. In the meantime, six case studies in the Mediterranean region concentrating on the main deltas and vulnerable coastal areas have been prepared for the Nile Delta, the Po Delta, the Ebro Delta, Thermaikos Gulf and Ichkeul/Bizerte Lakes. Additionally, six site-specific case studies are being developed for the Island of Rhodes, Kastela Bay, Syrian Coast, Izmir Bay, Malta Island and the Adriatic Cres/Losinj Islands. The first four of these six case studies are a part of a comprehensive Coastal Area Management Programme for each of the Studied areas.

An assessment of vulnerability to Climate Change and Sea Level Rise was completed for Viet Nam by the climate unit and the report published in 1992.

Economic Studies

Preparation of a Methodology to Undertake National Greenhouse Gas Abatement Costing Studies

UNEP convened two expert workshops on the economics of limiting energy-related greenhouse gas emissions in 1991 (London, January 1991 and Washington, D.C., May 1991).

Taking account of the workshop conclusions and in accordance with UNEP Governing Council Decision 16\41 (Annex 2), UNEP is supporting a project on the "Preparation of a Methodology to Undertake National Greenhouse Gas Abatement Costing Studies". The project, which began in November 1991, will last for fourteen months and is being coordinated by the UNEP Collaborating Centre on Energy and Environment at Risø National Laboratory in Denmark, with assistance from the Tata Energy Research Institute in India and Camines Energy Ltd. in the United Kingdom. The cost of the project is \$330,000.

The long-term objective of the project is to estimate the economic costs of policies and measures to limit greenhouse gas emissions in all countries. The short-term objective is to provide governments with a tested methodology for undertaking cost assessments of greenhouse gas emissions reductions at the national level.

The project is divided into two phases. The first phase consists of detailed studies of the underlying issues in estimating abatement costs, including analysis of modelling options and reviews of existing cost estimates, and a small set of national studies. These country studies aim at establishing the status of analysis and data in the countries concerned and draw lessons from past experience, and illustrate in depth the practical issues raised in embarking upon abatement cost studies in widely diverse countries. Drawing on this experience, Phase 1 of the project forms the basis for establishing a consistent and iterative approach to national abatement cost studies. The second phase of the project will then test and enhance the methodology through a series of national studies which apply and adapt the approach to their specific national conditions.

A status report for the first phase, entitled *UNEP Greenhouse Gas Abatement Costing Studies*, was issued in August 1992. The report presents the methodological requirements for costing analysis, reviews the main modelling approaches and current state of knowledge, summarizes the results of a set of preliminary national studies, and outlines issues essential to establishing a consistent and iterative process of abatement cost estimates. The country studies undertaken within this first phase were Denmark, the Netherlands, India, and Zimbabwe.

To broaden the scope of this project, the Asian Energy Institute (AEI), a network of eleven research institutions in the field of energy and the environment in major countries of Asia, undertook a collaborative study. This study, prepared for the United Nations Conference on Environment and Development (UNCED), identified and analyzed strategies to limit CO₂ emissions in Bangladesh, Brazil, China, India, Iran, Japan, South Korea, and Thailand. A summary of the results is contained in the phase one report of the UNEP/Risø project.

C. SUMMARY TABLE

The table below summarizes the information collected to date on completed and ongoing climate change country studies. Studies are listed by subject country and by study type. Please note that "Effects" studies refer to studies of vulnerability to climate change and adaptive responses to reduce vulnerability.

SUMMARY TABLE

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Afghanistan	No Information		No Information		No Information	
Albania	No Information		No Information		No Information	
Algeria	No Studies		No Studies		No Studies	
Angola	No Information		No Information		No Information	
Antigua & Barbuda	No Information		No Information		No Information	
Argentina	No Studies		Study Under Consideration	Switzerland/GEF	Study Under Consideration	Switzerland/GEF
Australia	Study Complete	Internal	Studies Complete	Internal	Studies Complete	Internal
Austria	Study Complete	Internal	Study Complete	Internal	Studies in Progress	Internal
Azerbaijan	No Information		No Information		No Information	
Bahamas	No Studies		No Studies		No Studies	
Bahrain	No Information		No Information		No Information	
Bangladesh	Preliminary Studies Complete	Internal	Studies In Progress SLR ¹ Study Planned	UNEP, ADB Netherlands	Studies In Progress	UNDP/GEF, ADB
Barbados	No Studies		No Studies		No Studies	
Belarus	No Information		No Information		No Information	
Belgium	Study Complete	Internal	Studies In Progress	Internal	Study In Progress	Internal
Belize	No Information		No Information		No Information	
Benin	No Studies		No Studies		No Studies	
Bhutan	No Information		No Information		No Information	

¹ SLR = Sea-level rise

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Bolivia	No Studies		Study Complete	Internal	No Studies	
Botswana	No Information		No Information		No Information	
Brazil	Study Complete Study In Progress	U.S. France/Possibly UNEP	Study Complete	UNEP	Study In Progress	France/Possibly UNEP
Brunei	No Studies		No Studies		No Studies	
Bulgaria	Study In Progress	Internal	No Studies		No Studies	
Burkina Faso	No Studies		No Studies		No Studies	
Burundi	No Studies		No Studies		No Studies	
Cambodia	No Information		No Information		No Information	
Cameroon	No Information		No Information		No Information	
Canada	Study Complete	Internal	Studies Complete and In Progress	Internal	Studies Complete and In Progress	Internal
Cape Verde	No Studies		No Studies		No Studies	
Central African Republic	No Information		No Information		No Information	
Chad	No Information		No Information		No Information	
Chile	No Studies		SLR Study Complete	Internal	No Studies	
China	Studies In Progress	UNEP/GEF, Canada	Study Under Consideration Studies Complete	ADB Internal, WWF	Studies In Progress	UNDP/GEF, GEF, Canada
Columbia	No Studies		No Studies		No Studies	
Comoros	No Information		No Information		No Information	
Congo	No Studies		No Studies		No Studies	
Costa Rica	Study In Progress	UNEP/GEF	No Information		No Information	
Côte d'Ivoire	Study In Progress	France	No Studies		No Studies	
Croatia	Study Under Consideration		SLR Study In progress Study Under Consideration	UNEP/MAP	No Studies	
Cuba	Preliminary Study Complete	Internal	Study Complete	Internal	Preliminary Study Complete	Internal
Cyprus	No Studies		No Studies		No Studies	

SUMMARY TABLE (continued)

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
² Czech Republic	No Studies		Preliminary Study Complete	Internal	Energy Study In Progress	Austria
Denmark	Study Complete	Internal	Study Complete		Studies Complete and In Progress	Internal
Djibouti	No Information		No Information		No Information	
Dominica	No Studies		No Studies		No Studies	
Dominican Republic	No Information		No Information		No Information	
Ecuador	No Studies		No Studies		No Studies	
Egypt	No Studies		SLR Study Planned Planning Studies	Netherlands Internal	No Studies	
El Salvador	No Information		No Information		No Information	
Equatorial Guinea	No Studies		No Studies		No Studies	
Estonia	No Information		No Information		No Information	
Eritrea	No Information		No Information		No Information	
Ethiopia	No Information		No Information		No Information	
Federated States of Micronesia	Study Under Consideration		SLR Study complete		Study Under Consideration	
Fiji	No Information		No Information		No Information	
Finland	Study Complete	Internal	Studies In Progress	Internal	Studies Complete and In Progress	Internal
France	No Information		No Information		No Information	
Gabon	No Information		No Information		No Information	
Gambia	Preliminary Study Complete Study In Progress	Internal UNEP/GEF	No Studies		No Studies	

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Georgia	No Information		No Information		No Information	
Germany	CO ₂ Inventory Complete	Internal	Studies In Progress	Internal	Energy Study Complete	Internal
Ghana	No Information		Study In Progress	United Kingdom	No Information	
Greece	No Information		No Information		No Information	
Grenada	No Studies		No Studies		No Studies	
Guatemala	No Studies		No Studies		No Studies	
Guinea	No Information		No Information		No Information	
Guinea-Bissau	No Information		No Information		No Information	
Guyana	No Information		No Information		No Information	
Haiti	No Information		No Information		No Information	
Honduras	No Studies		No Studies		No Studies	
Hungary	No Information		No Information		No Information	
Iceland	Study Complete	Internal	No Studies		Study In Progress	Internal
India	No Information		Study In Progress Study Under Consideration	ADB United Kingdom	Studies In Progress	UNDP/GEF, ADB
Indonesia	Studies In Progress	Japan, Norway	Studies Complete or In Progress SLR Study Under Consideration	UNEP, Japan, ADB, United Kingdom Netherlands	Studies Complete or In Progress	Internal, UNDP/GEF, ADB, Norway, UNEP/Risø
Iran	No Information		No Information		No Information	
Iraq	No Information		No Information		No Information	
Ireland	Study In Progress	Internal	Studies Complete	Internal	Studies In Progress	Internal
Israel	Study Complete	Internal	Studies Under Consideration		No Studies	
Italy	No Studies		No Studies		Energy Study Complete	Internal

SUMMARY TABLE (continued)

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Jamaica	No Information		No Information		No Information	
Japan	Studies Complete	Internal	Studies Complete	Internal	Studies Complete	Internal
Jordan	No Information		No Information		No Information	
Kazakhstan	No Information		No Information		No Information	
Kenya	No Information		Study In Progress Study Under Consideration	United Kingdom Switzerland/GEF	Study Under Consideration	Switzerland/GEF
Kiribati	No Information		No Information		No Information	
Korea, DPR	No Information		No Information		Study In Progress	UNDP/GEF
Korea, R	No Information		No Information		Study In Progress	UNDP/GEF
Kuwait	No Information		No Information		No Information	
Kyrgyzstan	No Information		No Information		No Information	
Laos PDR	No Information		No Information		No Information	
Latvia	No Information		No Information		No Information	
Lebanon	No Information		No Information		No Information	
Lesotho	No Information		No Information		No Information	
Liberia	No Information		No Information		No Information	
Libya	No Information		No Information		No Information	
Liechtenstein	No Information		No Information		No Information	
Lithuania	No Information		No Information		No Information	
Luxembourg	No Information		No Information		No Information	
Madagascar	Preliminary Study Complete	Internal	Preliminary Study Complete	Internal	No Studies	
Malawi	No Information		No Information		No Information	
Malaysia	No Information		Study Complete Study In Progress	UNEP ADB	Study In Progress	ADB

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Maldives	No Information		No Information		No Information	
Mali	Study In Progress	France	No Information		No Information	
Malta	No Information		No Information		No Information	
Marshall Islands	No Studies		SLR Study Complete	Internal	No Studies	
Mauritania	No Information		No Information		No Information	
Mauritius	No Studies		SLR Study In Progress	UNEP	Action Plan Completed	
Mexico	Studies In Progress	U.S., Canada, UNEP/GEF	No Information		No Information	
Moldova	No Information		No Information		No Information	
Monaco	No Studies		No Studies		No Studies	
Mongolia	No Information		No Information		Study In Progress	UNDP/GEF
Morocco	Study In Progress	UNEP/GEF	No Information		No Information	
Mozambique	No Information		No Information		No Information	
Myanmar	No Information		No Information		Study In Progress	UNDP/GEF
Namibia	No Studies		No Studies		No Studies	
Nepal	No Information		No Information		No Information	
Netherlands	Preliminary Studies Complete	Internal	SLR Studies Complete	Internal	Studies Complete and In Progress	Internal
New Zealand	Study Complete	Internal	Studies Complete	Internal	Studies Complete	Internal
Nicaragua	No Information		No Information		No Information	
Niger	No Information		No Information		No Information	
Nigeria	Study In Progress	UNEP/GEF	Study Under Consideration	Switzerland/GEF	Study Under Consideration	Switzerland/GEF
Norway	Study Complete	Internal	Study Complete	Internal	Studies Complete	Internal
Oman	No Information		No Information		No Information	

SUMMARY TABLE (continued)

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Pakistan	No Studies		Study In Progress	ADB	Studies In Progress	UNDP/GEF, ADB
Panama	No Studies		No Studies		No Studies	
Papua New Guinea	No Information		No Information		No Information	
Paraguay	No Information		No Information		No Information	
Peru	No Information		No Information		No Information	
Philippines	No Studies		Study In Progress	ADB	Studies In Progress	UNDP/GEF, ADB
Poland	Preliminary Studies Complete Studies In Progress	Internal U.S., UNEP/GEF	Preliminary Studies Complete and In Progress	Internal	Studies In Progress	U.S., Internal
Portugal	No Information		No Information		No Information	
Qatar	No Information		No Information		No Information	
Romania	Studies Complete and In Progress	Internal, United Kingdom	Studies In Progress	Internal	Preliminary Study Complete	United Kingdom
Russian Fed	Preliminary Studies Complete	Internal	No Studies		No Studies	
Rwanda	No Information		No Information		No Information	
St Kitts & Nevis	No Information		No Information		No Information	
St Lucia	Study Planned	US	Study Planned	US	Study Planned	US
St Vincent & the Grenadines	No Information		No Information		No Information	
Samoa	No Information		No Information		No Information	
San Marino	No Information		No Information		No Information	
Sao Tome & Principe	No Information		No Information		No Information	
Saudi Arabia	Study In Progress	Internal	Studies Under Consideration	Internal	Studies Under Consideration	Internal
Senegal	Studies In Progress	UNEP/GEF, France	No Studies		No Studies	
Seychelles	No Studies		Study Complete	Internal	No Studies	

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Sierra Leone	No Information		No Information		No Information	
Singapore	No Information		No Information		No Information	
Slovak Republic	Study In Progress	Internal	CZFR Study Complete Studies In Progress	Internal	Study In Progress	Internal
Slovenia	No Information		No Information		No Information	
Solomon Islands	No Information		No Information		No Information	
Somalia	No Information		No Information		No Information	
South Africa	No Studies		Studies Complete and In Progress	Internal	Study In Progress	Internal
Spain	No Studies		Studies In Progress	Internal	Study In Progress	Internal
Sri Lanka	Preliminary Study Complete		Study In Progress	ADB	Studies In Progress	ADB, UNEP/GEF
Sudan	No Information		No Information		No Information	
Suriname	No Information		No Information		No Information	
Swaziland	No Information		No Information		No Information	
Sweden	Studies Complete	Internal	Study Complete	Internal	Studies Complete and In Progress	Internal
Switzerland	Study In Progress	Internal	Study In Progress	Internal	Study In Progress	Internal
Syria	No Information		No Information		No Information	
Tajikistan	No Information		No Information		No Information	
Tanzania, UR	Studies In Progress	Internal and Canada, UNEP/GEF	No Studies		Study In Progress	Internal and Canada
Thailand	Study In Progress	Internal	Study Complete Studies In Progress	UNEP Internal, ADB	Studies In Progress	Internal, UNDP/GEF
The former Yugoslav Republic of Macedonia	No Information		No Information		No Information	
Togo	No Studies		No Studies		No Studies	

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Tonga	No Information		SLR Study Complete	Japan	No Information	
Trinidad & Tobago	No Information		No Information		No Information	
Tunisia	No Studies		Preliminary Study Complete	Internal	Preliminary Study Complete	Internal
Turkey	Preliminary Studies In Progress	Internal	Studies In Progress	Internal	Studies In Progress	Internal
Turkmenistan	No Studies		No Studies		No Studies	
Tuvalu	Study In Progress	ASPEI, UNEP, SPREP	Study In Progress	ASPEI, UNEP, SPREP	Study In Progress	ASPEI, UNEP, SPREP
Uganda	Study In Progress	UNEP/GEF	Study Under Consideration		Study under consideration	
Ukraine	No Information		No Information		No Information	
United Arab Emirates	No Information		No Information		No Information	
United Kingdom	Energy Study Complete	Internal	Studies Complete	Internal	Energy Study Complete	Internal
United States	Studies Complete	Internal	Studies Complete	Internal	Study In Progress	Internal
Uruguay	No Studies		Preliminary Studies Complete	Internal	No Studies	
Uzbekistan	No Information		No Information		No Information	
Vanuatu	No Information		No Information		No Information	
Venezuela	Study Complete Study In Progress	Internal UNEP/GEF	Preliminary studies complete Study Under Consideration	Switzerland/GEF	Study Under Consideration	Switzerland/GEF
Viet Nam	No Information		Studies Complete Study In Progress	UNEP ADB	Studies In Progress	UNDP/GEF, ADB
Yemen	No Information		No Information		No Information	
Yugoslavia	Study In Progress	Internal	No Studies		No Studies	
Zaire	No Studies		No Studies		No Studies	

SUMMARY TABLE (continued)

COUNTRIES	INVENTORIES		EFFECTS		MITIGATION	
	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE	STATUS	FUNDING SOURCE
Zambia	No Information		No Information		No Information	
Zimbabwe	Study In Progress	Internal and Canada	Study In Progress	United Kingdom	Studies In Progress & Completed	Internal and Canada, UNEP/Riso, UK

V. SUMMARY AND RECOMMENDATIONS

This draft report summarizes the information on country studies received by the UNEP Secretariat, and other sources, to date. Based on this information, 65 countries had undertaken, or planned to undertake, some form of a country study through internal, bilateral, or multilateral support. In addition, several countries have indicated a wish to participate in country studies, but lack the financial and technical resources to do so. The country studies that have been completed or are in progress are split fairly evenly among emissions inventories, impacts assessments, and mitigation analyses.

This draft report should not be interpreted as a complete list of country studies nor of countries requiring assistance to undertake such studies, as numerous countries have not yet responded to requests for information. It is recommended that this draft report be mailed to all countries through the IPCC Secretariat and through UNEP with a request for relevant information, as well as corrections and updates. Furthermore, it is recommended that this report be updated and redistributed every year to keep the information current. If kept current, the report will be a useful reference, particularly for countries and organizations which are contemplating initiating new country studies and which do not wish to duplicate earlier or current efforts.

This report also summarizes the ongoing work on country studies, and discusses the need for a comprehensive methodology. Although work is underway in several IPCC working groups and elsewhere to partially address this need, there is an urgent need to give a higher priority to these activities.

ANNEX 1

FROM THE REPORT OF THE FIFTH SESSION OF THE WMO/UNEP IPCC

Geneva, 13-15 March 1991

2.5.7 Subtask 3: Country Studies

2.5.7.1 This subtask would concentrate on soliciting country studies, particularly from countries not yet producing such studies, to add to the substantial base of studies already done by the EIS group. In soliciting new country studies, the subtask would begin by developing a set of guidelines for comparable national studies of energy-sector greenhouse gas reduction costs and would encourage the submission of such studies by international agencies and non-government organizations. Special attention would be paid to some of the issues raised in subtask 2, e.g., energy and economic infrastructure patterns (networks of electricity distribution, oil and gas pipelines and public transport).

2.5.7.2 This subtask would further synthesize and analyze the information contained in the reports already received by EIS. Items for synthesis and comparative analysis would include:

- i) quantifying as far as possible the extent of actions being taken or planned whether or not for reasons of climate change;
- ii) the scope for achievement of low cost changes, such as some improvements in energy efficiency and fuel substitution, and low cost means for promoting them.

2.5.7.3 It was anticipated that special arrangements among countries and organizations would be made and coordinated under this subtask. A number of key country studies could therefore be completed and compared in the first 9 months. Completing studies for the full set of participating countries, however, would take a number of years.

2.5.8 Related workshop

In accordance with the Ministerial Declaration of the Second World Climate Conference (Geneva, 29 October - 7 November 1990), a workshop on environmentally-sound energy technologies and their transfer to developing countries and transition economies would take place in Milan, Italy in October 1991.

ANNEX 2

DECISION 16/41 CLIMATE CHANGE
ADOPTED BY
THE UNITED NATIONS ENVIRONMENT PROGRAMME GOVERNING COUNCIL
AT ITS 16TH SESSION

Nairobi, Kenya, 20-31 May 1991

16/41. *Climate change*

The Governing Council,

Recalling its decision 15/36 of 25 May 1989 on global climate change and its decisions SS.II/3 A, B and C of 3 August 1990 on the Second World Climate Conference, the Intergovernmental Panel on Climate Change, and on the negotiations for a framework convention on climate change, respectively,

Bearing in mind General Assembly resolution 45/212 of 21 December 1990 on climate change and, in particular, its paragraphs 1, 7, 12 and 21,

Taking into account the recommendations of the Second World Climate Conference,

Having considered the reports of the Executive Director on the Second World Climate Conference,⁶⁵ the Intergovernmental Panel on Climate Change,⁶⁶ and the framework convention on climate change,⁶⁷

Noting the resolution 3.2.5/5 (Cg-XI) of 23 May 1991 of the Eleventh Congress of the World Meteorological Organization, on the World Climate Programme and its co-ordination, and, in particular, bearing in mind the work that has been done in these areas by the Intergovernmental Panel on Climate Change, the establishment of the World Climate Impact Assessment and Response

⁶⁵ UNEP/GC.16/21/Add.3, paras. 1-14.

⁶⁶ *Ibid.*, paras. 15-27.

⁶⁷ *Ibid.*, paras. 28-31.

Strategies Programme, which supersedes the World Climate Impact Studies Programme, and the indication in that resolution that the Global Climate Observing System is an essential activity associated with the World Climate Programme,

Noting resolution XVI-10 of the Sixteenth Assembly of the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization, by which it was decided to undertake the development of a Global Ocean Observing System, and the associated statement and declaration on a Global Ocean Observing System containing a recommendation for adoption by the 1992 United Nations Conference on Environment and Development,

I. *Protection of global climate*

Urges States, acting individually or in groups, as well as through the United Nations Environment Programme and other United Nations bodies or other institutions, to support actions aimed at the protection of the global climate for present and future generations of humanity;

II. *Intergovernmental Negotiating Committee for a Framework Convention on Climate Change*

1. *Urges* States, acting individually or in groups, as well as through the United Nations Environment Programme and other United Nations bodies or other institutions, to support the negotiating process aimed at the protection of the global climate for present and future generations of humanity;

2. *Requests* the Executive Director with due consideration of the immediacy of the process:

(a) To support fully the intergovernmental negotiating process through, *inter alia*, contributing to the cost of the negotiating process, including its funding, if necessary by examining the scope for savings in other Environment Fund activities or using a portion of the Environment Fund reserve;

(b) To support the secretariat of the Intergovernmental Negotiating Committee through the secondment of an appropriate staff member from the United Nations Environment Programme, and responding positively to further requests for secondment from within available resources;

(c) To make available to the secretariat of the Committee all relevant information and data collected by the Programme, including the results of its work on climate change impact assessments and response strategies and on the costs and benefits of dealing with climate change;

III. *Intergovernmental Panel on Climate Change*

1. *Expresses its appreciation* to the World Meteorological Organization for co-sponsoring the Intergovernmental Panel on Climate Change;

2. *Expresses its gratitude* to Governments and organizations for their support of the Panel's activities;

3. *Commends* the Panel for completing its First Assessment Report in less than two years;

4. *Further urges* Governments to strengthen their active participation in the work carried out by the Panel, its working groups and task forces;

5. *Supports*, considering the need for further assessments of all aspects of climate change, the continuation of the Panel and reaffirms its terms of reference as contained in Council decision SS.II/3 B;

6. *Urges* Governments and organizations to continue and increase their cash contributions to the Intergovernmental Panel on Climate Change Trust Fund;

7. *Requests* the Executive Director:

(a) To intensify co-operation between the United Nations Environment Programme and the Panel in the area of climate change impact assessments, including case-studies on the vulnerability to sea-level rise of small island countries and low-lying coastal areas and studies to assess response options and their cost implications;

(b) To support expert consultations on the costs and benefits of dealing with climate change in co-operation with other relevant international organizations, in particular the United Nations Development Programme and the World Bank;

8. *Welcomes* the Panel's recognition that its structure and the representation of developing countries on its bureau need to be reviewed and urges the Panel to give this task high priority;

9. *Requests* the Panel, through its Chairman, to report on the progress of its activities to the Governing Council at its seventeenth regular session;

IV. *World Climate Programme*

1. *Urges* all States to take appropriate steps to promote national climate activities and to support implementation of the World Climate Programme;

2. *Requests* the Executive Director:

(a) 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 co-ordination in the implementation of the World Climate Programme;

(b) To join the World Meteorological Organization and other international agencies which, together with the United Nations Environment Programme, co-sponsored the Second World Climate Conference, in the future development of the World Climate Programme;

(c) To join the World Meteorological Organization, in consultation with the United Nations Educational, Scientific and Cultural Organization and its Intergovernmental Oceanographic Commission, the Food and Agriculture Organization of the United Nations and the International Council of Scientific Unions and other relevant organizations in establishing a Co-ordinating Committee for the World Climate Programme;

(d) To intensify closer co-operation and better communication between the World Climate Impact Assessment and Response Strategies Programme and related national, regional and international levels of climate activities, and to support the proposed intergovernmental meeting to discuss co-ordination and resources for the Programme;

(e) To support, within available resources, the creation of a Global Climate Observing System, including its component parts - World Weather Watch, Global Atmosphere Watch and the Global Ocean Observing System - and to assist in ensuring that its development and implementation,

overseen by the scientific and technical committee of the Global Ocean Observing System, is pursued with urgency by scientists, Governments and international organizations;

(f) To report to the Governing Council at its seventeenth regular session on the progress and future activities of the World Climate Impact Assessment and Response Strategies Programme;

3. *Further requests* the Executive Director:

(a) To support research efforts including those by the Intergovernmental Panel on Climate Change and the Intergovernmental Negotiating Committee to anticipate and respond to adverse impacts of climate change at the global and regional levels, bearing in mind the special interests of small island countries and the need for inclusion of cost-benefit analyses;

(b) To assist Governments, particularly those of developing countries and small island countries, in country-specific studies to estimate the costs and benefits of dealing with climate change, and identifying the available technology and technology needs on a country-by-country basis;

(c) To strengthen, within available resources, public information programmes on the role of climate in development and on the additional risks posed by climate variability and change, within the framework of Earthwatch/Global Environmental Monitoring System;

(d) To enhance and expand the activities of the United Nations Environment Programme related to achieving a greater scientific understanding of the impacts of climate change.

*8th meeting
31 May 1991*




ANNEX 3

INITIAL LETTER SENT FROM UNEP TO ALL COUNTRIES
REQUESTING INFORMATION ON COUNTRY STUDIES



UNITED NATIONS ENVIRONMENT PROGRAMME
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT



 UNITERRA NAIROBI
 333930 or 520600
Fax (2542) 520711
 22068 UNEP KE

P.O. Box 30652
Nairobi, Kenya

Your Reference

Our Reference FP/4102-87-02

9 August 1991

Sir,

I have the honour to draw your attention to Governing Council decision 16/41 Climate Change of 31 May 1991 which inter alia requests the Executive Director to assist Governments particularly those of developing countries and small island countries in country-specific studies to estimate the costs and benefits of dealing with climate change and identifying the available technology and technology needs on a country-by-country basis.

In order for the United Nations Environment Programme to develop an appropriate programme in accordance with the above request it urgently needs the following information:

1. Is your country undertaking or has already undertaken a cost/benefit study related to climate change? If not is it planning to do so?
2. Is your country assisting or in a position to assist one or more developing or small island countries to undertake a cost/benefit study related to climate change?
3. Does your country wish assistance to undertake a cost benefit study related to climate change? Is this need related to lack of technical expertise or finance or both?

June 1, 1993

- 2 -

Where a study exists or is planned, brief information on the study methodology and the duration and costs of the study would be useful. It would be valuable to know if such studies are related only to the costs of limiting greenhouse gas emissions or if they also deal with the costs and benefits of adapting to climate change and would thus include a climate impact assessment and an identification of possible response strategies to different scenarios of climate change and sea level rise. The names and addresses of institutions and principal investigators for ongoing planned or completed studies would be useful as would be the making available to UNEP existing reports concerning cost/benefit studies and climate change impacts and response strategy studies.

In order that this information can be coordinated with the work of the Intergovernmental Negotiating Committee for a Convention on Climate change and the Intergovernmental Panel on Climate Change an urgent response would be appreciated.

Accept, Sir, the assurances of my highest consideration.



✓ Sveneld A. Evteev
Assistant Executive Director
Office of the Environment Programme

ANNEX 4

COUNTRY STUDY GUIDELINES: DRAFT PROPOSALS FROM FINLAND AND THE UNITED STATES

PART I.: NON-PAPER SUBMITTED BY THE DELEGATION OF FINLAND
12 SEPTEMBER 1991

GUIDELINES FOR COUNTRY STUDIES

1. NATIONAL INVENTORIES

1.1 Basic data from the country

- area, population, climate, natural resources, economic development (national income, energy consumption, structure of economy, etc.)
- current trends

1.2 Vulnerability to climate change

- coastal zones
- fauna and flora
- forestry and agriculture

1.3 Man-made emissions

- total emissions by gases as CO₂-equivalent
- CO₂, N₂O, CH₄, CFC, (NO_x, NMHC, CO)
- methodology provided for by IPCC and as presented in Appendix

- emissions by relevant sectors
- energy production and use including total fuel cycles, structure of energy production, national energy resources, etc.
- traffic,
- agriculture and forestry,
- land use,
- industry

- current trends of emissions
- emissions indicators (per capita, per GDP, per area)

1.4 Sinks and reservoirs

- forest area, deforestation
- amount of carbon in forests, health of forests
- other biomass
- wetlands
- land use, desertification, erosion, etc.

- current trends of sinks and reservoirs

2. NATIONAL OPTIONS

2.1 National specifications

- main factors affecting the emissions and the sinks (deforestation, population growth, rate of development, climate, etc.)
- main problems
- future trends in factors affecting emissions and sinks

2.2 Technical options for reducing emissions and enhancing reservoirs

- By relevant sectors

1) Energy

- energy efficiency and saving (end-use)
- energy technology (energy production and conservation) and alternative energy sources

2) Industry

- CFC
- new materials, products, etc.

3) Traffic

- automobile technology
- traffic systems
- physical planning including community planning and land-use planning

4) Agriculture and Forestry

- sustainable forest management to promote health of forests and ability to bind as much CO₂ as possible
- sustainable short-rotation forestry to replace fossil fuels
- agricultural management, variety of crops, etc.

2.3 Legal, economic and administrative options

- by sectors
- legal norms and standards
- economic measures
- research and development
- education, public awareness, etc.

3. NATIONAL POLICIES

3.1 Policy options and overall targets

- preventative policy
 - stabilizing and reducing emissions
 - enhancing sinks
- adaptive policy

3.2 Measures by sectors

- research and development
- energy policy
- traffic policy

- agriculture and forestry
- legal and economic measures

3.3 Impacts on emissions and sinks

- by gases (as CO₂-equivalent, gwp)
- net influence on global warming potential
- 2000, 2005, 2010, 2020

3.4 Socio-economic impacts

- costs, international harmonization, etc.

3.5 International cooperation in development and transfer of technology, financing, etc.

ANNEX 4 (continued)

PART II: METHODOLOGY PROPOSED BY THE UNITED STATES
13 SEPTEMBER 1991

PROPOSED COUNTRY STUDY Progress
(ELEMENTS OF A METHODOLOGY)

DRAFT

The following conceptual framework for a country study progress has been derived from comments received during the EIS meeting of the fourth meeting of IPCC WG-3. This outline builds on those comments and proposes a framework for carrying out a comprehensive country and regional study progress, which would assess current greenhouse gas sources and sinks, catalog technical options to reduce emissions and enhance sinks, and evaluate implementation options for the most promising technologies or practices. In this context, a comprehensive study would assess the vulnerabilities of a country to climate change and evaluate possible adaptation measures, as well as address mitigation options. In reviewing this draft countries may wish to consider the following:

- The proposed progress recognizes that countries have different capabilities, characteristics, and needs. It begins with a detailed characterization of current conditions, trends and potentially vulnerable areas (Element I) and proceeds through more complex levels of analysis (Elements II-III). Individual countries may choose to apply this progress in a manner consistent with other national policies.
- This outline suggests that assessment of both mitigation and adaptation strategies progress in parallel. The format reflects this. Comparison and analysis of the interrelationships or trade-offs implied by both types of measures are suggested in item III-C in this outline.
- The purpose of the adaptation elements is to examine potentially vulnerable systems and the effectiveness of response measures, including measures to anticipate climate change. The current draft is designed to provide information to policy managers within each country to enable them to evaluate the effectiveness of various options in light of climate change.

I. ANALYZE GHG EMISSION SOURCES AND SINKS AND VULNERABILITIES TO CLIMATE CHANGE

ADAPTATION

Assess Vulnerability to Climate Change

1. Analyze Impacts

Key areas that may be sensitive to changes in regional and global climate:

- Coastal zone management
- Water resources
- Agriculture
- Forests
- Fisheries
- Unmanaged ecosystems (e.g., wildlife, parks)
- Human health
- Air quality
- Energy demand
- Infrastructure
- Tourism

MITIGATION

A. Inventory of Greenhouse Gas Emissions, Sources and Sinks

1. Develop Inventory Based in IPCC Methodology

Relevant gases are:

- CO₂
- CH₄
- CFC and other ozone-depleting substances
- CO
- N₂O
- NO_x
- NMVOC
- SO_x

Not all gases need to be considered simultaneously; countries may wish to set

2. Specification of Climate Change Scenarios

A diversity of scenarios for regional climate change and sea level rise (including no change) should be specified. A broad range is needed in order to provide a sense of the sensitivity of each impacts area to changes in climate.

3. Characterization of Impacts

Choose among different approaches (e.g., models, expert judgement, historical experience).

4. Scenarios of Future Adaptive Responses

What are people likely to do on their own? Will people likely anticipate climate change? What sorts of natural adaptation are likely to occur? Will this adaptation be sufficient? Will it introduce problems (e.g., will the building of sea walls prevent the inland migration of wetlands)? What are the costs of each adaptive response?

5. Identification and evaluation of major uncertainties.

priorities, emphasizing those gases which are most important in their circumstances, or for which information is readily available.

Detailed information on how to develop greenhouse gas inventories can be found in the document, Estimation of Greenhouse Gas Emissions and Sinks: Final Report from OECD Experts Meeting, Revised August 1991. (This report will be available through the IPCC Secretariat and the U.K. Bracknell Laboratory).

2. Detailed Characterization of Key Sources and Sinks

The initial inventory should help countries to identify the most important sectors and gases as priorities for detailed characterization of high priority sources and sinks. Development of better information is likely to be necessary to assure the quality of the emission/sink estimates (I.A.1.), to develop scenarios of the future (I.A.3.), and to assess technical options for mitigation (II.). Critical categories may include:

- energy production, storage and distribution
- energy use
 - * transportation
 - * residential
 - * commercial
 - * manufacturing
- industrial progresses (not energy-related)
- landfills and other wastes
- livestock production
- other agriculture (rice, fertilizers, etc.)
- other land uses (forests)

Estimation of Greenhouse Gas Emissions and Sinks: Final Report from OECD Experts Meeting (available through the IPCC) suggests critical parameters for characterization of each source or sink category.

(Source/sink inventories in I.A.1. might need to be re-estimated on the basis of improved information developed in this step.)

3. Scenarios of Future Emissions and Sinks Over 20-30 Year Planning Horizon

Analysis of future gas scenarios would identify assumptions about changes in demographics, economic growth, consumption and production patterns, technological progress, and other key parameters driving emission or removal rates, as identified in A.1. and 2. above. Scenarios would be supplemented with:

- comparison with other forecasts
- analyses of sensitivities to key uncertainties in assumptions

II. ASSESSMENT OF TECHNOLOGICAL OPTIONS TO REDUCE GREENHOUSE GAS EMISSIONS OR TO ADAPT TO CLIMATE CHANGE

- A. Detailed description of alternative technical options for adaptation for each effects area (e.g., for sea level rise, society may: (i) retreat from, (ii) adapt to, or (iii) protect against sea level rise).
- B. The specific options selected for analysis should be chosen by the resource managers and reflect the indigenous characteristics of the country, including available resources, technologies, physical/institutional infrastructures, and socio-economic factors.

- A. Technological options, using bottom-up or microeconomic analysis, would be assessed for each major source/sink category, considering national circumstances. Assessment might consider available resources, physical and institutional infrastructures, and socio-economic factors, since these affect the economic, market and technical potentials of each option. One possible source of information for selecting technologies or practices in the IPCC technology assessment characterizations. This progress should consider:

1. Description, cost, other environmental or non-environmental benefits, and performance compared to alternatives
2. Identification and evaluation of major uncertainties and specific barriers to implementation

III. EVALUATE INSTRUMENTS TO FACILITATE IMPLEMENTATION

Depending on the country, some instruments would be more effective and efficient than others in inducing implementation of the most attractive options identified in II. Choice of instruments to analyze might reflect the reasons for differences between their market, economic, and technical feasibility.

A. Select/Evaluate Policy Instruments to Promote Adaptation

1. Evaluate Policies to Facilitate Adaptation

Are policies needed to facilitate adaptation? What types of anticipatory adaptive responses should be considered?

2. Identification and evaluation of major uncertainties and specific barriers to implementation.

B. Cost Effectiveness of the Alternative Adaptation Policies

1. Physical impacts (e.g., plant physiology)

2. Socio-economic considerations (e.g., changes in crop yields)

3. Macroeconomic impacts (e.g., changes in GNP)

A. Select/Evaluate Policy Instruments to Promote Adoption and Penetration of Technologies Identified in II.

1. Market-based measures, including taxes and other pricing mechanisms, emissions trading, subsidies or other financial incentives

2. Regulations

3. Training, education, and information dissemination

4. Other government actions (e.g., natural resource policies)

5. Research programs

6. Strategies combining the instruments listed above

B. Evaluate Macroeconomic Implications of Selected Technological Options and Instruments

Alternative packages of technological options, implemented through policy instruments, would have differing impacts on countries' economies. Selected "no regret", low and higher cost strategies might be assessed for their macro-economic and other impacts. This exercise might estimate:

1. Net greenhouse gas limitations achievable over time;

2. Consequence, including potential economic costs and savings, incremental capital investment requirements, trade, distributional and equity effects, facility life cycles;

3. Other environmental effects, either positive or negative (e.g., local air pollution);

4. International implications of national policies including foreign exchange and other

requirements (e.g., capital);
and

5. Barriers to implementation,
for example:
- * constitutional, legislative, regulatory factors
 - * cultural
 - * lack of public information
 - * R&D cycle time

C. Consider Policy Implications

An analysis and description of the relative implications of the strategies considered in steps II through III could provide the basis for the development of national responses to climate change concerns. In some countries, mitigation strategies may take precedence, while in others, adaptation measures may be inevitable or be preferred. The assessment in this step might specify, but would not be limited to:

- needs for additional data and information;
- needs to redirect existing programs;
- requirements for training, research, and institutional development;
- financial implications;
- priority for actions or next steps; and
- possible sources of assistance.

ANNEX 5

INITIAL LETTER SENT FROM UNEP TO ALL COUNTRIES
INQUIRING ABOUT INTEREST IN PARTICIPATION IN
COUNTRY STUDIES ON SOURCES AND SINKS OF GREENHOUSE GASES



UNITED NATIONS ENVIRONMENT PROGRAMME
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT



UNITERRA NAIROBI
333930 or 620600
Fax (2542) 520711
22068 UNEP KE

P.O. Box 30662
Nairobi, Kenya

Your Reference

Our Reference

ChG/Invent.

18 October 1991

Sir,

I have the honour to bring to your attention provisional plans by UNEP to initiate country case studies on the sources and sinks of greenhouse gases. These studies are to be undertaken on the advice of, and in conjunction with, the Intergovernmental Panel on Climate Change, Working Group I on Science. The purpose of the studies is to compile national inventories of net emissions of greenhouse gases for use in the international assessment of greenhouse gas induced climate change.

Application is to be made to the Global Environment Facility (GEF) to meet the costs of a pilot study likely to cost between US\$150,000 and 300,000 per country. Studies would be undertaken primarily by experts from within the study country assisted as necessary by international experts selected with assistance from the IPCC. The objectives of the proposed project as contained in the draft project proposal are as follows:

Short-term objectives:

- (i) Develop the on-going capability within countries to estimate greenhouse gas emissions;
- (ii) Identify opportunities to improve national inventory estimation and reporting methods, in all main regions of the developing world;
- (iii) Provide baseline information to evaluate policy options to reduce greenhouse gas emissions;

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- (iv) Strengthen human and material resources in developing countries for establishing a worthwhile, effective, permanent programme on greenhouse gas emission;
- (v) Give a picture of the general areas of greenhouse gas sinks;
- (vi) Provide a basis for further socio-economic, technological and policy analyses;
- (vii) Identify opportunities for strategic investments in demonstration of alternative technologies and practices which could have significant impacts in reducing greenhouse gas emissions;
- (viii) Identify and rank a wide range of cost-effective technical options for reducing emissions, including estimates of the investment cost required to demonstrate these options.


Long-term objective:

- (i) To have comprehensive knowledge of the emissions and sinks of greenhouse gases worldwide with respect to human and natural events.

..... The draft project proposal in the original language is attached.

The purpose of this letter is to enquire whether your country is interested in participating in the pilot phase of the project. A small number of prospective countries is being solicited in this way to determine their willingness to involve themselves in the project. A final selection would be made based on the degree of interest in undertaking studies and submitting the results to the IPCC; on the need to ensure an equitable geographic balance; and the need to insure a representative mix of developing countries including consideration of such factors as size, type of economy, e.g. market or transitional economy, and source of emissions, e.g. land-use, energy production and use. I should be grateful for an urgent response to this letter which should include information on any related study presently being conducted or contemplated in your country.

Accept, Sir, the assurances of my highest consideration.


Sveneld Evteev
Assistant Executive Director
Office of Environment Programme