

## VII. GLOBAL

### COUNTRY CASE STUDIES ON CLIMATE CHANGE IMPACTS AND ADAPTATIONS ASSESSMENT PHASE I

#### BACKGROUND

Adaptation to climate change will be required even if effective mitigation measures are agreed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC). The first assessment report of the Intergovernmental Panel on Climate Change (IPCC) concluded that an immediate reduction of 60% globally of long-lived greenhouse gases such as carbon dioxide would be required to stabilize the atmospheric concentrations at the present level. According to the 1994 report of IPCC Working Group I, "stabilization of atmospheric carbon dioxide concentration at all considered levels between one and two times today's could be attained only with global anthropogenic emissions drop to substantially below 1990 levels". According to IPCC findings even stabilization must assume some climate change. Therefore, a certain amount of adaptation to a changing climate will be necessary, especially in areas and sectors that are particularly vulnerable to extreme climatic events.

GEF Focal Area:	Climate Change
Country Eligibility:	<input checked="" type="checkbox"/> Eligible under financial mechanism for FCCC/CBD <input type="checkbox"/> Eligible under paragraph 9(b) of the Instrument
Total Costs:	US \$ 2,000,000
GEF Funding:	US \$ 2,000,000
Implementing Agency:	UNEP
Executing Agency:	UNEP
Tentative Approval Date:	April 1995
Project Duration:	18 months

An improved understanding of the potential impacts of climate change on socio-economic systems and the environment will enable countries to reduce their vulnerability to the adverse effects of climatic changes and to identify a range of adaptation strategies. Climate impact assessment and measures to adapt to climate change must be seen as an integral part of any sustainable development strategy. They should meet present-day development needs and minimize the expected adverse effects of rapid climate change. Intensified efforts are required to enhance and refine further the ability to anticipate climate change impacts, and identify strategies to adapt to climate change.

## **The United Nations Framework Convention on Climate Change**

The United Nations Framework Convention on Climate Change (UNFCCC) which entered into force on 21 March 1994 provides the main framework for climate change related research, assessment, and development of response strategies, including adaptation.

Article 4.1 (b) requires Parties to the Convention to formulate and implement national and regional programmes containing measures to mitigate climate change and "measures to facilitate adequate adaptation to climate change".

Article 4.1(e) indicates that Parties shall "co-operate in preparing for the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resource and agriculture and for protection and rehabilitation of areas affected by drought, desertification and floods".

Article 4.1(f) directs the Parties to take climate considerations into account in relevant social, economic and environmental policies and actions, and aim to minimize the adverse effects on economy, public health and the environment of measures taken to mitigate or adapt to climate change. This paragraph also urges Parties to cooperate and promote the exchange of information on the economic and social consequences of various response strategies.

According to Art. 4.3, developed country Parties included in Annex II "shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Art. 12.1", and shall provide financial resources to meet the agreed full incremental costs if measures covered by Art. 4.1.

Article 4.4 requires developed country Parties to assist countries that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation to those adverse effects.

Article 4.8. refers to the specific needs and concerns of developing countries which are highly vulnerable to the adverse effect of climate change. This includes the specific needs and concerns of small island countries, countries with low-lying coastal areas, arid and semi-arid areas, areas liable to forest decay, areas liable to drought and desertification, and countries with fragile ecosystems including mountainous ecosystems.

In accordance with Art. 12.1, countries shall include into their national communications "a general description of steps taken or envisaged by the Party to implement the Convention".

At its Tenth Session, the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC/FCCC) formulated clear guidance to the GEF as the interim operating entity of the financial mechanism. This agreement is contained in Decision 10/3 of the INC/FCCC.

Regarding programme priorities, the Committee concluded that "in the initial period emphasis should be placed on enabling activities undertaken by developing country Parties, such as planning, endogenous capacity building including institutional strengthening, training, research and education, that will facilitate implementation, in accordance with the Convention, of effective response measures".

Decision 10/3 also contains an agreement on a three stage approach regarding adaptation. It was recognized by the Committee that adaptation requires short, medium and long term strategies, each of which should be

Various other descriptions of methods and guidance documents are available which describe certain approaches or methods recommended for studies of a particular sector. "The Seven Steps for the Assessment of the Vulnerability of Coastal Areas to Sea Level Rise - A Common Methodology" published by the Coastal Zone Management Sub-Group of the IPCC in 1991 are included in the revised IPCC Technical Guidelines as one of the sub-components. Argonne National Laboratory prepared for the US Country Studies Programme the "Guidance for Vulnerability and Adaptation Assessments". This document is based on the IPCC

Under IPCC Working Group II, an expert group has been established to develop guidelines for the assessment of climate change impacts. "Preliminary Guidelines for Assessing Impacts of Climate Change" were presented and published in 1992. These guidelines have been further refined by the expert group and at its tenth Plenary Session in November 1994. The IPCC approved the "IPCC Technical Guidelines for Assessing Climate Change Impact and Adaptations". These guidelines will become part of the IPCC Special Report to the first Conference of the Parties (COP) of the UNFCCC. The objective of these guidelines is to facilitate the analysis of climate change impacts and the development of adaptation measures. They will allow comparable assessments to be made for different regions, sectors and countries. These guidelines are mainly addressed to scientists and experts in the field of climate impact studies. They do not aim to describe a single preferred method, but provide an analytical framework for climate impacts and adaptations assessments. The guidelines reflect current knowledge and will be updated as improved methodologies are developed.

The first Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), adopted in August, 1990, concluded that future action is required with respect to the development of a methodology to assess the sensitivity of the environment and of socio-economic systems to climate change. This information on climate change impacts should be integrated into the national planning process, particularly in developing countries. The Second World Climate Conference recommended that immediate steps should be taken on specific issues, including the impact of climate change on the hydrological cycle, the magnitude and nature of such impacts, on food security, the biological productivity of oceans, the potential impacts on forests and forest ecosystems, the vulnerability of urbanized societies, and various health aspects such as vector borne diseases.

A reliable set of methodologies for the assessment of climate change impacts, and well elaborated tools for the development of adequate adaptation strategies, will be required in order to implement the provisions of the Convention concerning adaptation and in order to carry out studies on the possible impacts of climate change. At present, the lack of reliable methods for climate impact assessment is an obstacle to estimating accurately the influence of climate change on society. So far, different approaches, methods and tools have been used in climate impact studies, and it is very difficult to compare the results and conclusions. The methods used so far have disadvantages, and limitations when applied under differing circumstances or when different sectors have to be addressed. Therefore, the further development and testing of comparable methodologies for national and regional assessments of the socio-economic and environmental impacts of climatic changes, and for the development of adaptation measures is seen as a priority objective.

### Linkages to UNEP Work and IPCC Activities

cost effective, take into account important socio-economic implications, and should be implemented on a stage-by-stage basis. In the short term, referred to as Stage I, the primary activity envisaged is planning. Planning "includes studies of possible impacts of climate change to identify particularly vulnerable countries or regions and policy options for adaptation, and appropriate capacity building". For Stage I, the Conference of the Parties (COP), at its first session, shall entrust to the GEF the task of meeting the agreed full costs of the activities required by Article 12.1 of the Convention. This would include relevant adaptation activities undertaken in the context of the preparation of national communications required under the Convention.

**Preliminary Guidelines.** Experts from Argonne Laboratories have established close working relations with the IPCC expert group and UNEP.

Methodologies for climate impact studies, including those described in the IPCC Technical Guidelines, are still preliminary and need to be further refined. UNEP is therefore proposing this country case studies programme in order to support the further development and improvement of methods for climate change impacts and adaptation assessment. This systematic improvement can only occur through application and testing of the IPCC guidelines and the methods referred to in these guidelines under field conditions in various countries. Various methods will, be applied as far as possible, and the results of the alternative approaches will be evaluated in order to get a better understanding of the applicability and limitation of methods when used under different circumstances. The experience gained in the course of these country case studies will be an important input for the further refinement of the guidelines and methodologies by the IPCC. The country case studies will be carried out in close cooperation among UNEP, the IPCC expert group and country experts.

As part of the World Climate Impact Assessment and Response Strategies Programme, (WCIRP) a component of the internationally implemented and coordinated World Climate Programme, UNEP has already conducted a set of regional studies on the environmental and socio-economic effects of climate variability and change in Brazil, South East Asia (Thailand, Indonesia, Malaysia), Vietnam, Namibia and in the Commonwealth of Independent States. The purpose of these studies was to develop and test a range of assessment tools and to provide examples of different analytical methods for climate impact assessment. In the framework of its Regional Seas Programme, UNEP has also carried out a large number of regional, country and site specific assessments of the impacts of climate change and sea level rise. This UNEP experience has contributed to the formulation of the IPCC Technical Guidelines. In parallel activities carried out for the IPCC and in support for the UNFCCC, UNEP has conducted other climate related country studies on inventories of sources and sinks of greenhouse gases and on the costs of mitigating climate change. For the project on "Country Case Studies on Sources and Sinks of Greenhouse Gases", funds have been received from the GEF pilot phase.

In the course of the last few years, a number of climate change related country studies have been initiated. Some of these programmes are organized and financed bilaterally. Others, such as the UNDP country studies, are financed through GEF or other multilateral sources. UNEP has established close working relations with a number of these programmes. UNEP also assisted in the coordination of these various initiatives through the "Climate Convention Information Exchange Programme (CC:INFO)", a project implemented and financed jointly by UNEP and the UNFCCC Interim Secretariat.

Through its in-house experience, its close links with the IPCC, and with other relevant programmes, UNEP is well placed to support the further development of methods and the improvement of the "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations" through a set of dedicated, climate impacts related country case studies.

## **PROJECT OBJECTIVES**

The objective of this project is to enable countries to develop and carry out studies of the possible socio-economic and environmental impacts of climate change, to identify particularly vulnerable areas and sectors, and to elaborate integrated and appropriate plans for adaptation to climate change, as required under the

Four detailed country study reports which will contribute to the development of national programmes to implement the UNFCCC and to the national communication of the respective country to the COP of the UNFCCC.

A set of illustrative country case studies on possible impacts of climate change and policy options for adaptation which will provide input for the considerations of the COP on the implementation of further stages towards adaptation, as requested in Decision 10/3 of the INC/FCCC. This set of country case studies may also include summary reports from country studies which have been implemented in the context of other country study programmes, but used the same methodological approach as this project.

A report containing recommendations on methodologies for studies of possible impacts of climate change and adaptation options. The report will describe the advantages and limitations of certain methods and approaches if applied under different circumstances, and recommendations for the refinement and improvement of the "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations".

Specific outputs of this project will be

The international exchange of information on impacts of climate change will be improved by establishing contacts among experts and scientific-technical institutions carrying out assessments of climate impacts and adaptations. This will support efforts of countries to cooperate in preparing for adaptation to climate change and to develop regionally co-ordinated adaptation strategies where appropriate, and will promote the harmonization of methodologies and approaches used in country studies of possible impacts of climate change and adaptation options.

The results of the country case studies carried out under this project, will supplement the results derived from country studies carried out by other countries using a comparable methodological approach and will increase the quantity and quality of baseline data relating to the impacts of climate change on various sectors, countries and regions. This will aid regional prediction of climate change impacts, contribute to the of climate change impacts. They will also provide input for the considerations of the COP of the UNFCCC on the necessity to implement further adaptation measures, as envisaged in Stages II and III of Decision 10/3 of the INC/FCCC.

Toward this goal, the project will apply and test the IPCC guidelines and various methods for assessing climate change impacts and adaptations. By applying the "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations" under field conditions in a set of country case studies, it will enable the further refining of the guidelines in accordance with the experience gained in the studies and contribute to ensuring the broad applicability of the guidelines. The case studies will also lead to a better understanding of advantages, disadvantages and limitations of various methods referred to in the IPCC guidelines when applied under different conditions.

UNFCCC by providing a set of common, broadly applicable methodologies. It will also assist countries in arriving at a realistic assessment of socio-economic implications of climate change, in identifying a range of policies for adapting to climate change which they might incorporate into national planning; and in recognizing opportunities for strategic investments in measures to adapt to climate change.

Trained personnel in the countries where the country case studies are carried out and a number of trained experts in other countries. Cooperation and communication among experts in the field of climate impacts and adaptation assessment in order to further methodological refinement and to facilitate cooperation in the development of adaptation measures is initiated.

**PROJECT DESCRIPTION**

**Pre-project Activities**

A pre-project workshop was organized by UNEP and Environment Canada at the end of 1993. Representatives from countries which expressed interest in participating in the proposed UNEP country case studies programme, IPCC experts, experts from the US Country Study Team and from countries which take part in the US country study programme participated in this workshop.

The purpose of this workshop was to familiarize the country experts with the "IPCC Preliminary Guidelines for Assessing Impacts of Climate Change" and methods used in climate impact studies, and to establish contacts between country teams and the IPCC experts. The country experts were asked to prepare draft work-plans for their respective country studies, using the IPCC guidelines as guidance.

Working relations with the US Country Study Management Team and with specialists from Argonne Laboratories which have prepared the "Guidance for Vulnerability and Adaptation Assessments" for the US Country Studies Programme have been established.

One of the main conclusions of the workshop was that there is a need for a more practically oriented handbook to complement the IPCC guidelines. The handbook would assist national experts in planning and conducting assessments at the country level. Recommendations were also made for improving the IPCC guidelines.

In 1994, the IPCC expert group has revised the guidelines and expanded the chapters on adaptation. The "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations" were approved by the IPCC Plenary in November 1994 and will be a part of the IPCC Special Report to the first Conference of the Parties (COP-1) of the UNFCCC.

A UNEP designed and funded project is under way to develop a handbook on methods for assessing the impacts of climate change and adaptation measures. This handbook will use relevant parts of the US "Guidance for Vulnerability and Adaptation Assessments". It was agreed with the US Country Study Management Team that experts from Argonne National Laboratory will cooperate as co-authors in the preparation of the handbook. A first draft of this handbook on methods will be available in mid 1995. This draft will be available to country teams for planning and conducting their studies.

UNEP has already established effective cooperation with relevant bilateral and multilateral programmes that are working on methodological issues related to climate change and carrying out country studies. An important element to facilitate this cooperation and coordination is the "Climate Convention Information Exchange Programme (CC:INFO)", a joint activity of UNEP and the UNFCCC Interm Secretariat. This cooperation included mutual participation in project workshops in the framework of the projects on country case studies on sources and sinks of greenhouse gases and the UNEP projects on national greenhouse gas

abatement costing studies. This new project will allow UNEP to extend that cooperation and will enable other country study programmes to benefit through further collaborative work on methodological issues, especially in the field of assessing impacts of climate change and adaptations.

A comparative analysis of relevant climate impacts studies carried out by various programmes and institutions will be done at the beginning of the project. This will include studies such as the country study programmes of the Asian Development Bank, the US Country Studies Programme, and the UNEP studies done under the framework of the Regional Seas Programme and the WCIRP. This analysis will focus on the impacts of such studies on the policy and decision making process of each of the participating countries and of the methods applied.

### **Country Selection**

The countries participating in this country case studies programme will represent a broad range of factors such as the major biogeographical regions, socio-economic structures and cultural backgrounds. The selection of countries will be based on the need to ensure an equitable geographic balance; and the need to ensure a representative mix of countries including consideration of factors such as, size, type of economy, biogeographical region, land use and specific vulnerability to climatic events. Ideally ten countries are needed to ensure fully-representative coverage. The country case studies programme will be carried out in two phases. Phase I, as described in this project, will start with four countries, which have already some experience with climate impact studies and where a certain amount of necessary data and scientific technical capacity are available.

Phase II country case studies will start after successful implementation of Phase I and as soon as sufficient funds are available to carry out additional country case studies. It will involve countries which have less experience in climate related country studies and which are likely to need more time for their internal preparatory process.

UNEP had consultations with a number of prospective countries to determine their interest and willingness to be involved in the country case studies. Requests for assistance on studies of vulnerability to climate change received directly by UNEP or through CC:INFO were also taken into consideration. Antigua and Barbuda, Argentina, Benin, Bangladesh, Cameroon, Costa Rica, Cuba, Ecuador, Estonia, Ethiopia, Lithuania, Pakistan, Senegal, Uganda, Uzbekistan and Venezuela have submitted formal requests to participate in the country case study programme. Experts from most of these countries participated in the 1993 pre-project workshop. Some of these requests were already submitted in mid 1993 and several of these countries have meanwhile received funds for climate impact studies from other sources such as bilateral programmes or UNDP.

The selection of Phase I countries was made based on the stated continuing willingness of the country to participate in the country study programme, taking into consideration aspects such as studies financed through other sources, availability of some in country expertise and experience in climate related studies and the need to ensure a representative mix of countries. It was decided to select one country from each of the four regions, eligible for GEF funding Africa, Asia, Latin America, and Eastern Europe. Antigua and Barbuda, Cameroon, Estonia, and Pakistan will participate in Phase I of the programme.

Countries which had expressed interest in participating in the UNEP country study programme but have meanwhile received funds from other sources to carry out impacts and adaptation studies as well as other countries carrying out studies on vulnerability to climate change are invited to co-operate with UNEP on

methodological aspects. This will apply in particular to US financed and UNDP country studies with a climate impacts component such as the country studies planned in Argentina, Costa Rica, Ethiopia, Uganda and the Maldives. Joint workshops with these countries and other countries carrying out climate impact studies under various other programmes are planned to consider methodological aspects. Other ways of sharing the expertise gained in the course of the country studies, such as exchange of experts and contacts among the institutions providing technical assistance will be explored in the course of the implementation of the respective projects. Close cooperation will also be established with other ongoing UNDP projects and enabling activities.

### **Methodological Aspects**

The country studies will follow the general framework provided by the "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations". The guidelines provide an analytical outline that comprises a number of steps:

The following seven steps are proposed in the guidelines

- (1) Definition of the problem;
- (2) Selection of the method;
- (3) Testing the method;
- (4) Selection of scenarios;
- (5) Assessment of biophysical and socio-economic impacts;
- (6) Assessment of autonomous adjustments;
- (7) Identification and evaluation of adaptation strategies.

A range of methods is identified at each step. The IPCC Guidelines give just a general description of the approaches and methods, thus instructions on their application are necessary. These instructions highlight the following issues and areas:

- (a) Definitions of
  - the goals of the assessment;
  - the study area and the exposure unit;
  - time horizon for the study; and
  - data needs and data availability.
- (b) Application of methods for assessments such as
  - experimentation;
  - impact projections, such as biophysical, economic and integrated systems models;
  - empirical analog studies, such as historical event analogies, historical trend analysis, and regional analogies for present and future climate;
  - the testing of the methods in feasibility studies;
  - data acquisition and compilation; and
  - model testing.
- (c) Selection and application of scenarios including
  - establishment of the present day situation;
  - selection of time-frame and evaluation of limits of predictability and comparability;
  - projection of environmental and socio-economic trends in the absence of climate change;

The country case studies shall be integrated into national policy frameworks and environmental action plans, and they shall be a contribution to the national programmes to implement the UNFCCC. In order to ensure this integration the country teams will work in close co-operation with national climate committees, the IPCC focal points, groups and institutions which are involved in the development of national plans or strategies to respond to climate change, and other relevant policy programmes. If other climate related studies are carried out or planned in the particular country, a mechanism to ensure regular consultations between the groups involved will be established.

Country teams consisting of national institutions and experts designated by the government will be set up to plan and carry out the country studies. An external institution or a consultant with special expertise in conducting climate impacts and adaptation assessments will be identified to provide technical assistance to the country team.

### Implementation of Country Case Studies

Special consideration will be given to the selection of scenarios used in the country case studies. To facilitate the comparability of results from different studies the determination of scenarios, both climatic and socio-economic parameters used in the study will be selected according to recommendations of the IPCC. Additional experts in climate diagnosis and climate modelling will be consulted.

In the country case studies, a broad approach will be taken so that several methods, referred to in the IPCC guidelines and other guidance documents as appropriate, may be used to address one specific problem. This will facilitate comparison of the various methods and identification of the advantages and limitations of those methods and will lead to a better understanding of their applicability under different circumstances. An appropriate selection of the methods will be carried out with the support of a designated technical assistance institution or consultant.

- (c) Identification and evaluation of adaptation options such as
  - anticipatory action to prevent loss;
  - spreading or sharing loss;
  - changing the location, use or activity;
  - the application of structural and legislative changes;
  - technological changes;
  - the use of financial and economic instruments; and
  - examining constraints and weighing objectives and trade-offs.
  
- (d) Qualitative and quantitative description of impacts including
  - a qualitative 'cross impacts analysis' which considers all factors of importance;
  - the use of indicators of change;
  - compliance with standards;
  - estimation of costs and benefits;
  - geographical description;
  - analysis of uncertainties and risks.
  
- projecting future climate; and
- environmental and socioeconomic trends with climate change.

The reports of each country case study will contain a precise description of the vulnerability of each region to impacts of climate change and of adequate adaptation measures and their environmental and socio-economic consequences. The reports will also contain an estimate of climate change related costs such as, socio-economic losses through crop failure; costs of rectifying damage caused, for example, by floods and droughts; and costs of preventive measures.

A final national workshop will be held to discuss the results of the assessment of climate impacts and adaptations. The participants will include policy makers, county teams and other national experts and the officials responsible for the development of a national plan to combat climate change. The participants will be selected to ensure that the results of this study are integrated into the national response strategy, and into other relevant national programmes.

The third step of the project will focus on the evaluation of adaptation strategies. After specifying the climatic impacts of importance and identifying adaptation options and assessing their effectiveness to reduce the vulnerability to climate impacts, their socio-economic and environmental impacts the possible constraints in implementing them will be evaluated. One additional aspect to be considered in the evaluation of a adaptation measures, in particular in the energy, agriculture and forestry sector, is the potential of such measures to limit greenhouse gas emissions, to sequester carbon or to release greenhouse gases. The results of the evaluation of the adaptation measures will be a set of recommendations to policy makers on adaptation measures, indicating the assumptions used and uncertainties involved.

After the first assessment of possible impacts of climate change is completed another national workshop will be held to evaluate these results, to identify needs for additional in-depth studies in sectors and areas which were identified to be vulnerable to climate change, including the identification of adaptation options. The detailed assessment will also take into account the need for an integrated approach which analyses the interactions between various factors affecting the area or sector concerned.

A first national workshop will be organized with the country team at which the country experts will be introduced to the "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations" and the application of methods and scenarios referred to in the guidelines. The detailed workshop for the country study will be formulated by the country team in close consultation with the institution or consultant providing technical assistance. The development of the national workshop will be based on data available and take into account available climate impacts studies, as well as other climate change related activities under way in the country. The study will use and integrate to the extent feasible the results of existing studies, such as a vulnerability assessment using only one approach, or addressing only one particular area or sector in the country, such as a study on vulnerability to sea level rise.

- a preliminary and rapid assessment of impacts of climate change on all socio-economic and environmental sectors of the country;
- detailed impact assessment in areas and sectors identified as vulnerable to climate change such as agriculture, forestry, hydrology and water resource management, coastal zones, human settlement, human health, unmanaged and fragile ecosystems;
- identification and testing of adaptation options, evaluation of socio-economic effects of adaptation measures, evaluation of autonomous adjustments, and formulation of recommendations for adequate adaptation strategies.

The country case studies will be carried in three major steps:

As appropriate, other countries of the region which are planning or carrying out climate impacts and adaptations assessments may be invited to participate in parts of the national workshops which provide an introduction and training in the application of the IPCC Guidelines and methods.

At the end of the project an international workshop will be convened with IPCC experts, and other country study teams to discuss the experience gained and lessons learnt during the case studies, to make recommendations for the further revision of the IPCC Guidelines and improvements of methods.

A project report will be prepared containing recommendations for further improvements of the IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations" and the handbook on methods which is currently prepared by UNEP, and a summary of the results from the country case studies. The project report will be submitted to the IPCC to provide input for the further revision of the IPCC guidelines, which is planned in 1996 and for consideration in the IPCC assessment. It will also be submitted to the COP, or Subsidiary Bodies as appropriate, of the UNFCCC as input for considerations on the necessity to implement the measures as envisaged in Stages II and III as stated in Decision 10/3 of the INC/FCCC.

Workplan

This project will be implemented in 18 months. The activities for Phase I of the country case will commence in the second quarter of 1995.

1995

Apr - June Identification of national institutions and setting up of country teams; finalization of country agreement; collection of relevant national studies and data to begin. Selection of institutions or consultants to provide technical assistance to country teams.

May

June/July First national planning workshop\* in each country for the country team and the institution providing technical assistance to organize work, finalize national workplans and discuss the methods to be used.

July

Country studies initiated with the assessment of the sensitivity of socio-economic sectors and natural ecosystems to climate change and variability, critical thresholds, and the identification of most vulnerable areas.

Nov/Dec

Second national planning workshop\* in each country for the country team, the institution providing technical assistance to the country team and external experts to evaluate and review the first phase of the country study and to plan and organize sectorial studies, integration of assessments and identification of autonomous adjustments; examine guidelines and various methods and decide on their application.

Dec

Second part of the assessment to begin.

1996

**Feb/March** Third national planning workshop<sup>a</sup> in each country for the country team and the institution providing technical assistance to discuss results of the second phase of the assessment and to organize further work on the required assessment of the adaptation options and evaluation of adaptation strategies.

**March** Identification and evaluation of adaptation strategies to begin.

**July/Aug** Final national workshop in each country for the country team and the institution providing technical assistance, policy makers and other experts as appropriate to discuss the integration of the results of the study into the national response strategy.

**Oct** International workshop of experts from country teams, IPCC experts and experts from other country study teams to discuss recommendations for the further improvement of methods and guidelines.

**Nov** Country study reports and final project report available.

<sup>a</sup> *experts from other country study teams to participate as appropriate*

## **PROJECT COST AND FINANCING**

The total estimated costs of this project are US \$ 2,000,000. The average estimated costs per country study will be between US \$ 300,000 and 400,000. Funds will be provided as a grant from GEF to the governments of Antigua and Barbuda, Cameroon, Estonia and Pakistan, which will then transfer the funds to the institutions designated by the government to carry out the country case studies. US\$ 240,000 are required for technical assistance to the country teams and for methodology work. US\$ 250,000 will be spent for workshops and steering group meetings.

The country case studies will be carried out in three developing countries and in one country with an economy in transition. Countries with economies in transition are eligible to receive GEF funds outside the Financial Mechanism of the UNFCCC. According to the workplan submitted by the government of Estonia the amount of funds which will be spent under this project outside the Financial Mechanism of the UNFCCC is US\$ 320,000.

For reasons of methodology development and refinement a broad geographical coverage of the country case studies is needed. Therefore a second phase of country case studies is planned. A counterpart contribution for additional country case studies of DKK 6,000,000 have been pledged by the Government of Denmark recently. A contribution of SFR 40,000 has been received from the Government of Switzerland.

## **PROJECT PLANNING AND IMPLEMENTATION**

The project will be implemented by UNEP as an internal project. A project co-ordinator will be designated to administer the project, to provide the necessary linkages between UNEP, the IPCC expert group, participating countries and other relevant organizations, to distribute guidelines and associated technical materials, workbooks, software etc. suitable for application nationally and to assist in the organization of workshops and meetings. The project coordinator will also ensure the necessary coordination with associated UNEP programmes such as the WCIRP, the Regional Seas Programme, and IUCC.

A Steering Group will be designated, consisting of representatives from UNEP, UNDP, the GEF Secretariat, the UNFCCC Interim Secretariat, and other relevant UN bodies, and experts from the IPCC, the Scientific Advisory Committee (SAC) of the WCIRP, scientific institutions providing technical assistance and from bilateral country study programmes.

Each country case study will be carried out by a country team of experts and relevant institutions as designated by the government. Existing data related to climate variability and the vulnerability of the environment and society to climatic events, as well as professional and support personnel from participating countries will be necessary inputs.

Contracts with competent scientific institutions or consultants will be arranged to provide technical assistance to the countries involved in the country case studies and to provide the overall guidance with respect to the specific task of testing guidelines and methods. Institutions with an internationally recognized experience in climate impacts studies such as the International Institute for Applied Systems Analysis, Austria (IIASA); the Institute for Environmental Studies at Free University Amsterdam; the National Center for Atmospheric Research (Environmental and Societal Impacts Group) Boulder, Colorado; the Center for International Climate and Energy Research - Oslo (CICERO), Norway; the Asian Institute for Technology; and the Potsdam Institute for Climate Impacts Research, Germany will be invited to tender their proposals.

The "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptation" and the handbook on methods which is currently being developed by UNEP will serve as guidance to carry out the country case studies. A continuous interaction between the IPCC expert group and the experts that are involved in the country case studies will be necessary to ensure that the experience from the application of the guidelines in the country context can be incorporated in the further refinement of the guidelines. Regular meetings and workshops shall provide the framework for this interaction.

Recognizing that there are several climate country study initiatives under way, organized and funded bilaterally or by international organizations, working relations with these donors, organizations and the countries participating in these programmes will be established in order to aim for the application of consistent approaches and methods and to exchange information about the experience gained and difficulties encountered in the course of carrying out climate impacts and adaptation country studies.

## **PROJECT SUSTAINABILITY AND RISKS**

The "IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations" are part of the IPCC Special Report to the first Conference of the Parties to the UNFCCC and may be recommended on a preliminary basis as guidelines for the development of national programmes. The main task of the country case studies is to further the understanding of assessments of climate change impacts and adaptations and to

provide recommendations for further improvements of common guidelines and methods. Through the IPCC, as an intergovernmental body, these findings will be disseminated broadly to experts in all countries, and to the COP of the UNFCCC. The IPCC will also ensure that the results of the country case studies and the data collected will be used for further advancement in the prediction and assessment of climate change impacts by the scientific community and by governments.

The project will establish country teams of technical experts to carry out the country case studies. These teams will work in close co-operation with the national authorities and committees as appropriate. They will cooperate with those charged with the formulation and implementation of the national programmes required under the UNFCCC.

The workshops planned under this project and the co-operation with other country studies programmes will enhance the dissemination of improved methods for assessing climate change impacts and adaptations, contribute to capacity building, and provide an important input for the further development of specific training programmes on methods. These workshops will also provide a basis to facilitate cooperation of countries in preparing for adaptation, as required under the UNFCCC.

The outputs of this project will contribute to future studies of the impacts of climate change and possible adaptation options carried out either with GEF funds or with funds from the respective country. The methodologies developed and refined in the course of this project will be applicable to these future studies and facilitate their implementation. The teams of trained experts from countries participating in this project may be called upon to provide training and assistance to other developing country Parties which are planning climate impacts studies.

No universal risks are involved in the project.

## **PROJECT BENEFITS**

The project will provide a set of tools for countries to assess the impacts of climate change; the specific vulnerability of particular sectors and geographical areas to climatic events; and to evaluate appropriate adaptation strategies. Countries using these tools will be able to identify appropriate adaptation measures that will be integrated into sustainable development policies and plans. The availability of improved methods and guidelines and the experience gained by national experts in this project will facilitate the development of other country-driven projects and strategies. Risks and uncertainties regarding preparation for adaptation to the adverse effects of rapid climate change will be reduced. The resulting improved understanding of vulnerability to climatic events and of the possible impacts of climate change will be an important input to long term investment planning such as irrigation schemes, coastal protection, and hydropower schemes, as well as for agriculture and forestry policies.

The country case studies carried out under this project will also provide an important input to the national communication to be prepared in accordance with the commitment under the UNFCCC of the respective countries.

This project responds directly to Decision 10/3 of the INCFCCC on temporary arrangements between the committee and the GEF, and the conclusions with regard to programme priorities and adaptation. According to this decision, in the initial period emphasis should be placed on enabling activities such as planning and endogenous capacity building. Regarding adaptation, the Committee agreed that adaptation to the adverse effects of climate change will require short, medium and long term strategies which should be cost effective and take into account important socio-economic implications. In the short term Stage I, "planning which includes studies of possible impacts of climate change to identify particularly vulnerable countries and regions and policy options for adaptation, and appropriate capacity building" is envisaged.

Stage II refers to measures that may be taken in particularly vulnerable countries to prepare for adaptation, including capacity building. Stage III would include measures to facilitate adaptation, and other adaptation responses envisaged by Art. 4.1 (b) and 4.4. Based on the outputs of Stage I as well as other relevant scientific and technical studies, including those of the IPCC, COP may decide that it had become necessary to implement measures envisaged under Stages II and III.

This project responds to this request of the INCFCCC by advancing the scientific technical understanding of the adverse effects of climate change through detailed country case studies and the development of improved methods to identify appropriate adaptation options. The availability of an improved set of consistent methods to assess climate change impacts and adaptations will facilitate the identification of appropriate adaptation measures.

The activities under this proposal would not otherwise have been undertaken by the countries to address their development goals. Both, the efforts to further improve methods for assessing the impact of climate change and adaptations and "studies of possible impacts of climate change" are required on account of the UNFCCC. The baseline does not involve any action or expenditure. The incremental costs for this project, consequently, are the full costs.

UNEP as implementing body for the WCIRP and through its close links with the IPCC has long experience in climate impacts related studies. UNEP has also broad experience in other climate change related country studies, including the project "Country Case Studies on Sources and Sinks of Greenhouse Gases" which received US\$ 4.7 million funds from the GEF pilot phase. Therefore UNEP is in a unique position to further advance the scientific technical understanding of climate change impacts and adaptation. However to effectively respond to the needs of the UNFCCC requires a programme that goes beyond the regular activities of UNEP Atmosphere Sub-Programme and builds stronger endogenous capacities in all the participating countries.

**BUDGET**

<b>BUDGET ITEM</b>	<b>1995</b>	<b>1996</b>	<b>TOTAL</b>
Country studies & national workshops	700,000	700,000	1,400,000
Consultants (technical assistance to countries)	100,000	100,000	200,000
Consultants (methods & specific support)	30,000	10,000	40,000
International workshop		125,000	125,000
Steering Group meetings		25,000	50,000
Participation in other workshops	40,000	35,000	75,000
Project Coordinator UNEP	25,000	25,000	50,000
Travel	10,000	15,000	
Reporting Costs		15,000	15,000
Evaluation		10,000	10,000
Communication	5,000	5,000	10,000
<b>TOTAL</b>	<b>935,000</b>	<b>1,065,000</b>	<b>2,000,000</b>

## TECHNICAL OPINION

### COUNTRY CASE STUDIES ON CLIMATE CHANGE IMPACTS AND ADAPTATIONS ASSESSMENT PHASE 1

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#### SUMMARY

The project has a very important goal, but it needs more elaboration regarding the management steps in project development, allocation of institutional responsibilities and international review of the findings. The need for international coordination of a climate impacts project was emphasized and it was recommended that the project be implemented as part of the World Climate Impact and Response Strategies Programme (WCIRP).

On country selection, the need to have countries with different socio-economic conditions and climates was re-emphasized. It was recommended that an island state participate in the case studies. The need for clear guidance on methodological aspects, especially on scenario selection was stressed. This aspect was also raised by STAP. The technical review proposed that the potential of adaptation measures to mitigate climate change be examined. The rationale for UNEP acting as programme manager needs clarification, and possible partners for project implementation were proposed.

The following specific amendments were recommended:

- make the project a part of the WCIRP;
- establish a review procedure with experts outside UNEP, which includes the Scientific Advisory Committee (SAC) of WCIRP, to carry out a mid-term review and a review at the end of the project;
- the payment to countries must depend on the contribution given by countries themselves;
- the selection of scenarios has to involve experts of climate diagnostics and climate modelling.

#### AGENCY RESPONSE

The project document presented to the GEF Council reflects the suggestions and recommendations raised in the technical review. The project will be implemented as part of the WCIRP. Experts from SAC as well as other external experts will form a Steering Group to provide guidance on project implementation and evaluation. The need for country contributions, the role of country teams and institutions providing technical assistance, as well as the involvement of IPCC and other experts in the selection of methods and scenarios are spelled out more clearly. The specific contribution of each country will be determined on a case-by-case basis, taking fully into consideration the comments of the reviewer. The selected countries are one from each of the four regions eligible for GEF funding - Africa, Asia, Latin America and Eastern Europe - and they represent different climates and socio-economic conditions. One island country will participate in the country case studies. Following the decision of GEFOP, the training component will be developed at a later stage.