



Foreign & Commonwealth Office

## Global Opportunities Fund – Climate Change and Energy Programme

### Newsletter of the project

#### Using Regional Climate Change Scenarios for Studies on Vulnerability and Adaptation in Brazil and South America (GOF-UK-CPTEC)

Year 1 - #1 - September 2005 - Semestral Distribution

### Project strategy summary

To provide high resolution climate change scenarios in the three hot spots (most populated and economically important basins in South America: Amazon, Sao Francisco and Parana-La Plata) in South America for development of studies that should lead to raising awareness among government and policy makers in assessing climate change impact, vulnerability and in designing adaptation measures.

### Project Issues to be addressed by GOF-UK-CPTEC

1. Characterization of the impacts of interannual-interdecadal climate variability and human-induced change on hydrologic processes;
2. Determination of the impacts of these climate and hydrologic variations on water resources for hydroelectric operations, agricultural systems, and human health and activities;
3. Enhancement of the capabilities of regional operational and research prediction systems in the basin, both in terms of science and infrastructure-Capacity building;
4. Combination of efforts of science and policy for developing successful strategies to cope with climate and hydrological changes, at national and regional levels in South America.

### Background

CPTEC, in collaboration with various others institutions in Brazil, has been running a project aimed at developing downscaled scenarios for South America (PROBIO-GEF). It uses a global model provided by the Met Office Hadley Centre (HadAm3P), coupled with four regional models, to produce fine-scale regional climate change scenarios for present (1961-90) and future (2071-2100) climate.

More accurate regional future climate change scenarios will focus on three regions: The São Francisco River basin in Northeastern Brazil, The Amazon basin and Parana-La Plata Basin in Southeastern South America.

The projections will also focus on three key issues: agriculture, hydroelectricity (due to Brazil's wide-scale use of hydro-electric power) and human health.

Assessments of climate change scenarios for the future in these regions will be provided and analysis of vulnerability and mitigation measures.

On what concerns the key issues will be put forward to both the scientific community and decision makers.

**Partners:** CPTEC (leader), USP, EMBRAPA, ANA, ONS, FBDS, UFRGS, INMET, FIO-Brazil; Argentina (INTA, UBA/CIMA); Peru (SENAMHI, UNALM); Ecuador (INAMHI), Bolivia (SENAMHI), Colombia (IDEAM), Uruguay (INA, SMN), Paraguay (DHN). Itaipu Binational (Paraguay-Brazil), Salto Grande (Uruguay), Yacireta (Paraguay-Argentina). Look for contacts with hydroelectric operators in Colombia, Ecuador, Peru.

The project also entails strong scientific collaboration with the UK Hadley Centre in sharing knowledge and capacity for the implementation of climate change scenarios at a more detailed and precise scale than is currently being done.

The project also looks for strong collaboration with the GWSP-ESSP for understanding how society can best adapt to future climate changes.

Both Brazil and other countries in the region would benefit greatly from this initiative, as it would provide more comprehensive treatment of uncertainties by increasing the range of future climate projections (i.e. plausible representations of the future and not merely predictions of the future) available to all.

Furthermore, the concept of stakeholder and policy maker engagement in natural sciences research in Brazil is undergoing initial and incipient development. Traditionally, engagement of those actors has been the ground of the social sciences.

However, it is very clear that the road connecting scientific knowledge to policy making and implementation has not been fully paved as yet in Brazil, but it is mandatory if the results of environmental science are effectively to benefit society.

### What benefits do expect to last beyond the project and how will the project ensure these benefits are sustained?

Even after this project is completed, delivered outputs will continue to be made available through CPTEC and centers involved and partner organizations to anyone interested in using climate change scenarios for research about impacts or vulnerability.

The web site to be designed as an output for this project will store regional climate change scenarios produced by the models and will be operational even after the project completion.

Location Sao Francisco River Basin  
Source: Project ANA/GEF/PNUMA/OEA



Location Amazonian River Basin

Location Parana-La Plata River Basin





## Global Opportunities Fund – Climate Change and Energy Programme

### Newsletter of the project

#### Using Regional Climate Change Scenarios for Studies on Vulnerability and Adaptation in Brazil and South America (GOF-UK-CPTEC)

Year 1 - #1 - September 2005 - Semestral Distribution

New initiatives and projects will add new material to the web site and, in that sense, this project's results will be continually updated and improved.

Implementation of a network of scientists and policy makers to be built by the project will be strengthened over time, thus resulting in permanent co-operation between products of scientific research and decision/policy making process.

### Approach

In this project, we envisage a three-pronged approach to engage stakeholder and policy makers with its results for effective use of more credible regional scenarios of climate change for South America.

- a) Firstly, we are going to influence government policy makers in charge of implementing nationally the global environmental conventions and other environmental programs in Brazil and other countries involved;
- b) Secondly, we are participating in climate change *fora* in Brazil and in some international projects on Amazonia and the La Plata Basin, to broadly divulge project results to stakeholders from many sectors of society; and,
- c) Thirdly, we are going to organize two meetings with stakeholders from government and private sectors for all countries involved.



#### a) Policy makers from government

We plan to communicate results of the project to Brazilian government policy makers through participation in activities carried out by national committees for the four global environmental conventions: Climate Change, Biological Diversity, Combat of Desertification, and International Waters.

Therefore, the results of the project will reach immediately the government policy makers in charge of implementing those conventions within Brazil and other countries involving international treaties and cooperation: ATC (Amazon Cooperation Treaty), MERCOSUR, Andean Market.

In particular, for the latter, information on change of occurrence of climate and weather extremes will prove to be a most valuable information for the design of the system to cope with natural disasters. Most of these projects are Brazilian initiatives but have strong collaboration of other countries via agreements and projects: LBA in Amazonia, GEF funded PLATIN in the La Plata Basin, as well as the São Francisco River project funded by ANEEL-WMO.

#### b) Participation in Climate Change Fora and working groups

“Fórum Brasileiro de Mudanças Climáticas” (Brazilian Forum on Climate Change). This is a high level forum whose members are from the academic community, policy makers and stakeholders in Government, industry and NGO's.

Regular meetings (CLIVAR, GHP-GEWEX, GWSP, IAI, IGBP, ICTP-TWAS, Regional and international Professional meetings and Conferences-AMS, EGU, IAMAS, IAHS, SBMet, SBAgromet, ABRH, FLISMET...).

#### c) Organization of Stakeholder and Policy Maker Meetings

The project will promote three different opportunities for meetings with stakeholders and policy makers.

The first one will be carried out at the beginning of the project to scope stakeholder needs of climate change projections and to inform them about available information and its uncertainties.

The second one will be carried out towards the end of the project and will communicate the advances on projections at the regional scale for South America and guide the stakeholders in the use of those scenarios.

The third event, an international conference, will be held in Brazil at the end of Year 3 to congregate both scientists and non-scientists.

#### Activities are divided in years (Starting in July 2005)

**Year 1)** Development of regional climate change scenarios using the set of global and regional climate models for climatology scenarios, complementing the work that has been done as part of PROBIO-GEF project in 2004. Although preparation of models will happen mainly during the first year, feedback on the impacts will be provided during following years in order to account for uncertainties.





## Global Opportunities Fund – Climate Change and Energy Programme

### Newsletter of the project

#### Using Regional Climate Change Scenarios for Studies on Vulnerability and Adaptation in Brazil and South America (GOF-UK-CPTEC)

Year 1 - #1 - September 2005 - Semestral Distribution

**Year 2)** Continuation of development of regional climate change scenarios using the set of global and regional climate models. Dissemination of information about the designed scenarios within the scientific community. Interactions with user communities and application of models and strategies using climate change scenarios.

**Year 3)** Targeted campaign to disseminate scientific research to a wider non-scientific audience, raising awareness of policy and decision makers about climate change impact, vulnerability analyses and design of adaptation measures in the region. Hot spots: Semiarid NE Brazil, Amazonia, Upper Parana basin.



### Expected outputs

The regional projections of climate change produced in years 1 and 2 will be made available to scientists in the form of reports and technical notes.

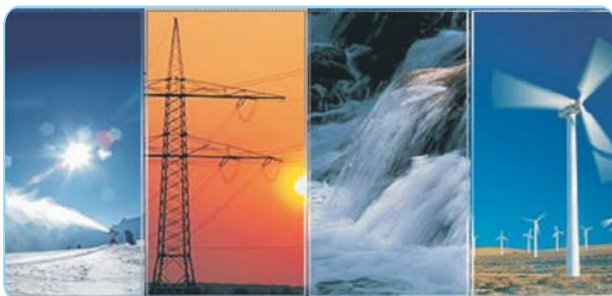
To non scientists, students and policy and decision makers information will be provided on a specially designed website, in various languages, technical reports, GIS (Geographical Information Systems) products, CDs and DVDs.

Two workshops will be prepared for non-scientist audience. The first will be held in Year 1 and a second workshop will be held in Year 3.

An international conference will be held in Brazil at the end of Year 3 to congregate both scientists and non-scientists (joint with GWSP?).

### Expected products and deliverables

- ✍ Development and transferability of methods for assessing consequences of climate change
- ✍ Vulnerability indicators of social impacts
- ✍ Development of protocols and guidelines
- ✍ Future scenarios for agricultural development
- ✍ Future scenarios for hydroelectric operations and development
- ✍ Future scenarios for water demand for human settling
- ✍ Future scenarios for health and disease spread
- ✍ Future scenarios of wind and solar energy potential
- ✍ Capacity building, training and educational activities including publication of educational materials, web sites and GIS material
- ✍ Development of "white papers" jointly between scientists and policy makers.



### Expected impact

The availability of regional climate change models for contrasting scenarios such as the A2 (high emissions) and B2 (low emissions) and the provision of these scenarios to government authorities will potentially impact on decision and policy making.

We expect that developed climate change impact modelling will be applied at both the basin and state levels, using suggested vulnerability analyses and adaptation measures.

It is also expected that the models will be relevant and useful to countries in the three basins (Brazil, Argentina, Peru, Bolivia, Ecuador, Colombia, Paraguay and Uruguay), as these countries will have access to data and any other generated product as requested.



Project "Using Regional Climate Change Scenarios for Studies on Vulnerability and Adaptation in Brazil and South America (GOF-UK-CPTEC)"

José Marengo, Leader and Manager

Carlos Nobre, Researcher

Cassiano D´Almeida, Researcher

Igor Andreevich Pishnitchenko, Researcher

Diana Raigoza, Researcher and editor

Josiane C.M de Oliveira, Administrative Assistant

Centro de Previsão do Tempo e Estudos Climáticos - CPTEC-

Rodovia Presidente Dutra, Km 40, SP-RJ

12630-000, Cachoeira Paulista, SP, Brazil

Telephone: +55 (12) 3186-8633

Fax: +55 (12) 3101-2835

Email contact: marengo@cptec.inpe.br /

draigoza@cptec.inpe.br / josi@cptec.inpe.br