Intergovernmental Panel on Climate Change (IPCC)
Task Group on Data and Scenario Support for Impact and Climate Assessment (TGICA)

Framework to facilitate development of appropriate data products and research capacity in developing and transition-economy countries

Background:

The TGICA is a specialized body of the IPCC that distributes data and scenarios to support research and assessment across the three IPCC working groups. The TGICA coordinates a Data Distribution Centre (DDC) which provides data sets, climate and related socio-economic/environmental scenarios, and other materials (e.g., technical guidelines on the use of scenarios). TGICA contributes to capacity building in the use of data and scenarios in developing and transition-economy regions and countries. TGICA has approximately 20 members drawn from the research community and is co-chaired by Richard Moss (US) and Jose Marengo (Brazil).

At its 24th Plenary in Montreal (September 24-26, 2005) IPCC endorsed a proposal by the TGICA to facilitate development of appropriate data products and research capacity in developing and transition-economy countries.

Data and scenario issues:

Currently, climate and related socio-economic data and scenarios are frequently not available at the time and spatial scales needed for research on impacts and adaptation in developing and transition-economy countries. For example, for climate scenarios, GCM data tends to be made available in the form of monthly means of selected variables. This poses a notable limitation on the many aspects of the impacts research and evaluation of adaptation options.

Some progress on this front has occurred with the PCMDI data archive of GCM simulation output, where daily mean values for time slices of 20th century and future simulations are available, along with some derivative indices of extremes as represented by the GCMs. Unfortunately, access to large data archives by climate change scientists within developing and transition-economy nations is limited by infrastructural problems, e.g., limited or prohibitively expensive bandwith that makes data transfers extremely problematic. In many cases data are disseminated in forms that are not readily usable by non-specialist researchers and require simplification. Finally, data resolution and representation often present problems. Frequently, large data sets must be downloaded and processed so that researchers can sift through and extract only a small subset of data that are relevant to their sector or region. A key limitation in developing appropriate data products is the availability of trained personnel to produce (let alone disseminate and support the use of) downscaled and tailored output along with the supporting meta-data.

Capacity issues:

It is recognized that the scientific community within developing and transition-economy nations is not lacking in theoretical knowledge but rather experience in conducting climate and impacts research. This is tied to the nature of the research environment and includes a number of issues such as a limited critical mass of researchers within any one institution, the tendency for short project-based activities that do not result in sustained research threads, rapid loss of scientists into administration or to developed nations, limited funding resources and the sustainability of research on climate change, impacts, and adaptation, and other related issues such as difficulties in travel and communications. In addition, there is a need for enhancing local capacity in the development and use of regional-scale climate change scenarios. Experts in impacts research on specific sectors or regions are not sufficiently familiar with the uses and limits and climate data and scenarios and various methods for developing data at appropriate temporal or spatial scales to make good use of those data that exist.

Framework for action:

The IPCC does not have a mandate to conduct training and fellowship programs, so the TGICA is proposing a framework for training and overcoming capacity limitations that could be implemented by an agency with experience in capacity building, such as the System for Analysis, Research, and Training (START). The TGICA framework relies on establishment of a network of post-doctoral or early career scientists located in (1) capacity rich developed countries, (2) capacity "middle class" developing countries, (3) and capacity/resource limited developing countries. The framework stresses mentorship and guidance to provide practical experience in developing and disseminating appropriate data products based on emerging resources growing out of coordination of GCM model output, the growth in scope of this output, and the complementary albeit slow increase in derivative products relevant to the impacts community. Successful realization of this framework will require identification of not only an implementing agency, but also sponsors who can support the limited costs of the proposal.

Under the framework, postdocs in the developed countries would be responsible for addressing issues of data access and dissemination using media and formats relevant to end users, along with support documentation and guidance.

Through this mechanism, climate change data resources would be accessible to regional scientists in the "capacity middle class" – those with the need and resources to handle this data directly but with limitations (such as bandwidth) that effectively restrict the access. To address such capacity issues, strengthening of existing regional research nodes (or establishment of new nodes) should be considered.

Scientists in the capacity middle class countries would be responsible for further development of the data resources into forms relevant to the needs and capacity of the regional research community. They would also play a mentoring role in facilitating scientists in the "capacity poor" regions. Additional junior scientists and post-docs drawn

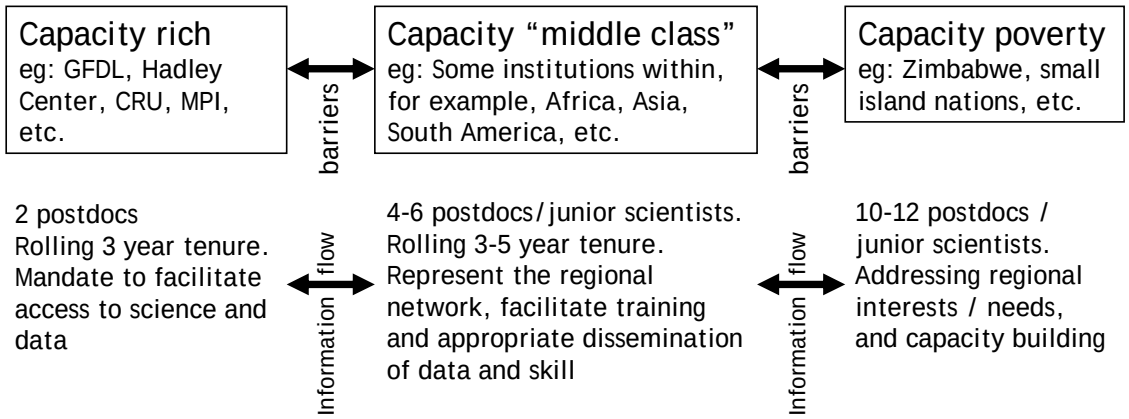
from the capacity poor regions would receive usable data with which to address their specific regional needs.

Resources should be available to permit the postdocs to rotate to different nodes in the network to gain experience in nations of different status.

The network would facilitate communication between scientists of different communities, ready access to appropriate data and skills, and a means for effective mentoring while growing the experiential skill base of all communities. Scientists in more capacity rich communities would benefit from access to the regional expertise essential to any relevant regional climate impacts research, as well from access to regionally held data archives currently unavailable to the broader community.

TGICA believes that implementing this on a medium term basis (5-10 years) would be relatively cost effective (especially as measured against much of the current investment in capacity building).

Schematic of TGICA Framework for Developing Appropriate Data Products and Scientific Capacity



Add volunteer regional oversight/mentor scientists

Use an implementation agency such as START

At average $40k/person + some overheads = ~$1million/year

= $10 million over 10 years

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