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PROGRESS REPORT

Task Group on Data and Scenario Support for Impact and Climate Assessment (TGICA)

(Submitted by Dr Jose Marengo and Dr Richard Moss, Co-Chairs
on behalf of the Task Group)

Progress Report

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On behalf of the Task Group

1. Background

1.1 The mandate of the TGICA is to facilitate wide availability of climate change related data and scenarios to enable research and sharing of information across the three IPCC working groups. The TGICA coordinates a Data Distribution Centre (DDC), which provides data sets, climate and other scenarios, and other materials (e.g., technical guidelines on the use of scenarios). It identifies information needs in support of IPCC work, facilitates research on climate impacts, adaptation, and mitigation, and makes related recommendations on cross-cutting issues. TGICA contributes to building capacity in the use of data and scenarios for climate-related research in developing and transition-economy regions and countries. The TGICA also convenes expert meetings on an as needed basis.

1.2 The TGICA held its 10th session in Sao Paolo, Brazil, from 19-21 April 2005. The session included presentations by Dr Luis Pinguelli Rosa, the Executive Secretary of Brazilian Forum on Climate Change, which advises the president of Brazil on issues related to climate change, and Dr. Carlos Nobre, an emeritus member of TGICA who described several ongoing research projects in Brazil on land use/cover change and potential climate change impacts. During the session, the Task Group prepared an input to the IPCC workshop on Emissions Scenarios in response to the invitation of the IPCC Secretary. This submission is available in the report of the workshop.

1.3 This brief report highlights a proposal by the TGICA to facilitate development of appropriate data products and research capacity in developing and transition-economy countries. Much briefer updates are provided on other ongoing TGICA activities including improvements to the DDC, facilitating access to the WG I AR4 model archive for impacts/adaptation research, and development of a proposal for an expert meeting on regional analyses, interactions, synthesis, and data. A concluding session notes budgetary needs for travel support during the coming year to sustain the TGICA workplan.

2. Enhancing capacity to prepare, disseminate, and apply climate change data in research on impacts and adaptation in developing and transition-economy nations

2.1 During several recent meetings, TGICA has discussed a variety of challenges to research on climate change impacts and adaptation that are especially relevant for developing and transition-economy countries. The challenges may be viewed as falling within two categories: issues related to data, and issues to do with the scientific capacity.

Data Needs

2.2 In terms of historical observation data, there is a critical need for daily records of meteorological variables spanning multi-decade periods. Currently available data are inadequate both in terms of temporal and spatial coverage for either evaluation of model data and statistical/empirical downscaling. Access to historical archive data is limited; some station data are held in the archives of NCAR and other similar centers, but these are typically only a subset of the full original data and remain difficult to access by researchers not holding accounts with the centers. Compounding this, much historical data record still resides in national archives and is not released for policy reasons. In some cases these data still remain as paper archives and are in urgent need of data rescue.

2.3 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. Some progress on this front has occurred with the PCMDI data archive of GCM simulation output, where daily mean values for time slices of the future and 20th century simulations are available, along with some derivative indices of extremes as represented by the GCMs.

1 *Data Access*

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3 2.4 Unfortunately, access to large data archives by climate change scientists within developing and
4 transition-economy nations is limited by infrastructural problems, e.g., limited or prohibitively expensive
5 bandwidth that makes data transfers extremely problematic. In many cases data are disseminated in forms that
6 are not readily usable by non-specialist researchers and require simplification (for example, the relatively
7 common GRIB format). While code fragments are sometimes made available to facilitate this, the code is
8 often not readily transportable to different computing platforms. Finally, data resolution and representation
9 often present problems. Frequently, large data sets must be downloaded and processed so that researchers
10 can sift through and extract only a small subset of data that are relevant to their sector or region.

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12 2.5 Some of the difficulties experienced by the impacts community in accessing relevant GCM data
13 would be alleviated if regionally specific and tailored climate change data products were developed and
14 disseminated. However, at present no organization known to TGICA members undertakes this service or
15 even coordinates production (let alone dissemination) of downscaled and tailored output along with the
16 supporting meta-data.

17
18 *Scientific capacity*

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20 2.6 It is recognized that the scientific community within developing nations is not lacking in theoretical
21 knowledge but rather experience in conducting climate and impacts research. This is tied to the nature of the
22 research environment and includes a number of issues such as a limited critical mass of researchers within
23 any one institution, the tendency for short project-based activities that do not result in sustained research
24 threads, rapid loss of scientists into administration or to developed nations, limited funding resources, and
25 other related issues such as difficulties in travel and communications, and the sustainability of research on
26 climate change, impacts, and adaptation. In addition, there is a need for enhancing local capacity in the
27 development and use of regional-scale climate change scenarios.

28
29 *Emerging opportunities*

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31 2.7 The recent coordination of GCM model output, the growth in scope of this output, and the
32 complementary albeit slow increase in derivative products relevant to the impacts community, suggests a
33 significant window of opportunity if appropriate frameworks and resources can be put in place in a timely
34 manner. With the apparent acceleration of climate change impacts this is a matter of some urgency. To
35 support a coherent approach to advancing the impacts and adaptation activities across developing and
36 transition-economy nations, there is a need to establish an appropriate framework within which such
37 developments may take place. In particular, such a framework must support activities that develop capacity
38 and facilitate the dissemination of and access to regional scenario products and information.

39
40 2.8 While the logistical and practical implementation of any framework to enhance climate change
41 research activities will naturally take a form unique to the region in question, TGICA suggests some points
42 of principle around which to base progress.

43
44 i. Mentorship and guidance that crosses the boundaries of traditional disciplines of modeling,
45 downscaling, impacts research, etc. This could take both passive and active forms; through internships,
46 oversight activities, etc., coupled with the development and proactive dissemination of a broad resource
47 base of support material tailored to relevant communities of scientists. Of importance here is a sustained
48 initiative that remains engaged with the different communities and that provides incentives for mentors
49 to remain active in the face of many competing demands on their time.

50
51 ii. Recognize the infrastructural limitations of developing and transition-economy nations, and
52 disseminate low-technology data products. Of immediate benefit would be the availability, at cost or
53 less, of CDs, DVDs, and other simple media forms containing data products relevant to targeted sectors
54 and regions which include appropriate software tools geared to the skill-base and resources of the
55 regional scientists.

1
2 iii. Facilitate access to trans-national regional historical data, and assist in data rescue. Both political
3 and infrastructural barriers exist that limit the availability of such data. Access to these data could
4 enhance understanding of regional systems and their potential responses to global climate change
5 forcing.

6
7 iv. Develop tailored products for the regions, reducing the additional preparation load of data
8 currently distributed in more raw forms. This would include appropriate RCM/empirical downscaled
9 products, GCM skill assessment, and derivative products of climate statistics related to, for example,
10 extremes, dry spell duration, threshold exceedence, etc.

11
12 2.9 These are principles not intended to guide IPCC activities per se, but suggestions for IPCC member
13 governments to use in planning additional initiatives to promote data access and capacity building. TGICA
14 urges governments and organizations to be proactive in developing such a program. The Task Group would
15 be pleased to serve as a resource and an information clearing house for tracking and disseminating
16 information about relevant initiatives.

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18 2.10 In addition, the Task Group seeks sponsorship for development and dissemination of appropriate
19 data products based on current and future holdings of the DDC.

20
21 *Proposal for a research network linking early career scientists in capacity rich, capacity middle class, and*
22 *capacity poor countries*

23
24 2.11 Recognizing that the IPCC does not have a mandate to conduct training and fellowship programs,
25 TGICA has discussed a framework for training and overcoming capacity limitations that could be
26 implemented by an agency with experience in capacity building, such as the System for Analysis, Research,
27 and Training (START). The TGICA framework relies on establishment of a network of post-doctoral or
28 early career scientists located in (1) capacity rich developed countries, (2) capacity “middle class”
29 developing countries, (3) and capacity/resource limited developing countries. The framework stresses
30 mentorship and guidance as highlighted in paragraph 2.8(i) of this report.

31
32 2.12 Postdocs in the developed countries would be responsible for addressing issues of data access and
33 dissemination using media and formats relevant to end users, along with support documentation and
34 guidance. Through this mechanism, climate change data resources would be accessible to regional scientists
35 in the “capacity middle class” – those with the need and resources to handle this data directly but with
36 limitations (such as bandwidth) that effectively restrict the access. To address such capacity issues,
37 strengthening of existing regional research nodes (or establishment of new nodes) should be considered.
38 Scientists in the capacity middle class countries would be responsible for further development of the data
39 resources into forms relevant to the needs and capacity of the regional research community. They would also
40 play a mentoring role in facilitating scientists in the “capacity poor” regions. Additional junior scientists and
41 post-docs drawn from the capacity poor regions would receive usable data with which to address their
42 specific regional needs. Resources should be available to permit the postdocs to rotate to different nodes in
43 the network to gain experience in nations of different status.

44
45 2.13 The network would facilitate communication between scientists of different communities, ready
46 access to appropriate data and skills, and a means for effective mentoring while growing the experiential skill
47 base of all communities. Scientists in more capacity rich communities would benefit from access to the
48 regional expertise essential to any relevant regional climate impacts research, as well from access to
49 regionally held data archives currently unavailable to the broader community.

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51 2.14 TGICA believes that implementing this on a medium term basis (5-10 years) would be relatively
52 cost effective (especially as measured against much of the current investment in capacity building).

1 **3. DDC management**

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3 3.1 TGICA members reviewed and approved updates to the DDC <<http://ipcc-ddc.cru.uea.ac.uk/>>. The
4 Group discussed ways to improve the user-friendliness of the DDC, particularly for developing-country
5 users. It also adopted internal guidelines intended to improve the management of the DDC and established a
6 working group that will take responsibility for interacting with DDC managers in between regular meetings
7 of the Task Group to facilitate ongoing maintenance and updates to the site.

8
9 **4. Access to AR4 model archive for impacts/adaptation research**

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11 4.1 Following discussions at TGICA-9 (September 2004), the TGICA Co-Chairs wrote to PCMDI
12 requesting permission to download a subset of variables from the WG I AR4 model runs that are stored at
13 PCMDI and to make these data available for impacts researchers through the DDC. The request was
14 approved by PCMDI. The TGICA thanks PCMDI for their cooperation. The data are being downloaded to
15 the GCM archive within the DDC held at the Max Plank Institute in Hamburg. Data transfer is proceeding,
16 and it is hoped that all of the requested data will be downloaded by October 2005. Seven experiments (of the
17 12 archived at PCMDI) will be placed on the DDC. Only a subset of variables relevant to impacts research
18 will be archived. Extreme events indices will be included when these have been reported by participating
19 modeling groups.

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21 **5. Expert meeting on regional analyses, interactions, synthesis, and data**

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23 5.1 The TGICA discussed and agreed to develop a proposal for a 3-day expert meeting on long-term
24 data development issues associated with regional research and assessment. It is intended that the meeting
25 will provide a forum for exploring the relationships among the data needed and produced by the different
26 research communities represented by IPCC's three working groups. The focus of the meeting would be on
27 future demands for regional information and on data, scenario, and research needs to facilitate investigation
28 of the interactions of climate variability and change, regional vulnerabilities, and strategies for adaptation
29 and mitigation. The meeting would also aim to create sustainable communication channels among the
30 research communities involved. If useful, the meeting will explore conceptual issues related to the
31 organization of regional aspects of future IPCC reports. A proposal will be prepared for comment by the
32 working groups. Two possible periods for holding the meeting have been identified to avoid periods of over-
33 commitment on the part of those involved in the AR4: late June/early July 2006, or the week of 12 February
34 2007.

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36 **6. Workplan and budgetary needs**

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38 6.1 During the coming year, TGICA priorities will include continued work on preparation and
39 dissemination of appropriate data products to facilitate impacts and adaptation research in developing and
40 transition-economy countries. The Task Group will also continue to improve the DDC, to update and expand
41 the range of technical guidelines to support users, and to address unmet data needs by expanded DDC
42 holdings.

43
44 6.2 The IPCC budget includes resources for two meetings (20 journeys) of the Task Group. The next
45 meeting of the TGICA will be held in Cape Town, South Africa from 7–9 February 2006. A second meeting
46 will be held during 2006. If the regional expert meeting is held and scheduled for June/July 2006, the TGICA
47 session will be scheduled jointly with the expert meeting. An additional 15 journeys are requested for
48 holding the expert meeting.

49
50 6.3 The core activity of the Task Group, the DDC, continues to receive support from the governments of
51 the United Kingdom, Germany, and the United States. Additional support has been received from the
52 government of Finland. The TGICA gratefully acknowledges this support. We note that additional support
53 will be required to enhance the products and services provided by the DDC, for example preparation and
54 dissemination of regionally-oriented DVDs containing data relevant to researchers in a particular region.