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TASK GROUP ON DATA AND SCENARIO SUPPORT FOR IMPACT AND CLIMATE ANALYSIS (TGICA)

Progress Report

(Submitted by the Co-Chairs of TGICA)

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INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

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

UNEP

Progress Report: Evolving Landscape of Data and Scenario Support for Climate and Impact Analysis

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

1. Background

1.1. The Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA) facilitates distribution and application of climate change related data and scenarios. The TGICA is an advisory body composed of individuals nominated by governments and accredited organizations and selected to serve on the basis of their personal expertise. Members serve on a voluntary basis. TGICA does not have an operating budget apart from modest resources allocated by the IPCC. These resources support participation of members from developing and transition-economy countries and the convening of approved expert meetings and workshops.

1.2. The TGICA oversees a Data Distribution Centre (DDC) which provides data sets, scenarios of climate change and other environmental and socio-economic conditions, and other materials (e.g., technical guidelines on the use of scenarios). Operation of the DDC is shared by the British Atmospheric Data Centre (BADC) in the United Kingdom; the World Data Center Climate at the Max-Planck-Institute for Meteorology (WDCC/MPI-M) in Hamburg, Germany; and the Socioeconomic Data and Applications Center (SEDAC) operated by the Center for International Earth Science Information Network (CIESIN) at Columbia University, New York, USA. Each of these institutions has voluntarily taken on responsibility for managing access to a subset of the data and information provided by the DDC.

1.3. The 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.

1.4. The TGICA held its 15th session in Geneva from 17 - 19 November 2008. This is the final report from this cycle of the Task Group, as the membership must now be refreshed in accordance with the Task Group mandate (Attachment 1). This report provides recommendations and suggestions to the IPCC Bureau regarding the process for refreshing the membership and the need for increased support for the Task Group. It also includes recommendations to next membership regarding activities for their coming term.

2. Evolving landscape for data and scenario support

2.1. The Task Group was established following a recommendation made at the IPCC Workshop on Regional Climate Change Projections for Impact Assessment (London, 24-26 September 1996). At that time, and as reflected in the Task Group mandate, the primary purposes of the TGICA have been to facilitate (i) distribution of climate change related data and scenarios to enable research, and (ii) sharing of information across the three IPCC working groups.

2.2. Since this focus was determined, a great deal has changed regarding needs and services for data and scenarios. Most significantly, the community of users has evolved from a relatively small group of researchers focusing on global-scale modeling of the impacts of climate change, to a large and diverse set of actors all across the world, including national, state/provincial, and local entities, business and industry, non-governmental organizations, and community groups, as well as through the UNFCCC Nairobi Work Programme on adaptation. Interests have shifted from “detection and attribution” to “response strategies” that

integrate adaptation and mitigation with sustainable development at scales far smaller than IPCC traditionally addresses in its assessment reports. Users are increasingly interested in mid-term time scales going out 30-50 years, as well the traditional long-term focus of scenarios to 2100. The more diverse group of users has a far more diverse set of data and scenario needs, including data products more appropriate to settings with limited computational, communications, and research capacity.

2.3. The process for preparation of scenarios has also changed. The IPCC convened an expert meeting, "Towards New Scenarios for Analysis of Emissions, Climate Change, Impacts, and Response Strategies," which was held in Noordwijkerhout, the Netherlands in September 2007, to provide a forum for coordination of plans developed by the research community. The resulting process, described in a meeting report, is designed to realize the potential of a more open, interdisciplinary process with a larger number of interactions across the climate modeling, impacts/adaptation/vulnerability, and integrated assessment modeling communities.

2.4. These changes provide new challenges and opportunities for the next TGICA.

2.5. In the view of the outgoing membership, the DDC should continue to provide a "one-stop repository" for data from IPCC sources, quality controlled and carefully vetted, and operating within a mandate from the IPCC. In addition, it should provide pointers to other centers and groups for data beyond its current holdings but needed for impacts, adaptation, and mitigation assessments. Specifically the Task Group and DDC should continue to focus on:

1. Archiving/distributing new data from scenarios on both long and intermediate-term projections as they come on line from the new scenario development process.
2. Pointing to high resolution observational data sets—with guidance on their use in observed impacts analyses.
3. Pointing to regional high-level resolution information beyond GCMs
4. Providing and pointing to updated socio-economic information at scales needed for impacts, adaptation, and mitigation assessments.
5. Providing and pointing to other environmental information on sea level, storm surge, air pollution, and other issues.
6. Developing, providing, and pointing to resources such as technical guidelines and exemplar studies at different scales, showing how different assessments have been carried out.
7. Continuing to plan and hold expert meetings and workshops that advance the state of research and assessment, and that contribute to building an improved basis of information for future IPCC assessments.

2.6. A number of changes and new directions should also be considered, within the mandate of the group:

1. Because of the changing user community and the proliferation of portals and organizations providing support to users of climate information, there is an increased need for coordination to maximize use of scarce resources. The TGICA membership should evolve to include a larger number of representatives of other organizations such as the Global Climate Observing System (GCOS) which seek to provide data and scenarios, as well as representatives of the expanded set of users.
2. The TGICA will need to increase efforts to encourage development and dissemination of more appropriate data products derived from GCMs and regional models, and more contextual information to ensure data is used properly and not to support mal-adaptation.
3. There may be greater opportunities for the Task Group to provide technical guidelines and to serve as a focal point for case studies and other information on the types of research and assessment that are needed. The Task Group could play a valuable role in helping to advance the movement towards new systems/services needed to manage the risks of climate change, without expanding its role in providing these services itself.
4. While the Task Group has made some progress in bringing resources online to support the emerging science of detection and attribution of observed changes to physical, biological, and socio-economic systems, there is more to do. This should be considered as a priority focus going forward.

5. The TGICA should evaluate whether it can play a role in helping to coordinate higher resolution global regional modeling efforts, in conjunction with the World Climate Research Programme and others.

2.7. Collectively these considerations have resource implications for the refreshed TGICA. Secretariat support during the AR4 was provided in alternating fashion by the Technical Support Units of Working Groups 1 and 2, in contrast to the situation in earlier assessment cycles when a dedicated staff member from one Working Group supported the Task Group. TGICA members strongly recommend that support return to the earlier model to improve consistency and follow through from meeting to meeting. In addition, successful implementation of the TGICA's agenda requires staffing by an individual with a research or scientific background, whose own interests overlap with the issue of serving data important for analysis and assessment of climate change and response strategies. With adequate technical support, there is an important window of opportunity where the TGICA can offer a considered and reasoned facilitation in the time leading to AR5.

2.8. The remainder of this report focuses on specific recommendations for the Task Group's and DDC's future agenda for (i) data distribution; (ii) technical guidelines; (iii) training and capacity building; and (iv) support for the new scenario process.

3. Data archiving and distribution

3.1. Current holdings and usage

3.1.1. The IPCC Data Distribution Center (DDC) provides access to data across the range of IPCC activities, structured into climate observations, climate projections, and socio-economic collections. The role of the TGICA in approving materials and providing oversight, as well as the process through which the operations of the DDC are coordinated, is described in the DDC Governance Document (Attachment 2).

3.1.2. Each contributing organization provides distinct in-kind contributions to the DDC. BADC hosts a climate observation dataset at half degree resolution, covering 1901 to 2000, and other data derived from projections evaluated in previous IPCC Assessment reports. Additional data on reconstructed, observed and projected atmospheric carbon dioxide concentrations are provided. The WDCC provides a long-term reference data archive for global model data used in IPCC reports. Monthly means of selected model variables are disseminated via a web-based portal for all past IPCC assessment reports. Model data sets can be distributed via DVD for users lacking robust internet access. CIESIN's portion of the DDC serves as the "archive of record" for the detailed socioeconomic scenario data developed for the First Assessment Report (FAR), Second Assessment Report (SAR), and for the IPCC Special Report on Emission Scenarios (SRES). It also provides access to socioeconomic and environmental baseline data from early IPCC reports. User support is ensured through a collaboration between BADC, CIESIN, and the WDCC.

3.1.3. In the first 9 months of 2008, more than 500,000 page views were recorded, with 5,000-6,000 visitors to the site each month. In that period, 164,000 climatology files, 28,000 monthly mean data files, and 2,420 socioeconomic data files were downloaded. More than 5,000 copies of technical guideline documents were distributed. Access was recorded from more than 160 countries. Figure 1 provides additional information on the data accessed by users.

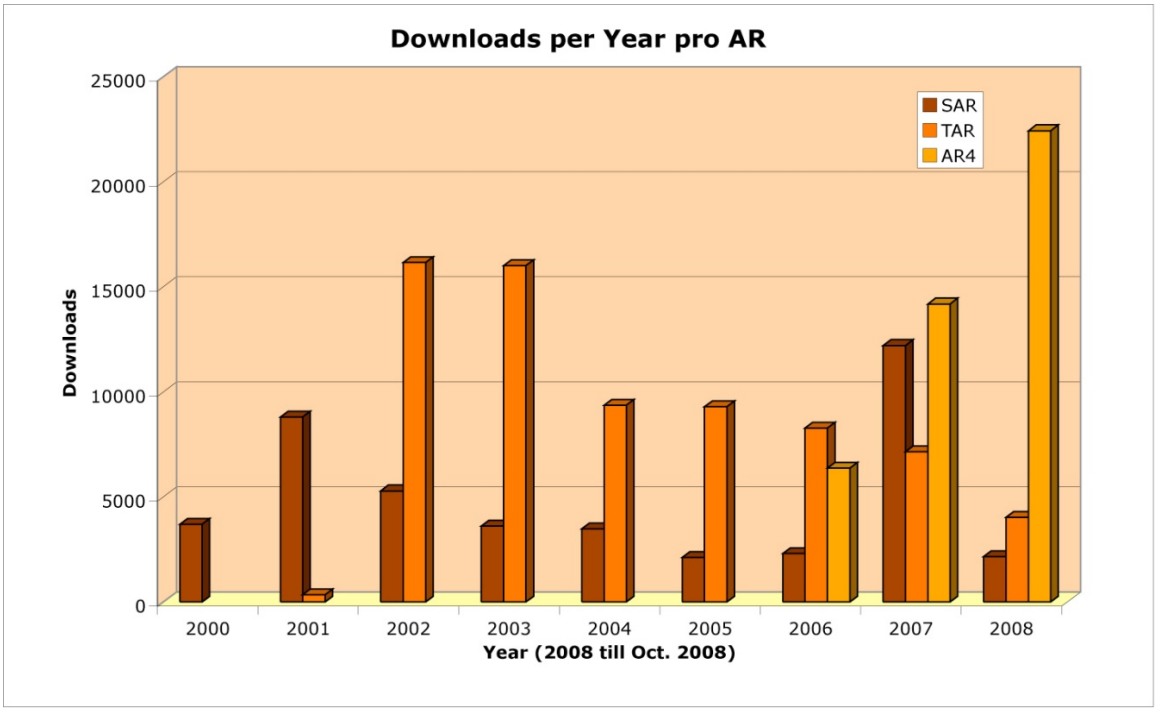

Figure 1. Annual downloads of model data sets from the SAR, TAR, and AR4.

3.2. Recent developments

3.2.1. A new visualisation tool deployed by BADC provides a unified graphical interface to observations and model projections.

3.2.2. In the near future, the DDC will disseminate a growing set of data produced during the Fourth Assessment Report (AR4). This will include observed climate impacts data from Chapter 1 of WG II and additional AR4 data from the WG 1 report.

3.2.3. The DDC is initiating data rescue of FAR climate model runs.

3.2.4. TGICA has contributed to preparations for climate model runs for the Fifth Assessment Report (AR5) by compiling a variable list for priorities for archiving of data from models runs to suit user needs. It has also developed a Memorandum of Understanding with the Program for Climate Model Diagnosis and Intercomparison (PCMDI) at Lawrence Livermore National Laboratory in the United States. Coordination with the World Climate Research Program (WCRP) is under way.

3.2.5. EU project funding has been secured to support data handling software development and user support. US support for the Socioeconomic portion of the DDC has been extended by NASA for five years (to July 2013) through the NASA SEDAC.

3.3. Evolving landscape and next steps

3.3.1. The DDC has evolved from simple data access to more sophisticated services and information products, motivated primarily by needs of the research/assessment community. These new services are useful for a wider audience, but to support this larger set of users well requires additional resources. Next Steps: Liaise with Working Group 2 about types of data services that will be most useful during preparation of the AR5. Solicit additional support.

3.3.2. As more regional climate model data become available, coordination of activities is needed at several levels, including data standards, access, and long-term archiving. Past experience working at global levels suggests that to meet increasing user demand and to use resources efficiently, it is essential to work in advance

to set up frameworks, find resources, and link with regional initiatives and archives where possible. Next Steps: Establish means to solicit new inputs for AR5 regional climate model runs and associated metadata; develop data management plans to address access and archiving needs.

3.3.3. The AR5 will need to draw on new climate/Earth system model runs that are currently under development by a wide range of modeling groups, including those involving coupled chemistry-climate processes. A schedule and criteria for sharing these data are needed. Next Steps: Establish intermediate criteria for information required in order for AR5 to judge quality and to meet preliminary qualifications (e.g., a model has been previously published, even if the current run has not been). Explore bringing selected coupled chemistry-climate model data into the DDC.

3.3.4. The observed impacts database developed for AR4 still has significant gaps in a number of world regions and types of impacts. Many more relevant cases may exist in the scientific literature, especially in journals published in developing countries or in languages other than English, or in new areas of potential impacts. AR5 authors may also wish to examine a set of cases using criteria modified from those used in AR4. Next Steps: Establish means to solicit new potential observed impact studies along with necessary metadata; develop data management plans to address access and archiving needs.

4. Methodologies and technical guidelines

4.1. Current status

4.1.1 The TGICA oversees preparation and distribution of technical guidelines on the use of scenarios. These documents are classified as IPCC "Supporting material" as defined in the Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports.

4.1.2. As of November 2008, three guidelines documents were available as PDFs for downloading from the DDC:

1. General guidelines on the use of scenario data for climate impact and adaptation assessment.
2. Guidelines for use of climate scenarios developed from statistical downscaling methods.
3. Guidelines for use of climate scenarios developed from regional climate model experiments.

4.1.3. In addition, there were three new guidelines documents under preparation:

1. Sea-level scenarios (this document was approved by TGICA-15, pending a small set of revisions to be carried out by the author team and overseen by a sub-group of TGICA).
2. Observed impacts (this document exists in draft form, and will be revised by the author team for consideration at TGICA-16).
3. Socio-economic scenarios (the contents of this document were discussed at TGICA-15 and will be developed into a draft report during the next 12 months).

4.2 Evolving needs for technical guidelines

4.2.1. The target audience of these guidelines documents is the climate impacts and adaptation research community, and the contents of the documents are technical in nature. However, as noted in section 2 of this report, the user base of the scenarios, data products, and supporting guidelines has broadened in recent years, as the importance of climate change adaptation has risen on the policy agenda. In addition to the research community, there are now increasing requests for information and guidance arising though the Nairobi Work Programme on adaptation, and from the resource managers, planners, NGOs and advocacy groups.

4.2.2. Some users have expressed the view that guidelines should be provided that are more accessible to a non-technical audience. However, it should also be noted that many other organizations are now providing information and guidance on the use of data and scenarios for a range of target audiences and regions. Some of this guidance refers to IPCC-based information; some uses information from other sources. Moreover, the quality both of the guidance and of the information it refers to is variable. This can be contrasted with the TGICA guidelines, which are subject to a peer review process and approval by the Task Group.

4.2.3. The primary target audience for TGICA guidelines remains the research community, and our highest priority should be to provide support on the use of data and scenarios held by the DDC or derived from these. Efforts should be made to identify the number and different categories of users through the DDC support team. We should not be competing with other agencies to provide guidance to all possible users. On the contrary, some of these other documents offer excellent sources of supplementary material that can be referred to by TGICA guidelines and/or linked to from the DDC. Nevertheless, it is still important to review user needs on a periodic basis, to ensure that the TGICA guidelines are comprehensible, informative, and relevant, and to reflect on the possible need for other methods of conveying this supporting information more effectively.

4.3. Updating and preparing new technical guidance materials

4.3.1. All three guidelines documents currently available at the DDC require updating from time to time. The general guidelines were revised in June 2007 to reflect emerging new information in the IPCC AR4, but will require a more substantial revision to capture new model developments, present examples from more recent literature, include new methods of scenario construction, and account for the process of new scenario development leading up to the IPCC AR5. This work should probably be undertaken during the next two years.

4.3.2. The two documents describing scenarios from statistical downscaling and from regional climate models require more urgent updating during the next 12 months to include new methods of downscaling and to describe emerging work on very high resolution climate modeling (e.g. for urban areas). The desirability of merging the two documents into a single set of guidelines for developing regional climate scenarios will also be explored.

4.3.3. In addition to the three guidelines documents already under preparation, some new candidate themes have been identified for consideration as guidelines (or as shorter fact sheets, which can be presented online as html pages):

1. A description of the new scenarios being developed for the AR5 is urgently needed at the DDC. This could be in the form of a short fact sheet, which could possibly be developed over time into guidelines, as new scenarios appear and as tools for applying these scenarios are developed.
2. Guidelines on representing uncertainties in IAV studies, including a discussion of how to make use of probabilistic information.
3. Guidelines on extreme weather events, including definitions of extreme events, and methods of developing scenarios of extremes. An earlier attempt by TGICA to draft guidelines on extremes was not followed up – this should be revisited. The document could be quite short, with links to other reputable reports already published elsewhere. These might also include an IPCC Special Report on Extremes, which has been proposed and is under review by the Panel.
4. Guidelines on the use of decadal scale climate predictions for assessing near-term impacts and adaptation options. This is an intensified area of study, recognizing recent improvements in model skill at forecasting climate beyond seasonal time scales, but also acknowledging the critical importance of initial conditions and natural variability in determining the near-term evolution of climate.
5. Guidelines on the development and use of “storylines” in developing regional scenarios for impact, adaptation and vulnerability analysis.

5. Training and Capacity Building

5.1. Current status and programs

5.1.1. The TGICA contributes to building capacity in the use of data and scenarios for climate related research in developing and transition-economy regions and countries. TGICA works with organizations and activities that have training as their core mandate but does not develop training programs on its own.

5.1.2. The TGICA, within the bounds of its mandate, has proactively engaged to a limited extent with different communities on capacity building and development. The perspective promoted by the TGICA is

articulated in the TGICA framework for capacity building (Attachment 3) which outlines a framework for linking developed nation capacity with nations of lesser capacity.

5.1.3. Within the limitation of facilitating the activities of other agencies, the TGICA has engaged directly and indirectly with key organizations undertaking capacity building. Most notable of these engagements is one with START (www.start.org), with whom a productive relationship has developed. This is best evidenced by the highly successful co-sponsorship of the 2007 IPCC TGICA Expert Meeting on Integrating Analysis of Regional Climate Change and Response Options, and the release of a meeting report with a forthcoming special issue of selected papers in the journal *Climatic Change*.

5.1.4. TGICA notes the continued weak synergy between institutions with climate change capacity building activities, as well as constraints on capacity to undertake training in developing nations (e.g. limited personnel to fulfill mentorship roles, few instructors for training workshops, infrastructural and data limitations, training material weakly tailored to developing nation contexts), especially in the context of the Nairobi work program.

5.2. Recent developments

5.2.1. TGICA is communicating with START around possible roles for TGICA on the START initiative for the coordination of regional climate downscaling (RCD). A similar dialogue has begun to communicate the TGICA interests to the WCRP on the proposed task force to coordinate RCD undertaken by groups on different continents.

5.3. Next steps

5.3.1. The TGICA recognizes that the there is an increasing shift toward adaptation alongside continuing mitigation interests. This brings a change in the character of information most in need, and new challenges for training and capacity building in order to effectively utilize this information. In response to this shift, the TGICA is examining a number of key options where it is in a position to facilitate. These include:

1. Establish a dialogue among the expanding number of climate information producing organizations. In this, the TGICA carries the imprimatur of IPCC assessment of the data that underlies much of the dissemination of information and is in a position to facilitate greater coherence between organizations in communicating to stakeholders. This may best be catalyzed by hosting a meeting between key members of different information providers (e.g. weAdapt, UKCIP, World Bank supported portals, etc.).
2. Facilitate greater synergy between capacity building organizations to leverage the combinatory value of the different activities. With the relationship with START, the TGICA is in a good position to help build communication between different groups of funding and implementation agencies that are targeting capacity building.
3. Provide new forms of data appropriate to use in low capacity settings on the DDC in response to the shift in information needs. This should also include expanding the contextual information for the data delivered through the DDC, including new data from CMIP5. Equally there is a strong need for distillations of the projected vast volume of CMIP5 data into forms of value to the impact and adaptation community, especially in developing countries.
4. Develop frameworks to interact with collections of non-IPCC approved region-specific climate data sets, thus facilitating the coherence and access of new regional data produced by different organizations and programs.
5. Develop support material for AR5 data targeted at appropriate usage of disseminated climate change data, especially for WG2 and 3 communities, in close coordination with WG1.
6. Develop improved support for small island nations and LDCs. There remains a need to facilitate usage of DDC information by these nations, for whom there remains a notable knowledge gap.

6. Potential role to take stock of and catalyze interactions for new scenarios

6.1. The process of generating new scenario literature for assessment in the AR5 is being self-organized and carried out by different communities of scientists, including the Climate Modeling (CM) Community, the Integrated Assessment Modeling (IAM) Community, and the Impacts, Adaptation, and Vulnerability (IAV) community. The new approach is designed to facilitate coordination and integration across these groups in order to provide greater compatibility and consistency of results, facilitate more concurrent work, and explore a larger range of potential climates and uncertainties. The approach should enable a more consistent approach to research and assessment on a wide of issues, e.g., carbon cycle feedbacks, analysis of adaptation and mitigation in a more integrated fashion. The approach involves many independent organizations and many interactions, summarized in Figure 2 (from the new scenarios expert meeting report).

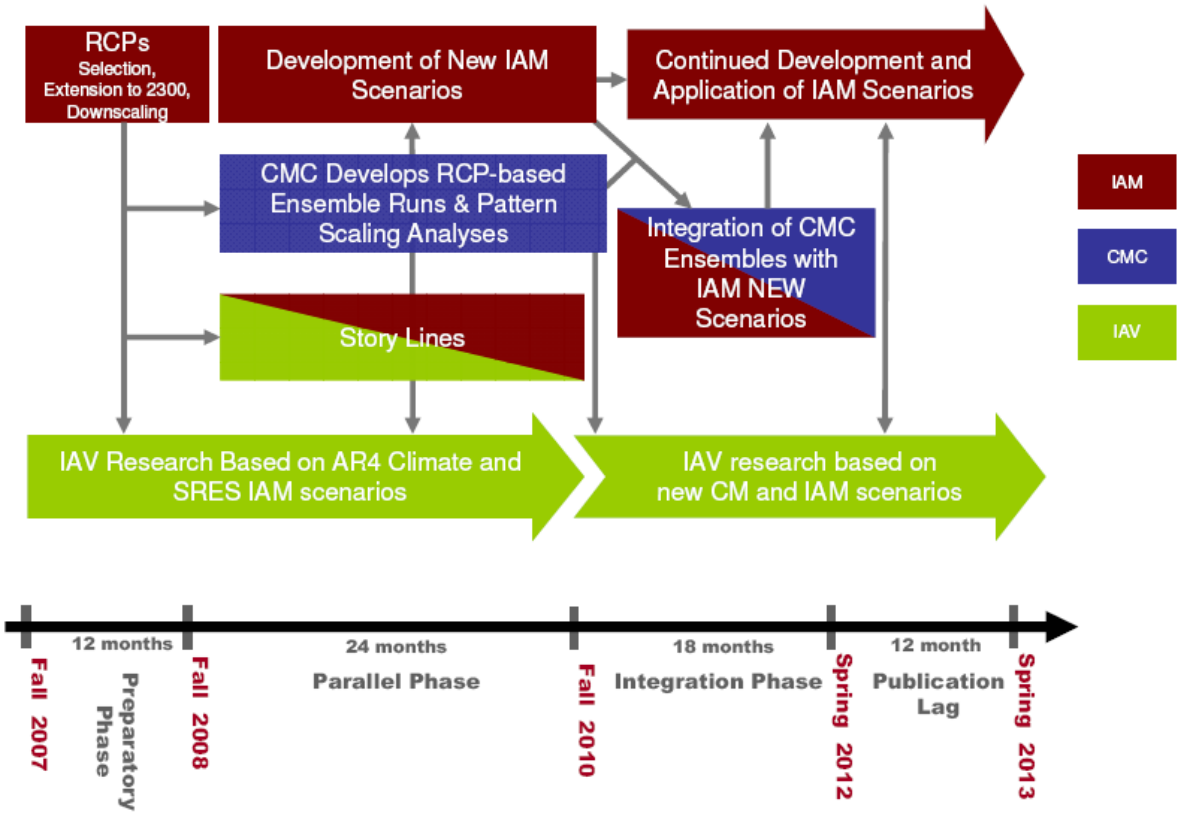

Figure 2. Major scenario-related activities across the IAV, IAM, and CM research communities.

6.2. Many interactions and developments are already underway. For example, the IAM and CC communities have carefully planned for transfer of data for the Representative Concentration Pathways (RCPs) at the end of the preparatory phase. These preparations are described in a “handshake document” that details data requirements and processes for transfer.

6.3. There has also been a recent initiative to establish an international network of IAV experts to serve as a focal point for the research community in the process of new scenario development. It is envisaged that such a network would serve at least three purposes, including (i) to help set the agenda for possible IPCC and related workshops to discuss strategies and avenues for engaging the IAV community and for ensuring communication between the IAV and CM/IAM communities; (ii) to represent the views of the IAV community in the development, provision and interpretation of socio-economic scenarios and narrative “storylines” emerging or derived from the new scenario process; and (iii) to assist in mobilizing the IAV community to observe, assist, and guide the application of the new IPCC-related scenarios both in research and in climate change decision-making. A group of invited researchers from around the world will meet to discuss these and other related issues at a workshop to be hosted by the Institute for Study of Society and the Environment (ISSE) at the National Center for Atmospheric Research (NCAR), USA in January 2009. It is worth noting that in spite of generous support from US sources, funding for the participation of experts from

developing countries and economies in transition (as well as from some developed countries) is nevertheless currently a constraint both on this meeting and on the anticipated future activities of this network.

6.4. The report of the expert meeting describes a number of needed developments, including:

1. Need for a long-term reference archive for RCPs, with appropriate support for use of the data by the IAV community.
2. Stimulation of IAV research, in coordination with WG2 Co-Chairs.
3. Development of an adequate "scenario library" to archive and serve the integrated scenarios produced in the integration phase, including the capacity to relate RCP and new socio-economic scenario information with related climate model scenarios.
4. Stimulation of further development and testing of methodologies such as
    - "pattern scaling" of climate scenarios for marrying RCP-based CM ensembles from the parallel phase to new IAM scenarios during the integration phase, and
    - approaches for developing IAV "storylines," qualitative explanations of the conditions and relationships among the key driving forces and their evolution over time that are needed for coordinating impacts assessments across geographic scales.
5. Encouraging and facilitating developing country and EIT participation.

6.5. While the IPCC is not itself preparing new scenarios or managing the process, it nonetheless has an important interest to evaluate progress in the process, especially as it affects the AR5. It is hoped that other organizations will step forward to lead many of these activities, but some may appropriately be housed at the DDC or at a minimum should be coordinated with the existing data archive. Current members of the TGICA, many of whom are involved in the scenario development process, believe that the TGICA could play a useful stock taking role, facilitating or catalyzing developments in the process as needed and approved by the IPCC through expert meetings and workshops. Were the TGICA to undertake this stock-taking function, its membership should include additional representatives of the IAM community.

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ANNEX 1

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

Mandate

1. *Background*

1.1 The Task Group on Scenarios for Climate and Impact Assessment (TGCIA) was established following a recommendation made at the IPCC Workshop on Regional Climate Change Projections for Impact Assessment (London, 24-26 September 1996), and further considered by the IPCC Bureau at its Eleventh Session (7-8 November 1996). A draft mandate statement for the Task Group was developed in a contact group at IPCC XX. At TGCIA VIII (Boulder, CO, USA, 30 June – 2 July 2003), the TGCIA discussed the mandate, suggested several changes, and proposed a change in the group's name to "Task Group on Data and Scenario Support for Climate and Impact Assessment". At its XXXth session, the IPCC Bureau reviewed and further refined the mandate and recommended an additional change in the name of the group to "Task Group on Data and Scenario Support for Impacts and Climate Analysis" (TGICA).

2. *Mandate*

2.1 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 disseminates information in support of IPCC work, as well as IPCC "approved" "adopted," "accepted," and "supporting" material (as defined in Appendix A to the Principles Governing IPCC Work). This includes, for example, information on:

- anthropogenic influences on climate
- climatological baselines and observations
- projected future climate
- other environmental, technological, and socio-economic factors and data relevant to impacts, adaptation, vulnerability, and mitigation research

2.2 The TGICA does not develop emission, climate, or other types of scenarios for the IPCC, make decisions regarding the choice of such scenarios for use in IPCC assessments, nor undertake modeling or research.

2.3 The TGICA is accountable to the Panel through the Bureau and reports to Sessions of the Bureau and Panel.

3. *Activities*

3.1 The TGICA coordinates a Data Distribution Centre (DDC) which provides data sets, climate and other scenarios, and other materials (e.g., technical guidelines on use of scenarios).

3.2 The TGICA identifies information needs in support of IPCC work, facilitates research on climate impacts, adaptation, and mitigation, and makes related recommendations on cross-cutting issues. These activities will be carried out in consultation with the three Working Group Co-Chairs. The TGICA will also solicit feedback from user communities.

3.3 The TGICA contributes to building capacity in the use of data and scenarios for climate-related research in developing and transition-economy regions and countries. TGICA works with

organizations and activities that have training as their core mandate but does not develop training programs on its own.

3.4 The TGICA may convene expert meetings on an as needed basis.

4. *Membership*

4.1 The task group will be co-chaired by two experts, one from a developing/ transition economy country and one from a developed country.

4.2 The TGICA will be composed of approximately 20 members known through their peer reviewed publications and works. Membership should include the following areas of research: climatology; climate modeling (both global and regional); physical, social, and economic impacts; adaptation; emissions modeling; and integrated assessment. The membership of the TGICA should reflect the need to aim for a range of views, expertise, and geographical representation (ensuring appropriate representation of experts from developing and developed countries and countries with economies in transition), with due consideration for the above-mentioned scientific and technical requirements. The term of membership on the TGICA will be linked to the assessment cycle of the IPCC and be refreshed near the start of a new comprehensive assessment.

4.3 Members will be selected through a process based on the lead author selection process of the IPCC. The Secretary of the IPCC will solicit nominations of experts from governments and organizations. The Co-Chairs of the TGICA and of the three Working Groups will develop a slate of approximately 20 members that will be selected by the IPCC Bureau, under general guidance and review provided by the Panel.

4.4 The TGICA may enlist other experts as contributors to assist with its work on an as needed basis.

ANNEX 2

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

WMO

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

UNEP

Governance of the IPCC Data Distribution Centre (DDC) by TGICA[1]

Approved by the TGICA at its 10th session in Sao Paolo, Brazil, 19-21 April 2005

1. Mission of the Data Distribution Centre

The Intergovernmental Panel on Climate Change (IPCC) Data Distribution Centre (DDC) provides access to data sets, climate and other scenarios, and other materials (e.g., technical guidelines on use of scenarios). The DDC operates under the oversight of the Task Group on Data and Scenario Support for Impact and Climate Assessment (TGICA), which was established by the IPCC to facilitate wide availability of climate change-related data and scenarios to enable research and sharing of information across the three IPCC working groups.

2. Principles

- The activities and membership of the TGICA are defined by its mandate, as approved by the IPCC.
- The TGICA is responsible for the DDC, providing leadership and oversight for its operations. It makes decisions about the materials (observational data, model data) to be included in the DDC. As specified in the TGICA's mandate, information provided through the DDC includes IPCC "approved," "adopted," "accepted," and "supporting" material.
- The TGICA makes decisions by consensus. All members of the Task Group participate in decision-making. Decisions regarding model data and scenarios are made in consultation with participating modeling centers. Decisions regarding operations of the DDC are made with the full participation of the DDC managers and reflect the expertise, responsibilities, and operating procedures of the institutions that comprise the DDC.
- The DDC supports research on climate impacts, adaptation, and mitigation, promotes communication and exchange of information across the IPCC Working Groups, and facilitates studies that use consistent scenarios and baseline data for integration into IPCC assessments.
- In its operations, the DDC will seek to build capacity for climate-related research in developing and transition-economy regions and countries.
- The DDC will support users of the data and information it disseminates. TGICA's membership is designed to include representatives of different research communities who use climate-related data and scenarios. These members are responsible for representing user needs and perspectives.
- The data and information on the DDC are available free of charge to all users.
- The operations of the DDC are primarily funded through voluntary "in-kind" contributions from governments that support the participating data centers that comprise the DDC. The TGICA seeks to maintain regular communication with representatives of supporting governments and the home institutions of the data centers.

[1] The purpose of this document is to describe the roles and responsibilities of TGICA Members and DDC Managers interact in operating the DDC. This draft was prepared by the TGICA Co-Chairs and was approved in this form by TGICA members at their 10th session in Sao Paolo, Brazil, on 19-21 April 2005.

3. DDC Structure and Roles of the DDC Managers

- The DDC is a shared operation of the Climatic Research Unit (CRU) in the United Kingdom; the World Data Center Climate at the Max-Planck-Institute for Meteorology (WDCC / MPI-M) in Hamburg, Germany; and the Socioeconomic Data and Applications Center (SEDAC) operated by the Center for International Earth Science Information Network (CIESIN) at Columbia University, New York, USA. Each of these institutions has voluntarily taken on responsibility for managing access to a subset of the data and information provided by the DDC.
- The DDC Managers make decisions by consensus. Lead responsibility for the DDC currently rests with the Climatic Research Unit, which coordinates the overall management of the DDC. Any one of the DDC Managers may bring matters to the attention of the TGICA.
- The DDC Managers are accountable for the successful operation of the DDC. They are charged with developing and maintaining the DDC in keeping with international standards and "best practices" for user access and support, appropriate cataloging, documentation, quality control, archiving, and preservation of DDC holdings. The DDC Managers are empowered to undertake the following actions:
    - Design and modify the DDC site in keeping with the overall direction provided by the TGICA to ensure that the DDC evolves and keeps up with changes in technology and standards. The objective is to make sure that the information on the DDC is easily accessible and usable.
    - Carry out performance monitoring and reporting including use and quality statistics.
    - Solicit user feedback and reactions to the site and report these regularly to the TGICA.
    - Develop proposals for improving the content, data delivery, and user support of the DDC for review and approval by the TGICA. Proposals for new DDC initiatives should be based on knowledge of the DDC managers and their home institutions, monitoring of the Web, and other information sources.
- At each regular meeting of the TGICA, DDC Managers will provide an overview of DDC operations and previously implemented or proposed modifications to the DDC.

4. The Role of the Task Group and Workgroups in Providing Leadership and Oversight for the DDC

- The TGICA provides oversight for the DDC and establishes policies for managing it.
- The TGICA establishes a standing "DDC Workgroup" of at least three members. The DDC Workgroup will periodically review the websites that make up the DDC and provide ongoing feedback to the DDC Managers. More specifically, it will review the DDC site before each TGICA meeting and prepare a report for discussion by the TGICA on its assessment of the state of the DDC and materials or aspects of the site that need to be updated. The DDC Managers may request input from the TGICA or workgroups as needed.
- The TGICA provides leadership for identifying needs for observations, model data, technical guidelines, and other materials in standard formats to facilitate research by scientists in diverse settings. It relies on its members and the DDC Managers for suggestions and proposals for new content.
- The TGICA must approve additions of data, scenarios, technical guidelines, and other materials to the DDC's holdings.
- Before being added to the DDC, materials must be peer reviewed to ensure quality and reliability for their intended purpose. Climate data and scenarios must meet the requirements established by the TGICA for such data as described at: **http://ipcc-ddc.cru.uea.ac.uk/ddc_provides.html**. IPCC "approved," "adopted," "accepted," and "supporting" materials do not require further review as they have already been reviewed through processes defined in IPCC's procedures. The Task Group should review other materials (e.g., technical guidelines; climate, socio-economic, or environmental data produced with models that have not been reviewed through established

diagnosis or intercomparison; other websites) before deciding to place them (or links to them) on the DDC. At least three independent reviews must be obtained. A written record of the review process and comments on proposed materials will be maintained as part of the record of the meeting at which the TGICA approves adding the materials to the DDC.

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.

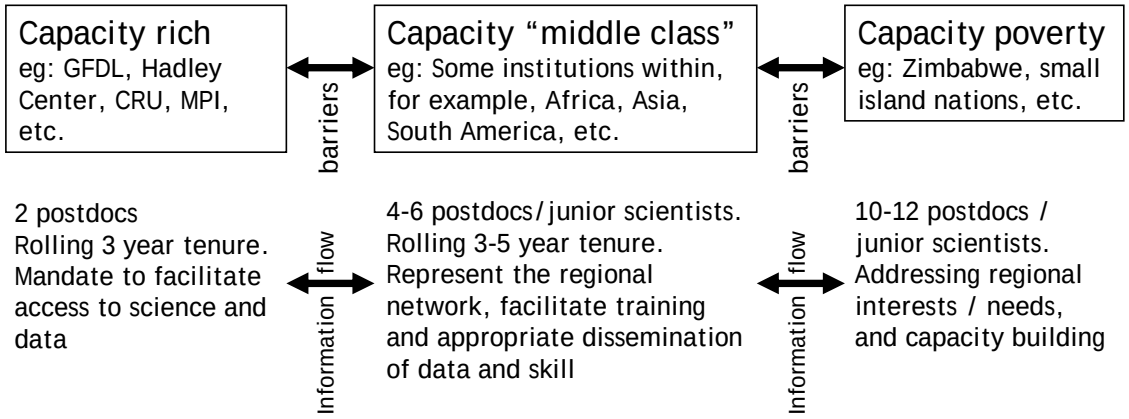
Scientists in the capacity middle class countries would be responsible for further development of the data resources into forms relevant to the needs and capacity of the regional research community. They would also play a mentoring role in facilitating scientists in the "capacity poor" regions. Additional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