

**EXPERT MEETING ON THE FUTURE OF THE TASK GROUP ON DATA AND SCENARIO  
SUPPORT FOR IMPACTS AND CLIMATE ANALYSIS (TGICA)  
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**THE FUTURE OF TGICA AND THE IPCC DATA DISTRIBUTION CENTRE**

**Version 2 of a Report on Future Options from the IPCC Task Group on Data and Scenario  
Support for Impact and Climate Analysis (TGICA)**

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**Document history.** This is a revision of a document originally prepared for IPCC XLI (Nairobi, 2015), presenting a vision for the Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA). At IPCC XLI the Panel decided to revisit the mandate of TGICA at IPCC XLIII, inviting comments on the document from scientists, the IPCC Bureau, governments and IPCC observer organizations ahead of an IPCC meeting of experts to be held in early 2016. Based on these comments and on the recommendations of the meeting, the document will then be revised by the Secretariat, in consultation with the TGICA Co-Chairs, for submission to IPCC XLIII.

### SUMMARY

*This document presents perspectives of the Task Group on the future of TGICA as the IPCC enters the next cycle, also incorporating feedback received at IPCC XLI and subsequent discussion at TGICA-22 in New York (June 2015). Three options are presented for the future of the TGICA and the Data Distribution Centre (DDC) it oversees;: (1) Discontinue or severely curtail TGICA and discontinue the DDC; (2) maintain the status quo; or (3) strengthen TGICA and upgrade the DDC. Each of these options carries with it organisational and resource implications.*

*While comments on TGICA at IPCC XLI indicated broad support for a continuing role in the IPCC (Options 2 and 3), Option 1 is also retained here for completeness. That notwithstanding, the document focuses on ideas for strengthening the operations of TGICA and the DDC. Dedicated programme support for TGICA would facilitate an enhanced liaison role across the IPCC Working Groups and with the Secretariat and wider user community. Increased resource allocation for the DDC would ensure essential continuity in the archiving and curating of data and scenario information used in IPCC assessments, enable the development of a proposed new dataset index, guarantee sufficient capacity for processing a more comprehensive set of data, and facilitate development of new documentation and guidance required by an expanding worldwide user community. In light of a significantly changed landscape of institutions and organizations, the Task Group would thus be better placed to serve a range of user requirements not being addressed elsewhere, and the DDC can provide a much needed authoritative reference among the proliferation of online data and scenario products of mixed quality being offered from other sources.*

### 1. Current status

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

TGICA is an IPCC body with members nominated by national Focal Points, bringing together diverse expertise and experiences drawn from a cross section of research communities representing all three IPCC Working Groups as well as DDC users. TGICA's current mandate<sup>1</sup> is to “facilitate wide availability of climate change related data and scenarios to enable research and sharing of information across the IPCC Working Groups”. The Task Group co-ordinates the DDC, produces guidance materials distributed through the DDC as peer-reviewed documents of IPCC Supporting Material and contributes to building capacity in the use of data and scenarios

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<sup>1</sup>[www.ipcc.ch/pdf/activity/tgica-mandate.pdf](http://www.ipcc.ch/pdf/activity/tgica-mandate.pdf)

for climate change research. Face-to-face or teleconference meetings of the Task Group are held 2-3 times per year, with sub-group tasks requiring more regular correspondence. The activities of TGICA are conducted by volunteer members, with limited administrative support provided from within the resources of one of the Working Group TSUs.

## 1.2 Data Distribution Centre (DDC)

The DDC provides a means of accessing climate, socio-economic and environmental data, both from historical observations and from future scenario projections, in support of IPCC work and as used in the IPCC assessments. It is jointly managed by institutions in the UK, Germany and USA<sup>2</sup>. The DDC is designed primarily for climate change researchers, but is also relevant to educators, practitioners, governmental and non-governmental organisations, and the public<sup>3</sup>. The DDC complements the dissemination of data and information from elsewhere in the IPCC, such as from the IPCC Working Group websites, and wider international research community, such as the CMIP5<sup>4</sup> portal at PCMDI<sup>5</sup>, socio-economic data at CIESIN<sup>6</sup> and emissions scenario databases at IIASA<sup>6</sup>, by providing access to key datasets used in IPCC assessment reports. Importantly, the DDC co-locates data relevant across Working Groups with a consistent quality control and appropriate supporting materials. Uniquely, it provides a persistent (though not fully comprehensive) repository of data and information from all five IPCC assessments. Discontinuing the DDC would raise serious questions about the ongoing curatorship of these and future data used in IPCC assessments.

DDC managers also provide expertise on data management in support of IPCC reports. For example, for the Fifth Assessment they designed the quality control protocol for climate model data, digitised key tables from the final report and in the process identified a number of minor errors, and provided guidance to the IAM<sup>7</sup> and IAV<sup>8</sup> communities on data stewardship. They also handle data and scenario information contained in Supplementary Material and Annexes that are included in the Assessment Reports, for eventual inclusion in the DDC.

## 2. Challenges and opportunities

TGICA (and the IPCC) are faced with a rapidly evolving landscape of initiatives and organizations handling and disseminating climate change related data and scenario information. This raises a critical need for authoritative and objective support of relevant data and guidance on their use.

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<sup>2</sup> UK: Funding from Department for Energy and Climate Change (DECC) – work undertaken at British Atmospheric Data Centre, Rutherford Appleton Laboratory (BADC), Science and Technology Facilities Council (STFC) Centre for Environmental Data Archival; Germany: Funding from Federal Ministry of Education and Research (BMBF) and DeutschesKlimarechenzentrum (DKRZ) – work undertaken at DKRZ, Hamburg; USA: Funding from NASA Socioeconomic Data and Applications Center (SEDAC) and US Government (for TGICA travel) – work undertaken at the Center for International Earth Science Information Network (CIESIN), Columbia University, New York

<sup>3</sup> More than 112,000 user sessions logged from Nov 2013–Nov 2014, representing over 86,000 users from developed and developing countries. The most active users are in USA and UK, with India, China and Brazil in the top 10. Most accessed pages: carbon dioxide projections, climate observations, guidance on global climate models.

<sup>4</sup>Coupled Model Intercomparison Project Phase 5

<sup>5</sup>Program on Climate Model Diagnostics and Intercomparison

<sup>6</sup>International Institute for Applied Systems Analysis

<sup>7</sup>Integrated Assessment Modeling

<sup>8</sup>Impacts, adaptation and vulnerability

## 2.1 Knowledge exchange across IPCC Working Groups

The mandate of 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. To date, this has primarily been accomplished through development of guidance materials for use by researchers working on topics at the interface between different Working Groups, for example, scenario data applications for IAV assessment, climate data downscaling and the nature and attributes of climate model data. The DDC also hosts data and scenario information generated by and of importance to the Working Group reports. There is growing pressure to facilitate enhanced cross-Working Group exchanges of data and scenario information, and the TGICA is uniquely constituted and well placed to contribute to this and complement the direct interactions between authors from different Working Groups that already occur.

## 2.2 Increasing engagement with users and accessibility of IPCC information

DDC managers have identified two broad categories of users. One group, the climate change research community, is beginning to expect a higher standard of data availability, including data and outputs generated as part of IPCC assessments. Furthermore, not only are high quality data essential for undertaking new research, but the outcomes of this research may themselves find their way into subsequent IPCC assessments. Through the DDC the IPCC already has the infrastructure in place that, with appropriate resourcing, can make data and supporting information from the assessment reports available in a comprehensive manner.

A second user group, more oriented towards regional to local scale applications, and arguably of priority societal importance, has different data and information needs. For example, the increasing interest from adaptation practitioners (engineers, urban planners, etc.) for derived products at the regional scale (such as intensity-duration-frequency rainfall curves, or heat stress indicators). Current resources do not enable TGICA and the DDC to engage with or contribute to the needs of these communities, leaving a gap in connecting them to IPCC data and scenario information and in feeding back their insights to the IPCC processes.

An online DDC User Survey, comprising 17 questions, is currently in progress<sup>9</sup>. Results will be reported ahead of the IPCC meeting of experts in early 2016.

## 2.3 A new look at documenting data associated with IPCC Assessments

The current process to distribute data and information used in the IPCC assessment through the DDC involves time consuming post-processing by the authors, the TSUs and the DDC. An opportunity exists to greatly improve the efficiency and use of shared data throughout the assessment process by the development of a dataset index and supporting metadata to record the source and provide a reference for each dataset used (see summary in Annex A). This would support the work of the author teams and would involve only a modest addition to the responsibilities of chapter authors and TSUs to contribute their metadata to the index. It would yield a significant and long lasting benefit through sharing of consistent and traceable information across the working groups during the assessment process, and provide systematic and complete documentation of all the data resources used. The intent is to be comprehensive in terms of the data resources covered, but for the index to be simple enough to avoid imposing a burden on resources.

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<sup>9</sup>See the home page of the DDC under Highlights at: <http://www.ipcc-data.org/>

## 2.4 Aligning TGICA's work with other international fora

Internationally, there is a burgeoning number of activities co-ordinating data and scenario information for use in climate change assessment. Though these may exhibit some overlaps with the work of TGICA – for instance, drawing on some of the same sources of data or providing guidance on similar topics – there are also important differences in terms of objectives, target audiences, topical scope and quality assurance. Here we provide a few comparative examples – a more thorough institutional mapping will be carried out ahead of the IPCC meeting of experts in 2016.

Climate change is the central theme of IPCC and of TGICA, whilst this may be only one of a range of issues considered in some other initiatives (e.g. the periodic Global Environmental Outlook scenarios exercise conducted by UNEP or WMO's Global Framework for Climate Services). On the other hand, some international activities may limit their attention to only a narrow set of applications (e.g. climate information for agriculture and fisheries in the international research program on climate change, agriculture and food security, CCAFS), whereas TGICA's remit extends to all potential applications of climate change data and information. While the DDC has archived and quality checked the full set of global climate model outputs assessed by the IPCC, some other providers of climate projections may select an illustrative subset of projections (e.g. the World Bank Climate Change Knowledge Portal), may focus only on specific regions of the world (as in many regional and national climate information providers), and may not necessarily provide the most up-to-date information. Moreover, the quality checks applied to data and information and the peer review process applied to guidance material, may not always meet the same rigorous standards required by TGICA.

## 2.5 Resource limitations constrain ability to achieve objectives

The IPCC assessments and Special Reports generate a considerable and growing amount of information relevant to climate applications and cross-disciplinary analyses. With limited resources, it has been challenging for the DDC and TGICA to offer adequate support for contributing to capacity building activities in accordance with the mandate. The main limitation is that the volunteer capacity of TGICA does not have dedicated staffing for support, such as for facilitating meetings, coordinating the development of new guidance materials, and liaising with the Working Groups. Instead it relies on the assistance of Working Group TSUs, when available. It has been particularly difficult to establish ongoing activities within the impacts, adaptation and vulnerability research and practitioner communities, who are more fragmented than the climate science and energy-emission modelling communities and so need more time-consuming engagement. It is important for TGICA and the DDC to engage on this issue more effectively and on a more continuous basis, especially with the advent of global initiatives such as the GFCS and Future Earth, who stand to benefit strongly from the TGICA's perspectives.

## 3. Options for the Future Role of TGICA and the DDC

The TGICA members have considered a range of options for the future, all except Option 1 falling within the terms of the current TGICA mandate.

### 3.1 Option 1 – Discontinue or severely curtail TGICA and discontinue the DDC

One option is to discontinue the DDC, and pass over its functions to the Working Groups. Since the DDC is an integral part of the current TGICA mandate, this would imply either substantially revising the TGICA mandate, or discontinuing TGICA. A revised mandate could limit TGICA activities to the production of guidance material and support for capacity building.

We have considered whether elements of the DDC, particularly archiving of climate scenario and emissions data, could be carried out by others. For instance, the responsibility and tasks could be taken up by the IPCC Working Groups who could individually store all of their relevant information in an accessible form, supplemented with guidance notes on the use of their data sets. With a commensurate revision of the mandate, the role of TGICA would be limited to providing guidance for the Working Groups on developing the necessary additions to their web pages.

This would shift the burden of curatorship onto TSU resources, including additional needs for information technology support. Further, it would necessitate that TSUs develop mechanisms to accommodate the interests of other Working Groups, where data sets are of direct relevance to more than one Working Group. Such a transfer thus carries substantial resource implications for personnel and infrastructure at the TSUs, and risks weakening the coherence of the archival activities. Moreover, the transitory nature of the Working Group leadership and TSUs poses an important continuity challenge for providing secure, long-term preservation of data, backed by the necessary expertise on data management and user support.

Additionally, sites developed by the research community outside of the IPCC structure serve an important role in supporting the scientific work that is assessed by the IPCC. A good example is the RCP database, developed for the Integrated Assessment Modeling Consortium and hosted by IIASA. Since these data were fundamental inputs to the IPCC AR5, the DDC still assumed a critical role in hosting a curated, quality controlled version to provide secure long term preservation of this resource. The fate of such resources would thus also need to be considered following discontinuation of the DDC.

### 3.2 Option 2 – Status quo

The second option is to maintain the status quo with no expansion of activities. Continual assessment of priorities to put existing resources to best use will be needed as not all needs could be served. For example, while at least the creation of a dataset index (see Annex A) might be conceivable with existing resources, without additional support the number of new technical guidelines and fact sheets, and any expansion of data hosted by DDC, would necessarily continue to be limited (TGICA has identified over 10 key topics for which guidance documents would be of potential value but which have not yet been developed due to limited resources). Likewise, the role of TGICA in enabling research and sharing of data and scenarios across the IPCC Working Groups and support for capacity building would continue to be small. The existing challenge to maintain current capabilities would continue, as it rests largely on the voluntary contributions and dedication of Task Group members who are often already heavily committed to other IPCC duties as well as their own institutional responsibilities. Under the status quo option, continued travel funding from the IPCC Trust Fund would be required to facilitate two full face-to-face meetings per year, with support for these and related teleconference meetings resourced by a responsible Working Group TSU (currently Working Group II).

### 3.3 Option 3 – Deploy increased resources for strengthening TGICA and upgrading the DDC

The evolving context of climate change research and associated support for decision making, the growing need for regional decision-oriented information from the IPCC that cuts across Working Groups, alongside the emergence of major new related initiatives (e.g. GFCS), raises important implications for TGICA's mandated activities that cannot be met under current resourcing. TGICA has a unique mandate within the IPCC: enabling cross-Working Group data and scenario exchange and interaction, co-ordinating the DDC (which is itself a unique

resource) and developing related supporting and guidance materials, and contributing to relevant capacity building activities. The data and scenario archive, documentation, technical guidelines and other IPCC supporting material provided by TGICA represent an authoritative source of information for the research community. To fully exploit the TGICA potential in the context of the evolving priorities, and to leverage the unique capacity of the TGICA, would require increased funding for TGICA and DDC beyond current levels, and full-time programme support beyond reliance on existing IPCC WGTSUs.

*Full-time TGICA programme support.* We envision a new position of one full-time professional for TGICA and DDC programme support that would serve the role of coordination of activities within TGICA, across the DDC centres, and between TGICA, the DDC, IPCC Working Groups and Secretariat (Table 1). Such support would also take over some functions currently supplied by the Working Group TSUs, such as meeting coordination, and logistics associated with scoping, hosting, and reporting from ad-hoc expert meetings the TGICA may propose.

**Table 1: Resourcing of TGICA and the DDC during the AR5 and suggested for the future**

2015 (AR5)	Future (AR6)
<b>TGICA</b>	
<b>Current and past technical support</b>	<b>Suggested technical support</b>
<ul style="list-style-type: none"> <li>• WG TSU during IPCC cycle - currently WG II; earlier WG I (WG III for some meetings)</li> <li>• WG TSU has limited resources; variable workload; not co-located with TGICA Co-Chairs; lack of permanent support constrains TGICA effectiveness; disrupts continuity</li> <li>• Support for meeting organisation; meeting minutes and website; some TGICA correspondence; production of supporting material</li> </ul>	<ul style="list-style-type: none"> <li>• Professional full time programme support</li> <li>• Experience of (climate change) research and administration located with TGICA Co-chair(s) <u>or</u> at DDC institution <u>or</u> at Secretariat <u>or</u> at a TGICA TSU</li> <li>• Co-ordination of activities across TGICA, DDC centres, with WGs, with Secretariat; meeting organisation including drafting agendas; minutes, website, production of TGICA supporting material; supporting contributions to capacity building (e.g. expert meetings, workshops, outreach)</li> </ul>
<ul style="list-style-type: none"> <li>• <b>TGICA resourcing:</b> ~0.25 FTE/year during AR5 cycle</li> </ul>	<ul style="list-style-type: none"> <li>• <b>TGICA resourcing:</b> ≥1 FTE/year independent of IPCC assessment cycle</li> </ul>
<b>Data Distribution Centre</b>	
<b>Current activities</b>	<b>Suggested additional activities</b>
<ul style="list-style-type: none"> <li>• Project management</li> <li>• Partner liaison/Help desk</li> <li>• Website re-structuring</li> <li>• AR5 archiving</li> <li>• Dataset linking</li> <li>• Unified reporting system</li> </ul>	<ul style="list-style-type: none"> <li>• Generate content for less technical/resource-limited audiences</li> <li>• Create dataset index (for traceability and cross-WG exchange)</li> <li>• Archive increased data volumes to current DDC standards</li> <li>• Archive results from IPCC assessed impact studies (observed and modelled)</li> <li>• Greater support for data users (tools, software and guidance)</li> <li>• Archive (rescue) and disseminate socioeconomic data/MIPs data</li> </ul>

	<ul style="list-style-type: none"> <li>• Develop regionally relevant data and support materials that integrate across WGs.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>DDC resourcing:</b> 3 donor countries: 2.1 FTE/yr+ in kind equipment and facilities</li> </ul>	<ul style="list-style-type: none"> <li>• <b>DDC resourcing:</b> Donor countries: 4.5 FTE/yr+ in kind equipment and facilities</li> </ul>

FTE = Full time equivalent staff

In addition, the support would serve an expanded role in two main areas:

1. Co-ordinating production of technical guidelines, fact sheets, and new material for the DDC by setting timelines, arranging virtual meetings, communicating with contributing authors, coordinating document review and publication.
2. Assisting TGICA in capacity building activities, including the possible organization of an annual or bi-annual workshop to serve developing region scientists, establishment of a contact point for feedback on TGICA guidance material and other initiatives, and maintenance of an existing list of networks for future outreach.

Establishing such a support position would greatly enhance the productivity of TGICA and its value to a broader community, and make the best use of the scientific and technical expertise of TGICA volunteer members and DDC managers. There are several options for location of such a position. The first option could be for a person to be located with one of the TGICA Co-Chairs, possibly funded by the nominating member country. However, this arrangement presumes that the Co-Chair remains in post for the full cycle, and may also pose difficulties of continuity between cycles. A second option would be for one of the countries supporting the DDC to host the position, with additional travel and subsistence funds for short-period secondments to work at the institution(s) of either or both of the Co-Chairs. A third option would be for the Secretariat to host the position with additional funds for short-period secondments. Finally, a more substantive option would be to accord TGICA an equivalent status to that of the IPCC Task Force on National Greenhouse Gas Inventories (TFI), with its own office and TSU.

*Increased resourcing of the DDC.* In addition, we propose increased funding for the DDC, to complement the current generous long-term support from the UK, Germany and USA (Table 1). We would estimate that an approximate 100% increase of personnel time allocated to the DDC, along with an expanded budget for infrastructural support (e.g. computers, data storage facilities) could yield substantial dividends. It would enable new datasets to be archived for which resources are currently insufficient, including data from chapters on observed impacts of climate change and impact projections from various global models. It would also facilitate an enhanced focus on linking to data and information for different world regions and on generic guidance for users in applying these. A third priority would be to improve accessibility and efficient distribution of data to users, especially in developing countries and EITs, where the potential for application of DDC data has yet to be fully realised. Finally, it would offer an additional impetus for the establishment of a dataset index (see Annex A) that could embrace a wider range of holdings than at present, including datasets from IAV research.

*General strengthening of TGICA.* Under all three options that assume a continued role for TGICA, its effectiveness could benefit from improved co-ordination of the TGICA nomination and selection process with that of the author selection for assessment reports, drawing from authors with data and scenario expertise as well as authors tasked with specific cross-Working Group activities. Liaison between the TGICA Co-Chairs and Working Group Co-Chairs could also be strengthened with a view to harmonising TGICA activities with the data and scenario needs of IPCC work during the assessment cycle.

### **3. Suggestion from the current TGICA membership**

Based on the experiences of the current TGICA membership (2010-date), we suggest that IPCC strongly consider the merits of Option 3. A strengthened TGICA and upgraded DDC, with dedicated support and more efficient use of scientific and technical expertise, would bring greater value to the IPCC and to the climate change research community, offer continuity of archiving of data and information used in the IPCC assessments, support and guidance for worldwide knowledge transfer, and serve to buttress the cyclical process of IPCC Working Group and topical assessments.

## **Annex A: IPCC Assessment Dataset Index**

The presentation of IPCC results relies heavily on references to data resources. Many visitors to the IPCC Data Distribution Centre web site are disappointed to find that data products cited by IPCC representatives are neither available nor discoverable through the IPCC DDC. The DDC has recently focused on making data which are held elsewhere discoverable, since resource limitations and intellectual property rights issues limit what can be held locally. A substantial range of resources referred to in the Fifth Assessment Report will be captured by the ongoing work by TGICA and the DDC to index the data used and provide appropriate links to the primary sources. This runs in parallel to ongoing efforts to collect core climate projections to ensure that this data are well documented and archived.

We propose the establishment of a cross-Working Group dataset index, which will exploit the system being used in the DDC for a posteriori capture of information about data and move to a more efficient procedure based on a priori capture of such information. The index would gather information from the authors as they prepare the report. The information would be no more than that authors would ordinarily be expected to record for their own use: where the data came from, an appropriate citation and possibly some keywords. The precise formulation of the questions to be answered would have to be agreed across TSUs, but should be of the order of 3 or 4 questions. The objective would be to reach an agreement on a level of information which is consistent with good practice and which can be recorded without disrupting the review process. The added value of the index would come not from any additional assessment but from being able to share information in a searchable form across Working Groups during report preparation and externally after publication.

The index would lead to efficiency savings by providing a systematic means of sharing information on data resources. It is important to decide on an appropriate level of detail, and this decision needs to be taken early in the review process (e.g. when the report outline is approved). From the DDC perspective, the implementation of an index would make it possible to develop a comprehensive index within the existing resource envelope.

There is an opportunity to improve substantially the way in which data resources are documented within the IPCC assessment reports. By exploiting a framework developed by TGICA and the DDC in co-operation with the Working Groups, this improvement can be achieved with modest resources.