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## **REPORT BY THE AD HOC TASK FORCE ON THE FUTURE OF THE TASK GROUP ON DATA AND SCENARIO SUPPORT FOR IMPACT AND CLIMATE ANALYSIS**

(Prepared by the Ad Hoc Task Force (ATF-TGICA) on the Future of the IPCC Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA))

(Submitted by the Secretary of the IPCC)

### **IPCC Secretariat**

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## REPORT BY THE AD HOC TASK FORCE ON THE FUTURE OF THE TASK GROUP ON DATA AND SCENARIO SUPPORT FOR IMPACT AND CLIMATE ANALYSIS

**The Panel is invited to take note of the outcomes of the Ad Hoc Task Force (ATF-TGICA) and to discuss the potential revisions to the Mandate and Terms of Reference for the Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA) introduced below and as contained in Annex 7 to the present report, with the objective of developing a decision on the future of TGICA and the IPCC Data Distribution Centre (DDC).**

### Executive Summary

At its 44<sup>th</sup> Session, the Panel decided (Decision IPCC/XLIV-8, paragraph 1) to establish an Ad Hoc Task Force (ATF-TGICA) to design a strategic plan and revised mandate and terms of reference for the transformation of the Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA) functions to serve the needs of the IPCC during and beyond the Sixth Assessment. This report represents the final outcome of the work of ATF-TGICA.

Priority objectives for a future TGICA and the IPCC Data Distribution Centre (DDC) have been identified, and a new mandate and Terms of Reference (TOR) for the future TGICA and a revised guidance document for the DDC were developed.

To inform its work, ATF-TGICA had developed a questionnaire and the responses obtained have been analysed. The ATF-TGICA thanks those who responded to the questionnaire.

The ATF-TGICA was asked to scope, implement and oversee a mapping exercise of activities undertaken by external organizations that are similar or related to TGICA or the DDC. This report lists institutions and web sites providing services similar to, and partly comparable to, the services provided by the IPCC DDC. They could act as potential partners and/or providers of additional, complementary, or alternative services compared to the services currently provided by DDC.

The ATF-TGICA was asked to develop a proposal for a longer-term vision, and a short-term strategy, which will enable the transformation of existing TGICA functionalities and to identify priority objectives of the DDC. Resource and time constraints have prevented development of consensus on the longer-term vision and short-term strategy, but the ATF-TGICA has identified options for further consideration.

The ATF-TGICA was asked to propose options for sustainable resourcing to support the needs of the transformed functions, including possible ways to expand country contributions. The ATF-TGICA has given such options preliminary consideration, but they require further work.

### Introduction

At its 44<sup>th</sup> Session, the Panel decided ([Decision IPCC/XLIV-8](#),<sup>1</sup> paragraph 1) to establish an Ad Hoc Task Force (ATG-TGICA) to design a strategic plan and revised mandate and terms of reference for the transformation of the Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA) functions to serve the needs of the IPCC during and beyond the Sixth Assessment. The present report represents the final outcome of the work of ATF-TGICA as mandated by the Panel at its 44<sup>th</sup> Session, including the extension of this mandate until the 47<sup>th</sup> Session of the IPCC as approved by the Panel at the 46<sup>th</sup> Session ([Decision IPCC/XLVI-8](#)<sup>2</sup>). The present final report is also based on the two progress reports<sup>3</sup> presented to the Panel at its 45<sup>th</sup> and 46<sup>th</sup> Sessions.

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<sup>1</sup> Available at <[http://www.ipcc.ch/meetings/session44/p44\\_decisions.pdf](http://www.ipcc.ch/meetings/session44/p44_decisions.pdf)>

<sup>2</sup> Available at <[http://www.ipcc.ch/meetings/session46/p46\\_decisions.pdf](http://www.ipcc.ch/meetings/session46/p46_decisions.pdf)>

<sup>3</sup> IPCC-XLV/INF.5 presented at the 45<sup>th</sup> Session, IPCC-XLVI/Doc. 9 presented at the 46<sup>th</sup> Session of the IPCC

## Roles and responsibilities of the ATF-TGICA

The Terms of Reference including membership rules of ATF-TGICA are contained in Annex 1 to [Decision IPCC/XLIV-8](#). The Panel has assigned to ATF-TGICA in its terms of reference following responsibilities:

- i. Reviewing options and identifying priority objectives for the future of TGICA, including those presented to the Panel at the 43<sup>rd</sup> Session of the IPCC and to the Bureau at its 52<sup>nd</sup> Session;
- ii. Reviewing options and identifying priority objectives for the Data Distribution Centre (DDC) including those presented to the Panel at the 43<sup>rd</sup> Session and to the Bureau at its 52<sup>nd</sup> Session;
- iii. Scoping, implementing and overseeing a mapping exercise of activities undertaken by external organizations that are similar or related to TGICA or the DDC, including but not limited to what is presented in the documents listed in (i) and (ii) above. The objective of this exercise is to evaluate the potential overlap, sustainability, and relevance of other products and services compared to TGICA and DDC functions, so as to identify remaining gaps and help refine priorities, and to explore potential partnerships;
- iv. Developing, based upon the information and findings from the above activities, a proposal for a longer-term vision, and a short-term strategy, which will enable the transformation of existing TGICA functionalities and to identify priority objectives of the DDC. This strategy should ensure continuity, transparency, accessibility, and integration across Working Groups of existing and emerging support needs for data and scenarios by the IPCC; mindful of human and financial resource constraints;
- v. Proposing a new mandate and terms of reference for the transformed TGICA functionality and for the core functions of the DDC;
- vi. Proposing options for sustainable resourcing to support the needs of the transformed functions, including possible ways to expand country contributions; and
- vii. Providing a progress report about its activities to the IPCC at its 45<sup>th</sup> Session.

The overarching purpose of ATF-TGICA is to design a strategic plan as well as a mandate and terms of reference (ToR) for the transformation of TGICA functions to serve the needs of IPCC during and beyond the sixth assessment cycle. This plan and the related ToR and mandate should take into consideration identified priority objectives of the Task Group and the IPCC Data Distribution Centre (DDC) it oversees, including emerging needs in relation to regional data and scenarios and results from a mapping exercise of other organizations and stakeholders, paying due attention to constraints on both human and financial resources.

It is of relevance to mention here that the Panel constrained the work of ATF-TGICA by requiring that all meetings will be held only through teleconferencing and/or in combination with existing IPCC meetings where Task Force members will be present (see also Annex 1 to the present report).

The membership of the ATF-TGICA is included in Annex 2 to the present report. There was large interest in ATF-TGICA from the very beginning so an additional group of the Friends of ATF-TGICA was formed with the view to enable maximally wide sharing and exchange of information while retaining an organisationally effective core task force in the form of ATF-TGICA, according to the ToR for ATF-TGICA membership. The list of Friends is shown in Annex 3 to the present report.

## Background and evolution of current situation

The Task Group was established in 1996 as the Task Group on Climate Scenarios for Impact Assessment (TGCIA), following a recommendation arising out of the IPCC Workshop on Regional Climate Change Projections for Impact Assessment (London, 24-26 September 1996).<sup>4</sup> This recommendation and terms of reference for the group were approved at IPCC Bureau XI (7-8 November 1996).<sup>5</sup> The first meeting of TGCIA was held in Washington, D.C., 5-6 May 1997 and the group met regularly chaired by M. Parry up to 2002, when the Task Group requested that the membership be renewed and a new workplan be developed ahead of the IPCC Fourth Assessment cycle. A draft mandate for the Task Group was developed in a contact group at IPCC XX where R. Moss was confirmed as co-chair. At TGCIA-8 in 2003, the Task Group discussed the draft 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". Bureau XXX reviewed and further refined the mandate, also recommending an additional change in the name of the group to "Task Group on Data and Scenario Support for Impacts and Climate Analysis" (TGICA). The TGICA Mandate was accepted by the 21<sup>st</sup> Session of the Intergovernmental Panel on Climate Change (IPCC) in 2003<sup>6</sup> and is still in operation. At Bureau XXXI in 2004, J. Marengo was appointed as the second co-chair of the Task Group and a slate of members developed in consultation with the Co-Chairs of the Working Groups (WGs) was approved.<sup>7</sup> In 2010 the membership was refreshed ahead of the Fifth Assessment cycle, following procedures outlined in the Mandate, and the re-constituted group met with the same Co-Chairs for the first time at TGICA-16 in August 2010. Both Co-Chairs stepped down in 2011, and T. Carter and B. Hewitson were selected by the IPCC chair and WG co-chairs as interim TGICA co-chairs from the existing membership, as reported at IPCC XXXIII in a submission on TGICA by the WG Co-Chairs.<sup>8</sup> The Task Group has continued its activities with an unchanged membership until the present-day, as the IPCC enters the Sixth Assessment cycle.

The activities of TGICA in the current Mandate include: to co-ordinate a Data Distribution Centre (DDC), which provides data sets, climate and other scenarios, and other materials such as technical guidelines on use of scenarios (see: <http://www.ipcc-data.org/>), to identify information needs in support of IPCC work, to facilitate research on climate impacts, adaptation, and mitigation, and to make related recommendations on cross-cutting issues. These efforts resulted in continuous oversight of the work of the DDC, regular workshops and expert meetings, and a number of products in the form of reports, e.g. technical guidelines on use of scenarios, which typically were made available for a wide clientele through the DDC. According to the Mandate paragraph 2.3 the TGICA reports to the Panel through the Bureau and has done so regularly with reports to the Sessions of the Bureau and the Panel.

The IPCC Data Distribution Centre (DDC) was established in 1998, following a proposal from TGCIA in 1997, endorsed by Bureau XIV. The Terms of Reference of the DDC were set out in Annex II of the TGCIA submission to IPCC XIII.<sup>9</sup> Further, IPCC XIII accepted the recommendations of an Ad-Hoc Committee on the Data Distribution Centre that both Germany and the United Kingdom could act as DDCs.<sup>10</sup> A third DDC node in the USA was added following TGCIA-3 in 2000 for hosting socioeconomic and environmental data. The DDC was originally established to ensure that impact researchers were able to obtain climate scenario data to enable them to undertake appropriate and co-ordinated climate impact assessment for the IPCC Third Assessment Report. Since that time its function and role has evolved and expanded and it has organized the timely distribution of a consistent set of up-to-date scenarios of changes in climate and related

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<sup>4</sup> Workshop report is available as PDF on request from the secretariat

<sup>5</sup> Terms of Reference is Annex B of the aforementioned workshop report available as PDF on request from the secretariat

<sup>6</sup> Available at <<http://www.ipcc.ch/meetings/session21/final-report.pdf>>

<sup>7</sup> Available at <<http://www.ipcc.ch/meetings/bureau-sessions/bureau31rep.pdf>>

<sup>8</sup> Available at <[http://www.ipcc.ch/meetings/session33/doc19\\_p33\\_progress\\_TGICA.pdf](http://www.ipcc.ch/meetings/session33/doc19_p33_progress_TGICA.pdf)>

<sup>9</sup> IPCC-XIII/INF.5(22-IX-1997)

<sup>10</sup> Available at <<http://www.ipcc.ch/meetings/session13/thirteenth-session-report.pdf>>

environmental and socio-economic factors for use in climate impact and adaptation and mitigation assessment during both the Fourth and Fifth IPCC Assessment cycles. The DDC is a shared operation between the [Centre for Environmental Data Analysis \(CEDA\)](http://www.badc.nerc.ac.uk/home/)<sup>11</sup> in the United Kingdom, the [Deutsches Klimarechenzentrum \(DKRZ\)](http://www.dkrz.de/about-en?set_language=en)<sup>12</sup> in Germany and the [Center for International Earth Science Information Network \(CIESIN\)](http://www.ciesin.columbia.edu/)<sup>13</sup> at Columbia University, New York, USA. Technical inputs from other centres or organizations with experience in the preparation and distribution of scenarios have also been solicited, and links are made to these groups from the DDC site. The data are provided by co-operating modelling and analysis centres. The DDC operates under the oversight of the TGICA and is guided by the [DDC Governance document](#),<sup>14</sup> that was prepared by TGICA in 2012.

Since the inception of TGICA and of the DDC in the late 1990s, climate change research, notably in the field of climate modelling and scenario development but also in relation to other scenario-related activities (such as the development of socioeconomic, land use, emissions and other environmental scenarios) has undergone substantial changes. Numerous challenges, some of them technical, have arisen on many fronts, whereupon the feasibility, scope and resourcing of TGICA's work has been questioned. TGICA itself repeatedly brought this situation to the attention of the Panel,<sup>15</sup> yet no obvious solution for the numerous problems identified was apparent, despite considerable efforts being made, including the decision by the Panel to revisit the mandate of TGICA (Decision IPCC/XLI-4,<sup>16</sup> paragraph 15) and to hold an IPCC Expert Meeting on the Future of TGICA,<sup>17</sup> which took place 26-27 January 2016 in Geneva. Finally in 2016 the Panel decided at its 44<sup>th</sup> Session to form ATF-TGICA to look further into the future of TGICA ([Decision IPCC/XLIV-8](#)<sup>18</sup>) and to propose solutions to the problems identified.

*Please note that due to time constraints these considerations do not represent consensus by the ATF TGICA.*

Based on the information available to ATF-TGICA following problem areas might require further consideration:

- a. The IPCC has commissioned and approved several sets of scenarios for climate change research since its inception (e.g. Nakicenovic et al., 2000<sup>19</sup>). New scenarios had been created periodically to reflect advances in research, new data, and to support the increasing sophistication of integrated assessment and climate models. The IPCC then decided<sup>20</sup> in 2006 to catalyze the development of new scenarios by the research community, rather than developing them itself, with the intention that those scenarios, and research building on those scenarios, would underpin its Assessment Reports.

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<sup>11</sup> Formerly the British Atmospheric Data Centre <<http://badc.nerc.ac.uk/home/>>

<sup>12</sup> <[http://www.dkrz.de/about-en?set\\_language=en](http://www.dkrz.de/about-en?set_language=en)>

<sup>13</sup> <<http://www.ciesin.columbia.edu/>>

<sup>14</sup> Available at <[http://www.ipcc-data.org/docs/TGICA\\_DDC\\_Governance\\_2012feb08.html](http://www.ipcc-data.org/docs/TGICA_DDC_Governance_2012feb08.html)>

<sup>15</sup> Available at <[http://www.ipcc.ch/activities/pdf/exmot\\_doc4\\_%20TGICA\\_Vision\\_Paper.pdf](http://www.ipcc.ch/activities/pdf/exmot_doc4_%20TGICA_Vision_Paper.pdf)>

<sup>16</sup> Available at <[http://www.ipcc.ch/meetings/session41/p41\\_decisions.pdf](http://www.ipcc.ch/meetings/session41/p41_decisions.pdf)>

<sup>17</sup> Available at <[http://www.ipcc.ch/pdf/supporting-material/EMR\\_TGICA\\_Future.pdf](http://www.ipcc.ch/pdf/supporting-material/EMR_TGICA_Future.pdf)>

<sup>18</sup> Available at <[http://www.ipcc.ch/meetings/session46/p46\\_decisions.pdf](http://www.ipcc.ch/meetings/session46/p46_decisions.pdf)>

<sup>19</sup> Nakicenovic, N., Alcamo, J., Davis, G., de Vries, B., Fenhann, J., Gaffin, S., Gregory, K., Grübler, A., Jung, T.Y., Kram, T., Lebre La Rovere, E., Michaelis, L., Mori, S., Morita, T., Pepper, W., Pitcher, H., Price, L., Riahi, K., Roehrl, A., Rogner, H.-H., Sankovski, A., Schlesinger, M., Shukla, P., Smith, S., Swart, R., van Rooijen, S., Victor, N. & Dadi, Z. (eds.), 2000. Emissions scenarios - a special report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, 509

available at <[http://www.ipcc.ch/publications\\_and\\_data/publications\\_and\\_data\\_reports.shtml](http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml)>

<sup>20</sup> Available at <<http://www.ipcc.ch/meetings/session25/final-report.pdf>>

- b. Climate model–based projections (e.g. CMIP6, Eyring et al., 2015<sup>21</sup>) have become resource intensive, since today they comprise data volumes in the range of Petabytes, possibly with CMIP6 even Exabytes, while at the time of TGICA’s inception a few MB sufficed. Consequently sophisticated storage facilities including data robots are needed and storage alone has become expensive (1 TB ~150 CHF/a), let alone its handling;
- c. Many institutions, including research groups, are today needed to maintain climate and other models, to generate meaningful scenarios and need therefore to work in a distributed manner. Coordination is a research prerequisite and is done outside and independently of the IPCC;
- d. The TGICA has also been tasked with activities that do not fall within the core activities of IPCC including facilitating research and serving various communities of data and scenario users. At the same time the need for climate services has grown world-wide, was recognized by governments and decisions were made accordingly to provide and develop these. These are tasks that extend well beyond IPCC’s core activities;
- e. With the efforts by the DDC managers to help with archival of data used by the IPCC for assessments under TGICA oversight, TGICA’s difficulties have only grown, not the least because IPCC core activities were so far typically done without clear concepts for long-term archival (curation) and sometimes organized separately by the three Working Groups. It is well known that curation not planned, co-ordinated and taken care of from the very beginning of an assessment will be much more difficult, if not impossible, and for sure very time-consuming and labour-intensive, a task beyond current means available to the DDC;
- f. TGICA has also drawn attention to the need for more effective and integrated curation, but without a common approach across all Working Groups its activities have become to some extent autonomous, while full integration into the IPCC Working Groups has become difficult;
- g. Since the IPCC’s principles and procedures refer only to Working Groups and Task Forces and lack a definition for Task Groups the legal status of the TGICA should be clarified (either by defining Task Group in a review of the principles and procedures of the IPCC or renaming TGICA appropriately);
- h. The status of the DDC and its relationship to the IPCC need to be clarified.

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<sup>21</sup> Eyring, V., Bony, S., Meehl, G.A., Senior, C., Stevens, B., Stouffer, R.J. & Taylor, K.E., 2015. Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) experimental design and organisation. *Geosci. Model Dev.*, 8(12): 10539-10583. doi: 10.5194/gmdd-8-10539-2015

ATF-TGICA has discussed the TGICA's problem areas and has made efforts to identify possible solutions by fulfilling its mandate according to the responsibilities the Panel as assigned ATF-TGICA as described in the following:

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**i. Reviewing options and identifying priority objectives for the future of TGICA, including those presented to the Panel at the 43rd Session of the IPCC and to the Bureau at its 52nd Session;**

**ii. Reviewing options and identifying priority objectives for the Data Distribution Centre (DDC) including those presented to the Panel at the 43rd Session and to the Bureau at its 52nd Session;**

**Annex 4** to the present report contains the priority objectives for a future TGICA (responsibility i) and the DDC (responsibility ii) as identified by the ATF TGICA.

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**iii. Scoping, implementing and overseeing a mapping exercise of activities undertaken by external organizations that are similar or related to TGICA or the DDC, including but not limited to what is presented in the documents listed in (i) and (ii) above. The objective of this exercise is to evaluate the potential overlap, sustainability, and relevance of other products and services compared to TGICA and DDC functions, so as to identify remaining gaps and help refine priorities, and to explore potential partnerships;**

ATF-TGICA made large efforts in collecting information: A questionnaire has been developed and the responses obtained have been analyzed. This was done without additional IPCC resources, the work was only possible thanks to personal engagement by members of ATF-TGICA. The Panel is invited to take the difficult circumstances into account under which this work was done.

**Annex 5** to the present report contains the questionnaire as well as the results from the analysis of the responses, falling into two groups or batches. The first batch consists of responses obtained from actors involved in particular roles within IPCC such as current and former WG Co-Chairs, TSU heads and scientific officers, coordinating lead authors and lead authors of previous reports, or particularly experienced scenario and data specialists. The second batch consists of responses solicited through designated IPCC Focal Points and Ministries of Foreign Affairs (if no focal point has been designated). **Annex 5** to the present report contains also a table listing institutions and web sites providing services similar and partly comparable to the services provided by the IPCC DDC. They could act as potential partners and/or providers of additional, complementary, or alternative services compared to the services currently provided by DDC.

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**iv. Developing, based upon the information and findings from the above activities, a proposal for a longer-term vision, and a short-term strategy, which will enable the transformation of existing TGICA functionalities and to identify priority objectives of the DDC. This strategy should ensure continuity, transparency, accessibility, and integration across Working Groups of existing and emerging support needs for data and scenarios by the IPCC; mindful of human and financial resource constraints;**

**Annex 6** to the present report contains considerations by the ATF-TGICA in proposing a longer-term vision, and a short-term strategy for the transformation of the existing TGICA.

*Please note that due to time constraints these considerations do not represent consensus by the ATF TGICA.*

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**v. Proposing a new mandate and terms of reference for the transformed TGICA functionality and for the core functions of the DDC;**

**Annex 7** to the present report contains the ATF-TGICA proposal for a new mandate and ToR for the future TGICA.

The DDC as a shared operation between independent data centers under the oversight of the TGICA and guided by the [DDC Governance document](#)<sup>22</sup> does not have a mandate or ToR approved by the IPCC. The ATG TGICA in response to its mandate is providing a proposal for an update of the existing guidance document for the DDC in **Annex 8** to the present report. Guidance notes and documents do not require Panel approval<sup>23</sup> and will be developed and finalised by the TGICA.

Annex 7 and 8 are based on the key priorities for the TGICA and the DDC presented in Annex 4 to the present report.

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**vi. Proposing options for sustainable resourcing to support the needs of the transformed functions, including possible ways to expand country contributions; and**

**Annex 9** to the present report contains the ATF-TGICA considerations for sustainable resourcing options to support the needs of the transformed functions, which also refer to the table contained in Annex 6 to the present report.

*Please note that due to time constraints these considerations do not represent consensus by the ATF TGICA.*

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**vii. Providing a progress report about its activities to the IPCC at its 45th Session.**

ATF-TGICA delivered progress reports to the Bureau at its 53<sup>rd</sup> and the Panel at its 45<sup>th</sup> and 46<sup>th</sup> Session. The present document represents the final report.

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<sup>22</sup> Available at <[http://www.ipcc-data.org/docs/TGICA\\_DDC\\_Governance\\_2012feb08.html](http://www.ipcc-data.org/docs/TGICA_DDC_Governance_2012feb08.html)>

<sup>23</sup> Available at <<http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-appendix-a-final.pdf>>, section 6.

## Annex 1

### Terms of Reference for the Ad Hoc Task Force on the Future of the IPCC Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA)

#### 1. PURPOSE

The purpose of the Ad Hoc Task Force (Task Force) on the future of the IPCC Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA) is to design a strategic plan as well as a mandate and terms of reference for the transformation of TGICA functions to serve the needs of IPCC during and beyond the sixth assessment cycle, to be considered by the IPCC at its 46th session. This plan and the related ToR and mandate should take into consideration identified priority objectives of the Task Group and the IPCC Data Distribution Centre (DDC) it oversees, including emerging needs in relation to regional data and scenarios and results from a mapping exercise of other organizations and stakeholders, paying due attention to constraints on both human and financial resources.

#### 2. TERM

The Task Force will initiate its work immediately after the 44th Session of the IPCC and continue its activities until the revised mandate and terms of reference are approved by the Panel, but no later than the time of the 46th Session of the IPCC, which is provisionally scheduled for September 2017.

#### 3. MEMBERSHIP

The Task Force will comprise of at least:

- Two Vice-Chairs from each of the three Working Groups, one from a developed country and the other from a developing or economy in transition (EIT) country;
- Current TGICA Co-Chairs;
- Six Government representatives, three each from developed and developing/EIT countries. DDC host countries will be given priority if they are willing to participate;
- One representative from each of the Working Group technical support units; and
- A representative of the IPCC Secretariat.

The Task Force will be Co-Chaired by two Working Group Vice-Chairs from different Working Groups, one from a developed country and another from a developing country/EIT. At least one of the Co-Chairs should preferably be female. The Task Force may consider inviting DDC managers and relevant TSU staff from the AR5 cycle to share their views and experiences. This Task Force will be open to government representatives and Bureau members who may be co-opted for supporting specific tasks, as required.

#### 4. ROLES AND RESPONSIBILITIES

The Task Force will be responsible for:

- i. Reviewing options and identifying priority objectives for the future of TGICA, including those presented to the Panel at the 43rd Session and to the Bureau at its 52nd Session;
- ii. Reviewing options and identifying priority objectives for the DDC including those presented to the Panel at the 43rd Session and to the Bureau at its 52nd Session;
- iii. Scoping, implementing and overseeing a mapping exercise of activities undertaken by external organizations that are similar or related to TGICA or the DDC, including but not limited to what is presented in the documents listed in (i) and (ii) above. The objective of this exercise is to evaluate the potential overlap, sustainability, and relevance of other products and services compared to TGICA and DDC functions, so as to identify remaining gaps and help refine priorities, and to explore potential partnerships;

- iv. Developing, based upon the information and findings from the above activities, a proposal for a longer-term vision, and a short-term strategy, which will enable the transformation of existing TGICA functionalities and to identify priority objectives of the DDC. This strategy should ensure continuity, transparency, accessibility, and integration across Working Groups of existing and emerging support needs for data and scenarios by the IPCC; mindful of human and financial resource constraints;
- v. Proposing a new mandate and ToR for the transformed TGICA functionality and for the core functions of the DDC;
- vi. Proposing options for sustainable resourcing to support the needs of the transformed functions, including possible ways to expand country contributions; and
- vii. Providing a progress report about its activities to the IPCC at its 45th Session.

## 5. MEETINGS

All meetings will be held through teleconferencing and/or in combination with existing IPCC meetings where Task Force members will be present. They will be chaired by the Ad Hoc Task Force Co-Chairs who will be responsible for preparing meeting agendas. Teleconferencing arrangements and meeting minutes will be prepared by the Secretariat.

## Annex 2

Ad Hoc Task Force on the Future of TGICA (ATF-TGICA)				
	Name	Gender	IPCC Role/ Country	Email
1	Edvin ALDRIAN	M	Co-Chair	<a href="mailto:edvin.aldrian@bppt.go.id">edvin.aldrian@bppt.go.id</a> <a href="mailto:e_aldrian@yahoo.com">e_aldrian@yahoo.com</a>
2	Andreas FISCHLIN	M	Co-Chair	<a href="mailto:andreas.fischlin@env.ethz.ch">andreas.fischlin@env.ethz.ch</a>
TGICA Co-Chairs				
3	Timothy CARTER	M	TGICA Co-Chair	<a href="mailto:tim.carter@ymparisto.fi">tim.carter@ymparisto.fi</a>
4	Bruce HEWITSON	M	TGICA Co-Chair	<a href="mailto:hewitson@csag.uct.ac.za">hewitson@csag.uct.ac.za</a>
Bureau Members				
5	Greg FLATO	M	WGI Vice-Chair	<a href="mailto:greg.flato@canada.ca">greg.flato@canada.ca</a>
6	Ramon PICHES	M	WGIII Vice-Chair	<a href="mailto:rpichs@ciem.cu">rpichs@ciem.cu</a>
7	Diana ÜRGE-VORSATZ	F	WGIII Vice-Chair	<a href="mailto:vorsatzd@ceu.edu">vorsatzd@ceu.edu</a>
8	Pius YANDA	M	WGII Vice-Chair	<a href="mailto:pyanda@gmail.com">pyanda@gmail.com</a>
Government Representatives/ DDC Host Countries				
9	Alice ALPERT	M	United States of America	<a href="mailto:AlpertA@State.gov">AlpertA@State.gov</a>
10	Cathy JOHNSON	F	United Kingdom	<a href="mailto:Cathy.Johnson@beis.gov.uk">Cathy.Johnson@beis.gov.uk</a>
11	Christiane TEXTOR	F	Germany	Christiane.Textor@dlr.de
Government Representatives				
12	Birama DIARRA	M	Mali	<a href="mailto:biramadia@yahoo.fr">biramadia@yahoo.fr</a>
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## Annex 3

Friends of the Ad Hoc Task Force on the Future of TGICA (ATF-TGICA)				
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## Annex 4

TGICA: key priorities (listed order does not indicate importance)

1. To provide expert information on data and scenario issues in support of the implementation of the work programme of the IPCC
2. To provide oversight of DDC activities, in close liaison with the Co-Chairs or their representatives of the three Working Groups (WGs)
3. To identify relevant external sources of data, scenario information, and external data partnerships, in close liaison with WGs
4. To develop and update good practice guidance materials related to data and scenario issues targeting IPCC authors that are not familiar with the IPCC process in cooperation with the WGs.
5. To incorporate relevant regional data and scenario information by establishing requisite policies, structures, linking and curation procedures as requested by the WGs
6. To foster external partnerships guaranteeing the stability of data sets they held
7. To contribute to building capacity in the use of data and scenarios for climate-related research, particularly in developing and transition-economy regions and countries. e.g. through encouraging activities such as expert meetings and liaison with relevant academic institutions to address the requirements of developing countries. To achieve this, TGICA may work with organizations and activities that have training as their core mandate but would not develop training programmes of its own.
8. In consultation with the Co-Chairs or their representatives of the three Working Groups to explore effective structures to fulfil the functions of the TGICA needed by the IPCC, including facilitating collaboration and integrated activities across WGs.

DDC: key priorities (listed order does not indicate importance)

1. To archive and provide transparency, traceability, and stability of data and scenarios used by the IPCC in its reports, available at the DDC or elsewhere
2. To archive and provide transparency, traceability, and stability of data and scenarios underpinning key figures and tables, and headline statements in the IPCC reports.
3. To establish MoUs with data centres that hold data or provide functions relevant to the IPCC in a transparent manner, under the guidance of the Co-Chairs or their representatives of the three Working Groups, to provide information via IPCC website relevant to data and scenarios.
4. To curate new data sets unavailable elsewhere and link to external data sets of relevance
5. To improve accessibility to Data Distribution Centre materials for supporting IPCC authors and external users, especially in developing countries.
6. To provide a sustainable structure established and approved by the IPCC to provide observed and model data and information relevant at regional and country level scales.

## Annex 5

### Considerations on a Long-Term Vision for TGICA

*Please note that due to time constraints these considerations do not represent consensus by the ATF-TGICA.*

**[Option 1:** The ATF-TGICA mapping exercise illustrates the many sources of climate information and services now available from institutions around the world. This represents a significant development relative to the situation that existed at the time TGICA and the DDC were first created, and this necessarily affects the long-term vision going forward. In addition, the limited financial resources available to the IPCC must be considered when developing a long-term vision, necessitating a focus on those activities that are essential to the core work of the IPCC and to its ability to provide robust, traceable and useful assessments of climate science.

The original mandate of TGICA<sup>24</sup> was rather broad, “to facilitate wide availability of climate change related data and scenarios to enable research and sharing of information across the three IPCC working groups”. Its activities included oversight of the DDC, facilitation of cross-working-group research and communication, capacity development, and organization of expert meetings.

As a starting point for developing a longer-term vision, there are some activities that may not be needed in the revised TGICA functionality. First, oversight of the DDC could be taken on by the IPCC Bureau as the body concerned with the scientific quality and traceability of IPCC products. [this assumes a somewhat narrower scope for the DDC as outlined below]. The Bureau has, among its members, suitable expertise for such oversight, and would allow alignment with other IPCC activities and priorities. Second, the IPCC mandate is to objectively assess the state of scientific understanding, not to ‘enable research’, and so this should not be retained as a task for the revised TGICA functionality. Third, sharing of information across the three IPCC WGs is most efficiently undertaken by the WG Bureaux and their TSUs, not by a parallel entity, and so this aspect of the original mandate need not be retained.

A somewhat narrower long-term vision for the TGICA functionality is to focus on facilitating the uptake and use of IPCC assessment products by policy- and decision-makers. This could include preparation (in consultation with WGs and the Communications office) of guidance documents or other supporting material as outlined in the principles of the IPCC.<sup>25</sup> TGICA has produced such documents in the past, and by focusing on this ‘added valued’ activity, the revised TGICA functionality could continue to support the IPCC and its stakeholders in providing documents that assist the user community and maximize uptake of IPCC products.

A longer-term vision for the DDC might entail a focus on archival and dissemination of data used in key IPCC products (such as figures and tables in the SPMs and SYR). Given the many sources of climate data and information now available (refer to the results from the mapping exercise as contained in Annex 6 to the present report), the original mandate of the DDC as a primary distributor of climate data would then no longer be an essential function. However, proper archival of information and data used in key parts of the IPCC assessment is crucial to ensure traceability and transparency and to support the IPCC error protocol.<sup>26</sup> ]

<sup>24</sup> Available at <<https://www.ipcc.ch/pdf/activity/tgica-mandate.pdf>>

<sup>25</sup> Available at <<http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-appendix-a-final.pdf>>

<sup>26</sup> Available at <[https://www.ipcc.ch/pdf/ipcc-principles/ipcc\\_error\\_protocol.pdf](https://www.ipcc.ch/pdf/ipcc-principles/ipcc_error_protocol.pdf)>

**[Option 2:** Currently the estimated budget of TGICA is less than CHF60 000 in a year as indicated in the budget decisions of the Panel. However, the actual expenditure is usually less than 50% of the budgeted amount. In the long term, there is a need to strengthen the support given to TGICA and mobilize additional resources as well as in kind support. This would enable the task group to undertake the following tasks:

- Curating, delivering and archiving (or linking to) climate and related emissions, socio-economic and environmental data, projections and scenarios from past and present IPCC assessment cycles;
- Support for WGs and their authors through hosting and provision of projection data.
- Easing access for users from developing countries, e.g. IPCC authors or researchers contributing to IPCC assessments. This could be done by developing capabilities to run analyses remotely on DDC servers and/or to deliver large datasets on DVDs or other media. Developing good practice guidance material (especially on topics that cross different areas of expertise covered by IPCC assessment reports) for IPCC authors and researchers on the use of data and scenario information, including the integration of multiple scales of global and regional information. Some guidance material would usefully be developed in conjunction with IPCC Expert Meetings or Workshops.
- Facilitating collaboration and integrated activities across WGs, in close consultation with WG Co-Chairs. The possibility to produce a data registry used to produce figures in at least the IPCC WG and Synthesis Report Summaries for Policy Makers, and perhaps also for further figures in the WG reports;
- Compiling and broadening access for use in IPCC assessments to well documented data sets of derived climate variables needed for impacts and adaptation analysis (e.g., time series of regional averages/extremes, variables related to fire risk, heat stress, flooding, changes in disease vectors)
- Facilitating the usage of data underlying the IPCC assessments and scenarios to “external” users such as National Meteorological and Hydrological Services, other government agencies and consultants from the global to the regional/national levels. This would be a co-benefit of work done to ease access for IPCC authors and climate researchers from developing countries;
- Working in collaboration with WGs to enhance the traceability of data used in IPCC Assessment Reports;
- Serving as an authoritative and trusted go-to place for scientific data used in the IPCC assessments, and ensuring quality assurance for external users to access the best available climate science (continuing to help establish good practices);
- Supporting capacity building. It would not involve establishing conventional programs of training, but may engage in such opportunities if they arise. Primarily, the support would focus on the users of the underlying data and the outputs of IPCC assessments in a multidisciplinary context. Clients for such support internally are authors of assessments on topics that are cross-disciplinary or cross-WG, and externally, are representatives of government departments and university researchers. Support is also desirable in the frontier area of climate and socioeconomic data integration, for informing both regional impact assessments and the development of tailored regional climate services.

- Facilitating delivery of the IPCC assessment reports and outputs needed to support climate services without having to advise policy-makers or deliver operational climate services, which is not TGICA's mandate but is rather the role of organizations such as the GFCS.
- Fostering the expansion of partnerships to bridge the gap between the internal foci of TGICA's IPCC activities and the activities of external agencies which IPCC both serves and depends on.

In terms of sustainable funding, TGICA could be slimmed down, though possibly with an expanded DDC as explained briefly below. Critically, there could be more rapid turnover of the group (2-3 year terms, which should comprise active members with clear roles. Some persons could be co-opted for special tasks, as now. Some face-to-face meetings would definitely be required (1 per year), but a lot can also be done virtually.

The DDC is currently distributed among UK, Germany and USA, thanks to those countries' generous support over many years. However, were there to be additional regional nodes added to the DDC in other countries, especially developing countries and EITs, then the DDC would be able to serve and represent the needs of those regions much more directly and effectively, whilst also offering opportunities to build capacity in the host regions.

This could be done with long-term background support in each centre that need not extend to much more than 1 or 2 FTEs per year plus a host institution willing to offer office and computing facilities.

It would be desirable to have nodes in each of S. America, Asia and Africa and possibly also in a small islands setting. Such a network could provide the IPCC with operational regional nodes for liaising on data and scenarios, but also contact points for WGs to organize regional activities supporting the assessment process. There are also other international research programmes that could interact with and add value to such as structure (e.g. CORDEX, PROVIA). As an IPCC DDC node, each regional center would undertake its activities following protocols already in place in the current DDC nodes and under the direction of TGICA.]

### **Considerations on a short-term strategy to enable the transformation of existing TGICA functionalities**

*Please note that due to time constraints these considerations do not represent consensus by the ATF-TGICA.*

In its considerations on the future work of the TGICA, and in order to be consistent with proposed ToR and mandate as contained in Annex 7 to the present report and the guidance contained in Annex 8 to the present report, the Panel is invited to take the following into account:

- The new proposed Terms of Reference and Mandate for the TGICA as contained in Annex 7 to the present report would best be adopted by the Panel before the TGICA membership is to be renewed. If the Panel should decide to approve the proposed TGICA's new Terms of References and mandate later than at its 47<sup>th</sup> Session, the IPCC runs the risk of jeopardizing a timely selection of the new TGICA members.
- Guidance on long-term archival is to be developed by the TGICA in close cooperation with the WGs and current author teams with highest priority to enable efficient and effective curation during the 6<sup>th</sup> Assessment Cycle of key supporting material for all products, including the special reports.

- Assisting the WGs and authors in preparing for curation tasks and development of partnerships, including development of Memoranda of Understanding, with other service providers to ensure curation, transparency, traceability, and stability of data and scenarios used by the IPCC in its reports as available at the DDC
- Current TGICA mandate is to coordinate the DDC. Presently the DDC depends on the in-kind contributions of a few individual countries or research institutions without a formal relationship to the IPCC. It is questionable whether this institutional situation responds well to the needs for the stability and sustainability of the IPCC. In addition, the TGICA has raised concerns that the limited availability of funds does not allow full implementation of the mandate of the DDC.

There are several options to improve this situation, including facilitation by TGICA of the following:

- Clarifying the institutional and legal status of the DDC within the IPCC;
- Clarifying the characteristics of the host institutions contributing to the DDC and their relationships to the IPCC.
- Clarifying the characteristics and categories of data provided by the DDC itself and those provided by external institutions to which the DDC provides links

## Annex 6

This large Annex consists of three parts: The 1<sup>st</sup> part contains the questionnaire verbatim, the 2<sup>nd</sup> describes the analysis of the responses to the questionnaire, and the 3<sup>rd</sup> part contains the mapping exercise table.

### Questionnaire

The following questionnaire was developed and used as described below in the next section of this Annex 6:

## Questionnaire for gathering information for the mapping exercise

The following questionnaire is being circulated to IPCC focal points to gather information on past and future activities of the IPCC Data Distribution Center ([DDC](#)) and the IPCC Task Group on Data and Scenario Support for Impact and Climate Analysis ([TGICA](#)). The inquiry is conducted by the Ad Hoc Task Force (ATF-TGICA) entrusted by the IPCC panel to conduct a mapping exercise according to following task:

“Scope, implement and oversee a mapping exercise of activities undertaken by external organizations that are similar or related to TGICA or the DDC .... The objective of this exercise is to evaluate the potential overlap, sustainability, and relevance of other products and services compared to TGICA and DDC functions, so as to identify remaining gaps and help refine priorities, and to explore potential partnerships.”

As background, TGICA is described here: <https://www.ipcc.ch/activities/tgica.shtml>, and the DDC is described here: <http://www.ipcc-data.org/>.

This mapping exercise and this questionnaire focuses on the needs of the IPCC during and after the preparation of a report. In accordance with the limited scope of the task given to the ATF-TGICA, it does not focus on the needs of external users such as the broader research community in developed or developing countries, nor any capacity building needs such as those of decision makers, e.g. in the context of adaptation.

The Ad Hoc Task Group on the TGICA has identified three key thematic areas that require climate information and data that are of relevance in this context:

- CMIP<sup>27</sup> model output (as assessed by WGI but also used by all WG)
- Risk analysis data base (WGII)
- Integrated Assessment Model (IAM) data base (WGIII)

When considering the questions below, please focus on the above themes.

Please note that the IPCC is operating under a very limited budget, see the flyer [IPCC RESOURCE MOBILIZATION](#).<sup>28</sup> Therefore, it is important that you help with your answers to assess priorities for the services or activities you mention, and that you provide estimates of associated resource needs whenever possible.

<sup>27</sup> Coupled Model Intercomparison Project, URL for phases 5 (CMIP5) and 6 (CMIP6): <http://cmip-pcmdi.llnl.gov/cmip5/> and <https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6>

<sup>28</sup> [http://www.ipcc.ch/pdf/brochure\\_resource\\_mobilization\\_en.pdf](http://www.ipcc.ch/pdf/brochure_resource_mobilization_en.pdf)

**Questions for respondents who have been involved in the preparation of IPCC products (AR, SR, TP)<sup>29</sup>**

Q1a: What *data*<sup>30</sup> did you need during the preparation of the IPCC product?

Q1b: From where did you obtain those *data*? If not from DDC<sup>31</sup>, why not?

Q1c: Were there *data*, which you would like to have obtained, but encountered difficulties in obtaining, where the DDC has helped or might potentially help?

Q2a: What *data*<sup>32</sup> you worked with do you consider worth-archiving/retaining?

Q2b: If you listed some under Q2a, to what extent is a proper long-term curation already taken care of?

Q2c: If you responded positively to Q2b, by whom is this curation done?

Q2d: If you responded positively to Q2b, are the arrangements satisfactory?

Q2e: If you listed some under Q2a and if curation is missing or current arrangements are not satisfactory, could the DDC potentially help (if not involved) or help more (if already involved)?

Q3a: Did any of the following help you in your work for the IPCC (multiple answers possible)?

- (i) Guidance material on issues related to the use of the data available at the DDC
- (ii) Guidance material providing more general information on data (available or not available from the DDC)<sup>33</sup> in support of the work of the IPCC
- (iii) Information on the scenario building process
- (iv) Remote data analysis tools (making large downloads or shipments obsolete)
- (v) Data visualization tools

Q3b: If so, which support/help did you get from the DDC, which from elsewhere?

Q4: Should TGICA provide guidance material for authors? What kind of guidance (if any, please assign priorities)? Are there alternatives?

Q5: Should TGICA provide recommendations to enhance cooperation and coordination among working groups (if any, please assign priorities)? How should TGICA make such recommendations? Are there alternatives?

<sup>29</sup> AR - Assessment Report; SR – Special Report; TP – Technical Paper

<sup>30</sup> In the following *data* (italic) is a generic term for any data listed under the three aforementioned thematic areas

<sup>31</sup> Please list your source by name and home page URL

<sup>32</sup> In the following *data* is a generic term for any data including *data* (with meaning as defined above)

<sup>33</sup> Please indicate if data are available from DDC

## Questions for all respondents who are aware of the existence of TGICA and DDC

Q6a: Of what significant activities or data services are you aware that are conducted/provided by TGICA?

Q6b: Of what significant activities or data services are you aware that are conducted/provided by DDC?

Q7: Please classify the items you listed under Q6a/b as serving to any of the following purposes mentioned in the mandate of the TGICA or the DDC (for each item multiple answers possible):

- (i) IPCC internal or
- (ii) IPCC external use,
- (iii) cooperation/coordination among working groups,
- (iv) curation,
- (v) transparency of the assessment,
- (vi) capacity building,
- (vii) decision making and planning

Q8: What priority do you assign to the items you listed under Q6a/b? Could you clearly single out some items that could be abandoned without significant loss?

Q9: If you have been involved in any of the items you listed under Q6a/b, what fraction of a FTE<sup>34</sup> does in your experience each of those items require?<sup>35</sup>

Q10a: Do you see an urgent need for additional activities or data services by TGICA than the ones you listed under any of the questions above?

Q10b: Do you see an urgent need for additional activities or data services by DDC than the ones you listed under any of the questions above?

Q11: If you listed any items under Q10a/b, what fraction of a FTE do you expect would each of these items require?

Q12a: Do you see a need for specific activities or data services by TGICA after the completion of a particular IPCC product to support transparency and tracability of IPCC assessments?

Q12b: Do you see a need for specific activities or data services by DDC after the completion of a particular IPCC product to support transparency and tracability of IPCC assessments?

Q13a: Given the limited resources available, do you see an urgent need for additional new activities or data services after the completion of an assessment cycle to be provided by TGICA, perhaps in partnerships with other organizations<sup>36</sup>, or elsewhere (if any, please assign priorities, list potential partners)?

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<sup>34</sup> Full Time Equivalent

<sup>35</sup> please include in your assessment all items that you possibly listed under Q4, in particular also those that could possibly be abandoned

<sup>36</sup> Please list the institution by title and home page URL

Q13b: Given the limited resources available, do you see an urgent need for additional new activities or data services after the completion of an assessment cycle to be provided by DDC, perhaps in partnerships with other organizations<sup>9</sup>, or elsewhere (if any, please assign priorities, list potential partners)?

### Questions to all respondents:

Q14: Should TGICA disseminate information in support of IPCC work? What kind of information? Do you see possibilities for alternative institutions to disseminate such information? Please assign priorities for each you mention and give your preference as to which institution best disseminates such information.

Q15: Should TGICA support the transparency and traceability of the IPCC assessments? How should this support be done? Are there alternatives? If you mention specific activities, please assign priorities.

Q16: Should TGICA facilitate research on climate impacts, adaptation, and mitigation in support of the IPCC? Which research and how should TGICA facilitate such research (if any, please assign priorities for each you mention)? Are there alternatives?

Q17: Should TGICA contribute to building capacity, notably to developing country authors in the use of data and scenarios for climate-related research in cooperation with organizations and activities that have training as their core mandate? Which teaching/instructional role do you see for TGICA and how should TGICA contribute to capacity building (if any, please assign priorities for each you mention)? Are there alternatives?

Q18: Can you offer any views on what kind of guidance, monitoring, coordination, and governance TGICA should provide to the DDC (if any, please assign priorities for each you mention)? Are there alternatives?

Q19: If possible please estimate the technical needs (e.g. hardware, software, perhaps even costs) for any of the activities and data services you have emphasized previously during this interview and you consider to be indispensable?

Q20: Can you offer any ideas on how to possibly improve the resource situation and the sustainability of the DDC that is currently based on voluntary in-kind funding by only three countries?

Q21: Are you aware of an organization or entity in your country or region that performs similar activities as TGICA and/or DDC and that you have not already mentioned above?<sup>37</sup> If yes, which institution<sup>38</sup>, what are these activities and how are they performed, are there opportunities for partnerships between TGICA and/or DDC?

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<sup>37</sup> e.g. in your response to Q13a/b

<sup>38</sup> Please list the institution by title and home page URL

## **Analysis of the responses**

To this Report, questionnaires filled by anonymous participants were divided in two batches. One batch consisted in responses from experts selected ex-officio, e.g. experts who were involved in a previous IPCC work such as former WG Co-Chairs, TSU heads and/or scientific officers, coordinating lead authors, lead authors, or scenario and data specialists. The second batch consisted of responses solicited through IPCC Focal Points and Ministries of Foreign Affairs (if no focal point has been designated).

The analysis of these questionnaires captured answers using statistics as well as non-statistical information, which could feed the mandate of ATF-TGICA. Code criteria were developed in order to capture this information. Statistics allow generation of various graphics, e.g. graphics showing preferences, and non-statistical analysis allowed to capture general aspects from the responses and/or respondents.

The results of this analysis were not merged due to the differing backgrounds of the participants, which in some cases could yield opposite results depending on the batch.

These results served to obtain an overview of participants' perspectives on further work of TGICA and DDC, which has been incorporated as a general basis into the various mandated responsibilities.

The original anonymous responses can be obtained from IPCC website.

The aforementioned two batches of responses were compiled and analyzed separately in two accompanying spreadsheets named:

- 1) Questionnaire responses interview batch.xlsx
- 2) Questionnaire responses focal points batch.xlsx

## Mapping Exercise Table

The following table lists climate data and information providers identified during the mapping exercise conducted by ATF-TGICA. It is not a comprehensive list, but provides an indication of the variety of climate related information available from various sources.

#	Title	URL	Hosting region	meta site	Comments
1	CMIP5 home page	<a href="http://cmip-pcmdi.llnl.gov/cmip5/">http://cmip-pcmdi.llnl.gov/cmip5/</a>	2,4,5,6 (WCRP)	No	Description of CMIP5 experimental design and links to model output archive.
2	CMIP6 home page	<a href="https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6">https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6</a>	2,4,5,6 (WCRP)	No	Description of CMIP6 experimental design and links to related datasets
3	ESGF projects page	<a href="https://pcmdi.llnl.gov/projects/esgf-llnl/">https://pcmdi.llnl.gov/projects/esgf-llnl/</a>	4 (Lawrence Livermore National Laboratory)	Yes and No	Provides access to CMIP3 and CMIP5 model output archive, and will be home to CMIP6 archive once available
4	ENES (European Network for Earth System modelling)	<a href="https://verc.enes.org">https://verc.enes.org</a>	6 (European network)	Yes	Is closely related to ESGF
5	Obs4MIPS	<a href="https://www.earthsystemcog.org/projects/obs4mips/">https://www.earthsystemcog.org/projects/obs4mips/</a>	4 (Univ. Colorado)	Yes	Provides access to a growing archive of observational data, in the same format as CMIP model output, to facilitate model evaluation.
6	Shared Socioeconomic pathways (SSPs)	<a href="https://tntcat.iiasa.ac.at/SspDb/dsd?Action=htmlpage&amp;page=about">https://tntcat.iiasa.ac.at/SspDb/dsd?Action=htmlpage&amp;page=about</a>	6 (IIASA)	No	Provides access to greenhouse gas, aerosols, land-use and other forcings used as input to CMIP6 models.
7	NOAA ocean observations	<a href="http://www.ospo.noaa.gov/Products/ocean/sst.html">http://www.ospo.noaa.gov/Products/ocean/sst.html</a>	4 (NOAA)	No	A range of sea-surface temperature products
8	Surface temperature observations	<a href="http://www.esrl.noaa.gov/psd/data/gridded/tables/temperature.html">http://www.esrl.noaa.gov/psd/data/gridded/tables/temperature.html</a>	4 (NOAA)	No	A large collection of different surface temperature data sets
9	National Snow and Ice Data Centre	<a href="https://nsidc.org/">https://nsidc.org/</a>	4 (Univ. Colorado)	No	Home page for a large archive of cryosphere data (snow, sea-ice, glaciers, ice sheets, permafrost)
10	UK Met Office obs	<a href="http://www.metoffice.gov.uk/hadobs/hadisst/">http://www.metoffice.gov.uk/hadobs/hadisst/</a>	6 (Met Office Hadley Centre)	No	Near surface air temperature, sea-surface temperature, and sea-ice concentration data set compiled by Hadley Centre

11	CCDS	<a href="http://ccds-dscc.ec.gc.ca">http://ccds-dscc.ec.gc.ca</a>	4 (Canada)	No	Canadian Climate Data and Scenarios site, providing historical climate data for Canada, along with CMIP3 and CMIP5-derived future climate scenarios
12	KNMI climate explorer	<a href="https://climexp.knmi.nl/start.cgi?id=someone@somewhere">https://climexp.knmi.nl/start.cgi?id=someone@somewhere</a>	6 (Netherlands)	No	Netherlands site hosting a range of observation and model-based climate information, along with user-oriented tools for analysis
13	UKCIP	<a href="http://www.ukcip.org.uk/">http://www.ukcip.org.uk/</a>	6 (UK, Univ. Oxford)	No	UK-based site providing climate data and tools to support adaptation planning
14	Country Level Impacts of Climate Change (CLICC)	<a href="http://www.unep.org/provia/CLICCPROJECT/tabid/1060147/Default.aspx">http://www.unep.org/provia/CLICCPROJECT/tabid/1060147/Default.aspx</a>	1 (UNEP)	Yes and No	UNEP Provia site for country-level impact studies
15	Provia Guidance document	<a href="http://www.unep.org/provia/RESOURCES/Publications/PROVIAGuidancereport/tabid/130752/Default.aspx">http://www.unep.org/provia/RESOURCES/Publications/PROVIAGuidancereport/tabid/130752/Default.aspx</a>	1 (UNEP)	Yes	Guidance document on assessing vulnerability, impacts and adaptation to climate change.
16	CORDEX	<a href="http://www.cordex.org">http://www.cordex.org</a>			Regional climate model output
17	CRU	<a href="http://www.cru.uea.ac.uk/data">http://www.cru.uea.ac.uk/data</a>			Observationally-based global temperature analyses
18	CMAP	<a href="https://www.esrl.noaa.gov/psd/data/gridded/data.cmap.html">https://www.esrl.noaa.gov/psd/data/gridded/data.cmap.html</a>			Gridded precipitation data
19	GPCC	<a href="https://climatedataguide.ucar.edu/climate-data/gpcc-global-precipitation-climatology-centre">https://climatedataguide.ucar.edu/climate-data/gpcc-global-precipitation-climatology-centre</a>			Global precipitation climatology
20	GPCP	<a href="https://climatedataguide.ucar.edu/climate-data/gpcp-daily-global-precipitation-climatology-project">https://climatedataguide.ucar.edu/climate-data/gpcp-daily-global-precipitation-climatology-project</a>			Global daily precipitation dataset
21	GCMD	<a href="https://gcmd.nasa.gov">https://gcmd.nasa.gov</a>			Directory of a wide range of global change datasets
22	GFCS	<a href="http://www.wmo.int/gfcs/">http://www.wmo.int/gfcs/</a>			WMO Climate services portal
23	IRIMHE	<a href="http://icc.mn">http://icc.mn</a>			Mongolia national remote sensing center
24	ACMAD	<a href="http://www.acmad.net/new/">http://www.acmad.net/new/</a>			African Center of Meteorological Application for Development

25	MESA	<a href="http://www.acmad-au.org/blog/category/acmad-mesa/">http://www.acmad-au.org/blog/category/acmad-mesa/</a>			Monitoring for Environment and Security in Africa
26	ECMWF	<a href="https://www.ecmwf.int/en/research/climate-reanalysis">https://www.ecmwf.int/en/research/climate-reanalysis</a>			European Centre for Medium Range Weather Forecasting – global reanalyses
27	GDPFS	<a href="http://www.wmo.int/pages/prog/www/DPS/gdps.html">http://www.wmo.int/pages/prog/www/DPS/gdps.html</a>			WMO Global Data-Processing and Forecasting System
28	COPERNICUS	<a href="http://www.copernicus.eu">http://www.copernicus.eu</a>			European Union Earth Observation Program
29	DKRZ	<a href="https://www.dkrz.de/about-en">https://www.dkrz.de/about-en</a>			German climate computing centre
30	NCDC	<a href="https://www.ncdc.noaa.gov/cdo-web/">https://www.ncdc.noaa.gov/cdo-web/</a>			US National Climate Data Centre
31	NARCCAP	<a href="http://www.narccap.ucar.edu">http://www.narccap.ucar.edu</a>			North American Regional Climate Change Assessment Program
32	CMAR-CSIRO	<a href="http://www.cmar.csiro.au">http://www.cmar.csiro.au</a>			Marine and Atmospheric Research - Australia
33	CSIRO	<a href="https://www.csiro.au/en/Research/Environment/Atmosphere-and-climate">https://www.csiro.au/en/Research/Environment/Atmosphere-and-climate</a>			Australia CSIRO Atmosphere and Climate Research
34	IAMC	<a href="http://www.globalchange.umd.edu/iamc/">http://www.globalchange.umd.edu/iamc/</a>			Integrated Assessment Modelling Consortium
35	ISIMIP	<a href="https://www.isimip.org">https://www.isimip.org</a>			The Inter-Sectoral Impact Model Intercomparison Project
36	AGMIP	<a href="http://www.agmip.org">http://www.agmip.org</a>			Agricultural Model Intercomparison and Improvement Project
37	WRI	<a href="http://cait.wri.org">http://cait.wri.org</a>			Climate Data Explorer
38	GEO	<a href="http://www.earthobservations.org/climate.php">http://www.earthobservations.org/climate.php</a>			Group on Earth Observations
39	SENMAHI	<a href="http://www.senamhi.gob.pe">http://www.senamhi.gob.pe</a>			Peru Ministry of Environment
40	GISS	<a href="https://data.giss.nasa.gov/gistemp/">https://data.giss.nasa.gov/gistemp/</a>			NASA Goddard Institute for Space Studies global temperature reconstruction
41	IEA	<a href="https://www.iea.org/policiesandmeasures/">https://www.iea.org/policiesandmeasures/</a>			International Energy Agency Databases
42	IGAD-ICPAC	<a href="http://www.icpac.net">http://www.icpac.net</a>			African Climate Prediction and Application Centre
43	CRC-OSA	<a href="http://crc-osa.ciifen.org">http://crc-osa.ciifen.org</a>			South America Regional Climate Centre

Hosting regions are:

- 1 Africa
- 2 Asia-Pacific
- 3 South America
- 4 North America, Central America and the Caribbean
- 5 South-West Pacific
- 6 Europe

Above table lists sites that are partly also tabulated in Annex 3 of the document «Institutional Analysis of TGICA»<sup>39</sup> containing a table that lists a total of 69 portals. The aforementioned table lists different and further sites possibly also of relevance.

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<sup>39</sup> Available at <[https://www.ipcc.ch/activities/pdf/TGICA\\_institutional\\_analysis.pdf](https://www.ipcc.ch/activities/pdf/TGICA_institutional_analysis.pdf)>

## Annex 7

### Terms of Reference and Mandate of the IPCC Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA)

#### 1 PURPOSE

The purpose of the TGICA is to

- 1.1 Provide guidance to the IPCC's Data Distribution Centre (DDC) in order to provide curation, transparency, traceability and stability of data and scenarios related to the reports of the IPCC
- 1.2 Facilitate, in cooperation with the DDC, the availability and consistent use of climate change related data and scenarios in support of the implementation of the work programme of the IPCC
- 1.3 Facilitate in cooperation with the DDC the availability and use of climate change related data resulting from the activities of the IPCC in accordance with the mandate of the IPCC

#### 2 ROLES AND RESPONSIBILITIES

With respect to IPCC's Data Distribution Centre (DDC) the TGICA will:

- 2.1 Provide oversight of the DDC's activities, in close liaison with the three IPCC Working Group Bureaus (WGBs).
- 2.2 Identify in close liaison with the Co-Chairs or their representatives of the three Working Groups (WGs) relevant external sources of data, scenario information, and external data partnerships.
- 2.3 Provide in close liaison with the Co-Chairs or their representatives of three WGs guidance to incorporate consistently and efficiently relevant regional data and scenario information into the IPCC assessment work by developing and proposing policies and structures that will help to link and curate data as needed and used by the Co-Chairs or their representatives of the three WGs.
- 2.4 Recommend partnerships with external organisations to ensure the stability of the IPCC data sets they hold.

With respect to the use of data and scenarios the TGICA will:

- 2.5 Provide expert information on data and scenarios in support of the implementation of the work programme of the IPCC.
- 2.6 In cooperation with the Co-Chairs or their representatives of the three WGs, develop and update good practice guidance materials related to data and scenarios, targeting IPCC authors who lack familiarity with the IPCC process and/or the relevant data and scenarios.
- 2.7 Contribute to building capacity in the use of data and scenarios for climate-related research, particularly in developing and transition-economy regions and countries. e.g. through encouraging activities such as expert meetings and liaison with relevant academic institutions to address the requirements of developing countries. To achieve this, TGICA may work with organizations and activities that have training as their core mandate but would not develop training programmes on their own.

Furthermore, the TGICA will:

- 2.8 Explore in close consultation with the Co-Chairs or their representatives of the three WGs options for a sustainable structure, functioning, and resourcing for the DDC building upon the material contained in Annex 9 to the present report.
- [2.9 Facilitate in close consultation with the Co-Chairs or their representatives of the three WGs effective structures to fulfil the functions needed by the IPCC, including facilitating collaboration and integrated activities across WGs.]

### **3 MEMBERSHIP**

- 3.1 Members including the TGICA co-chairs will be selected by the IPCC Bureau.
- 3.2 Members will be selected from nominations of experts solicited by the IPCC Secretariat from governments and observer organisations.
- 3.3 TGICA will be composed of approximately 12 members, but not more than 15. The composition of the TGICA shall aim to reflect to the extent possible:
  - a) the range of scientific, technical and socio-economic views and expertise as needed to fulfil its role and responsibilities;
  - b) geographical representation, experts from developed and developing countries and from countries with economies in transition,
  - c) a mixture of experts with and without previous experience in IPCC;
  - d) gender balance;
  - e) experts with a background from relevant stakeholder and user groups.
- 3.4 The TGICA shall have two Co-Chairs with suitable experience, one from a developed country and another from a developing country/EIT. At least one of the Co-Chairs should preferably be female.
- 3.5 The DDC managers and relevant TSU staff are ex-officio members of the TGICA invited to share their views and experiences.

### **4 TERM**

- 4.1 The term of membership on the TGICA is to be linked to the assessment cycle of the IPCC and be refreshed at latest with the author selection process of a new comprehensive assessment, though with contingency for members to serve shorter terms.

### **5 MODUS OPERANDI**

- 5.1 Within the framework of the purpose and the roles and responsibilities, the TGICA, in consultation with the WG Co-Chairs, will prepare its draft workplan for duration of its term, including a list of activities and meetings, associated deliverables and respective timelines. The workplan is subject to review [by the IPCC Bureau and approval by the Panel] [and approval by the Bureau] and contingent on the availability of funds.
- 5.2 TGICA should have one face to face meeting in a year. Additional meetings will be preferably held through teleconferencing and/or in combination with existing IPCC meetings where TGICA members will be present. The TGICA may convene expert meetings on an as needed basis. Teleconferencing arrangements will be provided from the IPCC Secretariat.
- 5.3 The TGICA Co-Chairs are responsible for preparing meeting agendas and minutes, with support from the IPCC Secretariat.

## 6 REPORTING

6.1 [**Option 1:** The TGICA is accountable to the Panel and the Bureau. TGICA may present progress reports to the IPCC Bureau]

[**Option 2:** The TGICA reports to the IPCC Bureau]

[**Option 3:** The TGICA reports through the IPCC Bureau to the Panel]

## Annex 8

*The formal, institutional relationship between IPCC's Data Distribution Centre (DDC) and TGICA and IPCC on the other hand is currently unclear. The following proposal of elements towards a guidance of the DDC needs therefore to be understood as remaining contingent upon a clarification of this relationship.*

### Guidance for IPCC's Data Distribution Centre (DDC)

#### 1 PURPOSE

- 1.1 The purpose of the DDC is to archive and provide transparency, traceability, and stability of data and scenarios that are relevant in the context of the IPCC.

#### 2 ROLES AND RESPONSIBILITIES

The DDC will:

- 2.1 Archive and provide transparency, traceability, and stability of data and scenarios used by the IPCC in its reports, available at the DDC or elsewhere.
- 2.2 Archive and provide transparency, traceability, and stability of data and scenarios underpinning key figures and tables, and headline statements in the IPCC reports.
- 2.3 Establish Memoranda of Understanding with data centers that hold data or provide functions relevant to the IPCC in a transparent manner, under the guidance of the TGICA and the Working Group Bureaus (WGBs), to provide information via IPCC website relevant to data and scenarios.
- 2.4 Curate new data sets unavailable elsewhere and link to external data sets of relevance.
- 2.5 Improve accessibility to Data Distribution Centre materials for supporting IPCC authors and external users, especially in developing countries.
- 2.6 Provide a sustainable structure established and approved by the IPCC to provide observed and model data and information relevant at regional and country level scales.
- 2.7 Respond to other suggestions by the TGICA subject to the availability of resources.

#### 3 REPORTING

- 3.1 TGICA reports on DDC's activities to the IPCC Bureau.

## Annex 9

### Considerations regarding a Proposal for sustainable resourcing

*Please note that due to time constraints these considerations do not represent consensus by the ATF TGICA.*

Assuming the future DDC will follow the guidance as contained in Annex 8 to the present report, DDC's activities will focus on providing access to archived data as resulting from IPCC assessments while mostly just linking to the institutions having the main responsibilities for the category of data listed. Institutions of interest in this context are listed in the table from Annex 6 to the present report.

The following is just an illustrative example for potential new partners with whom IPCC may wish to engage via Memorandum of Understanding or other forms of engagement to cover that IPCC data are curated properly:

Data category	Research organisation or Institution
Climate scenarios	CMIPx
Impact data	PROVIA and/or AgMIP
SSPs	IIASA

In our work we also considered following arguments: Sustainable funding for the revised TGICA functionality and the DDC should likely be treated separately. As a core element of the traceability of IPCC products, a revised DDC functionality should be treated as an essential part of the resources available to IPCC. If some governments are willing to take on the financial responsibility as in-kind contributions for the DDC (as has been the case in the past) that should be welcomed, but a sustainable fall-back option should be available. It is not clear if the facilities available to the IPCC directly would be suitable as an alternative DDC host, but this would have to be explored further. The eligibility of resources beyond funding from government and research organizations needs to respond to eligibility criteria that would yet have to be established in order to maintain the integrity and independence of the IPCC. This would require dedicated action from the Secretariat to advertise opportunities and to negotiate contributions. By separating the revised DDC and TGICA funding streams, the essential DDC archival activity can be prioritized, and the added value supporting materials can be prepared as funding permits.