

General	Comments	
1	<p>This is an important document on a very important topic. Unfortunately, in the opinion of this reviewer, it is not well presented, contains numerous misleading or wrong statements and is not at all really strategic until it presents the principles and recommendations at the end. The material in the preceding too many chapters should be re-written to make the case for the recommendations. The document is too long to be strategic and contains many repetitions of information. The specific comments that follow are based on the parts that were read – quite frankly I found it discouraging and was not able or willing to spend the time to read and comment in detail on the whole draft.</p> <p>This reviewer is a former head of a national meteorological service which included responsibilities for climate services and research; I am also a present and former chair of major international research programs on disasters and climate. I was also at the Third (and Second) World Climate Conference. So I have biases.</p> <p>In the end the statements of principles and the recommendations are good; it just takes too long to get there. Much of the report is a collection of information without any strategic presentation. In drafting a report of this type, the following questions need to be asked – over and over – why is this example included, is it needed, does it make a point that is relevant to the overall strategy?</p> <p>My view is that climate services must be seen as an extension of weather services. In my IMO lecture to the WMO Congress of 1999, entitled “Forecasting in 21st Century”, I wrote:</p> <p><i>“3. The Weather and Environmental Prediction Systems of 2010-30</i></p> <p><i>The atmosphere is one component of our environmental system. Because of its time varying nature and its role in driving change, it is natural to extend weather forecasting into physical environmental prediction, encompassing the atmosphere, components of the land surface, the hydrological cycle, the cryosphere and the oceans, with limited bio-ecosystem elements. This has already started in many countries and this trend should</i></p>	<p>G.A. McBean, CM, Ph.D., FRSC Professor and Director, Policy Studies Institute for Catastrophic Loss Reduction Departments of Geography and Political Science The University of Western Ontario London, ON, Canada Phone: 519-661-4274 email: gmcbear@uwo.ca</p>

be extended. As we move further into the 21st century, we will evolve towards full environmental prediction, with full and interacting bioecosystems. Just as the scope of weather forecasting will be broader, weather services in the 21st century will become organizations that warn and inform their citizens and governments, on changes on a seamless time scale stretching from minutes to decades; e.g., warnings of minutes for tornadoes, days for winter storms and air pollution episodes, weeks for floods and droughts and decades for climate variations."

The concept that national weather-climate services organizations "*warn and inform their citizens and governments, on changes on a seamless time scale stretching from minutes to decades*" is, in my view, important and should be a strategic emphasis of this report as it provides a logical and strategic way of moving this important activity ahead. It would allow the provision of climate services to be implemented more effectively and efficiently and would also enable ways of assisting countries with presently limited capacity to have enhanced capacity.

Although there is mention of weather-climate related disasters, I feel that this needs to be more emphasized in the introduction and logic for having climate services. The number of disasters, where a society is overwhelmed and needs outside assistance, impacting global society is increasing, from about 200 per year in the 1980's, to closer to 300 per year in the 1990's to over 400 per year for the period 2000-2008. The enormity of the problem is outlined by M. Wahlström (Assistant Secretary-General for Disaster Risk Reduction and Special Representative of the U.N. Secretary-General for the implementation of the Hyogo Framework for Action) who stated "*Over the last two decades (1988-2007), 76% of all disaster events were hydrological, meteorological or climatological in nature; these accounted for 45% of the deaths and 79% of the economic losses caused by natural hazards.*" She concluded with "*The real tragedy is that many of these deaths can be avoided.*" This is the main strategic reason for climate services and needs to be emphasized.

The International Council for Science (ICSU), International Social Sciences Council (ISSC) and the United Nations International Strategy for Disaster Reduction (UN-ISDR) are now co-sponsoring the new Integrated Research on Disaster Risk - Addressing the challenge of natural and human-induced environmental hazards program. This project and the way it is formulated is very relevant to this concept of climate services. The IRDR Programme will focus on hazards related to geophysical, oceanographic and hydrometeorological trigger events; earthquakes; volcanoes; flooding; storms, (hurricanes, typhoons, etc.); heat waves; droughts and fires; tsunamis; coastal erosion; landslides. The effects of human activities on creating or enhancing hazards, including land-use practices, are included and as are epidemics and other health-related situations where they are consequences of one or more of the aforementioned events. The IRDR Programme has three research objectives:

1. Characterization of hazards, vulnerability and risk

- 1.1: identifying hazards and vulnerabilities leading to risks;
- 1.2: forecasting hazards and assessing risks; and
- 1.3: dynamic modelling of risk.

2. Effective decision making in complex and changing risk contexts

- 2.1: Identifying relevant decision-making systems and their interactions
- 2.2: Understanding decision making in the context of environmental hazards; and
- 2.3: Improving the quality of decision-making practice.

3. Reducing risk and curbing losses through knowledge-based actions

- 3.1: Vulnerability assessments;
- 3.2: Effective approaches to risk reduction

There are 3 Cross-Cutting Themes:

1. Capacity building

	<ol style="list-style-type: none"> 1. Physical, institutional, social 2. Economic – financial 3. Skilled people <ol style="list-style-type: none"> 2. Case studies and demonstration projects 3. Assessment, data management and monitoring <p>IRDR is being undertaken to leave the legacy of an enhanced capacity around the world to address hazards and make informed decisions on actions to reduce their impacts, such that in ten years, when comparable events occur, there would be a reduction in loss of life, fewer people adversely impacted, and wiser investments and choices made by governments, the private sector and civil society.</p> <p>These concepts could be borrowed into the Climate Services Framework.</p>	
2	<p>UNESCO and its IOC have taken note with satisfaction of the high-quality work of the High Level Task Force for the Global Framework for Climate Services. We welcome the key recommendations of the report and we look forward to continue supporting the process towards the successful establishment and operations of the GFCS, including at the World Meteorological Organization's 16th Congress in May 2011 where we understand that the Taskforce's proposals for implementation and governance will be considered. In this light, UNESCO-IOC would also expect to put GFCS on the agenda of its Assembly in June 2011.</p> <p>Our enthusiasm for the GFCS as outlined in the HLT report is based on five main points:</p> <ol style="list-style-type: none"> 1. Climate services, much more so than weather, will require substantial interaction at the national and international level among various agencies. This is certainly a challenge, but at the same time an obvious opportunity for all of our agencies. We very much value the many viewpoints and inputs from different perspectives around the table. A caution in developing a service is that it must be operational. We need to avoid the 'be all for all' trap, and focus on not everything that is impacted by climate, but on the most robust observations and understanding of systems that allow us to deliver valuable services for societal benefit, operationally. 2. Climate services, by definition delivered on seasonal and longer time-scales, will depend inherently on 	<p>Wendy Watson-Wright, Ph.D. Assistant Director General and Executive Secretary IOC/UNESCO 1, rue Miollis 75732 Paris CEDEX 15 France Tel: +33 1 45 68 39 83 Fax: +33 1 45 68 58 10 Email: w.watson-wright@unesco.org http://ioc-unesco.org</p>

	<p>observing and understanding the dynamics of the ocean. For example, the 2010 predicted 150% above average hurricane season in the Atlantic was based almost entirely on ocean conditions - no el nino and warm tropical Atlantic.</p> <p>3. There is a common misperception that the ocean role is restricted to the ocean region - e.g. sea ice services, offshore oil and wind services, shipping, and coastal (e.g. inundation, erosion). However, ocean dynamics are also key to setting broad scale hydrological regimes (e.g. monsoon, drought) important for agriculture, etc that are not directly 'oceanic'. Thus the 'users' of ocean services include sheep farmers in the interior of Australia, farmers in the highlands of Ethiopia, river managers in China.</p> <p>4. Many of our international research and observational programs and systems were designed by scientists primarily with research and 'detection and attribution' goals. The key to GFCS will be to sustain systems with a very different design, targeting users, and designed with 'impacts, vulnerability and adaptation' goals. It is vital that development of GFCS serve to strengthen existing UN sponsored observing systems including GCOS, GTOS, GOOS and WIGOS.</p> <p>5. Governance: The key to success of GFCS will be government engagement. Due to the intergovernmental nature of UNESCO and its IOC, we are confident that we, together with WMO, can contribute to strong government engagement in favour of GFCS.</p>	
3	<p>Overall Comments:</p> <p>i) The HL T report has brought out all the critical issues related to the establishment of GFCS and all activities that are to be in place towards building up of climate services at national/regional! global levels are enunciated.</p> <p>ii) All other important associated factors such as sources of predictability; estimating benefits of climate services; science issues related to climate forecasts/outlooks/ predictions/projections; risk management and risk transfer through insurance for managing climate related risks; association of disaster risks and climate risks with the climate services etc., are very prominently highlighted in the HL T report.</p> <p>iii) Broad governance and implementation mechanisms suggested in the report can be considered and deliberated upon by the WMO Congress in its next meeting during 2011.</p> <p>iv) Broad principles elucidated for implementing GFCS Framework and the options of possible governance mechanisms can become good propositions for deliberations in the WMO Congress-2011.</p> <p>v) Prioritization of the issues for the implementation of GFCS needs to be brought out for the consideration of WMO linking to the on-going activities of WMO to launch first level of GFCS at the global scale.</p>	Government of India

Specific Comments:

Detailed account towards addressing following issues needs to be brought out in to the HL T Report so as to be considered appropriately towards preparing the implementation plan:

- i) Climate information and high resolution prediction fields at extend range (beyond 15-days, months, seasons etc.) that are generated by the developed countries such as NCEP, USA; ECMWF, UK; JMA, Japan etc., needs to ' become available at the earliest so as to quantitatively assess the usable quantum of the climate predictions at the national levels prior to the building up of appropriate national level activities in support of GFCS.
- ii) Ways and means of combining local scale observed climate data variability with that of the high resolutions climate predictions/projections are to be elucidated
- iii) Clear cut approaches for the generation of high quality observations across the entire climate system, planned under various WMO Programmes viz., GCOS; GOOS; GTOS; GEOSS etc. are to be made fast track atleast now so as to have relevant process scale climate variability assessment (Chapter 2: to bring commitment and to generate data needed to understand climate system processes).
- iv) Appropriate road map for addressing the issue of low predictability on seasonal time scales for climate variables such as temperature and rainfall both in tropics in particular and extra-tropics associated with extreme climate variability events (heavy rainfall; heat/cold waves; cyclones etc.)
- v) Road map for the development high resolution and hierarchical Earth System Models/Simulators needs to be brought out so as to account for biosphere/geosphere/ cryosphere interactions with the current oceanatmosphere framework of models.
- vi) Means of Leveraging the physical and computing resources and capacities available with the leading global centers needs to be accounted towards organising efforts for improving existing climate services under GFCS.
- vii) Possible roadmap for interfacing with the climate sensitive sectors (water; agriculture; transport; energy; infrastructure etc.) with climate predictions is to be elaborated (as envisaged under Chapter 5 for building partnerships for building sectoral specific applications).
- viii) A clear cut approach towards effectively addressing issues raised in Chapter 8 towards reducing gaps towards operating meaningful GFCS such as reducing uncertainties in climate information nalysis/predictions; climate impacts in various sectors; building geo-spatial, ICT and locational technology interfaces; climate impacts and vulnerability etc., are to be elucidated.
- ix) Exclusive treatment of issues towards building national level capacities and approaches towards building climate information and prediction services is to be provided with clear benchmark definition of capacity building and user interface.

These comments are in addition to the endorsement and concurrence of the Government of India to the comments of the LMG, forwarded by the Permanent Mission of India on 22 November 2010.

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South America and CIIFEN

The 1997-98 El Niño caused an estimated USD 100 billion in losses globally, with around USD 3-4 billion lost in Ecuador alone. In consequence, the United Nations General Assembly adopted a resolution calling for an enhancement of international cooperation to reduce the impact of such phenomena, especially in “the countries of the Pacific Ocean Basin”. The Governments of Ecuador and Spain responded to this call by supporting the establishment and further implementation of Centro Internacional para la Investigación del Fenómeno El Niño (CIIFEN) in Guayaquil (Ecuador) since 2003. This centre is international in scope and works closely with both the International Strategy for Disaster Reduction and WMO and is supported regionally by Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela. Since September 2010, these countries proposed CIIFEN to start the pilot phase to become the WMO Regional climate center for Western South America.

Some of the achievements on CIIFEN in the region are:

- To implement with the NMHSs from the region the Seasonal Forecast for Western South America (WCSA) which is operational and monthly produced since 2005.
- To build up the first Regional Climate Data base for WCSA region.
- To contribute on the development of an standardized methodology for seasonal predictions using statistical and dynamical modeling.
- To develop the first **climate user interface** for agriculture sector in the region which is currently operational in pilot areas of six countries. They include methodologies and systems to generate climate/agriculture risk maps, dissemination of information systems, communitarian networks and strategic alliances with local authorities, media, private sector and the NMHSs.
- To develop a coordinated regional strategy for capacity building having as a core for training activities the network provided through the Regional climate Outlook Forum for Western South America.
- To develop and promote conceptual methodologies for climate risk management at national level, key elements for climate early warning systems and near climate change adaptation approaches.
- CIIFEN is currently working on designing innovative climate services for disaster risk reduction, Andean ecosystems management, water sector and food security.
- CIIFEN has promoted several scientific activities within South America to improve the understanding of ENSO effects in the regional and local climate.

While the Centro Internacional para la Investigación del Fenómeno El Niño primarily deals with countries of the Andean region, efforts are also underway to strengthen regional capacity elsewhere on the continent. South American countries have recognised the need to strengthen regional capabilities in northern

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	and Amazonian areas, as well as in the southeast, both of which have different climates and needs to the region covered by the Centro Internacional para la Investigación del Fenómeno El Niño. Discussions as to how to achieve this are ongoing, but the solution would likely involve some kind of virtual climate centres, with countries in each region contributing specific capabilities.	
5	In my capacity as Chair of the JSC for the WCRP, Chair of NOAA's Climate Working Group and the US National Academy of Sciences' Board on Atmospheric Sciences and Climate I have been intimately involved in the discussions and planning for climate services within the US and internationally. Therefore I fully appreciate the challenge of the task at hand for the HLTF. Unfortunately, except for, say, Chapter 5, most of the document is written from a meteorological service mindset/knowledge base. As a result, the document in its present form falls well short of presenting a compelling case or architecture for a Global Framework for Climate Services (GFCS). The vast majority of the examples used to justify the need for climate services are specific to temperature and precipitation on daily to seasonal time scales. Yet, as stated in the text, data records and predictions of these variables are already available from a number of NMHS. Hence the justification for a GFCS is very weak and ill posed. The present document needs considerable reworking to justify the need for a GFCS through the lens of climate not just meteorology. In this regard, I would suggest that the needs and opportunities for the range of climate services discussed in Chapter 5 be cross referenced, supported, and substantiated in each and every other chapter in the document. For example, the rest of the document has very little reference to the need for climate information on decadal (and longer) time scales, regional sea level rise, changes in ground water, reanalysis of observational data, seasonal sea ice forecasting in the Arctic, marine and terrestrial ecosystems, monitoring of CO ₂ and other greenhouse gases in support of mitigation strategies, role of a GFCS for continental, regional and/or national climate assessments, etc. The need for, and attendant challenges in providing for climate information on regional scales is particularly weak. I am also surprised there is very minimal mention of the trailblazing efforts of the International Research Institute for Climate and Society (IRI). The lack of visibility of the IRI, which arguably has more experience on this very topic over the past 10 years than any other institution, is particularly troublesome and is another cause for concern regarding the process by which this document was generated. Lastly, the document clearly reads as one written by committee and has numerable redundancies and overlap. A considerable amount of streamlining and high level technical editing is in order.	Antonio J. Busalacchi Chair, Joint Scientific Committee, World Climate Research Programme
6	Frankly, I found all of this material extremely disappointing. Were climate scientists involved? All chapters are deficient in dealing with climate change. The whole issue of climate change and all the experience and implications of IPCC are largely missing.	Kevin Trenberth Kevin Climate Analysis Section, NCAR P. O. Box 3000, Boulder, CO http://www.cgd.ucar.edu/cas/trenberth.html (303) 497 1318

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7	<p>The report is very well structured and the flow of the contents is in good order. The contents are satisfactory and of relevant aspects regarding the downscaling the information to the city/urban level and focused for this purpose. Nevertheless there is a need to emphasize the following:</p> <p>Reflecting the magnitude of the interaction between the cities' contents and the atmosphere will ease the adaptation process.</p> <p>As climate change will affect the urban poorest populations most severely, the need for the scientific support is eminent since the impacts on social welfare and development has high momentum. The need to sensitise the decision makers to the vulnerability of these population is obvious, besides involving them in combating the climate change by providing the proper climatological data in reference to the shelters, public services, infrastructure and the required awareness.</p> <p>The GFCS is anticipated to help managing climate change threats. In this respect there is a need to assure simple delivery understandable to the technical support of cities and urban areas. This will help strengthening the local governance/advocacy and participatory approach that will impose more environment friendly rules based on knowledge provided by GFCS.</p> <p>As the situation of climate change is pertaining quick responses, there is a need to apply the best of adaptation and mitigation measures. Hence it is imperative to investigate the level at which the climate is changing in each city where adaptation/mitigation activities are intended. Due to the lack of capacities the utilisation of the data, research and the proper tools, are important at the local level for LD and developing countries. On this regard there is a need to use the available meteorological data and reprocess the climatological information using different time intervals that will allow investigation of indicative climate change, per weather parameter. This will suggest a collaboration mechanism between regional weather prediction centres, municipal's climatologists/meteorologists, civil engineers and technical staff who will deliver informative detailed reports to the decision makers. Focus must be on supporting local authorities and government agencies in adopting more participatory approach to urban environmental planning in general, climate and governance issues in particular.</p> <p>In conclusion, simplifying climatological information for the decision makers to translate into appropriate actions will benefit the urban and local areas. Downscaling to regional and local needs, time evolving climate change to which society will have to adapt. Also the need for advancing climate prediction science, understanding the earth science, tools for making predictions, technology and resources in order to reduce the uncertainty especially at the user level.</p> <p>UN-Habitat is ready to collaborate supporting this new international scientific body that can provide the appropriate climate information and prediction systems. The poor and the vulnerable populations are expected to benefit from such collaborations and combating climate change impacts will start from the base,</p>	<p>Sharif I Ahmed (PhD), Climate Change Specialist, Urban Environmental Planning Branch, UN-Habitat, P.O. Box 30030-00100, Nairobi, Kenya. Tel: (254) 20 7624772, Fax: (254) 20 7623715 Cell: 0725850597</p>

	<p>at local level to expand regularly to the national and regional levels. Scientific knowledge is critical to understanding the causes and effects of climate change, especially at the complexity of the local level. This understanding, in turn, allows us to develop practical tools that can help cities and their communities address climate change. Focusing on more resilient housing and climate-proof infrastructure and basic services will require that GFCS provides more accurate and simplified information handy and supportive to the local level decision makers. This will help all stakeholders to develop more informed adaptation and mitigation strategies at the local level.</p>	
8	<ol style="list-style-type: none"> 1. The needs of persons with disabilities should be incorporated throughout the report (please see specific entry points detailed below). 2. The report currently only refers to a need-based climate services. It would be useful to incorporate a human rights-based approach where appropriate. Such an approach is anchored in the responsibilities of States to implement human rights standards, including access to information, participation in decision making processes and access to justice. 3. References to international human rights law should be made throughout the report, in particular with regard to the rights to health, adequate food and water. 	<p>Oyuna Umuralieva Human Rights Officer Human Rights, Economic and Social Issues Section Development and Economic and Social Issues Branch Office of the High Commissioner for Human Rights Av. Giuseppe Motta 48 (of. 1-03) CH-1211 Geneva 10 Switzerland Phone: + 41 22 928 9647 Fax: +41 22 928 9050 Email: oumuralieva@ohchr.org</p>