AOSIS Submission on the 2013-2015 Review of the Long-term temperature goal

Views on the future work of the Structured Expert Dialogue (SED), including the further use of different sources of information

The Republic of Nauru, on behalf of the Alliance of Small Island States, welcomes the opportunity to present its views on the future work of the SED, including the further use of different sources of information. These views respond to the call for submissions contained in FCCC/SBSTA/2013/5, paragraph 135, and FCCC/SBI/2013/20, paragraph 169.

I. Introduction

The 2013-2015 Review of the long-term temperature goal is an issue of high political importance to the Small Island Developing States (SIDS), which support a global goal to limit temperature increases to below 1.5 degrees Celsius above pre-industrial levels.

The goal of limiting global average temperature increases to below 1.5 degrees is seen as essential for minimizing damage to small island developing and low lying States in a number of areas, including:

- Sea level rise
- The protection of coral reefs
- Ocean acidification
- Extremes of heat
- Food security
- Precipitation extremes
- Water availability
- Severe weather, tropical cyclones, droughts and floods.

The difference between impacts on Small Island Developing States (SIDS) and low-lying coastal States at a long term temperature increase of 1.5 degrees above pre-industrial levels, and impacts at a long term temperature increase of 2 degrees Celsius above pre-industrial levels is enormous, in terms of the additional burden such added impacts would imply for countries that are most vulnerable to the negative impacts of climate change, resulting from the emissions of others.

It is essential that the differences between these two goals be fully explored, so that a decision that is consistent with the ultimate objective of the Convention can be taken.

II. Status of the Review and future work of the SED

The 2013-2015 Review of the adequacy of the long-term global goal is now underway. The Review is still in its information gathering and compilation stage through the work of the Structured Expert Dialogue (SED), which aims to support the work of the Joint Contact Group (JCG) and so ensure the scientific integrity of the review through a focused exchange of views, information and ideas. The SED is mandated to consider scientific information relevant to the review through regular scientific workshops and expert meetings and assist in the preparation and consideration of synthesis reports on the review. See decision 1/CP.18, paragraphs 79-91.

Two very useful workshops have been held by the SED to consider the outcomes of Working Group I of the IPCC AR5 and the adequacy of progress made on adaptation and finance. Further sessions of the SED will be held in 2014-2015 to consider the outcomes of Working Group II and III of the IPCC and of the synthesis report. A critical aspect of the work of the SED must be to gather and consider information on the differing impacts in SIDS and other vulnerable countries between the impacts of climate change at long term temperature increases of 1.5 degrees Celsius, and at 2 degrees Celsius below pre-industrial levels, including how different emission pathways secure or compromise the ability to keep temperature increases to below 1.5 and 2 degrees Celsius.

The SBI/SBSTA Joint Contact Group (JCG) has set a broad outline for the work of the SED for 2014. A key consideration for the JCG for 2014 will be the establishment of a **clear timeline and process for consideration of the inputs to the Review and for the outcomes of the work undertaken in the SED**. Additionally, the JCG must consider how to make best use of the time during 2014 in the context of a possible session in October and the planning of activities in parallel with the ADP meetings to take place during that session. The SED will also need to work in 2015 to consider the outcomes of Working Group II and III of the IPCC and of the synthesis report as well as information relevant to the Review from non-IPCC sources that is produced and submitted to address information gaps.

II. The further use of different sources of information in the Review (i.e. non-IPCC information)

Parties have already agreed to take into account information relevant to the Review from a wide variety of sources, including non-IPCC sources. See decision 1/CP.18, paras. 79-91.

By decision 2/CP.17, paragraph 161, Parties agreed that the review should be based on information from various sources, including the following:

a) The assessment and special reports and technical papers of the Intergovernmental Panel on Climate Change (IPCC);
b) Submissions from Parties, national communications, first biennial update reports from developing country Parties and biennial reports from developed country

Parties, national inventories, reports on international consultation and analysis, international analysis and review, and other relevant reports from Parties and processes under the Convention;

c) Other relevant reports from United Nations agencies and other international organizations, including reports on emission projections, technology development, access, transfer and deployment, and reports on gross domestic product, including projections;
d) Scientific information on the observed impacts of climate change, including that from reports coordinated by relevant regional and sub-regional agencies.

Thus the main issues for consideration in connection with the further use of additional sources of information relate to the timing, source, process and organisation of this information.

Timing: Given the rapid evolution of the scientific and economic literature, effort should be made to solicit and access relevant scientifically sound studies published after the cut-off dates for the submission of information to the Fifth Assessment Report working group report process. Where relevant, existing scientifically sound literature that was not assessed by the IPCC process, or that was published after the literature cut-off dates for the AR5, should also be taken into account.

For example, a recent 2014 study has considered the degree of loss of cultural UNESCO world heritage sites related to different temperature increases and related sea level rise[1]. Another study revealed the potential of destabilization of parts of East Antarctica corresponding to 3-4 m sea-level rise.[2] This new insights are relevant to the 2013-2015 review of the temperature goal.

Source and criteria: The JCG and SED should also invite scientific information, relevant reports and studies that have been produced by UN agencies, international organisations, relevant regional organisations, sub-regional agencies and national agencies and which may not have been used in the IPCC process, but that are nevertheless highly relevant. The relevant scientifically sound research and studies undertaken by these bodies might otherwise be overlooked with a sole focus on peer-reviewed articles, despite their expertise.

Examples of such organisations and bodies include the Food and Agricultural Organisation, UN Development Programme, UNESCO, International Organisation on Migration, SPREP (South Pacific Regional Environment Programme), the Caribbean Community Climate Change Centre and other regional bodies. These organisations and agencies should be

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[1]Marzeion, B. & Levermann, A., Loss of cultural world heritage and currently inhabited places to sea-level rise, 2014 *Environ. Res. Lett.* 9 034001 (published 4 March, 2014). See http://iopscience.iop.org/1748-9326/9/3/034001/article

[2]Mengel, M. & Levermann, A., Ice plug prevents irreversible discharge from East Antarctica. *Nat. Clim. Change* 5 (2014).

invited to provide information on modelled or projected regional impacts related to long-term temperature increases of 2 degrees and 1.5 degrees above pre-industrial levels.

For example, UNDP has been involved in a project on climate change and sea level rise impacts in the Caribbean and Pacific.[3] This project overlaid high-resolution climate models on the Caribbean region to map likely sea level rises if average global temperatures were to increase by 1.5 degrees Celsius or by 2 degrees Celsius. The results gave an overview of the potential different effects on coral reefs, water supplies and agriculture. The project's second phase quantified the cost of these impacts on key sectors of the economy, putting a price on replacing lost environmental benefits like fresh drinking water.[4] Information on these effects is clearly relevant to the Review.

Process: Parties and relevant, credible, international and regional organisations and agencies should be invited to submit any scientifically sound studies of which they are aware, as well as studies and reports they have prepared that may not have been peer-reviewed but which are relevant, identifying observed and projected regional impacts and costs at different temperature thresholds in different regional and national contexts. This information should be collected by the SED, synthesized by the secretariat, and presented by these organisations, agencies and by non-IPCC regional experts at expert meetings and workshops.

Organisation of information solicited: The information gathered could be solicited, organized and submitted under the following categories:

a) Impacts, vulnerability and risks at warming levels of 1.5 and 2 degrees Celsius above pre-industrial levels on: sea level rise, water availability, crop production, ecosystem health, terrestrial and marine biodiversity, vulnerable populations, ocean acidification, food security, regional and national economic systems, territorial integrity, migration.

b) Impacts, vulnerability and risks at different levels of atmospheric CO2 concentration including 350 ppm on: ocean acidification, marine systems, production and biodiversity, crop production and quality, ecosystem health, terrestrial and marine biodiversity.

c) Costs of adaptation at warming levels of 1.5 and 2 degrees above pre-industrial levels.

d) Risks of rapid adverse changes in climate extremes and extreme events, risk of crossing of tipping points for sea level rise, the carbon cycle, natural systems and/or

[3]See http://intasave-caribsave.org/climate-change-caribbean-pacific/

[4]Project reports indicated that the type of impacts of each scenario would be largely the same for island communities but the scale of impacts would vary dramatically in different countries in the region.

socio-economic systems at warming levels including 1.5 and 2 degrees above pre-industrial levels.

Once the information is received, the Secretariat could be tasked with synthesizing what has been submitted in each area for the consideration of the SED.

III. Importance of regional information

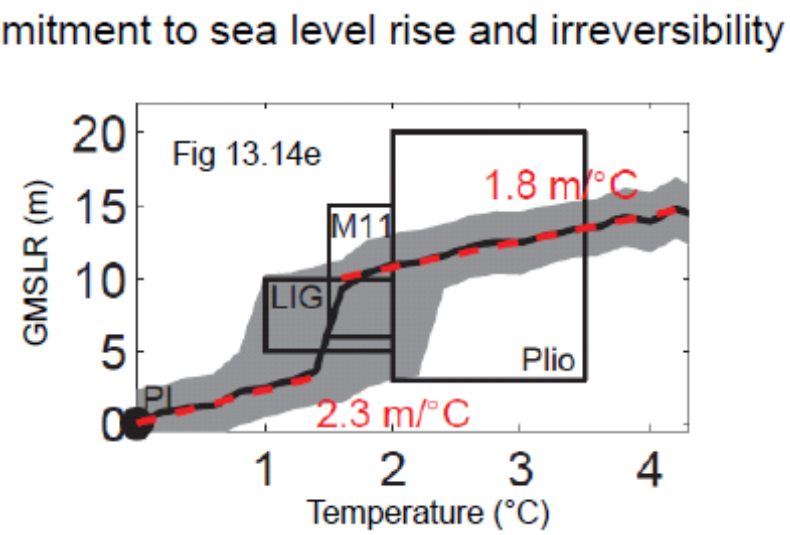
In addition to the submission of this information, it would be useful if, beginning at the session after the June 2014 meeting of the Subsidiary Bodies, activities could be organized featuring ***presentations by experts from regional bodies or research institutions*** to present, in particular, regional information relevant to the Review. This will be important, as the IPCC WG II report emphasizes that climate change impacts will differ between and within regions, with some regions projected to experience far higher temperature increases and impacts than others at different temperature thresholds.

IV. Irreversible impacts should be identified by the SED

There have been a number of inputs discussed by the SED that have value for ongoing ADP discussions. For example, a presentation on sea level rise noted that a likely range of global mean sea level rise for the period 2081–2100 compared with 1986–2005 of 0.40 [0.26–0.55] meters for RCP2.6, and 0.63 [0.45–0.82] meters for RCP8.5 is projected with medium confidence. In other words, the lowest and highest stabilisation scenarios would imply quite different outcomes for sea level rise as soon as 2081-2100. This has direct implications for impacts on SIDS and low-lying coastal countries, and hence should also have a direct influence on the choice of long-term goal for the 2015 agreement.

The SED also discussed the fact that long-term global mean sea level rise (GMSLR) is not proportional to global mean surface warming, but that between 1.5° and 2°C a steep rise in sea levels has to be expected due to large scale ice sheet disintegration[5] (See graphic below on commitment to sea level rise and irreversibility). This also has direct implications for the choice of long-term global goal used to guide the 2015 agreement in light of the irreversible impacts to which a 2°C goal would commit the international community over time spans of several decades even if GHG emissions were drastically reduced.

[5]Jonathan Gregory, Lead Author, Chapter 13, IPCC Sea level rise, Presentation to SED-2.



The IPCC's Working Group II Report's Summary for Policymakers reports that for unique and threatened ecosystems and cultures, and for extreme weather events, ***risks are already high around 1.5°C warming above pre-industrial levels*** (1°C above recent levels). Risks for large-scale singular events such as ice sheet disintegration, methane release from clathrates, and onset of long-term droughts increase disproportionately as temperatures rise above 1.5 °C. See Box SPM.1.

V. Important aspects of the IPCC WGII Report on SIDS should be taken up by the SED

Many findings with respect to the vulnerability of SIDS have not changed since the IPCC's Third Assessment Report. Chapter 19 of the TAR detailed some of the threats facing Small Island States and low lying coastal states as follows:[6]

> "19.3.4.1. Threatened Small Island States
> Because of their low elevation and small size, many small island states are threatened with partial or virtually total inundation by future rises in sea level. In addition, increased intensity or frequency of cyclones could harm many of these islands. The existence or well-being of many small island states is threatened by climate change and sea-level rise over the next century and beyond.
>
> Many small island states—especially the atoll nations of the Pacific and Indian Oceans—are among the most vulnerable to climate change, seasonal-to-inter-annual climate variability, and sea-level rise. Much of their critical infrastructure and many socioeconomic activities tend to be located along the coastline—in many cases at or close to present sea level (Nurse, 1992; Pernetta, 1992; Hay and Kaluwin, 1993). Coastal erosion, saline intrusion, sea flooding, and land-based pollution already are serious problems in many of these islands. Among these factors, sea-level rise will pose a serious threat to the ecosystems, economy, and, in some cases, existence of many small island states. It is estimated that 30% of

[6] http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=671

known threatened plant species are endemic to such islands, and 23% of bird species found on these islands are threatened (Nurse et al., 1998). Projected future climate change and sea-level rise will lead to shifts in species composition (see Chapter 17).

Many small island nations are only a few meters above present sea level. These states may face serious threat of permanent inundation from sea-level rise. Among the most vulnerable of these island states are the Marshall Islands, Kiribati, Tuvalu, Tonga, the Federated States of Micronesia, and the Cook Islands (in the Pacific Ocean); Antigua and Nevis (in the Caribbean Sea); and the Maldives (in the Indian Ocean). Small island states may face the following types of impacts from sea-level rise and climate change (Gaffin, 1997; Nurse et al., 1998):

- Increased coastal erosion
- Changes in aquifer volume and water quality with increased saline intrusion
- Coral reef deterioration resulting from sea-level rise and thermal stress
- Outmigration caused by permanent inundation
- Social instability related to inter-island migration
- Loss of income resulting from negative effects on tourist industry
- Increased vulnerability of human settlement due to decrease in land area
- Loss of agriculture and vegetation.

Gaffin (1997) concludes that without planned adaptation, the vulnerabilities of small island states are as follows:

- An 80-cm sea-level rise could inundate two-thirds of the Marshall Islands and Kiribati.
- A 90-cm sea-level rise could cause 85% of Male, the capital of the Maldives, to be inundated (Pernetta, 1989)."

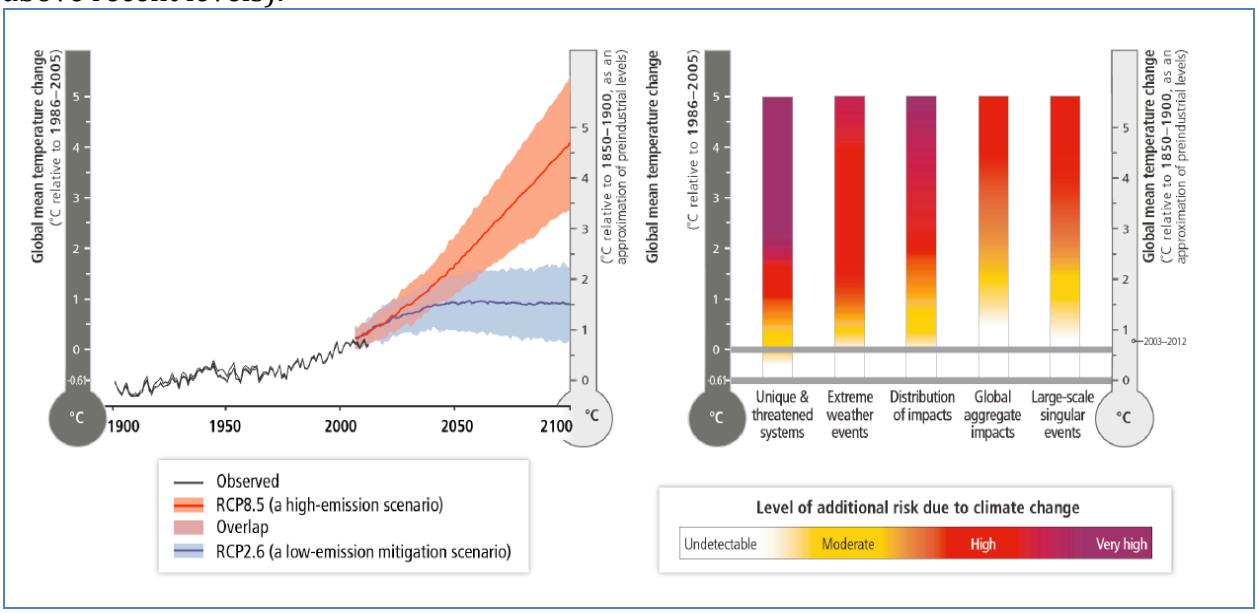
This information remains relevant for the Review. The IPCC Fifth Assessment Report's WGII Chapter on small islands builds on the TAR, finding that:

> "Small island economies can also be objectively shown to be at greater risk from sea-level rise in comparison to other geographic areas since most of their population and infrastructure are in the coastal zone. This is demonstrated in a study using the Climate Framework for Uncertainty, Negotiation and Distribution (FUND) model to assess the economic impact of substantial sea-level rise in a range of socio-economic scenarios downscaled to the national level, including the four SRES storylines (Anthoff et al., 2010). Although this study showed that in magnitude, a few regions will experience most of the absolute costs of sea-level rise by 2100, especially East Asia, North America, Europe and South Asia, these same results ***when expressed as percent of GDP showed that most of the top ten and four of the top five most impacted are small islands from the Pacific (Federated States of Micronesia, Palau, Marshall Islands, Nauru) and***

Caribbean (Bahamas).The point is made that the damage costs for these small island states are enormous in relation to the size of their economies (Nicholls and Tol, 2006) and that together with deltaic areas they will find it most difficult to locally raise the finances necessary to implement adequate coastal protection (Anthoff et al., 2010)." (emphasis added)

This level of detail will be essential in communicating the outcomes of the Review.

Graphics contained in the IPCC's Working Group II Report's Summary for Policymakers indicate that for unique and threatened ecosystems and cultures, and for extreme weather events, ***risks are already high around 1.5°C warming above pre-industrial levels*** (1°C above recent levels):



Graphics contained in other recent reports also provide useful detail for the review. See Marzeion, B. &Levermann, A., Loss of cultural world heritage and currently inhabited places to sea-level rise, 2014 *Environ. Res. Lett*. 9 034001 (4 March, 2014), Figure 1, (attached) http://iopscience.iop.org/1748-9326/9/3/034001/pdf/1748-9326_9_3_034001.pdf

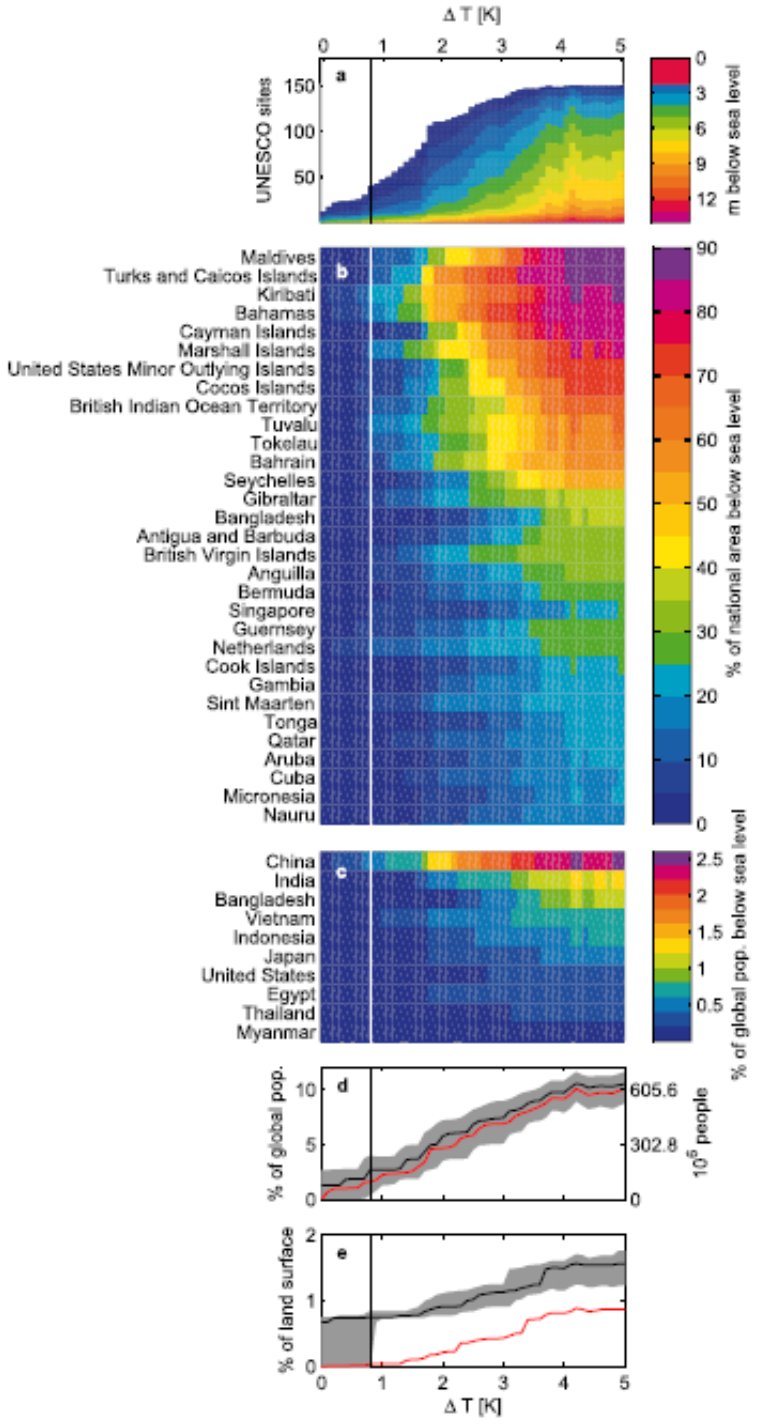


Figure 1. (a) Number of cultural UNESCO world heritage sites impacted by SLR, and depth of the sites below sea level, as a function of ΔT. (b) Increase of the percentage of national land surface lying below sea level, as a function of ΔT, sorted by descending loss of land surface. (c) Percentage of world population living in areas above current, but below future sea level, as a function of ΔT and country, sorted by descending percentage of living places affected. (d) black: global sum of (c), gray shading indicates uncertainty interval, red: the sum of (c) if glacial isostatic adjustment from the last glacial maximum is ignored. (e) Black: global percentage of land surface above current, but below future sea level, gray shading indicates uncertainty interval. Red: the same when glacial isostatic adjustment from the last glacial maximum is ignored. Vertical black/white lines indicate present day ΔT = 0.8 K