

The Science-Policy Nexus in Climate Change: Lessons from the Paris Agreement, #SR1.5 and COP 24

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Outline

- The IPCC and its processes – A brief overview
- Fifth Assessment Report – Mitigation targets
- Origins of the SR15 – Paris Agreement
- Salient findings of SR15
- What should the Report be telling us
- Four illustrative issues
 - Sea level rise
 - The global carbon budget
 - Species loss at 1.5 and 2 deg warming
 - South Asian monsoon
- IPCC, Science-Policy Nexus and Climate Negotiations

IPCC AND ITS PROCESSES

- Intergovernmental Panel on Climate Change – Set up under the WMO and the UNEP
- Governments elect Chair, Vice-Chairs, etc of the Working Groups (I, II and III)
- Nominations made for Authors, Editors, Reviewers by Governments and selected by the IPCC Chair, Co-Chairs and Vice-Chairs (can also be added by IPCC later)
- Three review stages –
 - First Order Draft – Only expert review
 - Second Order Draft – Experts and Governments and first draft of Summary for Policymakers
 - Final Government Draft – Text frozen and second review of revised Summary for Policy Makers (SPM)
 - Final Plenary review of SPM – line-by-line!!

AR5 and Some Features

- Shift to the notion of a Global Carbon Budget in Working Group I
 - Increase in global temperatures proportional to cumulative emissions (up to uncertainty over various models, etc) – provided the emissions go to zero at the end of the specified period
- Shift from notion of “vulnerability” to notion of “risk” in Working Group II
- Some detailed considerations of equity and the responsibility of developed countries vs developing countries in Working Group III
- Broad acceptance of approx 2 deg C increase over pre-industrial period as the focus of climate action (both mitigation and adaptation)
- Important – Appeared prior to SDGs agreement and the Paris Agreement.

Origins of the SR15 – Paris Agreement

- From COP16 at Cancun – Small Island States particularly pushed for 1.5 deg C
- Structured Expert Dialogue – IPCC scientists presenting/discussing with negotiators from UNFCCC – creeping acceptance of 1.5 deg C target
- Paris Agreement – Inclusion of 1.5 deg target – Article 2.1 (a).
- “This Agreement...aims to strengthen the global response to the threat of climate change,...including by: (a) Holding the increase in global temperatures to well below 2 deg C above pre-industrial levels and pursuing efforts to limit the temperatures to 1.5 deg C, “
- Decision in Paris – Invite IPCC “..to provide a Special Report in 2018 on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways”.

Salient Findings of SR15

(enormous response thro research/papers, >6000)

- “With clear benefits to people and natural ecosystems, limiting global warming to 1.5°C compared to 2°C could go hand in hand with ensuring a more sustainable and equitable society”
- “For instance, by 2100, global sea level rise would be 10 cm lower with global warming of 1.5°C compared with 2°C. The likelihood of an Arctic Ocean free of sea ice in summer would be once per century with global warming of 1.5°C, compared with at least once per decade with 2°C.”
- “Limiting warming to 1.5°C is possible within the laws of chemistry and physics but doing so would require unprecedented changes,”
- “The good news is that some of the kinds of actions that would be needed to limit global warming to 1.5°C are already underway around the world, but they would need to accelerate”

Salient Findings (Contd)

- Limiting global warming to 1.5°C would require “rapid and far-reaching” transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO₂) would need to fall by about 45 percent from 2010 levels by 2030, reaching ‘net zero’ around 2050. This means that any remaining emissions would need to be balanced by removing CO₂ from the air.
- Allowing the global temperature to temporarily exceed or ‘overshoot’ 1.5°C would mean a greater reliance on techniques that remove CO₂ from the air to return global temperature to below 1.5°C by 2100. The effectiveness of such techniques are unproven at large scale and some may carry significant risks for sustainable development, the report notes.
- Limiting global warming to 1.5°C compared with 2°C would reduce challenging impacts on ecosystems, human health and well-being, making it easier to achieve the United Nations Sustainable Development Goals,”

From the SPM

- Climate-related risks for natural and human systems are higher for global warming of 1.5°C than at present, but lower than at 2°C. These risks depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options.
- Climate models project robust differences in regional climate characteristics between present-day and global warming of 1.5°C, and between 1.5°C and 2°C. These differences include increases in: mean temperature in most land and ocean regions, hot extremes in most inhabited regions, heavy precipitation in several regions and the probability of drought and precipitation deficits in some regions.
- Climate-related risks to global mean sea level rise, biodiversity and ecosystems including species loss and extinction, ocean acidity and oxygen levels, health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.

From the SPM (contd)

- In model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO₂ emissions decline by about 45% from 2010 levels by 2030 reaching net zero around 2050. For limiting global warming to below 2°C, CO₂ emissions are projected to decline by about 20% by 2030 in most pathways and reach net zero around 2075. Non-CO₂ emissions in pathways that limit global warming to 1.5°C show deep reductions that are similar to those in pathways limiting warming to 2°C.
- All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR) on the order of 100–1000 GtCO₂ over the 21st century. CDR would be used to compensate for residual emissions and, in most cases, achieve net negative emissions to return global warming to 1.5°C following a peak. CDR deployment is subject to multiple feasibility and sustainability constraints

What we would have liked?

- “Robustness” of differences between 1.5 and 2 deg warming to be determined statistically and provided up front.
- Uncertainty provided adequate space in the presentation
- Better focus on feasibility
- SDG and poverty eradication alone cannot be the future for developing countries
- Greater focus on equity in mitigation – especially given the very short time-frame for action
- More critical view of scenario-building (cherry picking economic theory)

Contested Issues – I – Sea Level Rise

- Statement in SPM – 10 million less affected by sea level rise at 1.5 deg compared to 2 deg C corresponding to 0.1m lower SLR – What is the scale to contextualise this 10 million?
- Text in Chapter 3, p. 3-91: Population affected (at 2010 distribution) at 1.5 is 31-69 million worldwide. Population affected at 2 deg C is 32-79 million. Is 10 million statistically significant?
- Original paper (DJ Rasmussen et al 2018), has a mention of 5 million and also notes that some phenomena like Extreme Sea Level events have no difference between 1.5 and 2
- Also high level of local variations.

Contested Issues – II - Global Carbon Budget

- Original drafts spoke only of “remaining carbon budget”
- Suggested that emissions thus far will not lead to 1.5 deg warming
- It was indeed the straw that broke the camel’s back!!
- Final text – admits that Total carbon budget is an important concept BUT that it has not been calculated for 1.5 deg C.
- Refused to refer to earlier estimates – even as approximate figures
- Weaponizing uncertainty
- Refused to point out that the “increase” in the remaining carbon budget of 300 GtCO₂ were less than 10 years of emissions at the current rate of annual emissions.

Other Contested Issues

- Species loss – Significantly lower estimate at 1.5 deg C based on a single paper
- Precipitation and hydrology results presented with varying levels of confidence between the text and the summary
- Cherry picking examples of maladaptation – urbanization and increase in agricultural productivity!!
- Little effort to disentangle effects at 1.5 deg and 2 deg due to warming from other effects such as urbanization, degradation of ecosystems, etc.
- Confusing scenarios of emissions reduction with real world possible trajectories of emissions mitigation

#SR15 and the Paris Agreement

- Immediately relevant to the effort to operationalise the rules of implementation of the Paris Agreement – especially Global Stocktake (periodic review of achievement of goals)
- IPCC set to play increasing role in implementation of Paris Agreement.
- Monitoring of progress of Agreement, rules of reporting, judging adequacy of climate action (mitigation & adaptation), eligibility for climate finance – all of these will have technical components.
- IPCC will have key role in determining the modality, content and adequacy of these components.

Larger Issues

- Knowledge production dominated by the developed countries – by definition
- Lack of knowledge of even relevant publications by Third World authors
- Inability of Third World societies to convert their own experience and perspective into scientific terms
- Fundamental differences of viewpoint cannot be adequately captured by the IPCC rules of attribution of uncertainty and levels of evidence. Particularly relevant to policy aspects.

THANK YOU

Data:

