



Developing research about extreme events and impacts to support international climate policy

Friederike Otto (1), Rachel James (1), Hannah Parker (2), Emily Boyd (3), Richard Jones (4,5), Myles Allen (1,6), Daniel Mitchell (1), and Rosalind Cornforth (2)

(1) Environmental Change Institute, University of Oxford, Oxford, United Kingdom (rachel.james@ouce.ox.ac.uk), (2) Department of Meteorology, University of Reading, Reading, United Kingdom, (3) Geography and Environmental Science, University of Reading, Reading, United Kingdom, (4) Met Office Hadley Centre, Exeter, United Kingdom, (5) School of Geography and Environment, University of Oxford, Oxford, United Kingdom, (6) Department of Physics, University of Oxford, Oxford, United Kingdom

Climate change is expected to have some of its most significant impacts through changes in the frequency and severity of extreme events. There is a pressing need for policy to support adaptation to changing climate risks, and to deal with residual loss and damage from climate change. In 2013, the Warsaw International Mechanism was established by the United Nations Framework Convention on Climate Change (UNFCCC) to address loss and damage in developing countries. Strategies to help vulnerable regions cope with losses from extreme events will presumably require information about the influence of anthropogenic forcing on extreme weather. But what kind of scientific evidence will be most useful for the Warsaw Mechanism? And how can the scientific communities working on extreme events and impacts develop their research to support the advance of this important policy?

As climate scientists conducting probabilistic event attribution studies, we have been working with social scientists to investigate these questions. Our own research seeks to examine the role of external drivers, including greenhouse gas emissions, on the risk of extreme weather events such as heatwaves, flooding, and drought. We use large ensembles of climate models to compute the probability of occurrence of extreme events under current conditions and in a world which might have been without anthropogenic interference. In cases where the models are able to simulate extreme weather, the analysis allows for conclusions about the extent to which climate change may have increased, decreased, or made no change to the risk of the event occurring. These results could thus have relevance for the UNFCCC negotiations on loss and damage, and we have been communicating with policymakers and observers to the policy process to better understand how we can develop our research to support their work; by attending policy meetings, conducting interviews, and using a participatory game developed with the Red Cross/Red Crescent Climate Centre.

This presentation is an opportunity to share some of our findings from this stakeholder engagement with a wider community of scientists working on extreme events. Discussing the use of scientific evidence in UNFCCC loss and damage policy has not been straightforward, since this is a very controversial topic. However, the UNFCCC has now approved a workplan for the next two years and there will be windows of opportunity for interaction between scientists and policymakers. Currently it is not clear what kind of evidence of loss and damage will be required for the Warsaw Mechanism, and in fact, there has been no official discussion under the UNFCCC about what defines loss and damage. One possibility would be to attempt to define loss and damage from climate change from a scientific perspective, and to identify the research gaps which might be addressed to support this. In the presentation we will make a proposal for future research directions, including the development of an inventory of impacts from climate change.