Geophysical Research Abstracts
Vol. 20, EGU2018-11970, 2018
EGU General Assembly 2018

Anthropogenic climate change and glacier lake outburst flood risks: the climate litigation case of Huaraz, Peru

Christian Huggel (1), Mark Carey (2), Adam Emmer (3,4), Holger Frey (1), Noah Walker-Crawford (5), and Ivo Wallimann-Helmer (6)

(1) Department of Geography, University of Zurich, Switzerland (christian.huggel@geo.uzh.ch), (2) Robert D. Clark Honors College and Environmental Studies Program, University of Oregon, USA, (3) Department of Physical Geography and Geoecology, Faculty of Science, Charles University, Prague, Czech Republic, (4) Department of Human Dimensions of Global Change, Global Change Research Centre, Academy of Sciences of the Czech Republic, Brno, Czech Republic, (5) Manchester University, UK, (6) Advanced Studies in Applied Ethics, Center for Ethics, University of Zurich, Switzerland

Anthropogenic climate change is observed and expected to produce negative impacts on societies. To address the problem, both mitigation and adaptation efforts are pursued. An additional avenue is climate litigation although most cases have been declined at court so far. An exception is the case of a citizen in Huaraz in the Andes of Peru who sued the large German energy producer RWE over the risk of a devastating flood from an outburst (GLOF) of glacial Lake Palcacocha, at an amount proportional to the share of cumulative emissions of the German company. A State court in Germany recently admitted the case which is considered a historical breakthrough in climate litigation because it implies that the court acknowledges the basic legal responsibilities of (large) emitters for (potential) loss and damage caused by anthropogenic climate change elsewhere on the globe–given that the causal relation between emissions and damage or risk can be established. This causation problem is a major challenge for science and can only be addressed in an interdisciplinary way drawing on research in attribution of impacts and prospective disaster forensics.

In this study we analyze how and to what extent causation can be established between emissions and GLOF risk in Huaraz and explore the different perspectives this case raises. While from a legal perspective causation is central, from a scientific and responsibility point of view comprehensive risk attribution is required, implying investigation of all components of risk, i.e. hazard, exposure and vulnerability. However, so far this has not yet been achieved in relation to anthropogenic climate change. Here we study the attribution of the hazard component by systematically analyzing the cascade of impacts from emissions to climate change, glacier shrinkage, lake growth and flood hazard (probability and magnitude). For exposure of people and assets to GLOF, the historical development of residential areas and land-use change in the exposed areas are evaluated. Vulnerability in the Huaraz case is multi-dimensional and includes aspects such as risk governance, diverse risk perceptions, preparedness or early warning.

Our results show that all three risk components substantially contributed to GLOF risk in Huaraz. A quantification of the share of each component is not feasible at the current state of science and would furthermore raise fundamental issues of how different risk components are weighted for overall risk.

In the context of the current legal case in Germany we find that attributions of flood risk to anthropogenic climate change is possible but it needs to be seen how the court evaluates the different contributions to risk. From a risk management perspective the main objective is to effectively reduce risks, addressing all three risk components. We show that comprehensive risk attribution and disaster forensics can substantially inform risk management strategies and measures.

Finally, in terms of a responsibility and ethics perspective we emphasize the shared but differentiated responsibilities arising from GLOF risks attributed to anthropogenic climate change but also from exposure changes and vulnerability attributable to local social, political, economic and institutional drivers.