A look at climate-caused harms unfolding in Peru's Cordillera Blanca

August 26 2020, by Elza Bouhassira

Glaciated peaks in the Cordillera Blanca. Credit: wanderflechten/ CreativeCommons

The world is moving too slowly in its efforts to confront climate change, and some communities are already experiencing serious losses because of limits to adaptation that leave bases uncovered. Published by *Nature* in July, a new study examines the negative consequences stemming from changes in the mountain cryosphere in Peru's Cordillera Blanca. The study examines these changes within the framework of Loss and Damage (L&D), an international climate policy mechanism that promotes taking actions that prevent and address losses and damages associated with climate change.

The study, led by University of Zurich Ph.D. student Alina Motschmann,

focuses on three specific issues resulting from glacier retreat: ice loss, glacier hazards, and variability of water availability. The authors assert that choices made with regard to governance and adaptation will have a significant impact on how far-reaching climate-related harms that can't be adapted to will be. They suggest that Loss and Damage policy should take on a more comprehensive approach that better reflects the physical and social processes that result in such destruction.

What is Loss and Damage?

Loss and Damage (L&D) with capital letters refers to an international policy mechanism, while loss and damage with lowercase letters refers to actual harms that occur when mitigation and adaptation are not enough to stave off the consequences of climate change.

L&D emerged as a concept in 1991, when the Alliance of Small Island States suggested creating an international insurance pool to help cover the losses caused by sea level rise. Over time, the idea gained traction and its scope expanded to include a broader range of climate-induced harms. L&D was first institutionalized in 2013 through the Warsaw International Mechanism on Loss and Damage (WIM). WIM was created at the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), an international environmental treaty with near-universal membership. However, in the seven years since WIM was established, the need for L&D policy has soared while commitments on the international stage have stagnated, keeping progress on the sidelines.

"There is no official definition of L&D in the UNFCCC," Elisa Calliari, a postdoctoral researcher at the Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici told GlacierHub. She continued, saying, "Other definitions have been proposed in literature, and I would say that the most influential has been the one by Warner and van der Geest

(2013) that explicitly links L&D with the inability to cope and adapt to climate change impacts."

Lead author Motschmann told GlacierHub that the paper focused less on the policy definition of L&D and more on the losses and damages that are taking place, with the goal of understanding what is actually at stake for people and their governments. "Loss and Damage as policy tries to 'avert, minimize, and address damages and losses due to climate change' but in order to do that there is a need to know what these damages and losses are," Motschmann said.

Loss and damage is already happening in climate hotspots; they are encountering the life-altering effects of slow onset processes like glacial retreat and extreme events like glacial lake outburst floods. Both economic losses, like loss of assets and agricultural production, and non-economic losses, like loss of cultural heritage, ecosystem services, and Indigenous knowledge, have been felt in hotspots.

"There is still a link missing on how climate change events, whether slow or sudden, specifically impact certain areas. Therefore I think [L&D] needs case studies and real examples of how certain impacts can be considered losses and damages. We tried to show this for the Cordillera Blanca," Motschmann told GlacierHub.

A building and the Cordillera Blanca. Credit: Kate Dunbar

Why the Cordillera Blanca?

Broadly, mountain cryosphere systems are among the most vulnerable to climate change and any harm incurred within the mountain cryosphere will have effects in downstream communities that rely on the mountains for water. The Cordillera Blanca is the largest and tallest mountain range in Peru and it is the region with the largest glacier cover in the tropics. It has lost almost half of its glaciated area since the Little Ice Age, which ended in 1860.

The Cordillera Blanca also has a history of glacier-related disasters which will only be exacerbated as the effects of climate change continue to unfold. Better understanding of the Cordillera Blanca will support the development of more effective adaptation and mitigation plans to limit loss of livelihoods and culture that has not already taken place both in this region and elsewhere.

Loss and damage in the Cordillera Blanca

Ice loss was the first of three effects of glacier retreat examined by the research team. Ice and glaciers play a significant role in the culture of the Andean residents of the region. The values, traditions, and myths of local communities are intertwined with glaciers and mountains. Elderly villagers in the region told the research team that they consider the mountains to be part of their community.

Peru has the North, Central and South Cordilleras and each region has unique cultural associations with the mountains. "Depending on who is studying the topic—an NGO, a local, a student researcher, the government—people will have different opinions on what the significant cultural and spiritual elements are and have become over time," Luis Vicuña, a sociologist at the University of Zurich told GlacierHub.

The loss of intangibles like the belief that glaciers are part of the community is called cultural loss and damage. "The grounding principle

in L&D is not money, but value. And value is a human construct," Anthony Oliver-Smith, Professor Emeritus of Anthropology at the University of Florida told GlacierHub. If something is not valued, it is not a loss when it disappears. He continued saying, "What happens in the Andes with glaciers is that there are things that in effect have no quantifiable value and that can't be reduced to money."

Ice loss is also adversely affecting local economies because collapsing ice caves and lack of snowy conditions prevent tourists interested in skiing and climbing from visiting the region.

The harm caused by glacier lake outburst floods (GLOFs) was the second effect that the researchers looked at in the study. GLOFs can occur suddenly and upend lives in a matter of hours as water and ice rush downhill in a devastating mass. The Cordillera Blanca has seen 14 of these events, each of which has flooded pastures or killed livestock, among causing other harms.

As glaciers continue to melt due to climate change, the number of glacier lakes has increased from 223 in 1953 to 882 in 2013 and the number of lakes with large surface areas and volumes has tripled. An increase in population, industrial, and agricultural activities in recent years has also increased the possibility of greater harm from future GLOFs.

The third effect examined was variability of water availability. The Cordillera Blanca is recognized as a hotspot for glacier melt impacts on water resources. Research shows that peak flow from melting glaciers has already passed in the Cordillera Blanca and there will be decreased flow going forward. This means that there will likely be water shortages during the dry season which were previously mitigated by glacial meltwater. Many Indigenous communities in the region depend on agriculture for their livelihoods and water shortages will create risks of declining household food security and crop productivity.

There is also competition for the water that is available. "The problem of variability of water availability is not new—this is a problem all over the world. A big concern when there is water scarcity is who manages the water. In the Ancash Region that this paper focuses on, there are big mining enterprises that need water. Water is also used to generate hydropower, by the agro-exportation business, and by individuals," Vicuña told GlacierHub.

The researchers suggest that when analyzing loss and damage related to water resources it is necessary to consider how societies and governments manage water that is used in many different ways.

"The issues created by a lack of water will expand beyond the bounds of the study area in this paper. Researchers in general should look beyond geographical borders and more at the entire area that will be impacted by social problems like this," Vicuña told GlacierHub.

Policy implications

The authors of the paper suggest that going forward, filling in missing pieces on what constitutes a loss or damage will be essential to creating effective L&D policy.

Motschmann stated how the authors aimed to look at both physical and socio-economic processes leading to losses. "Only if we know about all the factors that play into creating losses and damages, can we find ways to avert or minimize them," Motschmann told GlacierHub.

It will be a challenge to incorporate cultural loss and damage because it can be difficult to measure. "A value that will be lost is the value that the glaciers have for identity, beliefs, and cosmology and it can't be quantified. It has to be understood with a different type of analysis," Oliver-Smith told GlacierHub.

Operating in parallel, climate negotiations and scientific research can together help reach a common goal: recognition that justice and compensation are needed for people who face damages that cannot be adapted to. As cases of loss and damage like those highlighted in this study accumulate from regions around the world, the case for L&D policy becomes stronger.

More information: Alina Motschmann et al. Losses and damages connected to glacier retreat in the Cordillera Blanca, Peru, *Climatic Change* (2020). DOI: 10.1007/s10584-020-02770-x

This story is republished courtesy of Earth Institute, Columbia University http://blogs.ei.columbia.edu.

Provided by Earth Institute at Columbia University

Citation: A look at climate-caused harms unfolding in Peru's Cordillera Blanca (2020, August 26) retrieved 25 April 2024 from https://phys.org/news/2020-08-climate-caused-unfolding-peru-cordillera-blanca.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.