



## **In the Shadow of Melting Glaciers—Climate Change and Andean Society**

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Source: Mountain Research and Development, 31(1) : 70-71

Published By: International Mountain Society

URL: <https://doi.org/10.1659/mrd.mm079>

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## In the Shadow of Melting Glaciers—Climate Change and Andean Society

By Mark Carey. Oxford, United Kingdom: Oxford University Press, 2010. vii + 273 pp. US\$ 24.95. ISBN 9780195396072.

Mark Carey in this book has crafted a well-written narration of the history of glacial lakes and glacier-related hazards in the Peruvian Andes and their interrelation with socioeconomic development in the region. In a fairly detailed manner, he describes the glacial lake outburst floods (GLOFs) that occurred in the Cordillera Blanca during the second half of the 20th century, emphasizing events in the 1940s and 1950s. The events during that period were particularly important for shaping the development of hazard reduction measures, with a focus on lowering potentially dangerous glacial lakes. Carey also thoroughly describes the devastating ice avalanches on Huascarán in 1962 and 1970, which caused tremendous destruction of the towns of Ranrahirca and Yungay, respectively. The latter event was triggered by an earthquake. In general, alarming glacier-related disasters have been reported every 3–4 years in the Cordillera Blanca since the mid-20th century; all are carefully referenced in the book.

However, the descriptions of the disasters are merely a vehicle for the real message in the book, which reflects the political economy of glacier-related hazards and disasters in the Cordillera Blanca over the last 60 years. As such, Carey explores the interrelations between physical hazards and disasters and the political and economic development of the Santa River valley, in particular, and Peru, in general. Politicians have used the occasional disasters, and the platform for discussions on how they shape the development of society, for their wider goals. In this respect,

national-level politicians have interfered with the local priorities on how to manage the omnipresent risk of glacier-related hazards.

The risk of outbursts of glacial lakes gradually, and increasingly, became of interest for the economic forces developing the hydropower potential of the Santa River, spearheaded by the Peruvian Santa Corporation. The corporation promoted balancing the reduction of risk of GLOF events with the opportunities of water regulation for hydropower production, as drained and lowered lakes to reduce risks for outbursts also increasingly served the purpose of water storage.

The book also provides an account of the struggle of local people against national political and economic forces. Local people are the first and foremost victims of repeated disasters but are usually put in the back seat when it comes to shaping management and reduction of current and future disasters. In the driving seat are politicians, technicians, and scientists—mostly from outside the Santa River valley, or even from outside Peru. Carey describes in an interesting way the interplay between the local and the national forces, which do not always agree on what should be done in terms of risk reduction and how to rebuild society in the aftermath of a disaster. One of the main schisms was the question of hazard zonation. The national government, represented mainly by the “Control Commission of Cordillera Blanca Lakes” (or Lakes Commission) created by Peruvian President Manuel Odría, argued for the importance of rebuilding Huaraz after the 1941 GLOF in such a way that any future flood would cause less damage to the town. Hazard zonation and retaining walls were the answer. The Lakes Commission was backed up by scientists. However, among the inhabitants of Huaraz, there was a massive resistance against such plans. Carey writes:

*Local opposition to both floodplain zoning and retaining walls occurred during a*

*period of widespread concern about glacial lake hazards. Locals were thus not ignorant of the risks. Rather, they were unwilling or unable to alter their community and believed instead that environmental control (lake drainage) could protect them. They put the onus on the national government to prevent additional disasters by engineering in the Andes. (p. 43)*

He continues:

*Many property-owning urban residents demanded a particular type of government response aimed primarily at draining lakes and rebuilding a destroyed city in a hazard zone. They saw hazard zoning and retaining walls as obstacles to “effective” disaster prevention and signs of government neglect, even though these two strategies were well-intentioned plans to protect the population. Whereas most disaster scholars argue that vulnerability stems from poverty, racism, and other forces that push marginalized populations onto marginal lands or into substandard housing, this Huaraz case shows that vulnerable populations are not just passive victims of historical processes beyond their control. (p. 44)*

This discussion on the interplay between national and local forces is particularly interesting and contributes to a larger global discourse on the implementation of flood zonation, and the improved construction of houses and infrastructure, as part of disaster risk reduction. The delicate question of relocation of people, both before as well as after a disaster have happened, is of great interest, and Carey’s analysis of the underlying socio-hierarchical reasons for resistance to safety measures proposed by the government institutions is useful also in more general discussions beyond Peru and the Andes. Yet he also notes how the local resistance backfired to some extent:

*They [local residents] rejected hazard zones because of their desire to maintain their autonomy, keep the state at bay, and preserve power. But their choices produced*

*the opposite result: they became highly dependent on the state to keep studying and monitoring glaciers and draining dangerous glacial lakes. By choosing lake drainage as the preferred solution ... local residents rejected the solution that would have made them independent of the national government, which was relocation of their communities outside hazard zones. (p. 145)*

Carey also touches on another social dimension related to glacier- and glacial lake-related hazards: local knowledge and local perception of the reasons behind the hazards. This dimension is too often rejected by people representing physical science and engineering-based solutions, which may result in severe local resistance when projects designed “from the outside” are about to be implemented. Negligence to take

such local knowledge and perceptions on board may contribute to a situation about which Carey concludes: “Local resistance to adaptation measures may have as much to do with *who* is proposing them as with *what* the plan recommends” (p. 192).

Although I thoroughly enjoyed the book, I also have to note some small shortcomings. These are mainly related to the scope of the book. While the title boldly promises an account of climate change impact on *Andean* society in general, it is a disappointment to realize that it deals only with the problems in a small area of Peru. The rest of the Andes are not addressed, and I am still curious to what extent the situation in Peru, as described by Carey, is matched by similar interactions between socioeconomic development and glacial hazards along the Andes in other countries. In

addition, the title indicates an account of “melting glaciers,” giving a sense that impact on downstream water availability would be in the forefront. Although touched upon in the book, this topic is not covered in a satisfactory manner. However, despite these minor shortcomings, I thoroughly recommend the book to anyone whose interest focuses particularly on glacier hazards in Peru and their interactions with the development of the society in the Cordillera Blanca.

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