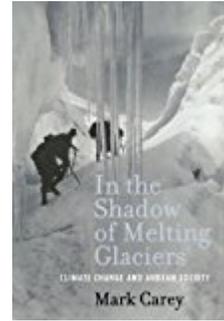


Mark Carey. *In the Shadow of Melting Glaciers: Climate Change and Andean Society*. New York: Oxford University Press, 2010. vii + 273 pp. \$99.00 (cloth), ISBN 978-0-19-539606-5; \$24.95 (paper), ISBN 978-0-19-539607-2.

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## Andean Outbursts: Co-Constructing Life in the Cordillera Blanca, Perú

Since the establishment of the Intergovernmental Panel on Climate Change in 1988 and the signing of the Framework Convention on Climate Change (UNFCCC) at the U.N. Conference on Environment and Development in 1992, climate change has been reported and assessed as a product of global warming provoked by 200 years of industrialization and deforestation. Today, “sustainable development” has come to encompass a raft of policies and mechanisms to mitigate climate change and adapt to a world characterized by increasingly intense and frequent, extreme hydrometeorological events. Yet, as Mark Carey’s *In the Shadow of Melting Glaciers* clearly demonstrates, the local impacts of global warming and the politics of life in the Andes, have been interacting with and influencing the outcome of climate change adaptation and risk management strategies in Peru’s Cordillera Blanca since the 1940s.

In the early morning of December 13, 1941, a large block of glacial ice plummeted into Lake Palcacocha, creating a huge wave that overwhelmed and destroyed the weak terminal moraine left behind by the retreating glacier. The resulting outburst flood swept down through Cojup Canyon and straight through the center of Huaraz, capital city of Ancash. “Within minutes, thousands were dead and a third of the city was obliterated” (p. 20). So begins Carey’s history of climate change and society in the Peruvian Andes. In the aftermath of the Huaraz dis-

aster scientists and engineers rushed to the scene in order to assess what had happened. The research that followed played an important role in developing the science of climate change, glacial retreat, and disaster risk management. However, the experts who came to the Cordillera Blanca “often relied on or were influenced by local residents” (p. 36). While the experts promoted hazard zoning and the relocation of vulnerable populations, many local people saw this as government disinterest and pushed instead for engineering solutions: the drainage of glacial lakes, the construction of levees, and support for post-disaster reconstruction. The struggles of local residents to influence the national disaster response eventually won the day, allowing Carey to argue convincingly that, while most disaster scholars suggest that “vulnerability stems from poverty, racism and other forces that push marginalized populations onto marginal lands,” the Huaraz case shows that “vulnerable populations are not just passive victims of historical processes” (p. 44).

Initially aimed at preventing future outburst floods, research also began to highlight the potential of glacial melt waters in terms of economic development. When, on October 20, 1950, another glacial lake outburst destroyed two high-profile state-funded development projects, including the nearly completed Cañón del Pato hydroelectric station, President Odría decreed the establishment of the Lakes Commission. While the creation

of the commission in 1951 was the exactly the kind of response that the Cordillera's inhabitants had been striving for, it was the destruction of the "hydroelectric facility and its setback to national industrialization plans ... that inspired the government's ... response" (p. 67).

Within two years the Lakes Commission had created a comprehensive glacial lake inventory of the Cordillera. The information generated by the Lakes Commission inventories served national integration and development objectives, indicating the safest and most productive places for constructing the reservoirs that could provide for electricity generation and the irrigation of agricultural lands. The Santa Corporation, a typical import-substitution industrialization project of the 1940s, modeled on the U.S. Tennessee Valley Authority, used hydrological data generated by the Lakes Commission to facilitate its mission to bring economic development to the Ancash department and to the nation as a whole. The Lakes Commission thus effectively merged disaster prevention with economic development agendas: "While studying hazards, it also carried out projects related to hydroelectricity, irrigation, tourism, road building, and job creation" (p. 98).

The last two substantive chapters of Carey's book bring us to the predominant contemporary narrative of the relation between global warming and glaciers: that of vanishing water towers. As with disaster risk management and the disaster economics that it spawned, the vanishing water towers narrative in Perú carried embedded assumptions about who should be in control of managing Andean landscapes, glaciers, and diminishing water resources. In chapter 6 Carey examines the role that state power companies played in the construction of glaciers as vanishing water towers, detailing the twists and turns in the historical relationship between environmental discourse and management that solidified "hydroelectric hegemony" and transformed glaciers from "natural hazards" into increasingly scarce "natural resources."

Chapter 7, "The Risk of Neoliberal Glaciers," brings us to the presidency of Alberto Fujimori and structural adjustment, which saw the privatization of state-run enterprises, including the hydroelectric industry. The Cañón del Pato hydroelectric plant was sold and ended up in the hands of U.S.-based Duke Energy, allowing state-owned Electroperú to withdraw completely from the Santa River basin and at the same time close down its Glaciology and Hydrological Resources Unit. In stark contrast to the vanishing water towers narrative, the newly privatized hydroelectric company dramatically increased its

use of glacial melt water from the Santa River and began building new reservoirs, even seeking to add water to lakes that had previously been drained to mitigate the risk of outburst floods. Thus, as glacial retreat continued and more hazardous glacial lakes continued to form, Ancash residents became increasingly vulnerable to glaciers and glacial lake hazards. Carey's analysis not only demonstrates how neoliberalism impacted local society-environment relations, but also how the outcome of neoliberal policy was contingent on the actions and pronouncements of local, national, and global actors.

While neoliberal reforms were playing out on the ground in Perú, global concern over climate change was consolidating following the signing of the UNFCCC in 1992. Global environmental change called for more global environmental monitoring. The U.S. space agency NASA was playing its part, developing advanced satellite imaging technology. In early 2003, NASA issued a press release stating that an ominous crack had appeared in a glacier immediately above Lake Palcacocha, threatening imminent disaster. Predictably, the announcement caused widespread panic. However, NASA's warning was issued without consulting Peruvian glaciologists or government officials. As it transpired, the "ominous crack" turned out to be no more than a rocky outcrop, but the ramifications of NASA's announcement rippled out through the Cordillera, influencing subsequent disaster risk management, tourism economics, and water and hydroelectric development and providing further evidence of the contested and the contingent character of historical events and their outcome.

Carey's research and the referencing of his sources are meticulous. As his analysis develops and new events and conjunctures are considered, he is always careful to return to the central themes of his history of climate change and Andean society and thus builds a very clear but sophisticated account of his subject. Indeed, Mark Carey's book is a triumph on several fronts. What he sets out to do, and achieves so brilliantly, is to address the lack of attention to how local people perceive climate change-related events such as glacial retreat and how they influence the science, technology, and policies that are developed to mitigate and adapt to its impacts. In addition to providing a fascinating and original contribution to the history of Perú, *In the Shadow of Melting Glaciers* also provides valuable insights into how environmental subdisciplines across the humanities and social sciences can engage with natural and social phenomena as active and dynamic agents of change. As global warming gathers pace, scientists, governments, and economists quan-

tify and issue predictions of climate change, and propose policy instruments and market mechanisms in response. Yet, in the end, the future history of climate change will be molded as much by the perceptions and actions of local people going about their business and striving to turn their dreams into reality. This is an important lesson for academics, but more especially for those proposing and implementing adaptation and mitigation strategies.

Mark Carey's volume deserves a place on the bookshelves of any serious historian of modern Perú and will also generate significant interest among environmental social scientists and climate change adaptation professionals. I shall certainly be adding it to the bibliography I provide to graduate students studying environment and development in Latin America, and can foresee the book becoming a classic text for students of environmental history and environmental sociology more generally.

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