

Mountain-dwellers can adapt to melting glaciers without caring about climate change

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A village official and his children in Copa, Peru, a community that's adapting to changing water levels due to retreating glaciers. Credit: Ben Orlove

For many people, climate change feels like a distant threat—something that happens far away, or far off in the future. Scientists and climate communicators often think that if everyone saw the devastating impacts of climate change, we'd all be more likely to accept it as real, and that accepting climate science is essential to taking action against it. A recent study, published in *Regional Environmental Change*, challenges the latter part of this assumption.

The study examined decision-making in three places affected by melting glaciers. For these communities in the Italian Alps, the Peruvian Andes, and the U.S.'s North Cascades, glacier retreat is a visible fact—"and the causes of glacier retreat are almost exclusively warming," explains lead author Ben Orlove, an anthropologist and co-director of the Center for Research on Environmental Decisions at Columbia University's Earth Institute.

Orlove and his colleagues wondered whether the people who live in the three locales notice these changes, whether they understand them to be the result of [climate](#) change, and whether this climate connection motivates them to take action.

They found that people in these villages are indeed aware of climate change and are even taking action to adapt to it. But the villagers don't often talk about climate change as a motivation for adapting. Instead, they're more likely to look closer to home for reasons to respond to the changing environment, focusing on how the responses can benefit their communities. The study suggests one potential way to reframe the conversation around climate adaptation and make it more appealing.

Exploring different frames of mind

Orlove's team looked at the frames of thinking that mountain-dwellers use to understand the changes happening around them. Mental "frames"

help us sort new information and reconcile it with our previous knowledge and beliefs. For example, says Orlove, "If a hydropower plant in the Italian Alps doesn't get enough water to generate electricity, what kinds of associations do the villagers make when they think or talk about these changes?"

The team examined how mountain-dwellers utilized two frames when talking about glacial retreat. The first was a climate change frame that focuses on global changes and the need for global solutions. The second was a community frame emphasizing action at a local level and recognizing positive opportunities for local advancement, in addition to the negative challenges of environmental change.

By analyzing peoples' speech patterns during in-depth interviews, [focus groups](#), and in records of community meetings, the researchers investigated how often people in the mountain communities used these two frames when talking about the impacts of climate change.

Different regions, different challenges, similar framing

The study found that villages in all three research sites are undertaking actions that could be described as adaptations to climate change. However, the communities themselves don't always think of their actions that way. The authors present three case studies.

Tourism in the North Cascades

Glaciers, rivers, lakes, and snowpack draw tourists to the slopes of Mount Baker in Washington State, providing the major source of income for the towns of Concrete and Glacier. But those natural resources are at risk as the planet's temperature climbs.

Orlove's team argues that these communities in the North Cascades are adapting to glacial retreat by finding ways to expand other forms of tourism. One example is through festivals that celebrate historical heritage and wildlife, and help to bring the community together.

However, Concrete and Glacier residents rarely used words associated with the climate change frame when describing the changes or the local response. Instead, they use a community frame, emphasizing the importance of bolstering tourism and supporting livelihoods and the next generation.

"These kids who get out of high school, there's not much for them to do except go out of town and find a job in [the nearby town of] Mount Vernon or Seattle," said one interviewee. "Some of them of course go to college, but probably the majority of them don't. So there's no real way to make a livelihood up here. We're dependent on tourism."

Hydropower in the Italian Alps

As glaciers in the Italian Alps shrink, river levels are declining, reducing the ability of hydropower plants to generate electricity. To keep up with demand, the villages of Trafoi, Stilfs, and Suldén have installed biomass generators that burn wood chips to generate electricity, and the extra heat gets piped into homes.

The researchers found that although residents sometimes describe the wood chips as a renewable resource—a term from the climate change frame—they're more often to rely on the community frame. Many villagers mentioned liking the wood heat for its coziness, and emphasized that the wood chips are a local resource that supports local independence. Others mentioned the next generation, noting that the wood chip industry provides local jobs and that the pipes have provided conduits to install fiber optic cables; both of these encourage

younger people to stay in their communities rather than seeking a future elsewhere.

Water in the Peruvian Andes

The village of Copa in the Peruvian Andes is also watching its water supply fall. Meanwhile, its need for water has only increased, as warmer temperatures and irregular rainfall make crop irrigation more important.

To adapt to these changes, Copa has upgraded its water infrastructure to reduce water leakage. It is using concrete to line the canals that carry water from the river, and building pipe systems to bring water into homes instead of hauling buckets from the canal. As with the previous examples, these developments are most often seen through a community frame, with a focus on how the modern water system earns recognition for the village. "They speak with pride of the village square," says Orlove, "with piped water giving it a more urban look."

By the numbers

Using both human judgment and computer keyword analysis, Orlove and his team analyzed how often people in these communities referred to environmental changes, whether they attributed these changes to climate change, and whether they described their activities as adaptive responses to the ongoing changes.

They found that the villagers frequently talk about climate change impacts. In interviews, focus groups, and community meetings, changes in ice, water, socioeconomic changes, weather, and agriculture come up in about 13 percent of conversation turns (defined as the words that one person speaks without interruption). "In other words," the paper notes, "they do not find climate change hard to see."

However, people linked these alterations to climate change in only 4 percent of the conversation turns, and they describe their actions as adaptive responses in only 5 percent of conversation turns. Overall, people were five times more likely to refer to the community frame than the climate change frame (4.83 percent versus 0.93 percent).

Reframing the conversation

In each of the case studies, communities see the effects of climate change and take steps to address the impacts. Yet they do all of this without making much use of climate change terminology. While the villagers believe in climate change and do occasionally bring it up in conversation, the community is more relevant for them.

To Orlove and his colleagues, this challenges the notion that people need to 'believe' in climate change in order to take action against it. Furthermore, the authors write, "it could be argued that the community frame is more effective than the climate change frame because it emphasizes 'co-benefits' of adaptation"—such as protecting local resources from outsiders, retaining control over energy production, and increasing one's connection to their community.

The findings emphasize that [climate change](#) communication should be more of a dialogue than a one-way conversation, and that scientists can learn a great deal from the communities they work with.

"It's not that the only solutions are found in these locally organized communities," says Orlove, "but people have not often looked for resources there, and when you do, you'll see that there is social capital. People value their town, and they know each other and interact. They care about their environments and about their communities. We can recognize that as a resource that shouldn't be overlooked at a time when climate needs far exceed available funds."

This ability of people to engage with their neighbors and to craft solutions they care about could be helpful outside of mountain villages as well, says Orlove. "If we see self-organizing here, can we see self-organizing in other places, like in New York?"

More information: Ben Orlove et al, Framing climate change in frontline communities: anthropological insights on how mountain dwellers in the USA, Peru, and Italy adapt to glacier retreat, *Regional Environmental Change* (2019). [DOI: 10.1007/s10113-019-01482-y](https://doi.org/10.1007/s10113-019-01482-y)

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