

## Introduction

“Great *apu*, we have come here to greet you and show you respect,” said the shaman while raising his arms and looking toward Mount Huaytapallana, which houses the *apu*, the nonhuman being embodied in the mountain. The crowd of about a thousand pilgrims who had gathered around the shaman imitated his gesture of saluting Huaytapallana. The solemn atmosphere lasted several minutes, after which people started to embrace and wish each other a happy new year. Then the forceful sound of a piece of ice breaking off the glacier interrupted the cheerful mood, reminding people not only of Huaytapallana’s spiritual power but also of the threat of global warming and the glacier melt it causes. Unnerved by the sound of the calving glacier, a woman asked, “What will happen to Huaytapallana when the ice is gone?” while a man next to me exclaimed, “Huaytapallana has heard our prayers.” When I asked the pilgrims about their view of the mountain’s melting glacier, one person said, “The *apu* is dying,” while another claimed “it is a *pachakuti*,” a Quechua term for the turning of the world upside down.<sup>1</sup>

This account is an extract from my field diary in 2014 from when I took part in the annual celebration of the Andean New Year at the foot of Huaytapallana’s glacier in the central highlands of Peru. The experience made an unforgettable impression on me and induced me to write this book. Who is the *apu*? Why is it dying? Why does its future death produce a *pachakuti*? And more broadly, how do global climate change and the retreat of Huaytapallana’s and the rest of Peru’s tropical glaciers affect the culture and ritual customs of the country’s Andean population?<sup>2</sup> By addressing these and other related research questions, the book contributes to the growing body of anthropological research on climate change. Using case studies from four field sites in the Peruvian highlands, it offers an ethnographic account

of how Andean people interpret and make sense of climate change and how this becomes a part of their daily lives, prompting them to reinvent social practices and reshuffle their worldviews. My argument is that rather than viewing climate change as an isolated or external phenomenon, Andean people experience it as one of many forms of change occurring in their lives. Moreover, even though Andean people are among the first to suffer from climate change, many do not view this as anthropogenic, and those who do think it is caused by their own activities, not by the agency of people in other parts of the world (Jurt et al. 2015; Paerregaard 2019b).<sup>3</sup> It is therefore my contention that climate change and its impact on the society and culture of Andean people must be investigated within a broader context of environmental tensions, economic development, social conflict, and cultural change at the local, regional, and national levels.

As one of the most densely inhabited mountain regions in the world, the Andes is extremely sensitive to global warming, which causes glacier melt, flooding, and water scarcity and leads to environmental degradation, social conflicts, and out-migration. Using Peru as an example, my research suggests that climate change represents both a dilemma and a possibility for countries in the Global South that suffer from water scarcity.<sup>4</sup> Rising temperatures, irregular precipitation, flooding, and water shortages pose fundamental environmental problems for Peru.<sup>5</sup> But climate change also challenges the country's hierarchical structure by urging the state to include its marginal communities in climate adaptation projects. At the same time, climate change opens the door for new forms of political engagement by inciting people to review the human-environment relationship and the ideas of control and dominance that inform the state's politics. In other words, climate change, glacier melt, and water scarcity transform Peruvian society in multiple ways. On the one hand, they cause social conflicts, fuel internal migration, and jeopardize economic growth; on the other, they pave the way for new forms of social inclusion and citizenship and offer vulnerable populations a new perspective on Peru's environmental politics and the development model underpinning its prosperity (Paerregaard, Stensrud, and Andersen 2016). The book's proposal is that this tension between anthropogenic change and environmental crisis versus social inclusion and political mobilization constitutes an inherent paradox not only in Peru's current efforts to reduce poverty and raise the living standards of people in marginal areas while mitigating the impact of climate change but also in climate change politics in other parts of the world.

## ANTHROPOLOGY IN THE ANTHROPOCENE

Most of the existing literature on climate change within the social sciences focuses on the immediate consequences of global warming (Yearly 2009). Employing such concepts as resilience, adaptation, and vulnerability, this first generation of climate change scholarship examines how exposed communities adjust to rapid environmental change (Adger 2006; Adger et al. 2003; Folke 2006; Oliver-Smith 2016) and how external agencies assist them in implementing emergency plans and inventing coping strategies to overcome natural hazards caused by climate change (Oliver-Smith and Shen 2009). Anthropologists in particular offer a comprehensive understanding of social reliance and vulnerability as embedded in everyday human agency because they apply a broad, holistic view of human and natural systems and study within the shifting contexts of environmental and social change (Crate 2011). Anthropologists also work directly with people who are affected by this change and are exposed to the new climate realities (Hastrup 2013), which enables the researchers to identify how global warming affects locations where it is being felt most urgently and examine how people experience and adjust to climate change locally (Crate and Nuttall 2009, 2016).

While the strength of anthropology is to capture the subtle ways people deal with climate change in their local life worlds, it also recognizes that these are never homogeneous, isolated, or static, but form part of the larger world. Modern anthropologists are therefore adept at examining long-term environmental change, contextualizing this in national and global perspectives, and embracing several scales in the study of climatic and social change (Barnes et al. 2013; Barnes and Dove 2015; Hastrup 2016). Writing on behalf of the emerging community of anthropologists studying climate change, Kirsten Hastrup contends: “We must learn to theorize across ethnographic fields and offer our theories to the wider community of scholars and scientists for inspection and inclusion in the general field of climate change research” (2016, 36). A growing number of anthropologists have taken up this challenge of studying climate change as a multiscale phenomenon (Bauer and Bhan 2018; Bear and Singer 2014; Greschke and Tischler 2015) and exploring how it is experienced, anticipated, and perceived by people and becomes part of their everyday lives in a variety of places (Paerregaard 2016; Stensrud 2016a, 2016b; Strauss and Orlove 2003). Recent anthropological studies have also investigated how climate change challenges ideas of nature and culture and instigates people to rethink their relationship to the environment and

interpret meteorological phenomena (Ingold 2007; Paerregaard 2014b), how people predict the local implications of climate change and model nature's course (Hastrup and Skrydstrup 2012), and how global warming produces new patterns of human mobility (Hastrup and Olwig 2012).

One of the questions addressed by the anthropological literature is the conflictive nature of not only climate change but also climate change research, which in many places is an issue of dispute and contestation (Hulme 2009). Even though climate change is global and impacts all corners of the world, it does not manifest itself as a distinct and independent phenomenon (Calder 2015). As Heike Greschke points out: "Despite being regarded as a serious problem for all humans in present and future times, climate change is not directly perceptible. Knowledge about the causes and effects of global warming has to be mediated and can only become socially relevant at particular sites if it connects to life experiences and culture-specific patterns of interpreting the environment" (2015, 123). Consequently, people's perceptions of climate change are shaped by their own experiences and cultural ideas and are often at variance with the science-based and Western-generated global discourse on climate change, which separates the epistemic from the normative and detaches global facts from local value, destabilizing knowledge at the same time that it seeks to stabilize (Adger et al. 2012; Crate 2011; Jasanoff 2010; Mathur 2015; Paerregaard 2018a).

Elaborating on this observation and its implications for the dissemination of climate knowledge, Werner Krauss and Hans von Storch write: "The communication between climate science and the general public is severely disturbed" (2012, 214). The cause of this discord, Krauss and von Storch assert, is that "global climate models and their regional counterparts neither reflect nor match the climate reality people inhabit" (2012, 214). To conceptualize this discrepancy and understand why climate change has become a political battleground and a key narrative within which all environmental politics is now framed, Krauss and von Storch describe climate change research as a postnormal science.<sup>6</sup> Such a research approach differs from traditional scientific practice, demanding what Krauss and von Storch call "an extended knowledge basis"—that is, the inclusion of the social and cultural disciplines and the voices of the people they work with in climate research (2012, 226). In other words, to engage with society and make its results available to non-professionals, climate change science must collaborate with the social sciences and the humanities and make use of their qualitative-oriented methods and frameworks to examine climate change as not only a physical but also a

social and cultural phenomenon (Moulton et al. 2021). Ethnographic studies bring home this point by showing how global discourses on climate change intertwine with indigenous cosmology, local morality, and national politics, and how this merging of different knowledge systems generates unexpected and controversial ideas about the human-nature relationship and the causes of global warming (Brügger, Tobias, and Monge-Rodríguez 2021; Burman 2017; Crona et al. 2013; Green and Raygorodetsky 2010; Paerregaard 2013a).

But as a postnormal science, climate change does not only question the nature of its facts, values, stakes, and urgency. It also raises fundamental questions about humanity and its role in planet Earth's future prospects. The scientific community now overwhelmingly attributes global climate change to human activities, prompting many to employ terms such as *anthropogenic* and the *Anthropocene* to underscore humans' double role as both a main contributor to and a steward of the planet's climatic and environmental problems (Steffen, Crutzen, and McNeill 2007). In the words of Hastrup: "Humans are everywhere, not only as destroyers of nature but also as providers of collective solutions" (2016, 36). The acknowledgment of humans' pivotal role for the planet's evolution speaks to the heart of anthropology and induces anthropologists to engage in climate research by inquiring into the multiple ways people explain climatic change, particularly how they account for their own contributions to its cause and effect (Greschke 2015; Jurt et al. 2015; Paerregaard 2020a; Schnegg, O'Brian, and Sievert 2021). The questions such an anthropogenic research focus asks include: Who are the "we" in the Anthropocene? And how do we distribute blame and guilt in the discussion of what has caused anthropogenic climate change? As Sayre points out: "The politics of the anthropogenic must give way to a politics that identifies which people have caused which changes, with what consequences to whom, and demands a justice that is indistinguishably social and environmental at the same time" (2012, 67).

Some scholars, however, find that conventional political thinking fails to tackle the underlying problems of anthropogenic climate change, which, according to historian Dipesh Chakrabarty, produces a crisis in the distribution of natural reproductive life on the planet. Chakrabarty argues that "our political and justice-related thinking remains very human-focused" and asserts that "we still do not know how to think conceptually—politically or in accordance with the theories of justice—about justice towards non-human forms of life, not to speak of the inanimate world" (2017, 32). Therefore, Chakrabarty writes, there is an urgent need for a politics of the

Anthropocene that reaches beyond conventional understanding of “the political” as a mere human affair and addresses anthropogenic climate change and, in particular, what he calls the Great Extinction—that is, human-driven extinction of other species on a massive scale and other irreversible human footprints on Earth’s system.

Chakrabarty’s critique of the politics of the anthropogenic echoes recent anthropological works on posthumanism that both inspect the human/nonhuman relation as a multispecies engagement (Aisher and Damodaran 2016; Kirksey and Helmreich 2010), a human-nature collaboration (Choy et al. 2009; Tsing 2015), a multinatural lifeworld (Latour 2011), and an ecology of mutually constitutive materials (Ingold 2012) and call for a revision of the universality and the notion of a unified cosmos implied in conventional politics, whether practiced by the Right or the Left (Latour 2013). This critique also resonates with the notion of environmental cosmopolitanism, as suggested by Ben Campbell (2008), and the idea of a cosmopolitics, as proposed by Isabelle Stengers (2010, 2011), that regards the cosmos as an unknown and open space of divergent worlds and explores the possibility of articulating them with each other to become a common world (Blaser 2016, 546–547).<sup>7</sup> Such a cosmopolitics recognizes that the world is more than one socio-natural formation: in Marisol de la Cadena’s words, a “kaleidoscopic simultaneity of similarity and difference” (2015, 22). And while a cosmopolitics aims to interconnect its multiple forms of existence, it does not treat them as commensurable (2015, 22). As de la Cadena writes, “A new pluriversal political configuration—perhaps a cosmopolitics, in Stengers’ terms—would connect different worlds with its socionatural formations—all with the possibility of becoming legitimate adversaries not only within nation-states but also across the world” (2010, 361).<sup>8</sup>

Unlike scholars who scrutinize cosmopolitics as a project that starts as a theoretical claim and aims to disrupt established ways of thinking politics, I approach it as an empirical phenomenon that emerges from humans’ experience and interpretation of their own anthropogenic agency and that can both coproduce and alter conventional political practices (Paerregaard 2019c). As demonstrated by de la Cadena (2015) in her study of mountain deities and other earth beings in the Andes, indigenous ritual practices and cultural imaginaries speak to and defy the established rules of political engagement at one and the same time. But climate change not only reveals the blind spots of conventional politics; it also complicates humans’ contributions to cosmopolitics. As my ethnographic case studies show, the encounter

with glacier retreat and chronic water shortage challenges Andean people's own understanding of their relationship with the earth beings they believe control the water flow and questions their notion of what it implies to be human.

My bottom-up approach to cosmopolitics has implications for the way I conceptualize the Andean pluriverse and, as I discuss in the section on data collection, the way I position myself in the field. For years Andean anthropologists posited the society-environment nexus as a divide between two separate worlds, one exclusively human and the other, labeled "nature," comprising all other forms of existence. While their works are full of ethnographic accounts of how the line between the two realms are blurred in ritual practices, symbolic representations, and mythical configurations, such crossings of the human-nature divide are described as activities and ideas that unfold and exist in people's cultural world rather than in the real world (Abercombrie 1998; Allen 1988; Bastien 1978; Bolin 1998; Gose 1994; Isbell 1978). More recently, a growing number of anthropologists have taken issue with this approach. Questioning the opposition between humans and the environment that underpins this approach and putting its notion of a "pure" natural world under arrest, they argue that reality or nature emerge from rather than precede human practice (Blaser 2013; de la Cadena 2015; Descolá 2013; Ingold 2012; Latour 2013). Instead of drawing on the "ethic/emic" framework that anthropologists conventionally have used to distinguish their own perspectives from those of their interlocutors, these scholars employ the term *ontology* to describe people's embeddedness in the environment they inhabit, claiming that anthropologists should take their interlocutors' ideas of nature at face value and recognize them as being as valid as their own (Descolá 1996; Ingold 2007; Latour 2011). Some scholars even propose an indigenous cosmopolitics that departs from a reality that is constituted by indigenous people's own concept of the world and that may give rise to a *political ontology*: a hegemonic struggle of defining and creating the world (Blaser 2016; Burman 2017; de la Cadena 2010).

While supporting the effort to break up the society-nature divide and welcoming the invitation to acknowledge the epistemological value of indigenous (as well as other) people's *worldings*—that is, their way of inhabiting and perceiving the world (de la Cadena and Blaser 2018)—my approach is pragmatic. More specifically, to study the cultural impact of climate change in the Andes, I borrow from both the conventional understanding of mountains and other nonhuman agents inhabiting the environment as symbolic

representations in Andean ritual practice and cosmology and the new reading of these forces as possessing agency and being real. Employing the two theoretical positions as complementary rather than exclusive approaches, I argue that the mountains attain different meanings in different settings. In some contexts, they are best understood as figures of existential importance in people's lives and livelihoods that demand recognition as material beings acting as agents on a par with humans. In other contexts, they should be approached as symbolic configurations that may be critical for people's cultural practices and ideas but that nevertheless are issues of dispute and objects of negotiation and contestation and therefore cannot be dealt with unequivocally as self-contained, autonomous agents. I develop this proposition further in the four case studies, which illustrate how the social status that people attribute to mountains varies both within the same setting and across regions, sometimes appearing as metaphorical representations, other times as material beings.

My overall argument is that by making humans mindful of their own position in Earth's system and the impact their activities have on it and of their role as a planetary agent in relation to other life-forms, firsthand experiences of rapid climatic change upset people's perceptions of nature and their ideas of what are figurative characters and what are real agents in the environment. But climate change not only undermines local worldviews and epistemologies; it questions science's authority and calls for a new cosmopolitics (Paerregaard 2020b). Or as Candis Callison puts it: "Climate change cuts to the core of who and what human concerns are and how they are mediated and moralized. It enables questions beyond what the realm of science offers: What is our relation to each other, locally and globally? What is our relationship to the earth?" (2014, 23). The species identity emerging from such a climate consciousness is neither exclusive nor stable and may coexist with and even coproduce existing identities based on national, ethnic, or cultural belonging. Rather than replacing traditional kinds of intrahuman politics and existing forms of cosmopolitics, the awareness of living in an anthropogenic world adds a new dimension to environmental, social, and indigenous politics, in some situations transforming it and in others merely transfiguring it.

There is not one but many answers to the planet's environmental problems, and even though these become evident to many when they witness hard-core climatic facts, people's stakes and options in an anthropogenic world differ just as their possibilities of responding to its challenges vary



(Beck 2010; Emmett and Lekan 2016). By drawing the attention to humans' responsibility for glacier retreat and the world's water crisis, cosmopolitics undercuts fixed ideas of what is human and nonhuman. However, in doing so it also affirms the terms of ordinary politics by bringing to the fore the social and economic inequalities climate change glosses over. An ethnographic study of the vernacular experience of rapid glacier retreat and water shortage in mountain regions offers a look into the moral and cultural landscape that frames the global discourse on climate change and highlights the predicaments that impel people struggling to adapt to its consequences to simultaneously contest and abide by the established rules of political engagement.

### WATER METABOLISM

Just as I examine how mountains and water sometimes are objects of interpretations and configurations and at other times emerge as beings in the real world, I scrutinize how people both construct water as a cultural image and engage with it as a substance endowed with life and agency. Borrowing from the growing body of anthropological literature on water's social nature (Attala 2019; Beresford 2020; Orlove and Caton 2010; Paerregaard 2018b; Strang 2005, 2015), I explore on the one hand how water fashions Andean people's worldview and interaction with nature and, on the other hand, how Andean culture and ritual practice shape their adaptations to climate change and the water crisis it causes. To unpack the human-water nexus in the Andes and the ideas that drive Andean offerings, I investigate these as a replicate of the metabolic process by which material objects change chemical composition and physical form and, as a result, produce energy and life.<sup>9</sup> A key concept in this proposal is water metabolism, which is derived from the notions of social metabolism and the hydrosocial cycle and which I employ with two classics in anthropology in mind, one old and one more recent: Karl Marx and his notions of metabolism, human alienation, and second nature, and Roy Rappaport and his proposal to study rituals as a regular part of the human-nature relationship.

Around 150 years ago Marx wrote that the ideologists of bourgeois society had created a false opposition between nature and humans and criticized the notion of humans as a species alienated from nature, free to exploit its physical environment (Marx 1992). As a politically engaged intellectual, Marx pointedly drew attention to social inequality and environmental pollution,