Religions **2013**, *4*, 290–305; doi:10.3390/rel4020290

OPEN ACCESS

religions

ISSN 2077-1444

www.mdpi.com/journal/religions

Article

Bare Rocks and Fallen Angels: Environmental Change, Climate Perceptions and Ritual Practice in the Peruvian Andes

Karsten Paerregaard

School of Global Studies, University of Gothenburg, S-405 30 Gothenburg, Sweden;
E-Mail: karsten.paerregaard@globalstudies.gu.se

Received: 6 February 2013; in revised form: 22 April 2013 / Accepted: 23 May 2013 / Published: 28 May 2013

Abstract: One of the many dimensions of globalization is climate change that in recent years has caused much concern in the developed world. The aim of this article is to explore how people living on the margins of the global world conceive climate change. Drawing on ethnographic field data from the 1980s and today it examines how the ritual practice and the religious belief of a rural community in the Peruvian Andes has changed during the last 27 years and how the villagers perceive this change. It argues that the villagers traditionally conceive the environment as co-habited by humans and non-humans but that recent environmental change in the Andes has caused a shift in this world-view. Today, many villagers have adopted the global vocabulary on climate change and are concerned with their own impact in the environment. However, the villagers reject the idea that it is human activities in other parts of the world that cause environmental problems in their community and claim that these must be addressed locally. It suggests that even though the villagers' reluctance to subscribe to the global discourse of climate change makes them look like the companions of climate skeptics in the developed world, their reasons are very different.

Keywords: Peru; Andes; globalization; climate perceptions; environmental change; ritual offerings

---

Introduction

One of the many faces of globalization is climate change and the impact it has on the environment. As with other globalization processes, climate change affects social life everywhere; yet people experience it very differently. In the developed world, where many conceive global warming as a

major threat to not merely the physical environment but also human life, scientists, reporters and policymakers often use climate change as a crystal ball to read the future challenges of a globalizing world [1]. The sense of urgency to find answers to these challenges is fueled by a growing awareness in the Western world that it is modern lifestyle and not long term environmental change that causes global warming [2,3]. But how is climate change perceived in other parts of the world and, in particular, how do the people who are most vulnerable to global warming account for its impact on their environment? Do they share the dominating view in the developed world that climate change can be attributed to human activities and current processes of modernization and globalization? Or do they associate it with other forms of change in their surrounding? And how does global warming challenge their world-view and concept of the environment?

Aim and Scope

This article tries to answer these questions by discussing how people living in the Peruvian Andes perceive climate change and how current environmental change in the region challenges the notions of nature and culture that their ritual practices and religious belief are based on. Rather than trying to establish an actual link between climate change and other forms of change in the Andes, the article seeks to clarify how Andean people account for environment change through their own observations of for instance temperature fluctuations and variations in precipitation and their own interpretations of the consequences such changes may have for their future lives. Analytically, the article focuses on ritual practices as an arena within which Andean people both manifest and rethink their perception of the climate and environmental change as well as the relation between nature and culture. The ritual thus serves as a lens to explore how people revise their world-view in a time of rapid environmental, economic and social change.

Drawing on long-term ethnographic fieldwork in a community situated in the Colca Valley of Peru's southern highlands the article examines, firstly, the village's cosmological order based on the idea that non-human beings inhabiting the surrounding mountains control the melt water and, secondly, the villagers' perception of climate change and its effects on the village's environment and water supplies. While some villagers continue to make offerings to the non-humans beings out of fear for the harm they can cause humans, others question their powers and the need to conduct such rituals. However, the article suggests that even though water scarcity and other environmental changes have prompted many villagers to rethink the traditional world-view, they do not subscribe to the discourse of global warming. Rather than locating the cause of the growing water scarcity in other parts of the world, they regard it as one of many changes occurring in their own surroundings. The article therefore argues that the Andean understanding of nature is incongruent with the global discourse on climate change. It concludes that even though Andean communities are painfully aware of the changes their environment is undergoing, they search for answers to these changes locally and reject the idea that their environmental problems require global solutions.

Drawing on the growing body of literature that explores non-Western native perceptions of climate change [4–7] the article argues that Andean people perceive the climate as an essential element of nature and the non-human forces they believe regulate humans' relation to their environment. In the line with the findings of anthropologists in other parts of the world, my study indicates that the

Western dichotomy between nature and culture resonates little with an Andean world-view based on an epistemology which regards humans as an integral part of the physical environment [8,9]. From this perspective the claim brought forward in the developed word that it is human activity that causes climate change is met with skepticism given that humans are viewed as one among many creative forces in the world. Although changes in the environment indirectly can be related to human behavior, e.g., when humans neglect to make offerings to the non-human beings, ultimately, it is these forces and not humans who control nature and therefore can cause environmental change.

However, I also propose that the processes of change the Andean region currently is experiencing make many question the world-view they traditionally use to account for environmental change. I therefore follow the suggestion by Strauss and Orlove to study climate change by observing how it challenges prevailing ideas of nature and culture and instigates people to rethink their relation to the rest of the world [10]. While my research supports those scholars who argue that the effects of climate change are of increasing concern for the indigenous people of the Americas [4,5,11] it differs from their findings in a number of respects. Most of the existing literature is focused how global warming threatens indigenous cultures and it mainly seeks to portray the impact of climate change through the eyes of indigenous people and their memorization of glacier melting and other environmental changes. I take one step further and ask how Andean people perceive environmental change and how this affects their ideas of how they are positioned in a globalized world. One of the finding of my research is that rather than pointing at global warming as the main cause of environmental change Andean people are greatly concerned with the impact their own activities have on the environment. Moreover, unlike other studies of how climate change challenges indigenous ideas of nature and culture I am interested in knowing how environmental change intersects with other forms of change. Thus, in the Andes global warming occurs at a moment of economic, social and cultural transformation prompting Andean people to adopt new lifestyles and consumer habits. Similarly, in the Andes international agencies, NGOs and the national states are implementing development and modernization programs and introducing new technologies that connect rural communities to the wider national and global world.

To grasp this meshwork of local, national and global change I draw on recent anthropological theories on globalization. More specifically, I propose that we study climate change as a global assemblage of material, collective and discursive relations that mutually shape each other [12] rather than viewing it as a single, one-way process in which human activities in one place of the world (the developed world) impact the life and the environment in another part of the world (the developing world). In the words of Ong and Collier, such an approach does "not examine changes associated with globalization in terms of broad structural transformations or new configurations of society or culture. Rather, it examines a specific range of phenomena that articulate such shift." ([12], p. 4). Among such phenomena are ethics, values and, I will add, ritual practices and religious belief, which I shall demonstrate play a critical role in the way Andean people interpret environmental change. Another way of approaching climate change is to examine this as one among many frictions that shape the lives of people when these engage in contact with the world. Viewing environmental change as global friction, or "grips of worldly encounters" as Tsing prefers to call them [13], enables me to examine globalization and climate change as a complex encounter between communities, development agents, states and other actors representing different and sometimes diverging perspectives on global processes

and explore ethnographically how this encounter produces new ways of addressing environmental issues and imagining the world of tomorrow.

Capturing the Local

To capture the frictions of environmental change in the Andes and to explore ethnographically how these frictions create encounters between different stakeholders and generate alternative climate perceptions I identify a "local" that in the words of Tsing eludes the "optimistic popular accounts of the spread of the market economy and Western liberal democracy" and the portrayal of globalization as a "worldwide advance to a global era" ([13], p. 11). Analytically, such an endeavor implies that I view the local from the inside rather than from the outside, as the epicenter in people's life-world rather than as a unit in a geographical yardstick. As Wilbanks and Kates point out, "the bulk of the research relating local places to global climate change has been top-down, from the global toward the local, concentrating methods of impact analysis that use as a starting point climate change scenarios derived from global models" [14]. It is therefore warranted to ask how environmental change is perceived from below and how global warming is imagined as a local phenomenon. To do this I draw on Lambeck's notion of the local as an instance beyond the global-local divide defined as "a tempo or perspective that both recognizes significant features of the human world and helps bring them into some kind of focus" ([15], p. 197). Examining the local untwined and irrespective of the global implies that we study it as something that is not already deposited but must be continuously realized ([15], p. 209) and that we explore it as "constituted by means of acts and consequences rather than specific spaces or individualized places, that is, by acts of habitation" ([15], p. 206). Such a study implies to shift in weight from the singular to the specific and requires that we refocus our analysis from scale and connectivity to "acts and the circular ripples of their consequences" ([15], p. 206). More bluntly, it means to "catch the *there* out there". Borrowing from Raffles, the locality I identify as field site for my research is "a set of relations, on ongoing politics, a density, in which places are discursively and imaginatively materialized and enacted through the practices of variously positioned people and political economies" ([16], p. 324).

One way of studying the local as an act of habitation and instance of social life independent of the dyad global-local is to bring ritual practices and collective events to the forefront and to ask how these provide people with a feeling of belonging to a place identified by a specific landscape and topography and attributed a particular social and cultural meaning. As Lambeck points out, "Insofar as ritual is a social act, so do participants, including witnesses, acknowledge each other as moral persons, bound to a common order and to common criteria for evaluating each others' acts" ([15], p. 207). Ritual performance thus binds people into particular communities of shared ethical criteria and specific commitments, which attach them to a local that is singular insofar as it defies geographical scaling. My point is that in Andean ritual performance the opposing point of reference to the local is not the secular "global" that imbues the literature on globalization and the Western discourse on global warming. Rather what comes into play in the ritual is the intangible and timeless "universal" that constitutes the non-human and spiritual powers which native people in many developing countries believe inhabit nature and control the human world. By studying the local as an instance of social interaction and ritual practice, then, a world-view emerges that recognizes global warming as a universal issue but at

the same time insists that this must be addressed locally instead of globally. Instead of evocating a threating contrast between the modern global world and a nature that has run wild as implied in the Western discourse on global warming [17], the Andean commitment seeks to establish a ritual dialogue locally between human and non-human stakeholders inhabiting the same environment.

The article reviews ethnographic material gathered in Tapay, an Andean village in Peru's southern highlands, over a period of 25 years. The material includes field data from a study I conducted in 1986 followed of two restudies in 1990 and 1993 [18]. This research documented the village's irrigation system and the ritual practices associated with water management. The article also draws on more recent research I conducted in the village in 2011 in which I examined the changes that had occurred since my first studies. My field methodology encompasses formal interviews with community leaders and ritual experts and informal conversations with villagers of both sexes and different generations. In my 1986 study I collected life stories of a selected group of villagers, conducted a village census and employed a household survey with questions regarding economic activities, irrigation practices, family relations and community participation. In my restudy in 2011 I employed a new survey with one fourth of the households in Tapay's two largest hamlets on perceptions of climate change. I complemented the survey with informal interviews with 15 villagers in the same two hamlets on what they believe cause environmental and climate change. I also collected life stories of eight elderly villagers with a focus on climate change. I structure the article by first introducing Tapay's irrigation system and water cosmology and then describe the changes the village has undergone since I did my field study in 1986. In the following section I use my ethnographic insights to reflect on alternative ways of understanding the global/local and the universal/particular divides. In the conclusion I sum up the article's main findings and use these to discuss the problems of viewing the world with Western eyes and ignoring non-Western perceptions of climate change.

Tapay

The Colca valley is situated in Peru's southern Andes between 3,600 and 2,200 m. Its inhabitants are distributed in 11 villages that vary in size from more than 6,000 to a few hundred. A growing number of people in the valley live of tourism, trade and transport but to the majority farming and herding continue to be the principal occupation. As the rain season only lasts three months (from January to March) and precipitation often is unpredictable, agriculture needs irrigation which is supplied by melt water running in the rivers and the man made canals from the nearby ice- and snowcapped mountains to the villages. Some mountains supply a single village but other villages share melt water from the same mountain or tap into the river or canals of their neighbors. Most of the canals and irrigation systems were designed and constructed in pre-Hispanic times just as the villagers' ancestors made the terraces and the fields they use to plant their crops.

At first glance, Tapay appears to be the very last joint in the global-local chain. Located in the lower end of the valley on the fringes of one of the deepest canyons in the world and surrounded by mountains, the village can only be reached on foot or by mule. The absence of shops and, up to a few years ago, also the lack of electricity, health centers and other modern services underscores its isolated position in the valley, an isolation that has led to a constant out-migration and drop in population. In 1986 the total population of Tapay was 983 inhabitants ([18], pp. 36–40). In 2009 it was merely

667 [19]. The villagers are scattered in nine hamlets—located in the agricultural zone below 4,000 m—and a small population of herders living on the *puna*—tundra-like short-grass-land above 4,000 m. While the inhabitants of the hamlets are concentrated in nucleated settlements, the herders live in dispersed clusters of houses. Notwithstanding the geographical dispersal, all villagers are part of a dual organizational structure that divides them in two opposed moieties, Hanansaya (upper part) and Urinsaya (lower part). As I shall show, the dual structure plays an important role in the irrigation system and the ritual practice of offering to the mountain deities and the ancestors.

The village's ecological diversity offers the inhabitants a unique niche to grow a wide range of fruits and crops that are exchanged for other products on the regional barter market. Vertically, the villagers live on different altitudes. From 2,250 m at the banks of the Colca River where the hamlet of Paclla lies, rising to Chugcho at 2,400, Llatica at 2,500 m, Fure at 2,650 m, Cosñihua and Malata at 2,600 m and Puquio at 2,700 m to an elevation of 3,000 meters, where the central hamlet called Tapay lies, the slope is covered with fruit trees, lending a jungle-like atmosphere to the landscape. The subtropical climate of the lower part of Tapay also allows the villagers to specialize in the production of cochineal that recurrently has been the object of an economic boom on the world market. Periodically, this trade assures the villagers a cash income far beyond the reach of other Andean peasants. Above the central hamlet, from 3,000 m up to 3,400 m, agriculture is devoted almost entirely to maize. Finally, Tocallo at 3,800 m specializes in potatoes, barley and beans while the herders living on the *puna* above 4,000 m produce meat and wool [20].

In most Colca villages irrigation is supplied by a few main water sources—rivers, streams, canals or water springs. In Lari water is transported from sources above the village via three separate canal systems that feed into the irrigation system [21]. Thawing snow from the surrounding mountains also contributes water to Yanque. However, irrigation in Yanque differs from that of Lari, in that it is supplied by two different mountains sources, one on each side of the Colca River. Consequently, each moiety of the village controls its own irrigation system. Irrigation in Cabanaconde largely adheres to the pattern of Lari, disposing of three main water sources, but only one local spring, used mainly for drinking water [22]. In Tapay, by reverse, irrigation is dispersed. Four different rivers—of which the biggest is fed by melt-water from Mount Seprigina—and a multitude of springs supply the village with water allowing Tapeños to operate various independent irrigation systems. The most significant difference between Tapay and the rest of the Colca valley is, however, the organization of irrigation. While neighboring villages appoint an array of authorities to manage water distribution at the *toma* (off-take), moiety as well as village level, in Tapay the local users of each water source are in charge of organizing the maintenance of the irrigation system, allocating water and resolving water conflicts. Indeed, unlike its neighboring village, no central authority controls water distribution in Tapay where the villagers of each hamlet store water from springs and runoff-fed canals overnight in reservoirs to be distributed the next day.

Today, this organization has changed little except that the users at the major water sources now elect a water committee that is represented at the *junta de usuarios* (the regional organization for water-user) in the provincial capital of Chivay. Each of these reservoirs is the subject of annual cleaning rituals during which a *regidor* (water distributor) is elected for the irrigation cycle [23]). Also, up to the mid 1990s a *juez de agua* (water judge) was selected to solve conflicts arising between the *regidor* and the water-users over water distribution but today this task is assumed by the water

committee appointed by the users according to a new water law introduced by the Peruvian government in 2009. Yet, neither the state nor any other central authority have so far interfered directly in the organization of irrigation in the village that continues to manage water in its own way.

Thanking Mount Seprigina

One important insight of my study in 1986 was that even though there are many water sources in Tapay and irrigation is organized locally, people believed that water is controlled by a centralized power. Thus, many Tapeños reported that the water flowing through their village was controlled by spiritual beings inhabiting its many water sources and these beings all are submitted to a single power living in Mount Seprigina. Maintaining good relations with these spirits and, in particular, Mount Seprigina by making offerings was therefore crucial. In 1986, Tapeños also told me that every spring was protected by a spirit that demands *pago*,[1] a ceremonial offering that is made to the water source several times a year and that is quite common in the Andes [24,25]. By the same token, they declared that the harvest hinges on these ceremonies intended to appease the spiritual powers and ensure a continuous flow of water. During my fieldwork I observed that while each hamlet made offerings to the water spirits at different places and times, the acts were linked in a cosmological order that supposedly transcended and united what was in other ways a dispersed and fragmented system of water distribution, an order that became evident in the repetition and overlap of *pagos*. Thus, some of the *pagos* ceremonies were repeated up to several times and in a number of cases the second and the third offering coincide in time and space. In the following a complete calendar of cleaning ceremonies and offerings is presented with reference to the village's springs and off-takes:

* June 24, San Juan: Cleaning of and first offering to springs in Chugcho, Pallajua and Huilcasco, Hanansay.
* July 29, Santa Maria Magdalena: Cleaning of and first offering to off-takes in cental hamlet, Hanansaya.
* August 5, San Clemento: Cleaning of and first offering to springs in Puquio, Hanansaya.
* August 8, San Clemento: Cleaning of and first offering to springs in Urunja, Hanansaya.
* August 24, Santa Marta: Cleaning of and first offering to springs and off-takes in Cosñihua and Malata, Urinsaya.
* August 30, Santa Rosa de Lima: Cleaning of and first offering to off-takes in Fure.
* September 8, La Virgen de Natividad: Second offering to springs in Puquio and Chugcho, Pallajua, Urunja and Huilcasco, Hanansaya.
* September 10, La Virgen de Dolores: Cleaning of and first offering to off-takes in Llatica.
* September 20, San Francisco: Cleaning of and first offering to off-takes in Tocallo.
* October 4, San Francisco: Second offering to off-takes in the central hamlet.

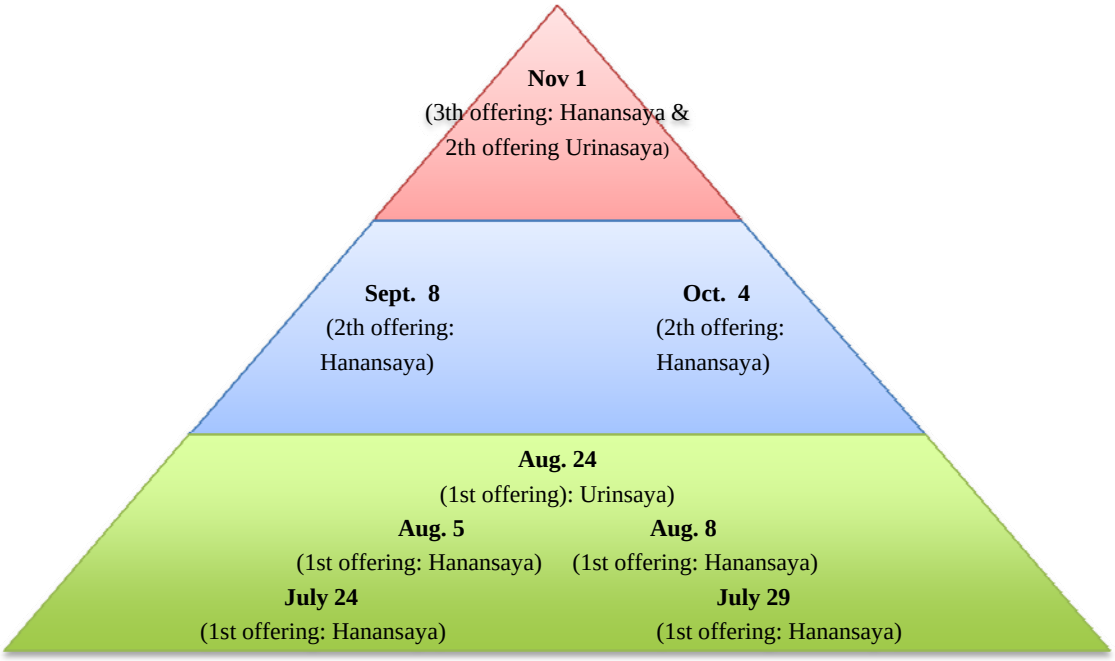
---

[1] *Pagos*,which literally means payments, are also called *t'inka*, a common denotation for all kinds of offerings. Besides offerings to the water there are *t'inka* to Mother Earth (*pachamama*), to the ancestors (*gentiles*), to the mountain deities (*apu* or *machu*), to animals, to houses, *etc*. Other Colca villages make similar offerings to the water and the earth.

* November 1, Todos Santos: Second offering to springs in Cosñihua and Malata, Urinsaya, and third offering to the mountain peak supplying the water to off-take in the central hamlet, the two hamlets in Urinsaya and to all springs in Hanansaya.

In the calendar a number of offerings in the moieties coincide when repeated either for the second or third time. Time and place vary for all first offerings, while the second offerings partially coincide in time even though they took place at the same locations as the first. As for the third, place and time are identical for all offerings: November 1 on Mount Seprigina. The model shown in Figure 1 demonstrates this interplay of dates:

Figure 1. Model of offerings in Tapay.



In the model, we observe that while the villagers make three offerings a year to the water sources in Hanansaya, in Urinsaya they only make two [26]. The dates may seen to interrelate, in that a number of offerings in Hanansaya (Puquio, Chugcho, Pallajua and Huilcasco) are repeated the second time on the same date—although at different places—and that the second offering of Urinsaya coincides in time as well as place with the third offering of Hanansaya. This falls on All Saints Day (Todos Santos) and is considered the most important of all rituals associated with irrigation. During my stays in Tapay in the mid 1980s and early 1990s the *regidor*, together with a specialist in offering called *paqo*, made a personal visit to the summit every years and delivered the offering directly to the spiritual powers controlling the flow of water. As to the four hamlets not included in the dual division, all except one made a first offering at places and times different from the rest of the village. In 1986 I obtained no knowledge of either a second and a third offering or the existence of any *pagos* in these hamlets. Hence, Paclla (which has no official offerings at all), Llatica, Fure and Tocallo are not included in the model.

The model demonstrates how all offerings advance towards the same geographical spot: Mount Seprigina, and culminates at the same point in time: November 1. In essence, this illustrates how in the Andean world-view the dimension in time merges with the dimension in space [27], a mergence made

possible because Tapeños on this particular day act as a united community of water-users paying respect to a single power believed to control the village's many scattered water sources. Before I elaborate on the meaning of this event it is pertinent to describe it ethnographically. The offering expert and his assistant who were contracted by the *regidor* to conduct the ritual told me that several elements are required to satisfy the powers controlling the water. Among these are: seeds and leaves of the coca plant (Erythroxylum coca var. coca), *conuja* (an herb from the *puna*), *qorilibro* and *qolqelibro* (small objects of gold and silver), *pichuwira* (fat from the breast of llama), maize of three different colours, *qochayuyo* (sea weed), and starfish. Some of the objects were burned at the spring, at the off-take from the river or at the very peak of the mountain where the source is located. Additionally, several items were consumed during the offerings, for instance *chicha* (prepared as a thick brew of maize of three different colors), wine and seawater [25].

Three of the components of the offering ceremonies—seaweed, starfish and seawater—have a common origin, indicating a belief in deeper ties between the apparently independent springs. The idea of the Earth as floating on a sea that unites all parts of the world is common in many parts of the Andes [28]. That irrigation constitutes a cohesive system in the Tapeño world were partly indicated by the Tapeños themselves. When I asked why they made offerings, people me offered various explanations. Some pointed out that it is because water is a living being which gives life only if it receives something in return. This, nevertheless, does not explain why the offering ceremonies merge geographically, as if they all were subject to the same higher powers. However, the fact that the offering to Seprigina falls on All Saints Day, the celebration of the departed, brings us on the track of exactly who these powers are. In Tapay people divide the dead into two classes: the recently deceased and the *gentiles* also called *abuelos* (grandparents), *i.e*., those who lived in Tapay before the Incas and the Spaniards. According to the Tapeños, *gentiles* are the living and spiritual part of the skeletons and human bones found in the pre-Hispanic graves located in great numbers in the village [15]. As they are perceived as not entirely dead, the villagers are fearful of them. In 1986 it was also a common belief among my older informants that water flows because the *gentiles* urinate. According to this view, Tapeños are virtually at the mercy of the ancestors who, at their discretion, can move the water from one hole to another or even withhold it altogether. Only by performing the *pagos* at the right time and place can their anger be appeased, and they be persuaded to let the water flow again.

Although Tapeños seemed to disagree when I asked them to explain the merging of their offering ceremonies, I interpreted these differences as variations on a theme rather than as competing understandings. Thus, it was quite evident from my material that people conceived of spiritual rather than human powers as controlling water and that this belief was intricately linked to the nature of the village's irrigation system fed by local springs, rather than rivers, streams and canals, and organized by local groups of water-users, rather a central water authority. In other words, as water sources are diverse and water is allocated locally, conflicts are few and authority decentralized. Power to control water was therefore imagined not as a social relation between humans but as a symbolic relation between humans and nature embodied in the mountain deities and the ancestors. But how have the changes occurred in the past 27 years affected Tapay's irrigation system and, in particular, their ritual practices?

Questioning Mount Seprigina

Even though Tapay looks much the same today as it did 25 years ago, the villagers feel the outside world is present in new ways. In the past decade Peru's national economy has tripled, generating not only a boom in the country's cities but also a trickle down effect in marginal places such as Tapay. The long promised road to the village is still under construction but the villagers now have running water, electricity and telephones. Moreover, Tapay receives substantial support from the central and regional government to improve agricultural production and a new high school and a health center have been built in the village. On the negative side Peru is experiencing the impact of global warming and today the country is counted as one of the world's most vulnerable countries to climate change causing water conflicts in the cities as well as on the countryside [29]. The country contains 70 percent of the world's tropical glaciers that provide a large part of water used for irrigation and consumption both in rural and urban areas [30]. It has been calculated that within the coming 15 years all the glaciers below 5,500 m.a.s.l. are bound to disappear ([31], p. 56), a scenario that represents a threat in a country where 90 percent of the population lives in dry, semi-dry or sub-humid areas ([31], p. 57).

Few Tapeños have detailed knowledge about these changes but when I did my field study in 2011 many complained that Mount Seprigina and the neighboring mountains only are snow covered during the rainy season. In my 2011 survey on perceptions of the climate the majority affirmed that this has changed in the past 25 years pointing to temperature fluctuations and irrigular precipitation as the most notorious signs of this change. The vast majority of the households also claimed that water today is scarce. These data suggest that there is a broad consensus among Tapeños that climate change is seriously affecting their lives. Nevertheless, new opportunities have emerged providing the villagers with alternative livelihoods and introducing them to different ways of seeing the world. Since Tapay became a backpacker haven a decade ago, dozens of tourists visit the village on a daily basis providing many villagers who have put up hostels and restaurants with an extra income. Most of the visitors come from Europe and other developed countries and through the stories they tell about modernity and globalization Tapeños have appropriated terms such as global warming and climate change and been introduced to Western ideas of global warming.

Upon my return to Tapay in 2011 it was therefore no surprise that villagers employed a new terminology to observe and interpret environmental change and that they talked of the climate as a phenomenon posing serious threats to their lives. Yet, at the same time the 15 villagers I interviewed stated that environmental change can have a variety of causes and while several of them adeptly used the term global warming to account for these, they disagreed when I suggested it as a problem caused by the industrialized countries. Some of the interviewed argued that rising temperatures are due to the introduction of modern life style in Tapay and Peru's contaminating mining industry. Others suggested that climate change is a cyclical phenomenon that people in the Andes have known for centuries and that is related to natural disasters such as earthquakes, hunger and plagues. One man said: "In Europe you're worried about climate change but we've known it for a long time. Today water is scarce but things will change again." Another villager pointed out to me that climate change is a phenomenon that occurs locally, not globally, and that global warming is caused by the encounter between warm water coming up from the earth and the cold water falling as rain from the sky.

Even though people in Tapay were reluctant to recognize environmental change as a global and an irreversible phenomenon many expressed their doubts about the cosmological order they traditionally believed in. During my field research in the 1980s and early 1990s, a small group of Protestants called *hermanos* campaigned against not only the Catholic church but also Andean customs and ceremonial practices such as the offerings to the mountain deities and the ancestors and they repeatedly tried to obstruct the villagers' ritualization of the annual cleaning of the water reservoirs and canals in Tapay [32]. Even so, the vast majority continued to participate in these events and many of the *hermanos* actually gave up their struggle and reconverted to Catholicism. In 2011 I noticed a change in not only the way the *hermanos* view of the village's ritual practices but also how the rest of the villagers conceive this cosmology. A growing number of villagers now had their doubts about the effectiveness of the offerings and the many rituals associated with irrigation in Tapay and although they continued to comply with them, many said they merely do it because it is a custom. These doubts were particularly evident among the *hermanos* who were even more radically in their rebellion against Catholic and Andean rituals compared to what I observed in 1986. Indeed, on a previous visit I paid to Tapay in 2010 the *regidor* in the main village, who had converted back and forth between Catholicism and Protestantism several times, refused to make the traditional offering to Seprigina on Nov. 1. Some villagers claimed that this could bring misfortune on the *regidor* and his family but others found the issue of little importance. Curiously, when I did my restudy in Tapay in 2011 several villagers reported to me that more rain had fallen that year than in the past 15 years. Nonetheless, when I pointed this out to the *regidor* who was responsible for the ritual in 2011 he told me that he intended to carry it out as planned, despite the seemingly unpredictable climate and the mountain deities' and the ancestors' dubious response. "Not because I believe it'll make any difference but because it's a custom", he said. Some villagers approved of his decision to continue the offerings but as one pointed out to me: "We do it not because there'll be more water but to elude the anger of the mountain and the ancestors."

Although the 15 villagers I interviewed interpreted the cause of climate change in various ways, they agreed it is to be found locally rather than globally and that they therefore must assume the responsibility of its consequences. Moreover, my interviews show that even though the villagers concurred that the offerings no longer appease the spiritual powers controlling the water supply in the village few dared to neglect them all together. While raising doubts whether the rituals any longer serve as a useful means to establish a relationship of exchange with the non-human beings, the majority of the interviewed still believed these have the power to punish them for their misdeeds. According to several of the villagers, these include their newly acquired modern lifestyle and consumer habits that in their eyes have contributed to the growing pollution of the environment. Yet, despite the majority of the interviewed recognized their own impact on the environment they believed it is the mountain deities and the ancestors who eventually control the water flow and the climate. A small group found it is the *hermanos* and their stubborn resistance to participate in the offering ceremonies that has caused the anger of the non-human beings inhabiting the mountains while a few suggested that climate change is one of many ongoing changes of nature. In the eyes of these villagers, even though raising temperatures are inevitable, they are only temporary and like other natural disasters such earthquakes, they will be followed by better times. Rather than accepting the Western notion of climate change as a global irreversible phenomenon caused by people elsewhere, then, the

interviewed villagers attributed the environmental changes Tapay is undergoing to their own acts and, more importantly, the will of the mountain deities and the ancestors.

Converging Perceptions of Climate Change

Tapeños' reluctance to view environmental change in their village as related to global warming and human activities in Europe and other foreign places illustrates the problems of bridging two apparently incongruent world-views: one based on a global/local paradigm and the other on a universal/particular paradigm. The first paradigm prevails in the developed world where the discourse on global warming portrays climate change as a man-made phenomenon, the outcome of a century-long globalization process that connects people world-wide but also generates serious environmental problems. From this perspective, the global is the aggregated effect of human encounters and activities in the world. In the past two decades this force has gained momentum and today it has taken a life of its own and become a power that penetrates and absorbs all the places of the worlds converting these into locals. In the universal/particular paradigm, on the other hand, a realm of non-human beings superior to humans but nonetheless sensitive to their needs constitutes the universal. Insofar as humans engage in a symbolic relation of exchange and pay respect to these beings, these will assure the reproduction of social life. Humans and the moral communities they form, on the other hand, represent the particular in this paradigm. Unlike the local in the dyad global/local that is a mere micro-cosmos of the global, the particular in the universal/particular divide is more than just a mini version of something larger. It is a unique way of being and can therefore not be ranked on a geographical scale as the local in the global/local divide. The two paradigms also differ in the way the two poles communicate. In the global/local divide communication is a top-down flow: from the global to the local. By reverse, in the dyad universal/particular the flow is bilateral allowing humans who constitute the particular to engage in ritual acts of exchange with the non-human beings who constitute the universal. In this paradigm the two extremes are part of a larger universe of meaning and cannot replace each other.

My data show that even though Tapeños find the global/local paradigm incomprehensible and useless as a way of explaining environmental change, it is gaining ground in the village, at least partly. Thus in the past two decades many villagers have started to question whether the non-human forces are receptive to the offering rituals and whether they still have the power to produce water. Other changes add fuel to Tapeños' growing doubt about the cosmological order they used to believe governs their world. Thus the environmental changes that Tapeños reported to me in 2011 are happening at the same time as the villagers are becoming familiar with televisions, cell phones and other modern technologies providing the villagers with new sources of information about the world. Moreover, government agents, NGO workers and Western tourists visit the village and communicate with Tapeños on a daily basis offering the villagers a new perspective on environmental change. In other words, Tapeños are experiencing climate change as one of the many global frictions that currently are transforming their village and linking this to an assemblage of global connections. As a result, many villagers now employ terms such as global warming and contamination to account for water scarcity, irregular precipitation, unexpected temperature fluctuation, *etc*. In other words, Tapeños' encounter with the global world has provided them with a new vocabulary to articulate their concern for environmental change, which many now attribute to their newly acquired modern lifestyle.

Despite these changes many Tapeños continue to make offering rituals. Few villagers expect that the rituals actually will produce more rain but many fear that neglecting them will cause the anger of the mountain deities and the ancestors. In their view, then, humans' relation with the non-human forces is no longer reciprocal but based on the latter's raw power to punish the former for their disrespect or newly acquired consumer habits contaminating the environment. The shift in Tapeños' understanding of their ritual offerings from a two-way relation of exchange of symbolic objects, acts and services to a one-way communication of fear and punishment suggests that the villagers no longer have the same trust in the non-human powers as they use to. Rather than perceiving rising temperatures and water scarcity as problems caused by the mountain deities and the ancestors many villagers now see them as the result of their own activities. Nonetheless, my data also suggest that even though Tapeños recognize that human activities can cause environmental change most villagers insist that it is their own and not others' activities that is the problem. Moreover, in their eyes humans still co-habit the world with non-human beings; by the same token they still believe that these have the power to hold Tapeños and other human beings accountable for their misdeeds. The villagers may have adapted the local perspective from the global/local paradigm on their village but their objection to the idea of a global power penetrating the many locals remains unchanged. More bluntly, Tapeños now view the world through a paradigm that could be labeled universal/local.

Conclusions

The aim of the article has been to uncover an explanation for and engagement with climate change that is distinct from the dominating discourses on global warming. More specifically, I have examined Andean people's perceptions of global change, in particular environmental change, from the mid 1980s when I did my first fieldwork to the present when I did my restudy. Based on this research, I have found a marked contrast between local understandings of environmental processes and the discourse prevailing in the developed world about global warming. However, I have also observed important changes in the local perceptions over the last two to three decades which I have argued are influenced by ongoing globalization processes. To explore how these processes shape Tapeños' understanding of environmental change I have used recent anthropological literature on global change to show how climate change intersects with a host of other political, economic, cultural changes. In particular, I have demonstrated how Tapeños' perceptions of environmental change are articulated through a series of global frictions and assemblages allowing the villagers to engage in contact with external agents such as tourists, development agencies and the state and in this way appropriate a new vocabulary to perceive climate change and other global processes. My data suggest that by engaging in these frictions and assemblages Tapeños have reconfigured their own position in the world and redefined the meaning of Tapay from being a specific place identified by its ritual practices and religious ideas to being a local facing the same environmental, economic and social problems as the many other locals in the world. This shift in their world-view has encouraged Tapeños to reflect more critically over Andean ritual practices and religious ideas and acknowledge their own contribution to environmental change. Nevertheless, many villagers continue to make offerings to the mountain deities just as they still fear their power suggesting that even though Tapeños now see themselves as actively engaged in global processes of change, they search for local rather than global answers to their environmental

problem. Even more important, they find the dominating discourse on climate change problematic because it portrays humans as the new master of the planet Earth and presents them as a species superior to non-humans beings.

Paradoxically, this makes Andean people, who in the discourse on global warming are portrayed as some of the major victims of global warming, odd companions of climate skeptics in the US and Europe. However, importantly, my data also suggest that even though Andean people agree with the opponents of the global discourse on climate change in the developed world in some respects they do it for very different reasons. Thus Andean people's reluctance to acknowledge that climate change is the outcome of human activities is based on a belief that nature and culture are inextricably tied together and that non-human forces play a critical role in the development of modern society. Their skepticism toward the global discourse on climate change is therefore based on a general critique of globalization and modernity which place them in a very different position, morally as well as politically, than climate skeptics in the developed world. Thus in contrast to Western explanations of climate change, whether articulated by climate advocates or skeptics, Andean people challenge conventional ideas of globalization by offering an image of a world that is co-inhabited by humans and non-humans and that only can come to terms with its environmental problems by giving voice to both of them. Listening to these voices may enrich the world-view of all actors struggling to make a better world.

Conflict of Interest

The author declares no conflict of interest.

References

1. Ulrik Beck. "Remapping Social Inequalities in an Age of Climate Change: For a Cosmopolitan Renewal of Sociology?" *Global Networks* 10, no. 2 (2010): 165–81.
2. Mike Hulme. "The Conquering of Climate: Discourses of Fear and Their Dissolution." *The Geographical Journal* 174, no. 1 (2008): 5–16.
3. Mike Hulme. *Why We Disagree about Climate. Understanding Controversy, Inaction and Opportunity*. Cambridge: Cambridge University Press, 2009.
4. Julie Cruikshank. *Do Glaciers Listen? Local Knowledge, Colonial Encounters & Social Imagination*. Vancouver: University of British Columbia Press, 2005.
5. Inge Bolin. "The Glaciers of the Andes are Melting. Indigenous and Anthropological Knowledge Merge in Restoring Water Resources." In *Anthropology & Climate Change. From Encounters to Actions*. Edited by Susan Crate and Mark Nuttall. Walnut Creek: Left Coast Press, 2009, 228–39.
6. Susan Crate. "Climate and Culture. Anthropology in the Era of Contemporary Climate Change." *Annual Review of Anthropology* 40 (2011): 175–94.
7. Carla Roncoli, Todd Crane, and Ben Orlove. "Fielding Climate Change in Cultural Anthropology." In *Anthropology & Climate Change. From Encounter to Actions*. Edited by Susan Crate and Mark Nuttall. Walnut Creek: Left Coast Press, 2009, 116–37.
8. Philippe Descola, and Gisli Pálsson. "Introduction." In *Nature and Society. Anthropological Perspectives*. Edited by P. Descola and G. Pálsson. London: Routledge, 1996, 1–21.

9. Stuart McLean. "Stories and Cosmogonies: Imagining Creativity Beyond "Nature" and "Culture"." *Cultural Anthropology* 24, no. 2 (2009): 213–45.
10. Susan Strauss, and Ben Orlove, eds. *Weather, Climate and Culture*. Oxford: Berg, 2003.
11. Robert Rhoades, Xavier Zapata Rios, and Jenny Aragundy Ochoa. "Mama Cotacachi: History, Local Perceptions, and Social Impacts of Climate Change and Glacier Retreat in the Ecuadorian Andes." In *Darkening Peaks. Glacier Retreat, Science, and Society*. Edited by B. Orlove, E. Wiegandt and B. Luckman. Berkeley: University of California Press, 2008, 216–25.
12. Stephen Collier, and Aihwa Ong. "Global Assemblages. Anthropological Problems." In *Global Assemblages. Technology, Politics and Ethics as Anthropological Problems.* Edited by A. Ong and S. Collier. Malden: Blackwell, 2005, 3–21.
13. Anna Lowenhaupt Tsing. *Friction: An Ethnography of Global Connection*. Princeton, N.J.: Princeton University Press, 2005.
14. Thomas Wilbanks, and Robert W. Kates. "Global Change in Local Places: How Scale Matters." *Climate Change* 43 (1999): 601–28.
15. Michael Lambeck. "Catching the Local." *Anthropological Theory* 11, no. 2 (2011): 197–221.
16. Hugh Raffles. "Local Theory: Nature and the Making of a Amazonian Place." *Cultural Anthropology* 14, no. 3 (1999): 323–60.
17. Joseph Masco. "Bad Weather. On Planetary Crisis." *Social Studies of Science* 40, no. 1 (2010): 7–40.
18. Karsten Paerregaard. *Linking Separate Worlds. Urban Migrants and Rural Lives in Peru*. Oxford: Berg, 1997.
19. INEI (Instituto de Estadística y Informática – Peru), 2009. Available online: http//www.inei.gob.pe (accessed on 23 May 2013).
20. Karsten Paerregaard. "Complementarity and Duality. Oppositions between Agriculturalists and Herders in an Andean Village." *Ethnology* 31, no. 1 (1992): 15–25.
21. David Guillet. *Covering Ground. Communal Water Management and the State in the Peruvian Highlands*. Ann Arbor: University of Michigan Press, 1992.
22. Paul Gelles. *Water and Power in Highland Peru. The Cultural Politics of Irrigation and Development*. New Brunswick: Rutgers University Press, 2000.
23. Karsten Paerregaard. "Why Fight Over water? Power, Conflicts and Irrigation in an Andean Village". In *Irrigation at High Altitudes: The Social Organization of Water Control in the Andes*. Edited by William Mitchell and David Guillet. Washington, DC: Society for Latin American Anthropology and the American, Anthropological Association, 1994, 189–202.
24. Peter Gose. *Deathly Waters and Hungry Mountains. Agrarian Ritual and Class Formation in an Andean Town*. Toronto: University of Toronto Press, 1994.
25. Billie Jean Isbell. *The Defend Ourselves. Ecology and Ritual in an Andean Village*. Prospect Heights: Waveland, 1978.
26. Karsten Paerregaard. "Exchanging with Nature: Tínka in an Andean Village." *Folk* 31 (1989): 53–73.
27. Niels Fock. "Ethnicty and Alternative Identification: An Example from Canar." In *Cultural Transformations and Ethnicity in Modern Ecuador*. Edited by Norman Whitten. Urbana: University of Illinois Press, 1981, 213–35.

28. Joseph Bastein. *Mountain of the Condor. Metaphor and Ritual in an Andean Ayllu*. St. Paul: West Publishing, 1978.
29. Mark Carey. *In the Shadow of Melting Glaciers: Climate Change and Andean Society*. Oxford: Oxford University Press, 2010.
30. Francou Vuille, P. Juen, I.G. Wagnon, Mark B.G. Kaser, and R. S. Bradley. "Climate change and tropical Andean glaciers: Past, present and future." *Earth-Science Reviews* 89 (2008): 79–96.
31. María Teresa Oré, Laureano del Castillo, Saskia Van Orsel, and Jeroen Vos. *El Agua, ante nuevos desafíos. Actores e iniciativas en Ecuador, Perú y Bolivia*, *Agua y Sociedad*. Lima: Instituto de Estudios Peruanos, 2009.
32. Karsten Paerregaard. "Conversion, Migration and Social Identity: The Spread of Protestantism in the Peruvian Andes." *Ethnos* 3–4 (1994): 168–86.