

Chapter 1

Environmental Pluralism

Knowing the Namibian Weather in Times of Climate Change

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Introduction

At present, human knowledge about the weather and climate is undergoing a period of transformation. From one perspective, global warming modifies local weather patterns: winds are changing, soils are drying, permafrost is thawing, storms are increasing, and melting glaciers are contributing to rising sea levels. These phenomena challenge local understandings if, for example, they invalidate weather predictions that held true in the past (Brüggemann and Rödder 2020; Ehlert 2012; Krupnik and Jolly 2002; Green, Billy, and Tapim 2010; Roncoli, Ingram, and Kirshen 2002; Schnegg, O'Brian, and Sievert 2021). From another perspective, newly developing scientific knowledge of climate change that is spreading around the globe promotes new ways of seeing nature. If, as Hulme explains, “the idea of climate works to stabilize cultural relationships between humans and their weather” (Hulme 2015: 10), then the globalization of climate change knowledge can alter the way people understand the weather as well (Jasanoff 2010; Paerregaard 2013; Pettenger 2016).

Following both transformations, the aim of this chapter is to explore whether and how global climate change and scientific knowledge alter local understandings of the weather in Namibia. In doing so, this chapter focuses on perceptions. In my related work, I have developed a phe-

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nomenological perspective and argued that perceptions are not the only way of accessing the world.¹ On the other side of the coin are practices through which we enact the environment. As I have shown, people switch between perceiving and practicing, which helps to explain how different ways of accessing the world create different ways of knowing the environment and, possibly, also different worlds (Schnegg 2019, 2021a, 2021b). While this duality of practicing and perceiving provides a very effective approach to explore different layers of knowing, it first requires an in-depth understanding of the epistemic structures (i.e., perceptions) that this chapter provides.

The anthropological literature has shown convincingly that scientific and indigenous ways of knowing the environment are in part based on distinct ontological assumptions about how the world works (Antweiler 1998; Berkes 2008). In environmental science, climate is defined as the “average weather.” Thus, while weather describes the conditions of the atmosphere over a relatively short period of time, climate refers to long-term averages of daily weather, described in terms of the mean values and variability of specific indicators. To accumulate knowledge about both the weather and climate, environmental scientists rely on a number of epistemological assumptions. They often *assume* knowledge to be independent of contexts, allowing explanations gleaned from one set of specific circumstances to be applied to other, similar contexts (DeWalt 1994; Schnegg 2014).² Moreover, environmental scientists *assume* that many patterns are beyond direct human observation and require the aid of scientific instruments for study. The aggregation from weather to climate follows formal rules that transcend local meaning systems (Jasanoff 2010). While, in these scientific terms, human activities can affect climate, these relationships are understood as global aggregates both in terms of cause and in terms of humanity’s ability to mitigate the harmful consequences of human-induced climate change (Schnegg 2019, 2021a).

Therefore, on a more abstract level, scientific climate knowledge is grounded in a set of principles: science allows for the separation of cause and effect on a large temporal scale, e.g., burning coal on an industrial scale one hundred years ago may have effects on the climate-influenced weather today. Science also allows for the separation of cause and effect spatially. Emissions from industrialized countries can contribute to extreme weather events in less industrialized countries. Additionally, scientific climate knowledge does not recognize natural forces, such as the wind or water, as agents incorporating a design. Moreover, scientific knowledge is not based on immediate sensory experiences but on longitudinal measurement and observation. Finally, while scientists can predict local weather patterns a few days in advance, predictions of changes

in climate and average weather conditions can be made on an extended timescale.

Indigenous understandings of the weather differ in many regards. They are often embedded in holistic worldviews that connect the land to the air and water, the earth to the sky, plants to the animals, and people to spirits (Cochran et al. 2013; Paerregaard 2013; Antweiler 1998).³ Thus, reasoning includes diverse aspects of nature, and weather results from the interaction of these components, to which humanlike agency is often attributed (Roncoli, Ingram, and Kirshen 2002). Moreover, given its importance as the source of weather and its uncontrollability, the sky and the dynamic events that occur there are unsurprisingly animated frequently in human thought (Donner 2007; Ingold 2006). Storms punish; lightning frightens. Across many cultures, weather-related phenomena are associated with specific supernatural powers (Bierlein 1994). Given this, weather predictions are often based on an interpretation of the intentions of the supernatural world and how these are present in the behavior of the elements of nature, including birds, plants, animals, winds, cloud patterns, and the movements of the moon and stars (Elia, Mutula, and Stilwell 2014; Orlove et al. 2010; Roncoli, Ingram, and Kirshen 2002; Nyong, Adesina, and Osman-Elasha 2007; Ifejika Speranza et al. 2010; Lefale 2010; King, Skipper, and Tawhai 2008).

On an abstract level, many indigenous explanations of the weather share a number of ontological and epistemological principles as well. First, they are usually integrated into human moral concerns, thereby establishing a concrete and relatively short-term temporal link between human-induced causes and weather-related effects. For example, when humans do something immoral or careless, they are more or less immediately punished by harmful weather events. To calm and placate disturbed natural agencies, people may take various actions, including offering ritual sacrifices. Secondly, these causal linkages are local: “*our*” behavior shapes “*our*” weather (Friedrich 2018; Rudiak-Gould 2014; Schnegg, O’Brian, and Sievert 2021). Third, nonhuman agents, including the elements of nature, also influence the weather. Sometimes their interactions are mediated by supernatural powers (Rayner 2003). Fourth, local weather-related reasoning does not always rely on causal explanations but may reflect a more fatalistic view. Fifth, epistemologically, laypeople’s tacit knowledge is typically laden with emotion and sensitive to the context in which it is applied (Gorman-Murray 2010; Vannini et al. 2011).

While these differences between indigenous and scientific knowledge are relatively well established in anthropology, what happens when those epistemologies collide is much more controversial. There are at least three different answers that can be proposed to this question.

Established Approaches to Linking Different Ways of Knowing

In one view, indigenous knowledge will (and should) be overcome, giving way to scientific truth. Studies conducted in the *public understanding of science* (PUS) paradigm begin from the premises of an information-deficit model. They attribute skepticism regarding scientific knowledge to a lack of understanding resulting from a lack of information. For example, a large number of studies show that common explanations of climate change implicate the hole in the ozone layer, while experts eschew this connection (Kempton 1991; Löfstedt 1991; Rayner 2003; Bostrom et al. 1994; Thompson and Rayner 1998). A conclusion in this research has been that this “misinterpretation” can be corrected through better communication. In general, research that is conducted in the public understanding of science paradigm is based on a sender-receiver communication model that has been criticized as being one-dimensional and in part naïve (Hulme 2009; Jasanoff 2010; Kearney 1994; Weingart, Engels, and Pansegrau 2000).

In another view, indigenous knowledge is increasingly repressed by dominant discourses. This *sociocultural approach* is not restricted to knowledge but encompasses norms, values, actors, and their social networks. As Jasanoff states, “Without human actors . . . even scientific claims have no power to move others” (Jasanoff 2004: 36). Instead of assuming a linear transfer of climate change knowledge from sender to receiver, the sociocultural model explores how social fields, including science, politics, the media, and the general public, negotiate climate change socially and culturally (Krauss 2012; Jasanoff 2010; Rudiak-Gould 2012). To study this, a discourse-centered analysis is typically used to deconstruct how dominant actors shape forms of knowing and, eventually, reality. Theoretically, the sociocultural approach is often grounded in science and technology studies (STS) (Jasanoff 2010; Weisser et al. 2014; Pettenger 2016).

In a third view, indigenous and scientific knowledge are less mutually contradictory than is often assumed (Gagnon and Berteaux 2009; Nyong, Adesina, and Osman-Elasha 2007; Huntington et al. 2004; Herman-Mercer, Schuster, and Maracle 2011; Weatherhead, Gearheard, and Barry 2010; Roncoli, Ingram, and Kirshen 2002; Risiro et al. 2012, Orlove et al. 2010; Lefale 2010; Kalanda-Joshua et al. 2011). Indigenous knowledge offers new insights for science, and both perspectives can be integrated (*integrated approach*) to effectively tackle the environmental problems we face.⁴ For example, Gearheard and colleagues (2010) have argued in their comparison of indigenous and scientific interpretations of changing wind patterns among Inuit hunters in the Canadian Arctic that similarities in observations and interpretations of long-term patterns can strengthen confidence in the conclusions, while differences can lead to new questions for

further investigation. While many authors have pointed to this approach as an opportunity for collaboration (Nyong, Adesina, and Osman-Elasha 2007; Huntington, Suydam, and Rosenberg 2004; Huntington 2000; Green, Billy, and Tapim 2010; Ifejika Speranza et al. 2010), others take a more cautious view (Nadasdy 2003; Chanza and De Wit 2013).

Although the three approaches differ significantly, they are similar in their focus on the interactions between distinct epistemologies and forms of knowing when asking: (1) how one “wins over the other” (public understanding of science, sociocultural approach), or (2) how they complement and stimulate one another (integrated approach). In doing so, they assume that an actor typically has (only) one way of knowing, and also that this way of knowing typically differs between the scientist and the nonscientist. The framework I offer overcomes this view and argues that people can (but also may not) combine plural ways of knowing about the environment. I propose to address this as an *environmental pluralism*.

Environmental Pluralism

Anthropological research in the fields of medicine and law has shown convincingly that the introduction of new principles of knowing does not automatically lead to the replacement of existing ones. In medical anthropology, it is widely agreed that people recognize different, often contradictory, interpretations of the body, its functioning, and ways of diagnosing and treating its illnesses. People differentially draw upon these understandings at different times (Pelto and Pelto 1997). In a similar vein, legal anthropologists have shown that multiple normative frameworks often coexist and that people actively choose between them depending on context (Merry 1988; Benda-Beckmann, Benda-Beckmann, and Wiber 2006). While the ideal of plural normative orders and knowledge is applied successfully in other social fields, a careful study of how pluralism might also be relevant for knowledge of the environment has not been adequately considered.

Environmental pluralism describes a situation, where a person uses different, ontologically and epistemologically distinct knowledge systems to explain environmental phenomena. It brings into focus the role of climate change in introducing new knowledge about the natural world that can result in multiple—even contradictory—ways of knowing the environment based on different epistemological and ontological assumptions (Schneegg 2019, 2021a; Schneegg, O’Brian, and Sievert 2021).

From the literature, there are some indications that environmental pluralism exists. For example, Ehlert (2012) reports that wet rice farmers in

Vietnam combine both traditional and modern means of weather forecasting to make farming decisions. Among the farmers she studied, short-term weather predictions are typically based on “reading the water,” while the longer-term future is judged with meteorological knowledge transmitted by radio and loudspeakers set up by the state (Ehlert 2012). Similarly, Paerregaard (2013) has shown that climate change discourses introduced new ways of understanding human-environment interactions in the Peruvian community she studied. At the same time, people deny that the changes they observe could be caused by factors outside the community itself (Paerregaard 2013). Equally, for the Iñupiat in western Alaska, their local discourse on weather change and the scientific discourse are separate discourses. Unlike the examples of hybrid ways of explaining, where different discourses are mainly compatible, Iñupiat knowledge and daily observations of the environment are far from matching the generalized scientific knowledge. At the same time, they can readily apply both ways of knowing depending on their situation (Marino and Schweitzer 2009: 212).

Against this background of the existing literature, I discuss my case study, which reveals in more detail how environmental pluralism emerges and exists.

Being in Northwestern Namibia

Fransfontein is a community of roughly 250 households in the arid environment of northwestern Namibia, a region also referred to as Kunene. The communal pastures surrounding it are dotted with small settlements of five to twenty homesteads each. They cluster around drilled boreholes that provide water to humans and their livestock. The majority of people consider themselves as *ḥnūkhoen* (or Damara people). *ḥnūkhoen* is a Khoekhoegowab word and literally translates as “black people.”⁵ Most likely, the name was given to the *ḥnūkhoen* by strangers. Before contact with German colonizers in the late nineteenth century, the *ḥnūkhoen* were presumably hunter-gatherers, with significant contributions to their economy coming from small-scale trading.

With forced integration into a colonial system that began around the turn of the twentieth century, and which was mainly achieved through land and grazing taxes, the need to produce for the market grew. Taxation was a major force that led to the spread of pastoralism among the Damara people, and today all Damara households own livestock. However, during the middle of the twentieth century the reduction of land through the Odendaal Plan meant that it became impossible to make a living from

the land alone.⁶ Livelihoods began to diversify, leading to new subsistence patterns that involved labor markets and the state. While some combine pastoralism with wage labor in the local economy, others link pastoralism with state welfare and wage labor in the national economy through strategies such as migration (Greiner 2011).

Since German colonial rule, Fransfontein has had a school, and since the 1970s, all children attend at least primary school. The classes are taught in Khoekhoegowab, and a few students proceed from the secondary school to university. The radio is the most important means of public communication. A radio station (NBC Nama-Damara) that broadcasts in Khoekhoegowab can be received throughout the entire area, where only approximately two hundred thousand Khoekhoegowab speakers in total reside. Much of the information aired is personal and relates to family matters, e.g., upcoming funerals, weddings, and things “lost and found.” The radio is also the most important source for people to get to know about climate change and its scientific causes and explanations. Moreover, in Fransfontein, some households have access to electricity and own a television. However, many people, especially the older residents, have never seen a meteorological map or the perspective on the weather that such maps entail.

In the arid environment of northwestern Namibia, precipitation varies between one and three hundred millimeters per year with marked variation in both time and space. As in the rest of Namibia, the precipitation increases from west (the Atlantic coast) to east and is coupled with a high evaporation rate. Every seven to ten years the amount of precipitation is so low that scientists refer to it as a drought. These interannual fluctuations recur regularly (at least they have done so for as long as reliable data has been recorded), and meteorologists associate the cyclic ups and downs with El Niño and La Niña phenomena. Droughts are the most dramatic weather-related events, and if asked how the weather shapes their lives, the people in Fransfontein are likely to respond that “droughts” pose the most severe challenge for them all. In Fransfontein, one word often used to refer to a drought is *tû-i lkhai*, which literally translates as “no food.” Thus, for the people, drought is more than a lack of precipitation; it is a sociobiological phenomenon largely focused on its effects. The period from 2013 until the time of writing is considered a drought in Kunene, both by scientists and by the local people (Schnegg and Bollig 2016). This situation made it comparatively easy for me to talk to people about potential explanations.

I first came to Kunene in 2003 when my wife and colleague Julia Pauli and I were looking for a place to conduct a community ethnography. We lived in Fransfontein for more than a year, and we have returned many

times since. In 2010, I started a comparative research project to explore how the notion of community-based natural resource management (CBNRM) transforms social forms of water sharing in northwestern Namibia (Schnegg 2016), and I have returned more regularly to Fransfontein since then. During this engagement and my associated preoccupation with water and the water cycle, it became clear to me just how detailed the knowledge is that people in Fransfontein have about the weather. The data presented and analyzed here was mostly collected after 2015 as part of a larger project on different ways of knowing the environment (Schnegg 2019). In total, I taped interviews with diverse people that covered a broad range of topics, including the weather, the forces that influence it, its changes, and its causes.

Different Ways of Knowing Weather Change

The concept of environmental pluralism directs a researcher to pay attention to whether and how actors combine different ways of knowing. It puts into focus different forms of knowledge that may coexist in various degrees of integration, from complete independence to significant overlap. Different ways of knowing tend to coexist separately because their foundational epistemologies offer largely mutually contradictory explanations that cannot be subsumed under one framework. In the Namibian case, indigenous, religious, and scientific bodies of knowledge exemplify different epistemologies that are sometimes hard or even impossible to integrate. To explore the hypothesis that knowledge coexists in plural forms, I follow three cases in my analysis. Through these case studies I show how and to what degree people in Fransfontein combine different forms of knowing to make sense of weather events (i.e., drought) in times of climate change.

Indigenous Discourses

The following episode explains the meaning of this translation quite well.⁷

One day in late February 2015, I was sitting in front of my hut in ǀgamo!nâb (literally translated “place with no water inside”), preparing for the interviews I was planning to conduct in the late evening. ǀgamo!nâb is a small farming community about seven kilometers outside of Fransfontein, situated uphill. The surrounding land is relatively flat, and the views are endless. The temperature had risen to more than thirty-five degrees Celsius by ten o’clock in the morning and I knew it would not get cooler again until seven in the evening. Like most other people in ǀgamo!nâb, I spent my day in the shade.

Sitting under a tree, I could see the clouds forming toward the east, an estimated two hundred kilometers away from us. While they were approaching us, the temperature rose to more than forty degrees Celsius. Just around noon, my neighbor Robert passed by to ask for a cup of sugar and some tea. While chatting, we soon turned our conversation to the impressive cloud formation approaching from inland and began to discuss whether it would rain that day. Around that time of the day and year, almost any conversation turns to the subject of rain. Robert, about sixty years old, has spent all his life in that area. Like most people there, he is a pastoralist and keeps a small number of goats, sheep, and cattle. When I asked Robert if he thought it would rain that day, he replied, "Yes, Michael, don't you feel that she is not blowing so strongly? She will let him in." I did not understand. So he explained further: "You know, around this time of the year, the female wind, *huri#oab*, comes every morning from the coast and searches for her male lover *tū#oab*, far inside the land."⁸ He pointed toward the east, where the clouds had begun to form. "There, the two meet, and only if they agree will they jointly return and bring the rain." He was right. We received some soft rain later that day (Schneegg 2019).

The particular episode is singular, and yet it already points to some general principles: two winds, *huri#oad* and *tū#oab*, bring the rain. Both winds are animated in human thought and have a gender and a personality. While the westerly wind is female, the easterly wind is male. To bring the rain the two must interact and, more importantly, agree. During the morning hours, she (*huri#oab*) comes and searches for the easterly wind (*tū#oab*) farther east of Fransfontein, where the clouds eventually form as they interact. If she continues to blow too strongly, the clouds will not reach Fransfontein. Only if she stops and lets him in will they arrive.

Similarly to Robert, most people I consulted framed this interplay of wind and rain using the metaphor of a love affair. According to Helga, a woman in her late sixties, the two propose to each other. To use Helga's words: "She goes down there and takes the male wind. Then they both come along this way, and that will bring the rain. They are a couple."⁹ Later in the course of the interview, she makes additional reference to the engagement ceremony. Engagement ceremonies were most likely the precursor to Christian marriages among the Damara and are still an integral part of the splendid marriages people celebrate (Pauli 2011, 2019). The events span over three days, and each day the family of the groom has to ask for the bride in a nightlong ceremony. On the first two days the groom's family is sent home, and only on the third day is marriage agreed upon. As with human engagements, only if both the male and the female wind reach an agreement do they decide to come together and move toward the west, pushing the clouds, and eventually bringing the rain to Fransfontein.

If the winds fail to agree for longer periods of time, the result is a drought.

Religious Discourses

Robert and I were still sitting in front of my hut looking at the sky and the heavy rainclouds that were forming in the north, where the descendants of European settlers own big commercial farms. While we talked, Robert explained.

Michael: And is there drought on the white farms as well?

Robert: No, there is no drought on these farms.

Michael: Why not?

Robert: Maybe the rain, because God is also white, because the rain always prevails there, this side. They have long hair, and God is also white; I saw in the Bible.

Michael: So He favors some people?

Robert: Yes, God favors the white people, because He is having, he is white, and He is having long hair like them.

According to Robert, and many others I talked to, a Christian God is the ultimate cause of things. German missionaries have Christianized people in this area since the late nineteenth century, and most consider themselves as Lutheran Protestants or as belonging to one of the quickly spreading Pentecostal churches. For many people today, God has many things under His control. Or, as Robert put it, "The rain is not in our hands; it is in God's hands, and this is why in some years it rains and some it does not. It can even happen that it will not rain for three years." When asked whether God would make the winds agree, he denied it. For him, the two domains are not intertwined.

This example shows how a different context, the political and economic inequality between European settlers and indigenous people, triggered a very different explanation of the lack of rainfall than the first: one being religious and the other being predominantly indigenous. This explanation relates to colonialism, Christianization, and God. Christian beliefs and indigenous knowledge come from different epistemological frameworks and are not fully integrated in one worldview. They become meaningful and are applied in different contexts.

A second case further exemplifies Christianity as a relevant knowledge domain. Charles is a well-respected elderly man in the community who worked for the so-called second-tier administration under colonial rule. Today he is an admired local leader, and many people seek out his advice.

When we talked, Charles explained: “The ongoing drought is a punishment from God; all we can do is pray.” Charles related the drought to supernatural forces and eventually to humans who have done something wrong. They are punished. This is a widespread concern, and many people gave similar responses when I asked them about the current situation in which rains fail to come.

However, Charles, like others, did not see God as the single cause. In the course of our conversation, we touched on the political situation and the changes since independence in 1990 as well. In this context, Charles gives a second reason for the ongoing drought: overstocking. Remember, drought means “no food,” and overstocking is a plausible cause. In the area around Fransfontein, there are two factors that drive stocking rates up: in-migration from large herd owners (mostly from the north of Kunene) and so-called part-time pastoralists. Part-time pastoralists are farmers who combine well-paid jobs in the urban centers with pastoralism in the rural hinterland (Schneegg, Pauli, and Greiner 2013). Part-time pastoralists have financial capital to invest, and their herds often become very large. To put it in Charles’s words: “As we can observe, the leader and the government are doing nothing. In the past, they reduced the number of cattle so that it matches the carrying capacity of the land. If the number of livestock gets over the carrying capacity, you are destroying the land.”

Charles paints a positive picture of the apartheid regime, in which he was a member of the local government. Admittedly, at that time, the state was much more active in controlling and regulating people’s herding decisions. The state and the Ministry of Agriculture actively relied on scientific knowledge about the management of rangelands and the model of a “carrying capacity,” the maximum number of livestock that can be held in a given area, as an appropriate management tool. With the postapartheid government and the weakening of the state, drought also occurred as a man-made phenomenon. This tendency to explain drought as a result of the social and economic ruptures after independence has also been observed by Sullivan among the *!nūkhoen* people with whom she worked (Sullivan 2000, 2002). This case shows once more that in two different contexts, alternative explanations are appropriate. In the first instance, this is a religious model, in which God is the ultimate power and—only a short while later—it is a political one, in which the loss of state control is the ultimate cause.

Scientific Discourses

Charles explained that both people and God cause drought, and he is equally aware that the ongoing destruction of nature plays a critical role

in changing weather patterns. He continued: "As the countries are developing, some gases go up in the air, and this can have negative effects on the clouds and the weather. There is also a cyclone, which has a negative effect on the SADC [Southern African Development Community] area. For those reasons, there is no rain this year." Charles made a reference to development and emissions that cause climate change. Like many people in the area, he has accumulated scientific knowledge through listening to the radio, and he relates this knowledge to his observations about the weather. Thus, in another context, he refers to a third model to make sense of the ongoing drought.

In a similar vein, Hanna reasoned about the rains and, again, eventually, the effects of climate change.¹⁰ Hanna is about thirty years old and teaches science in the primary school of Fransfontein. She did not grow up in the area, originating instead from a community some three hundred kilometers south, which is mostly inhabited by a different ethnic group, the Ovaherero. Damara and Ovaherero people speak different languages, and many hold prejudices about each other. These prejudices derive from the influence of German missionaries who have promoted the (historically wrong) notion that the Damara people were slaves of the Ovaherero in the past. Today, many Damara are likely to consider Ovaherero to be arrogant and overly proud, while many Ovaherero would respond that Damara are lazier than one should be. It is in this interethnic context that Hanna's explanation must be placed, when she explains why the effects of climate change are different here and there.

Michael: Do you know why it's not raining anymore?

Hanna: People are cutting too many trees in this area. This contributes to climate change, which causes this drought. The trees store CO₂. It's true.

Michael: You said the other day that in the community where your parents live it is raining nicely; how can this be?

Hanna: It rains nicely, very nice.

Michael: So why? Do you have an explanation?

Hanna: There, people are not the same; people are not building their houses with trees. Us, we only build with bricks. So we don't cut down the trees.

Hanna considered deforestation responsible for the drought in Fransfontein, yet at the same time the drought was not really an issue in Omatjete, where she was born. While the people in her home community respect trees and do not cut them down, the people she knows in Fransfontein do not possess the same knowledge. Her argument refers to a global discourse about deforestation, which is seen as a key driver of climate change

in scientific debates. At the same time, she localizes this discourse to explain the differences she observes.

However, for Hanna, like all my informants, God too plays His role. When she reflects on the differences between people in both places, she finds that the inhabitants of Fransfontein are too lavish and lazy as well. They would not even send their children to school if not coerced, and the parents would not care. Educated in a very religious family, she is confident that this is against God's will and that He punishes those who misbehave. A drought, as the Bible says, is a common means of punishment, and people should take this seriously by changing their behavior.

Again, just as in the two cases discussed before, we find a reference to different epistemological frameworks and explanations for one phenomenon, the drought. In different contexts, varying epistemological and ontological frameworks are applied to explain why the rains fail to come. As in the cases analyzed before, Hanna confirms the notion of an emerging environmental pluralism rather well.

In brief, Robert, Charles, and Hanna all explain the occurrence and existence of drought as the most dramatic weather-related phenomenon they experience in particular ways. However, there are parallels too. In their views, and following the meaning "no food," *ñû-i lkhai* can have two distinct causes: first, low precipitation, and second, animals that overpopulate an area and reduce the grazing to such a degree that the animals will die. People attribute the latter to the grazing management of the current government and the inequality that was introduced through colonialism and that still continues today. When it comes to explaining why there is no rain, the *ñûkhoen* people see the interaction of two winds that are animated in human thought to be one cause. Moreover, the lack of rain is also explained as God's will. And, with "climate change," a new explanatory model for the lack of precipitation has been introduced. It links changing weather patterns to changes outside the local realm. While those different explanations coexist in society, they also exist simultaneously for many individuals.

Discussion: Patterns of Pluralism

To explain the drought, one of the most salient weather phenomena in northwestern Namibia, individuals refer to various knowledge domains, i.e., indigenous, religious, and scientific ways of knowing. None of the people I interviewed referred to one cause alone, and many, like the three informants I introduced, use plural epistemological frameworks.

While Robert's understanding of the drought is deeply rooted in the dominant *ñûkhoen* cultural model, which explains weather as an inter-

action between different winds that have their own intentions, he equally acknowledges that God is the ultimate cause to explain why settlers of European descent receive much more rain than the people of Fransfontein do. Charles's knowledge is rooted in a *ʔnūkhoen* worldview as well. However, as someone who occupied a prominent position in the government, responsible for rangeland management for many years, he extends his reasoning into the scientific domain. Drought, as the inability to provide food, is therefore also explained as a failure of the "new" political system to enforce scientific truth. Thirdly, God plays a crucial role in Charles's reasoning. In the last case study, Hanna connects the two domains of scientific and religious knowledge.¹¹ While on the one hand she draws upon deforestation as an explanatory model derived from the climate change discourse, she refers to God on the other. Hanna's case also reveals an interesting gradient between environmental pluralism and different, merging epistemologies. Although she clearly refers to climate science knowledge to explain climate change by relating it to deforestation and burning trees, she localizes that global scientific model. In so doing, she integrates a circulating global model into the local worldview, in which local agents make the weather. Her reasoning underlines the importance of moral discourses that frame knowing about the weather to a large degree.

Conclusion

The analysis reveals that people combine explanations from different epistemic sources to make sense of weather change. At the same time, the analysis does not explore the nature of this coexistence in detail. It remains a challenge for future work to show how bounded or coherent those discourses remain and under what circumstances a discourse is more likely to become dominant. Equally, while the cases I present indicate that knowledge systems are applied in specific situations and contexts to understand aspects of weather-related phenomena, the analysis does not systematically establish when and under what conditions one system is more likely to be applied than others (Schnegg 2021b).

Both types of analysis are methodologically challenging and require following the same individual across contexts of space and time. A strict confirmation of an environmental pluralism hypothesis would be that the actors perceive or enact the world differently depending on the situation they find themselves in. While I have provided selected evidence to support this, much more research is required here (Schnegg 2019, 2021a, 2021b).

What are the theoretical and methodological lessons learned? Since climate change knowledge about the weather has been challenged and is

transforming, the concept of environmental pluralism opens up space for exploring the coexistence of epistemologically and ontologically different knowledge systems. The empirical evidence from Namibia confirms the existence of environmental pluralism and proves useful for understanding current transformations and for assessing the consequences they have.

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Notes

1. As a matter of fact, this chapter was drafted in early 2016, prior to my other writing on the same theme.
2. This assumption has been challenged by a great many authors since Husserl's original work in the *Krisis* (Husserl 1976). Today especially the fields of science and technology studies (STS) systematically demonstrate that in fact the knowledge acquired in scientific investigations of climate change is context dependent (Grundmann and Rödder 2019; Hulme 2016; Jasanoff and Martello 2004; Wynne 1995).

3. Throughout the chapter, I use the terms *local knowledge*, *lay knowledge*, and *indigenous knowledge* interchangeably to denote what Berkes defined as “a cumulative body of knowledge, belief, and practice, evolving by accumulation of TEK and handed down through generations through traditional songs, stories and beliefs. [It concerns] the relationship of living beings (including human) with their traditional groups and with their environment” (Berkes 1993: 3).
4. Within the political arena, the *Intergovernmental Panel on Climate Change Synthesis Report* stresses the value of indigenous, local, and traditional knowledge as a major, and still largely unexplored, resource for adapting to climate change (IPCC 2015: 80; Nakashima et al. 2012; Martello 2001).
5. Khoekhoegowab is a “Khoisan” language of the Khoe-Kwadi family with four (primary) click sounds (ǀ, palatal; ǁ, lateral; ǃ, dental; ǁ, alveolar) that function like other consonants. The region around Fransfontein is multiethnic and multilingual. In this chapter, I restrict myself to the largest ethnic group but hope to broaden my focus in future work.
6. The term Odendaal Plan refers to a commission and the report it published in 1963. The report recommended, among other things, the establishment of so-called “homelands” to foster South Africa’s racist apartheid politics. Homelands were to become the settlement areas of people with specific ethnic classifications.
7. I reported this encounter in Schnegg (2019) as well.
8. In Khoekhoegowab, the suffix for male nouns is “b” and for female nouns “s.” Words can be taken out of their normal gender context to indicate that this particular instance is atypical, e.g., atypically shaped or atypically strong. The word for wind is *ʰoab*, which is male. If the wind were to be referred to with a female ending, this would imply that it was unusual, which is not done. It is likely that this can explain the use of the male “b” in connection with the female wind *huriʰoab*.
9. Interview, Fransfontein area, 21 January 2015.
10. This episode has partly also been reported in Schnegg (2019).
11. On another day, she, like Charles, mentions indigenous explanations as well.

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