



Research article

Reassembling more-than-human sustainability: Relations with snow

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ARTICLE INFO

Article history:

Received 7 September 2022
Received in revised form 7 June 2023
Accepted 19 June 2023
Available online 6 July 2023

Handling Editor: Outi Rantala

Keywords:

More-than-human sustainability
Relational ontology
Feminist new materialism
Winter tourism
Narrative methodologies
Snow

ABSTRACT

This article illuminates the importance of reassembling sustainability from a relational, more-than-human perspective in response to critical debates regarding sustainable development and its underlying managerial paradigms. Theoretically, the study develops the concept of more-than-human sustainability by building upon relational ontologies and feminist, new materialist work. Empirically, the study draws upon ethnographic fieldwork of shadowing snow in ski areas in the Tyrolean Alps. Integrating more-than-human relations in winter tourism through speculative storytelling, the findings uncover the hidden relations of waiting-for, connecting-to, and thriving-with snow, examining how these perspectives disrupt capitalist modes of operation and open alternative approaches to sustainability in future winter tourism. The study concludes by examining alternative approaches to sustainable world-making by critically engaging with more-than-human relations in tourism.

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Introduction

What are you doing all summer?

Despite the maintenance and preparations? Waiting for the first snowfall (...) because what else is there to do?

(Excerpt, fieldwork in a Tyrolean ski area)

The wait for the first snowfall of the winter season is a time that is full of anticipation and insecurity. Snow is an indispensable aspect of alpine winter tourism—its business models, narratives, and imagination (Jensen & Gyimóthy, 2021). The quote highlights the importance of snow, this crucial actor, in the highly developed economic winter tourism industry. However, with rising temperatures and decreasing snow reliability in alpine ski areas (Steiger, Knowles, Pöll, & Rutty, 2022; Steiger & Scott, 2020), the wait for the first snowfall has become increasingly precarious. The changing global climate is leading to the disappearance of snow and with it, the basis for the winter tourism industry is crumbling. Rech, Paget, and Dimanche (2019) make this point succinctly, asserting that “without snow, snow-based tourism no longer exists” (p. 101). If the wait never ends, what else is left? At the same time, ski resorts face increasing criticism regarding the industry's role as a driver of these changes (Wegerer & Nadegger, 2023). The excessive use of water and energy through current adaptation strategies such as artificial snowmaking (Damm,

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Köberl, & Pretenthaler, 2014; Falk & Lin, 2018) and the deforestation, waste and sewage associated with catering to mass tourism clash with the “pure” narrative of the white winter wonderland in the Alps.

Amid these tensions, the pursuit of sustainable tourism has developed significant momentum for maintaining market and business opportunities and a positive image of the alpine winter tourism industry. However, thus far, sustainable development and adaptation strategies in tourism have prioritized economic growth, human needs, and a resource-based view of nature and the environment as manageable commodities (Bertella, 2020; Jóhannesson, 2019; Rantala, Salmela, Valtonen, & Höckert, 2020a). Tourism researchers are increasingly criticizing these dominant perspectives, in which nature, landscapes, and other natural elements such as snow are mere resources for profitmaking and sustainability is equated with sustaining business and profit opportunities (Bramwell, Higham, Lane, & Miller, 2017; Gren & Huijbens, 2014; Higgins-Desbiolles, 2018). While the recognition of snow as a valuable resource has gained importance, the inherent norms of traditional approaches in resource-based, growth-oriented relations to snow and to nature more broadly, and the ability to achieve sustainable tourism goals have rarely been questioned (Bramwell et al., 2017; Gren & Huijbens, 2014). This human- and growth-centered understanding of sustainability reduces the value of alternative approaches to world-making that fall outside such capitalist, patriarchal, and growth-oriented modes of functioning (Rantala et al., 2020a). More often than not, the goal is sustaining tourism (Higgins-Desbiolles, 2018, p. 157), rather than sustaining versions of a “good life” that acknowledge tourism's constitutive relations with planet Earth (Gren & Huijbens, 2012, 2014).

This study follows calls by Davies and Riach (2019), Calás and Smircich (2018) and Guia and Jamal (2020) to reassemble the concept of sustainability from a relational, more-than-human perspective. The theoretical section details the shortcomings of managerial and resource-based views on sustainability and redefines relations with snow, nature, and the Earth as crucial for the very becoming of more-than-human sustainability (Calás, Ergene, & Smircich, 2018; Davies & Riach, 2019). To reassemble sustainability, this article introduces the relational conceptualization of more-than-human sustainability to tourism studies as a promising avenue for transitioning from human- and growth-centered approaches to a more inclusive, ecological economy (Calás et al., 2018; Davies & Riach, 2019; Rantala et al., 2020a). The empirical study of snow in alpine winter tourism reveals the constitutive power of more-than-human relations for engaging in alternative world-making, asking the following questions. How can we re-think sustainable, more-than-human relations in tourism? How can we foster these relations to shift toward a relational, more-than-human understanding of sustainability?

More-than-human sustainability

The dominant concepts of corporate sustainability (Ergene, Banerjee, & Hoffman, 2021; Ergene, Calás, & Smircich, 2018) and sustainable development approaches to tourism (Higgins-Desbiolles, 2018; Wegerer & Nadegger, 2023) are deeply embedded in a neo-liberal managerial ecology. For example, the United Nations (UN) equates sustainability with sustainable *development* through their 2030 agenda (UN, 2015), emphasizing “business and corporate interests and the financialization and marketization of sustainable development” (Hall, 2019, p. 1052). Scott, Hall, and Gössling (2019) define global tourism's vulnerability to climate change using indicators that reflect this managerial ecology, including the sectors' adaptive capacity through tourism *competitiveness*, tourism *demand*, contribution to the *GDP*, and the threat to tourism *assets* such as degradation of ecotourism *attractions* or tourism *infrastructure*. While the adaption of increasingly popular “doughnut economics” (Raworth, 2018) acknowledges the significance of social and ecological considerations in business models and articulates a more nuanced understanding of the concept of growth, the anthropocentric goal still emphasizes protecting safe space for *humanity* or “destination development [emphasis added]” (Hartman & Heslinga, 2022, p. 3). In these models, nature and the planet Earth remain life-supporting, rather than life-making entities.

These research and business models, policies, and goals address important issues for the protection of the planet and social equity in tourism. Nevertheless, the terminology and perspectives applied reproduce neoliberal and capitalist modes of relating (Banerjee & Arjaliès, 2021; Ergene et al., 2018), and their application remains “overcommitted to tourism and under committed to sustainability” (Cotterell, Hales, Arcodia, & Ferreira, 2019, p. 886). Clear distinctions between natural entities as passive resources, boundaries, or ceilings, and humans as active participants in sustainable development strategies perpetuate a nature-culture dualism (Davies & Riach, 2019; Good & Thorpe, 2020) and continue to prioritize economic interests over ecological concerns (Banerjee & Arjaliès, 2021; Ergene et al., 2021). These modes of relating in sustainable business paradigms highlight human relations to nature as important but situate them outside of the very existence of tourism and sustainability. From this perspective, sustainable tourism is *dependent on* nature, but not *becoming with* nature.

Faced with increasing global challenges linked to the climate crisis and the Anthropocene, this one-dimensional conceptualization of sustainable tourism–Earth relations fail to generate solutions for “the very managerial priorities that created the environmental and social problems in the first place” (Ergene et al., 2021, p. 1324). Tourism businesses continue to operate in a capitalist, growth-oriented paradigm, even when the stated goal is sustainability (Bertella, 2020; Higgins-Desbiolles, 2018). Guia and Jamal (2020) and Rantala et al. (2020a) highlight the need to rethink sustainability in tourism research and practice in ways that go beyond neoliberal, anthropocentric, or essentialist understandings and highlight sustainable tourism as becoming within more-than-human relations.

A relational ontology for reassembling sustainability

Building upon actor–network theory (Latour, 2005), tourism researchers (Jóhannesson, 2016; van der Duim, Ren, & Jóhannesson, 2013, 2017) conceive tourism as a process of ordering that emerges out of more-than-human relational activities. Relational encounters with animals, such as mosquitoes (Valtonen, Salmela, & Rantala, 2020) or sled dogs (Äijälä, 2021;

Granås, 2018); spaces, such as the beach (Franklin, 2014), forests (Farkic, Isailovic, & Taylor, 2021) or ski resorts (Rech et al., 2019); and elements, such as light (Jóhannesson & Lund, 2017), sand (Baldacchino, 2010), ice (Bjørst, 2010), and water (Rhoden & Kaaristo, 2020) constitute the heterogeneous entanglements that form tourism. In these entanglements, nature, landscapes, and the Earth are not just *part of* tourism, but are the more-than-human relations that *make* tourism. Thus, tourism is an “earthly business” (Gren & Huijbens, 2012, p. 156) that requires sustaining the more-than-human relations at its core.

A relational ontology de-centers the human vision of a sustainable future and extends the relations between human beings and the Earth beyond resource-based and commodified interactions (Ergene et al., 2018; Gren & Huijbens, 2012; Guia & Jamal, 2020). As such, more-than-human relations differ from the traditional dualistic relations between nature and tourism in their ontological perspective on the very existence of things. A relational ontology advocates for the Earth (Banerjee & Arjaliès, 2021; Ergene et al., 2021) and earthly critters (Haraway, 2016) as active participants in the web of relations constituting a livable, more-than-human future. The fine-grained differentiation between the “weak” form of *being-in-relations-with* nature (as highlighted by the traditional concepts above) and “strong” *becoming-in-relation-with* nature is crucial for understanding ontological consequences. As Good and Thorpe (2020) argue, the “weak relations [...] occur between ideally isolated individuals,” while “strong relations [...] mean that people, organizations, planets, atoms, ideas, and so on, are not only constituted by relations, but that we only know them by being in relation with them” (p. 364). Hence, more-than-human relations imply an entangled becoming-with-many, in a collaborative multiplicity from the very start (Evers, 2019; Ren & Jóhannesson, 2018; see also Calás & Smircich, 2023).

A relational ontology allows us to reevaluate and reassemble the more-than-human relations that constitute sustainability and tourism. Relations separate, come together, and pull apart (Barad, 2007) and can make and unmake worlds, tourism, and concepts such as sustainability (Haraway, 2016). At the same time, these concepts “arise, gather steam and stabilize (or not), and only exist within particular relations that are constantly (re)enacted” (Kuhn, Ashcraft, & Cooren, 2019, p. 31). Relations constitute what sustainability is (or is not) and what matters (Stinson, Hurst, & Grimwood, 2022). Hence, Tsing (2015), p. 20) emphasizes the precarity and indeterminacy of these fragile relations, which “re-make us as well as others.” As these relations are in continuously precarious states of becoming, traditional concepts and nature-culture dualism can be re-enacted differently. The fluidity and indeterminacy of these relations and the possibility of reassembling opens a space in which “this something [such as sustainability] becomes a different thing” (Kuhn et al., 2019, p. 31).

Reassembling sustainably from a more-than-human perspective requires redefining and establishing new webs of relations while critically positioning our becoming within (and not outside of) these relations (Calás & Smircich, 2023; Ergene et al., 2018). This approach requires testing these relations and questioning “with what entities are [we] proposing to live” (Latour, 2011, p. 7), and what matters for *unmaking* “worldly configurations” (Barad, 2007, p. 91). Thus, critical management scholars stress the need to *reassemble* sustainability by invoking generative relations of new knowledge, processes, and practices for organizing sustainable business (Ergene et al., 2018; Heikkurinen, Clegg, Pinnington, Nicolopoulou, & Alcaraz, 2021). A relational perspective acknowledges the vital role of more-than-humans, constituting tourism as an earthly business and the relations with these more-than-humans in establishing sustainable approaches. Reassembling sustainability requires possible paths of interrogating and actively crafting these relations in a different way.

New materialist engagement for more-than-human relations

To reassemble *sustainable* tourism, more-than-human relations must shift from an extractive to a regenerative perspective (Banerjee & Arjaliès, 2021). Non-capitalist and ethical modes of relating such as responsibility, rest, care, safety, and becoming-with-multiple-others (Calás et al., 2018; Calás & Smircich, 2018; Davies & Riach, 2019) must be valued for constructing a different, more-than-human understanding of sustainability. At present, such careful, responsible, and non-capitalist relations remain largely invisible, irrelevant, or on the fringes of traditional capitalist modes of operation (Calás et al., 2018). Nevertheless, these approaches have great potential for transforming more-than-human encounters. Reassembling the concept of sustainability in tourism requires explorations of potential approaches for rethinking and fostering these hidden more-than-human relations to shift toward a relational understanding of sustainability in tourism.

In recent years, tourism scholars (Bertella, 2020; Markuksela & Valtonen, 2019; Rantala, Valtonen, & Salmela, 2020b; Valtonen et al., 2020) have highlighted alternative realities for tourism that draw on critical feminist, new materialist approaches (Bennett, 2010; Calás & Smircich, 2023; Coole & Frost, 2010; Haraway, 2016). For example, Bertella (2020) argues for a less anthropocentric and more eco-feminist understanding of sustainability in food tourism, advocating ethical eating practices. In their work regarding the performativity of promotional materials in polar bear tourism in Canada, Yudina and Grimwood (2016) highlight the potential of care perspectives for framing wildlife relationships. By traveling, sleeping, and living with mosquitoes, Valtonen et al. (2020) unravel the often violent and hostile multispecies encounters with these tiny, but persistent insects as fellow travelers, and explore their ethical consequences. These insights on alternative relations present imaginaries that demonstrate how speculative, new materialist perspectives could transform the more-than-human relations that are described and integral to tourism (Guia & Jamal, 2020; Jóhannesson, 2019; Valtonen et al., 2020).

Speculative engagement in relations with more-than-human others (Bertella, 2023; Valtonen et al., 2020; Valtonen & Rantala, 2020) allows us to “undermine familiar representations of capitalism” (Gibson-Graham, 1996, p. 543) and business-oriented notions of sustainability. As such, a feminist new materialist engagement with more-than-human sustainability has the potential to consider how things could be different (Ergene et al., 2018; Haraway, 2016; Puig de la Bellacasa, 2017). Thus, I engage a more-

than-human methodological approach in the empirical study of snow in winter tourism encounters, to account for and unravel multiple encounters that constitute sustainability in a different way.

On more-than-human methodologies

In the following section, I invite you to think with me and through the relations to snow along a more-than-human methodological approach as I attempt to uncover the mess of shadowing snow, unlearning “methodological habits” (Law, 2004, p. 9), and realizing that this started long before the fieldwork began. In an earlier attempt at the section, I stuck to more linearity, detailing my methodological choices. This linear process seemed both simpler—ordered, structured—and more complicated—staged, scrutinized, rationalized—than it was (Rosiek & Snyder, 2020). However, with guidance and generosity, the reviewers invited me to embrace the mess and multiplicity of these encounters, stretching far beyond the field. The more-than-human methodology of shadowing (Czarniawska, 2007, 2014; Vásquez, 2019; Vásquez, Brummans, & Groleau, 2012) and narrative analysis (Grimwood, Stinson, & King, 2019; Tucker & Shelton, 2018; Valtonen et al., 2020) emerged as a practice of “messy” encounters, rather than the linear process that I wanted it to be. But let us start from a beginning.

Fieldwork: shadowing snow in alpine ski areas in Tyrol

The snow encounters take place in two Tyrolean alpine ski resorts. Tyrol is a federal state in the Western region of Austria. High-alpine peaks dominate its topography, with more than 60 % of its area at 1500 m or more above sea level (Tirol Atlas, 2007). With 80 ski areas and 3700 km of slopes, winter tourism is a central economic sector (Statistik Austria, 2020). Thus, local relationships with snow and its precarious future due to the climate crisis and rising temperatures are a central part of everyday tourism and work experiences in ski areas. Predicting and enacting sustainable futures with(out) snow is central for the economy and ways of life in these alpine landscapes. While numerous studies have calculated, simulated, and problematized the (fading) economic relation to snow (see Steiger et al. (2022) for an overview), insights regarding processes, practices, and work with snow are rare (see Jensen and Gyimóthy (2021) for a notable exception). Thus, I had to get close to snow, this tiny actor that keeps the industry both running and crumbling.

Noticing the crucial, but largely unnoticed, role of tiny particles such as snow in tourism research, required an approach that allowed me to turn my “eyes, ears, nose, and entire sensory system” (Jensen, 2019, p. 2) to “the humblest of actants,” which are “deeply ingrained into existing networks” (Czarniawska, 2007, p. 106). One method for data collection that prioritizes such fine-grained relations and their constitutive consequences is shadowing. Shadowing someone or something in an organisation or workplace implies following, moving with, and becoming a shadow of and through the followed; to be close and almost intimate with relations in action and as action (Czarniawska, 2007; Vásquez, 2019). Shadowing prioritizes relations over entities and practices and processes over outcomes (Czarniawska, 2007, 2014; Vásquez, 2019; Vásquez et al., 2012). Similar approaches in tourism research have produced rich and in-depth understanding of the complex relations with more-than-humans - see, e.g., Ren (2011), in her work on cheese in a tourism destination, or Äijälä (2021), in his mobile video-ethnography with sled dogs. As such shadowing snow allowed me to stick to snow as closely as I could in different organizations, work processes, and throughout the season. I entered the field with my notebooks, my phone, multiple layers of clothes and even more pens to become a shadow of snow. I was ready to begin, turn on my senses and follow the flow of relations, trajectories, and relations with snow; or at least I thought so.

Data collection: encounters with snow

During my first day in the field, I quickly realized the mess I was in. I was overwhelmed. I was meant to follow, take notes, pictures, and videos, and observe snow. In the winter seasons 2020/2021 and 2021/2022, I spent roughly 80 h in two ski areas in Tyrol—one in high-alpine terrain with high snow security, and another smaller ski area at a lower altitude, which had a greater risk of snow-scarce winters. I followed snow, and with it, various work practices like grooming and maintaining slopes, shaping a snow park, producing artificial snow, and building new infrastructure such as restaurants and lifts. My freezing fingers scribbled 35 pages of field notes and sketches, I snapped 306 photos and recorded 43 videos of work settings, routines, and practices. I captured the snow quality, quantity, and density; the weather conditions; and the surrounding landscape. I kept track of conversations, emotions, or disruptions. Through the shadowing process, snow and I became “a peculiar duo” (Czarniawska, 2007, p. 56), including complex dynamics and mutual exchanges.

The relational ontologies of more-than-human entanglements I had so carefully theorized caught up with me in the field, when encountering the “slippery, indistinct, elusive, complex, diffuse, messy, textured, vague, unspecific, confused, disordered, emotional, painful, pleasurable, hopeful, horrific, lost, redeemed, visionary, angelic, demonic, mundane, intuitive, sliding and unpredictable” (Law, 2004, p. 66)—snowy—mess. These encounters disrupted what I know, how I know, and changed the very fabric of my being; the chilblains on my toes after a night with/in snow, my-snow-worker bodies leaving footprints while trudging through fresh powder. While I was still trying to understand snow from afar, I possessed, and was already possessed by, the practices of living and working with snow, sensing and moving through tourism landscapes, winter weather, and seasonal changes (Edensor, Barry, & Borovnik, 2021). I realized that I was not—and had never been—merely a shadow, but was already in the middle of things, in medias res (Cooren, 2015), before I approached the field for the first time.

Encounters with workers, snow, machines, practices, and routines merged with my “hinterlands” (Law, 2004). Growing-up in the Alps, my countless days on the mountain as a skier, snowboarder, and local, and my own rhythm has been aligned to this industry for so much longer than this fieldwork could ever be. These—my—hinterlands were crucial in surfacing, mingling, and entangling with the flux of snow in the winter tourism industry. I was equipped with an embodied vocabulary (Jensen & Gyimóthy, 2021) and sensibility (Evers, 2019) to both know, notice, and tune into the ordinary affects and more-than-human cues (Stewart, 2007) of my-others-snow encounters. The snow encounters were onto-epistemological (Barad, 2007): They were practices of relational knowing and being. I recorded voice memos reflecting on each day in the field to preserve and cope with the multiplicity of impressions and sensations and to provide detailed and thick descriptions of affectual encounters with snow. Transcribed, these memos account for another 47 pages of text.

Data analysis: speculative storytelling for more-than-human world-making

How could I possibly analyze and unpack all these encounters—between snow, workers, practices, my very own hinterlands—into findings? Again, I initially grasped at the straw of methodological rigor and linearity (Law, 2004; Manning, 2015), applying a round of open coding. (This could be a way out of this mess, couldn't it?) First-order codes highlighted practices (e.g., using tools to engage with snow, feelings mobilized with snow, and bodily practices when touching snow), mobility (such as movement in the terrain or tracks in the snow), weather circumstances (winter storms, sunshine, and weather changes), feelings and emotions (including feelings of restlessness, anger, and uncertainty), along with characteristics of snow such as its quality (powder or slush, artificial or natural) or quantity (e.g., snowfall, no snow, too much/little snow). This coding could have led me to themes that highlight efficient work practices with the resource snow in these highly industrialized organizations, the optimization of artificial snowmaking through a combination of weather, digitalization, and embodied knowledge, and the operationalization of year-round planning to sustain snow for another winter season. These aspects fall neatly into the singularity (Law, 2004) offered by traditional notions of efficiency and technology for sustainable development. But these were not the encounters that took me by surprise, made me ponder, tinker, and dwell. This was not the multiplicity (Law, 2004) that challenged what we seek to sustain in the first place.

Analyzing my fieldwork required a reflexive, attentive, responsive, and critical stance regarding my own role as a researcher, the more-than-human relations in the field, and the performative dynamics and assumptions adopted in crafting these stories (Bertella, 2023; Valtonen et al., 2020). To target the critical role that more-than-humans such as snow play within winter tourism, this analysis required “fluid and speculative approaches that challenge anthropocentric tendencies and uphold the complexity and multifariousness of non-human life and physical formations (and processes)” (Chakraborty, 2021, p. 119). Narrative approaches in tourism research (Evers, 2019; Grimwood et al., 2019; Tucker & Shelton, 2018; Valtonen et al., 2020) and in feminist work (Haraway, 2016; Tsing, 2015; Valtonen & Pullen, 2021) provide avenues for decentering the human in knowledge creation. Narratives open space for creative disruption, propagate change, and nurture potential, possible, and different sustainable futures by reimagining more-than-human relations (Ivanova, Buda, & Burrai, 2021; van Dooren, Kirksey, & Münster, 2016). Narrative inquiry gives voice to relations, animals, landscapes, and objects, making them the protagonists of other types of stories and of other worlds (Höckert, 2020; Tsing, 2015). These stories, or scientific fabulations (Höckert, 2020), allow for the emergence of worlds on the fringes and to grasp relations that are not quite graspable.

In crafting these narratives, snow became more than an object of inquiry, it was ontologically active (Rosiek & Snyder, 2020). Careful and responsible storytelling must avoid misguided or anthropocentric fixations on representation (Äijälä, 2021; Chakraborty, 2021; Tallberg, García-Rosell, & Haanpää, 2021; van Dooren et al., 2016). I cannot speak for snow or make snow speak, and yet, I became an intermediary and passer (Cooren, 2015) —a “trusted guide” (Stewart, 2007, p. 5) — of the narrative with snow, as much as I contributed to and interfered with snow. I am as much response-able for the harm and the beauty in these narratives and their becoming (Rosiek & Snyder, 2020) as for the site I tried to observe or shadow. Thus, I can only write from within these snow encounters, and hardly by distancing them through coding and categories. Rosiek and Snyder (2020) emphasize that stories have the potential to “co-constitute the writer, reader, and focus of study” (p. 1157). This entails thinking, making, being curious, and writing *with*—rather than *about*—a more-than-human world (Valtonen & Salmela, 2023). Consequently, I began to patch together these lines of relations through the seasons, drawing on my fieldnotes, reflective memories, and visuals. This iterative process allowed me to unfold the prism of the workers' and my intimate relations with snow and demonstrate why the relations, practices, and connection with snow we assemble matter. In the web of narration, I followed a speculative winter season, and the feelings, practices, and relations that unfold with it, in three vignettes. Crucially, these are not the only stories to tell; however, in their ontological politics (Mol, 1999), the performativity of the mundane practices that make up realities can reveal more-than-human relations that surprise, overwhelm, matter, and disrupt, but usually remain on the fringes of the sustainable winter tourism discussion.

Findings

Building upon the disruptive and transformative, but nevertheless careful and curious, approaches to more-than-human narration, below I will guide you through a speculative winter season with snow. The first part of each section draws attention to thick and intense encounters between working practices and snow. The second part unfolds the contextual web of intimate relationships within the field, while the third part reflects on the transformative potential of the complex encounters for reimagining and reassembling sustainability in a different way.

Waiting-for snow

I sit in my office waiting for a call from Alex, who works in one of the ski areas. I wonder: Will today be the first day of my observations? Is there any snow? Is the weather forecast accurate enough for me to take my field books and go? Moments like this leave me a bit uncertain. I am tinkering; sitting around, waiting, longing, asking, doubting, getting un//ready—there is much time to spend before things happen. Patience is followed by restlessness: When is the first snowfall happening? Is it happening? In some years, it is worse than this, the ski resort staff says. Snow just does not show up. What are we supposed to do here, then? That shadowing snow means following such a stubborn and free-spirited being... It obviously requires a great deal of flexibility and patience—for me as a researcher and other tourism workers in the field. We are not used to standing still and waiting, especially when such a tiny particle leaves us waiting. Nevertheless, here I am, here we are—or more so, here we are not yet. However, I soon learn that this wait is also a central part of the daily interactions with snow in mundane working practices. We are forced to wait until snow decides to show up. Staff, machinery, lifts, and even guests—are all lined up awaiting another snowflake to begin the season, taking deep breaths in the frosty winter air.

Waiting-for snow at ski resorts invites us—sometimes even forces us—to pause and slow down. The friction between the excitement and anticipation of the first snowfall, the beginning of a new winter season, and this moment of stillness and seemingly doing nothing, unfolded in every moment of this early time in the winter season. The workers in the ski areas waited for weeks and months for the snow to arrive. The most apparent and lengthy period that is characterized by *waiting-for snow* is the pre-season in late autumn and early winter. However, seasonal work routines, such as opening the ski area or maintaining the slopes after a snowfall, are also characterized by the unpredictability and recalcitrance of snow. Even in the middle of the season, snow demands that we slow down and shift gears. *Waiting-for* (and apart from) snow shifts into collaborative, entangled moments of stillness and pause; waiting *with* snow, until heavy snow storms pass and the mountain is safe for workers again; waiting *with* snow to open up new paths and areas of the alpine terrain. Snow is not bound to the schedules or hierarchies of winter tourism businesses or to the operating hours and seasonal periods of ski areas—it is an “unpredictable actor” (Rech et al., 2019). Snow forces ski areas, tourism workers, and me—as a researcher—to slow down and wait.

Waiting and slowing down contrast with “hectic everyday life and capitalist rhythms” (Rantala et al., 2020a, p. 8). These states challenge fast-paced growth, acceleration, urgency, and the constant flow of output-oriented activity that continues to reverberate in contemporary green growth and sustainable development approaches (Davies & Riach, 2019; Jeffrey, 2008). However, the friction between sustaining a functioning ski area and fulfilling customer and stakeholder demands for a “good” and timely start to the season and *waiting-for snow* is more than disruptive; it is speculative (Höckert, 2020). *Waiting-for snow* is simultaneously “being in a fever and forced to slow down” (Tsing, 2015, p. 242). It creates a space for hesitation, reflection, and new avenues of perception and feeling (Jeffrey, 2008; Rantala et al., 2020a; Valtonen & Pullen, 2021). The atmosphere in these waiting periods shifts from excitement and anticipation to more strained, challenging, and fearful emotions such as uncertainty. As we were forced to slow down by snow, we—researchers, workers, and customers—questioned our positions in this web of relations as well as our ability to decide what to do and when to start on our own. The wait made us realize that winter tourism “requires human action, but yet exceeds that requirement” (Tsing, 2015, p. 263). It highlights the depth of more-than-human relations required for sustaining—or the very becoming of—the start of the winter season. In this wait, sustaining the predetermined temporal boundaries of the managerial winter season yield to slow and indeterminate temporal relations of mutual entanglement full of insecurity and anticipation. *Waiting-for snow* is not passive, it requires seeing, feeling, and reflecting upon more-than-human relations that go beyond the value-oriented modes of sustaining production.

Connecting-to snow

Finally, the predicted snowfall arrives. Tiny snowflakes dance in the sky and slowly make their way to the ground; however, once there, the trouble starts. The snow after a snowfall, in its icy, powdery, and overwhelming mess, must be molded, shoveled, flattened, and formed to be “perfect.” With shovels, snowcats, and all types of machinery and tools used for different purposes, workers begin to relocate piles of snow, dispersing layers across the landscape, patting down, and loosening up the snow blocks again. The logistics of putting snow to work seem complex enough. To listen to the snow, the staff relies on tools and sensors, machines, and technology and, most of all, their bodies. They walk and slip, touch and gently catch snowflakes; skin to snow. The snow enables me and all of us in the ski area to move. It builds new paths by covering rocky alpine terrain. Snow also makes us slip, fall, and slows us down. It is fluffy or crusty, a blanket or a concrete wall. It piles up and creates new landscapes, while just hours or even minutes later, it is melting and crumbling these landscapes away again. Not all encounters are lovely. Some are freezing, hurtful, and violent. Connecting on the ground, air, and everywhere, feeling the nuances through all these years, the workers seem to “get it.” They seem to understand each other.

Listening, communicating, and understanding—especially ways beyond written or spoken human language—are not always easy. To understand snow, ski area workers use various tools, such as thermometers, sensors, GPS satellites, weather forecasts, and less technical objects like shovels or plows. Some tools such as thermometers or measuring tapes are used for translation purposes (Bencherki, 2016) (e.g., providing insights regarding the density or quality of snow). Others, such as smartphones with weather apps or GPS systems, keep track of snow for monitoring, and more mechanical tools and machines enable the

manipulation of larger amounts of snow (e.g., snowcats, shovels, or plows). However, the most crucial tool interacting with snow are (human) bodies. They serve as more intuitive, affective intermediaries that translate and provide feedback when listening, sensing, and feeling snow in daily work practices. Feeling the surface through walking, smoothing snow out by stomping, struggling and slipping on icy surfaces, and freezing fingers highlight that understanding and relating to snow in a ski area is a complete bodily experience. What does the snow feel like in terms of density (from a fluffy, loose powder to a sticky snowball)? How does it react to the touch? How quickly is it melting? Moments of mutual understanding occur in these embodied encounters (as shown in Figs. 1 and 2) of touching, feeling, and *connecting-to* snow.

Listening, touching, feeling, translating, and understanding—in short, communicating—are the ways by which two beings are held together or in common (Cooren, 2018). This broad perspective regarding communication, in forms of talking, listening, reading, seeing, and sensing, opens the possibility of reassembling new means of connection and mutuality beyond managerial relations with snow as a profitable resource. These affective and sensible encounters with the material and chemical semiotics of more-than-human bodies (Haraway, 2016; Kuhn et al., 2019) allow workers in the snow and ski area to become better attuned to each other daily. The workers in the ski area exemplify a large register of corporeal and technological practices that enable them to listen and “render each other capable in problems novel to them all” (Haraway, 2016, p. 18). In the same way, the materiality of the snow embodies past processes, making them sense-able. Ski tracks on the slopes tell stories of busy days, the smooth and ever-shifting dunes narrate the direction of the wind during the last storm, the snow crystals solidify past weather events and avalanche danger, and the reflection of the sunlight warns workers of icy or slippery patches. Through *connecting-to* snow, the ski area is “habitually known, affectively experienced and sensorially apprehended through material qualities that are conditioned by weather and, in turn, influence the range of human activities that can occur” (Edensor et al., 2021, p. 9). Thus, *connecting-to* acknowledges close connection and the affective registers that are required for understanding and sustaining landscapes, workers, snow, and winter tourism through one another, rendering workers, snow, and landscapes response-able (Haraway, 2016)—in a communicative and affective sense—with more-than-human relations at their core.

Thriving-with snow

As the leaking tank of the snowcat leaves a bright line of red dots on the white, snowy surface, disappointment and anger immediately take over one of the staff members. His most precious companion on the mountain is threatened, disrupted, and contaminated—the snow is not adequately taken care of. Even worse, this is his fault. Throughout the long working hours at night, in freezing temperatures, and with the constant insecurity and uncertainty of what to expect from snow in terms of quantity, quality, and cooperation, relations in the ski areas are held together by something much more profound than duty or economic profit. Despite the struggle, danger, and additional burden of work, an unexpected snowfall in the field sparks, above all, joy, belonging, and becoming. Trudging through deep powder and enjoying the soft contours of the ever-shifting layers of snow, we are held in by a white winter wonderland story. For the staff, it is not just about working with snow to get a paycheck at the end of the month or keep the ski area open. It is becoming with, caring for, and thriving together. Snow is much more than a thing to shovel around. It is a whirlwind of energy that comes with every snowfall, cozily wrapping workers, cable cars, and the whole landscape in its windy arms and soft blanket. It is thriving-with by taking a joyful jump in a fresh pile of powder snow, a deep breath in the crisp air, and the feeling of being at home in the middle of a snowstorm.

Despite the harsh conditions, freezing temperatures, long and tiring shifts, and the volatility that comes with following and working with snow, workers' relationships with snow are primarily guided by care. Using caution and respect, every patch of snow is taken care of and cared for. Work routines are continuously being transformed to avoid wasting even the tiniest bit of snow. Even more so, staff's whole life routines are devoted and bound to snow. They get up extra early, get stuck in the ski area when roads are closed due to avalanche danger, and live within the natural and managerial season. However, these ideas of care and devotion are not one-sided endeavors oriented toward snow. Ski workers in the field also feel cared for by snow. They are provided with the opportunity to breath cold winter air, create new playful landscapes, and enjoy daily routines together with snow (as shown in Fig. 3). Snow gives them a reason to be outside and to become a (more-than) human being; however, this home is not built for eternity. Every step leaves a track, every snow cat produces emissions, and every touch changes or melts the snowy surface. Hiding human impact is impossible. At the same time, the overwhelming presence of snow in deadly avalanche accidents and its inconvenient absence emphasizes the human vulnerability and fragility in these precarious entanglements.

Making kin and taking care (Haraway, 2016; Puig de la Bellacasa, 2017) relate to commitment and the manner of enduring one another despite the friction in the thick present; bringing each other close, home, and forward into possible futures (Haraway, 2016; Valtonen et al., 2020). Curiosity, knowledge, and care for snow attune workers to each other and attach them beyond the next paycheck or the duration of the season. Snow remains with them throughout the summer and in their everyday lives, guiding their lives with a sense of more-than-human relations. Amid these joyful and intimate encounters, snow is more than a resource. It is a home, a friend, a co-worker, and a companion. Snow is what holds them together. This ontological commitment of becoming-together-in-relation is what is at stake in sustaining winter tourism futures and the abundant possibilities of relating.

Thriving-with snow also means mourning its uncertain future, repeated experiences of winters that are far too warm and managing traces of dirt, dust, and petrol left in the white wonderland. Becoming responsible for snow entails “dwelling about a loss and appreciating what it feels like, that the world has changed” (Haraway, 2016, p. 38), even if we try to sustain it at all costs.



Fig. 1. Tools and gloves are put aside to interact with snow at the most intimate level: bare skin on snow.

What if it stops snowing? What will happen to the ski area, to the workers? Whom do they care for, and who cares for them? After every warm winter and snow-scarce season, it becomes increasingly clear that the snow, workers, and winter tourism are all at stake with respect to each other (Haraway, 2016; van Dooren, 2014), and such stakes are far beyond economic viability.



Fig. 2. For several minutes, observing the tiny crystals dancing on a jacket sleeve is guided by curiosity and care for the fragile snowflakes.



Fig. 3. A snow park shaper is searching for an obstacle hidden in 30 cm deep powder snow to start rebuilding the park; however, some playful turns in the powder are mandatory in advance.

The stakes are kinship and home, which lie within still possible but troubling futures; thus, sustaining tourism is much more than sustaining profitable relations with snow. The obligations, accountability, and responsibility entailed by having met and making kin (Haraway, 2016; Rantala et al., 2020a; van Dooren et al., 2016) enable *thriving-with* each other in playful, careful, curious, and cautious encounters. They lay bare the precarity and fragility of the present and allow speculation regarding different futures.

Discussion

I next discuss the theoretical, methodological, and managerial contributions of this study to reassembling sustainability from a relational perspective, suggesting novel ways of finding hope and fertile soil for alternative more-than-human futures in the tourism industry.

Reassembling more-than-human sustainability

The empirical insights of *waiting-for*, *connecting-to*, and *thriving-with* snow open spaces on the fringes of the growth-oriented winter tourism industry. They materialize the temporal disruption of *waiting-for* snow as an inherent aspect of the winter season itself. *Connecting-to* embraces the crucial dimensions of touching, listening, and attuning in creating response-able snow-human bodies. *Thriving-with* emphasizes how the very existence of winter tourism requires the sustainability of more-than-human relations between snow, workers, and landscapes, becoming home, friends, and caring with-and-through each other. Snow has a value, place, and importance in these different relations for sustaining tourism far beyond considerations of economic profitability (Heikkurinen et al., 2021; Rantala et al., 2020a). It is more than a life-depending resource—it is a life-making care-taker, pace-maker, and home-builder.

Theoretically, the more-than-human encounters of *waiting-for* and slowing down (Jeffrey, 2008; Rantala et al., 2020b), *connecting-to* and mutual response-ability (Cooren, 2018; Tsing, 2015), and *thriving-with* in becoming kin (Haraway, 2016) uncover fertile soil for understanding sustainable tourism as rooted in a relational ontology. The three vignettes stress the importance of acknowledging the ontological consequences of being in relation *with* nature, rather than merely relating *to* nature as in capitalist, managerial approaches. In these speculative stories, earthly critters, including humans, animals, and particles, create livable futures—and not merely profits—in which they are interdependent and responsible for one another (Haraway, 2016). Sustaining tourism requires acknowledging and taking responsibility for this multiplicity of encounters and the ontological politics (Mol, 1999) that come with them.

Methodologically, I highlight the potential of more-than-human shadowing (Czarniawska, 2007; Vásquez, 2019) and speculative and narrative engagement (Höckert, 2020; Valtonen et al., 2020) with more-than-human relations for knowing, worlding, and reassembling sustainability. Shadowing allowed for mobility and dynamic encountering of “stubborn” actors in winter tourism practices. Narrative engagement with these encounters allowed me to uncover moments of disruption, surprise, and wonder that usually remain on the fringes of managerial approaches. By focusing on stories of more-than-

human *waiting*, *connecting*, and *thriving* in these messy encounters, this more-than-human methodology exposed novel relations and kinships, uncovered moments of reflexivity and thinking differently about ski areas, (human) selves, and sustainable future homes.

Although these careful, intimate moments of creating worlds occur in lived daily practices, the winter tourism industry still largely follows the imperatives of growth, exploitation, and economic value production. Managerially, a holistic conceptualization of more-than-human sustainability in the tourism industry must focus on embedding careful, reflexive, and responsible, but also inherently fragile, human–Earth relations into business models, imagining new practices and capacities for collaboration (Jóhannesson, 2019; Ren & Jóhannesson, 2018), thinking differently about more-than-human relations in tourism (Haanpää, Salmela, García-Rosell, & Äijälä, 2021; Valtonen et al., 2020), and eventually introducing new business models that will allow these relations to thrive (Calás et al., 2018; Gren & Huijbens, 2014). Preexisting careful, responsible, and affective more-than-human relations highlight this possibility and enable an “ongoing transformation already in process toward more-than-capitalist (not anti-capitalist) diverse economies” (Ergene et al., 2018, p. 224). However, for these entanglements between snow-workers-researchers-landscapes to matter, they must be reflected in strategies and policies for sustaining (and sustainable) tourism. One possible avenue could be to engage in more-than-human storytelling, as proposed and demonstrated in this paper, beyond research methodologies, as an avenue for listening, telling, and activating alternative sustainability stories which allow “something that was absent [to be] present” (Haraway, 2016, p. 131).

Hopeful imaginaries and speculative worlding for sustainable winter tourism futures

Truly careful and affective relations to snow show that there is hope and potential for everyday practices to go beyond essentialist and market-based visions of sustainable tourism (Ergene et al., 2018; Guia & Jamal, 2020; Higgins-Desbiolles, 2018). The findings provide a glimpse of the hidden, impactful everyday relations of human–Earth encounters that exist within or even despite capitalist modes of functioning in the tourism industry (Gren & Huijbens, 2014; Jóhannesson, 2019). The moments of disruption of business-as-usual modes of functioning open a space for hope in troubled times. *Waiting-for* redefines who or what makes the season start and sets the pace. *Connecting-to* embraces the importance of mutual understanding in work practices. *Thriving-with* unfolds the relationality of living, mourning, caring, and becoming-together for what matters in sustaining tourism. Not only are these “new stories [...] born every moment,” but these more-than-human relations contribute “to the new histories that are being created” (Rantala et al., 2020a, p. 12). In these stories, sustainable worlding extends beyond commodified and resource-based views of snow and open space for new ways of living that are based on temporal indeterminacy, affective response-ability, and careful being-in-common. Knowing and telling these stories is the first step in reassembling sustainability. Thus, this study encourages future research in tourism practices and processes to unfold, question, and retell dominant stories of sustainability (and beyond), engaging in the active reordering of tourism (van der Duim, Ren, & Jóhannesson, 2017) as an earthly business (Gren & Huijbens, 2014).

Conclusion

This study brought the slow, affective, and careful entanglement with snow to the center of a relational, more-than-human approach to sustainability. First, a critical evaluation of sustainability highlighted the inability of the contemporary managerial sustainability paradigm to solve environmental problems by limiting tourism–Earth relationships to capitalist modes of functioning, centered on growth, resource-use, and exploitation. By reassembling more-than-human sustainability from a feminist, new materialist perspective, this study carves out the constitutive and performative power of more-than-human relations for the very existence of tourism and sustainability. These relations can *unmake* the tourism paradigm by either perpetuating the dominant, development-oriented perspectives on sustainable tourism or opening space for non-capitalist, careful, responsible encounters to emerge on the fringes of our current economies. Empirically, shadowing snow and the web of relations in the alpine winter tourism industry allowed me to craft and imagine sustainability differently, amid the disruptive relations of the everyday business of capitalist ruins and blasted landscapes (Kirksey, Shapiro, & Brodine, 2013; Tsing, 2015). This study highlights the surprising moments of friction and togetherness, mutuality and understanding in more-than-human encounters, and their constitutive power in making alternative worlds between snow and others in the winter tourism industry.

Valtonen et al. (2020) emphasize how “common [and sustainable] worlding with multiple others demands that we think differently” (p. 9). In conclusion, this study invites readers to further rethink sustainability with more-than-humans and “from within” Earth (Gren & Huijbens, 2014; Jóhannesson, 2019; Rantala et al., 2020b). When we reassemble sustainability, these careful, intimate, and mutual more-than-human relations should be placed center stage in our knowledge creation, business relations, and tourism practices. As this study shows, a speculative engagement in *waiting-for*, *connecting-to*, and *thriving-with* snow can provide fertile ground to reassemble winter tourism and sustainability in novel forms. What other stories and concepts might emerge from reassembling the multiple webs of relations that order tourism realities from a more-than-human perspective?

Funding sources

This work was supported by the research project “Geschäftsmodell Wintersport” funded by the Tourismusforschungszentrum Tirol (Tyrolean Regional Government, Austria) and the Marietta-Blau Grant (OeAD, Austria).

Declaration of competing interest

The author has no conflicting interests to declare in the production of this article.

Acknowledgments

I want to thank the associate editor Outi Rantala and the three reviewers for their caring engagement and attentive comments. I further would like to thank Emily Höckert and the ILA Group at the University of Lapland, as well as Consuelo Vásquez and Nicolas Bencherki and the RECOR group at the UQÀM for the engaging conversations and helpful feedback on earlier versions of this manuscript.

Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.annals.2023.103613>.

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