Received: 22 December 2020 | Revised: 5 August 2021 | Accepted: 30 August 2021

DOI: 10.1002/wcc.740

ADVANCED REVIEW

WIREs CLIMATE CHANGE WILEY

Affective adaptation = effective transformation? Shifting the politics of climate change adaptation and transformation from the status quo

Andrea J. Nightingale[1,2] | **Noémi Gonda**[2] | **Siri H. Eriksen**[3]

[1]Department of Sociology and Human Geography, University of Oslo, Oslo, Norway

[2]Department of Urban and Rural Development, Swedish University of Agricultural Sciences, Uppsala, Sweden

[3]Department of Public Health Science, Faculty of Landscape and Society, Norwegian University of Life Sciences, Ås, Norway

Correspondence
Andrea J. Nightingale, Department of Sociology and Human Geography, University of Oslo, Oslo, Norway.
Email: andrea.nightingale@sosgeo.uio.no

Funding information
Svenska Forskningsrådet Formas, Grant/Award Number: 2018-00442; Vetenskapsrådet, Grant/Award Numbers: 2015-03323, 2018-05866

Edited by: Lisa Dilling, Domain Editor, and Editor-in-Chief: Mike Hulme

Abstract

Alarming rates of environmental change have catalyzed scholars to call for fundamental transformations in social-political and economic relations. Yet cautionary tales about how power and politics are constitutive of these efforts fill the literature. We show how a relational framing of adaptation and transformation demands a political, cross-scalar, and socionatural analysis to probe the affects and effects of climate change and better grasp how transformative change unfolds. We bring affect theory into conversation with the literature on adaptation politics, socio-environmental transformations, subjectivity, and our empirical work to frame our analysis around three under investigated aspects of transformation: (i) the uncertain and unpredictable relations that constitute socionatures; (ii) other ways of knowing; and (iii) the affective and emotional relations that form a basis for action. Affective adaptation represents a different ontological take on transformation by reframing the socionatural, normative and ethical aspects as relational, uncertain, and performative. This directs analytical attention to processes rather than outcomes. The emphasis on the encounter between bodies in affect theory points to the need for experiential and embodied ways of knowing climate to effect transformative change. Effective transformation requires recognizing uncertainty and unpredictability as *part of* transformative processes. This is not because all outcomes are acceptable, but rather because uncertainty and unpredictability are elements which help generate affects (action) and emotional commitment to shared human and more than human relations in action, projects, and policies.

This article is categorized under:

Vulnerability and Adaptation to Climate Change > Values-Based Approach to Vulnerability and Adaptation

KEYWORDS

adaptation politics, affect, affective adaptation, climate change, effective transformation

1 | INTRODUCTION

Adaptation to climate change has emerged as a global agenda, but its persistent Darwinian legacy hampers effective transformative change. Too much emphasis is placed on human impacts and behaviors mediated through infrastructure, institutions and individual values, without adequately accounting for how these are always mediated by power and politics (Dolšak & Prakash, 2018; Taylor, 2014). Vulnerability is treated as an adjective and assumed to attach to individuals or groups of people ("vulnerable women") without recognizing that vulnerability is an adverb; it describes dynamic processes over time and context. To move beyond this inherently Darwinian framing, adaptation needs to be conceptualized within the social-political and more than human *relations* through which *socionatural* change takes place.

In this review article, we bring together scholarship on the politics of adaptation, knowledge and scale, with a conceptualization of affect, to accomplish this move. The terms socionatures and more-than-human are used to reflect the relational qualities of the world. Rather than a separate human dimension from the environment, the social and natural are always connected (Haraway, 2016). We coin the term 'affective adaptation' to capture, through a relational ontology, the parallel goals of (i) transformative, climate change adaptation that is effective in producing just, equitable processes and (ii) transformations in embodied, emotional relations between humans and nonhumans.

Our analysis is framed around three under investigated aspects of transformation: (i) the uncertain and dynamic relations that constitute socionatures; (ii) other ways of knowing; and (iii) the affective and emotional relations that form a basis for action. Affect allows us to better capture the uncertain, aleatory, and ultimately unpredictable effects of transformative efforts. Our concern is to think through the intellectual and pragmatic ruptures that open up new socionatural relations that allow humanity to move beyond the status quo. We are motivated by the alarming observation that scientific facts are inadequate for generating the wide-spread social and political action needed to address global environmental change. If scientific evidence is inadequate, then we postulate that emotional and affective relations are required. So here we take inspiration from Greta Thunberg's approach and argue that along with facts and "hard science," emotional and affective ways of knowing climate change are necessary to shift our current anthropocentric, egoistic, and ultimately unsustainable ways of living.

Like much of the literature, we conceptualize adaptation as a normative outcome, but for us, not as desired states, rather as desired relations and processes through which change can be enabled. Transformation we understand as fundamental alterations to political, economic and socionatural relations, practices, values and meaning-making (O'Brien, 2018; Pelling, 2011), but we reject the dominant framing of climate change as an inherently *external* threat. Within the current literature, there continues to be too much separation of the social political from the biophysical. Discussions of vulnerability are illustrative of this cleavage: while the literature has built a multidimensional understanding of vulnerability, sectorial approaches dominate in empirical studies, focusing on how access to land, water or levels of poverty influence adaptive capacities (Ajibade, 2017; Kmoch et al., 2018). Multi-scalar social political as well as emotional and affective relations that underpin vulnerability are underdiscussed, in part because they are difficult to assess on linear or sectorial scales.

In contrast, a relational framing of adaptation and transformation illustrates how local and global initiatives to support adaptation can in fact *cause* vulnerabilities and hamper positive change (Atteridge & Remling, 2018; Mikulewicz, 2021; Murtinho et al., 2013). For us, climate change and society are co-productive (O'Lear, 2016). Adaptation is not about society adjusting to a changing external world, but rather biophysical and social political changes are always embedded within each other and co-emerge. Part of our purpose here is to show how this kind of relational framing of adaptation and transformation demands a political, cross-scalar, affective, and socionatural analysis.

We gain inspiration from the burgeoning efforts to engage human-environment relations through the lens of affect and emotions (Anderson, 2005, 2009; Brown et al., 2019; Edensor, 2012; González-Hidalgo, 2020; González-Hidalgo & Zografos, 2017, 2019; Hardt, 1999; Ives et al., 2020; Lorimer, 2008; Nightingale, 2013; Pieck, 2013; Pile, 2010; Singh, 2013, 2017; Sultana, 2011; Thrift, 2008; Tschakert et al., 2019; Verlie, 2019). Affect does not have a straightforward definition, but is often described as the simultaneous relations that "overflow" and help put thought in motion (Curti et al., 2011), or the contingent outcomes of encounters between the human and more-than-human (Anderson, 2012; Dawney, 2013, 2018). We take from affect theory its attention to the "aleatory [uncertain, contingent, chancy] dynamics of lived experience" (Anderson, 2012, p. 18), as ways of knowing, but also ways of relating. Emotions such as love, hate, anxiety, joy, gratitude, desire, empathy, fear and other affective relations facilitate action as they flow between humans, between human and nonhuman bodies and technologies, and as such are crucial ingredients of politics (Anderson, 2012; Dawney, 2018; Ginn, 2014). For example, our emotional responses to information about glaciers

melting are different if we can experience that melting—walking in a landscape with a recently retreated glacier, or seeing glaciers calf at an increasing rate (Clayton et al., 2003). We argue affect offers conceptual resources for shifting away from instrumental adaptation analyses by allowing us to think through the emotional, experiential, embodied and more-than-human relations that underpin knowledge claims, animate political change, and open up the space for transformation (Anderson, 2012; Dawney, 2013, 2018). We therefore let go of the notion that we can direct transformation or know what it ought to look like in advance, in favor of processes, which allow for affective and emotionally engaged political deliberation across actors and scales.

In what follows, we first review the literature on the politics of climate change adaptation focusing on relationality, scale, and knowledges to probe how affective and political relationships that drive transformation remain insufficiently theorized. In Section 3, we elaborate the concept of affective adaptation and show how it conceptualizes the importance of affect and to be affected—the fact that changes always happen both *within* (individuals, collectives, societies, socionatures) and *in relation to* (other humans, groups of humans and nonhumans). Section 4 shows how affective adaptation can be used to think through transformation on the ground. We draw on examples from our own empirical research in Nepal, Nicaragua, and at the global level in order to help illustrate how an affective approach to adaptation can envision more transformative outcomes. The conclusion summarizes our argument and findings.

2 | FROM THE POLITICS OF ADAPTATION TO AFFECTIVE ADAPTATION

The adaptation literature has mushroomed in the last decade. In order to formulate the notion of "affective adaptation," we first review some of the advances and gaps concerning relationality, scale, and knowledge within that literature. Our inspiration comes from critical work that has probed: the over-emphasis on biophysical and infrastructural responses, issues of maladaptation, and the co-option of adaptation initiatives into on-going power dynamics. This work takes adaptation as a "socio-political process that mediates how individuals and collectives deal with multiple and concurrent environmental and social changes" (Eriksen et al., 2015, p. 523), helping to place adaptation within the wider socionatural and political economic relations through which humans cope with change. While sometimes a bit contradictory, this literature helps to link two climate change debates by conceptualizing adaptation as both a response to "externally imposed" environmental change, and to constitute part of the socio-natural processes that shape climate change and inequity (Blackburn, 2018; Carr, 2019; Eriksen et al., 2021; Forsyth, 2020; Pelling et al., 2015; Tschakert et al., 2016).

We take this work further by drawing on insights from STS, feminist theory, affect and emotion to highlight that effects always emerge *in relation*. These relations are complex and aleatory, meaning there are always uncertain and unpredictable outcomes of planned and unplanned encounters, cross-scalar interactions, and the translation of knowledge into action. These literatures help us to conceptualize the world in a constant state of becoming, capturing how trajectories of change are shaped by inherently stochastic human and more-than-human relations. This is known as a relational ontology, or a conceptualization of the world as made by and composed of dynamic relations (as opposed to separate, interacting parts; Anderson, 2012; Pile, 2010; Ruddick, 2010). In this framing, the status quo requires that some relations are repeated and remain relatively stable over time. Transformative outcomes entail fundamental shifts in these repetitive relations. Below we conceptualize more carefully how power and subjectivity operate in order to explore some of the barriers and possibilities for such transformations to occur.

2.1 | Relationality in adaptation politics

To move from a generic understanding of relational co-production to an operational analysis of transformation, we explore how knowledge and scale co-constitute the social political and more-than-human affects of adaptation. Taking a relational approach to adaptation politics is not new, the question is more about what kind of conceptualization underpins relational analyses. Most often, a broadly historical materialist approach is used in the literature, which understands interconnections between political economies and livelihoods, probing how actions in one place effect other places (Carr, 2008; Taylor, 2014). Relations of gender, class, ethnicity, and labor, as well as broader capitalist relations, embed vulnerability in the political economic history of a place and adaptation approaches (Arifeen & Eriksen, 2020; Mikulewicz, 2021). Building resilience or supporting a change in the political economy of one place, for a certain group of people, can increase vulnerabilities for other people in another place (Taylor, 2014; Tschakert &

Tuana, 2013), known as maladaptation (Magnan et al., 2016). For example in Africa, Carr (2019) critiques how programs aimed at building resilience promote stability, rather than a dynamic approach that recognizes the influence of agency, power relations and social difference. Mikulewicz (2021) similarly shows how changing labor relations at the village level in São Tomé and Príncipe reshape social differentiation processes such that adaptation projects exacerbate the vulnerabilities that emerge. Schipper et al. (2021) have investigated how adaptation governance arrangements and policy interventions are necessarily political, turbulent and contingent, underpinned by uncertainty, contradictory visions of the future, ethics and contested politics. All these studies empirically reinforce the analytical point that vulnerability and adaptation outcomes are produced from social political dynamics (Antwi-Agyei et al., 2018; Blackburn & Pelling, 2018; Carr, 2019; Eriksen et al., 2021). Uneven outcomes are not unfortunate side effects, they constitute adaptation processes. Yet the predominantly historical materialist underpinnings of this work means that knowledge, social relations, and the biophysical world are held as separate interacting domains with power and politics. For example, pre-existing gender and race relations are understood as somehow enrolled in power; whereas, our relational ontology understands these inequalities as relations through which power and knowledge are materialized, with tangible socionatural effects.

A relational ontology rooted in feminist and Science and Technology Studies (STS) in contrast insists on the emergent nature of vulnerability and how it is co-produced within *socionatural* change. For example, Goldman et al. show how Tanzanian pastoral Masai's vulnerability to drought is uneven over time and space (Goldman et al., 2016; Goldman & Riosmena, 2013). It is directly connected to not just rainfall, but also the Masai's abilities to control access to specific grazing lands, relations with each other and their animals, and government programs that are intended to help them (but often do not). She conceptualizes drought as enacted in practice, such that there are multiple ways of understanding *what* a drought is, not just multiple perspectives on "drought" as the same ontological entity. This approach foregrounds several drought realities and enactments of them to dislodge the superiority of scientific knowledge, drawing attention to other ways of knowing. Maladaptation is thus not just about the connections between uneven political economies as presently framed, it is also about realigning relations between people and the more-than-human world with significant consequences for the socionatural outcomes that *can* result.

Conceptual resources for analyzing the relational, situatedness of vulnerability on an empirical level are found in feminist scholarship (Bee et al., 2015). This work has dismantled essentialising constructions of (gendered) vulnerabilities, which assume that all people of a certain group (women, people in Africa, etc.) are equally vulnerable to environmental change (Arora-Jonsson, 2011; MacGregor, 2010; Moore, 2008). Rather, feminists underscore the importance of subjectivation processes in climate change politics. People's experience of the exercise of power is always situated, and relationally produced from their social political and more than human interactions, producing multiple subjectivities (Gonda, 2019; Nightingale, 2017, 2018). Subjectivity is another hotly debated concept, but here we take Butler's understanding of it as performative, something which is rehearsed in the everyday, or the "effect of power in recoil" (Butler, 1997, p. 6). Subjectivities emerge from the simultaneous acceptance of and resistance to power; it allows for agency and the possibility of power to be both disciplining and emancipatory (Nightingale, 2011). Tschakert and Tuana (2013) have used this understanding to argue that vulnerability is not always negative. Instead, they conceive of it as the ability to affect or to be affected (Butler, 2009; Tschakert & Tuana, 2013). Similarly, Cote and Nightingale (2012, pp. 483–484) have highlighted how resilience is situated, contending that adaptation politics should pay attention to "subjective identities and affective relationships, through gender, class and ethnicity, for example, that shed a light on the multiple, complex and contested rationalities in ecological decision-making processes". In empirical work, this means that environmental change is always a context for the unsettling, but also entrenching of social inequalities. Gonda's (2016) work illustrates this well, showing how adaptation programs targeted at "vulnerable women" become a context for them to build leadership and collective action skills to challenge other problems in their community.

These subtle but significant conceptual differences in how power and subjectivity are imagined point to another inconsistency; how the relationships between the individual and society, the cognitive and the affective are (implicitly) conceptualized. Most of the literature operates within an additive understanding, whereby the sum of individual actions explains collective action. But others, especially in an historical materialist framing, emphasize structural conditions that constrain individual behavior. As a result of these inconsistencies, the politics of adaptation literature continues to grapple with the way that adaptation actions relate to transformation, whether they be individual, collective, or part of formal policy processes. While much of the conversation engages a relational understanding of climate change adaptation, as it is operationalized, there is little scope for posing uncomfortable questions related to knowledge politics. These questions include: how to frame and identify what climate change effects are (Hulme, 2011; Nightingale et al., 2020); who decides about the relations between causes and effects (Goldman et al., 2016); and based on which knowledge

claims (Forsyth, 2020; Lövbrand et al., 2015; Wijsman & Feagan, 2019). Yet it is precisely these dimensions that have unintended *affects* that shape efforts at transformation. This lack of adequate engagement with scale and knowledge politics, and the multidimensional affective and political relations that contribute to the socionatural effects of climate change, serves to maintain the status quo.

2.2 | Scale

Adaptation programs and policies make significant choices about scale, which we argue is always a political choice. It shapes which processes emerge as causal, and directs attention to some impacts and levels over others. Yet the politics of climate change adaptation research has yet to really embrace, "how the framing of where processes and change happen are imbued with normative constructs of scale" (Fisher & Dodman, 2019, p. 245). And how not only uncertainty, but also "unknowability" of climate change and adaptation (Cote & Nightingale, 2012; Hulme, 2018) shape dynamics of governance, deliberation and change. Here we mean that adaptation itself is poorly known: what constitutes an adaptive practice? Over what spatial and temporal time scales? For whom?

Scale is crucial to these questions, not least because we see significant contradictions in how climate change is conceptualized as a global problem, whereas adaptation and vulnerability are usually conceptualized at smaller scales. While we celebrate the increasing attention to social justice and local knowledges as a basis for adaptation interventions (Schipper et al. 2014; Ziervogel et al., 2017), framing adaptation as a local activity can also be problematic. For example, studies have investigated how governance interventions can support adaptation in agriculture for individual farmers, or other changes in practice at the local level (Vermeulen et al., 2018), but without adequate consideration of wider scale political economies, social inequalities, biophysical changes, or even the aspirations of people targeted for support. When local people are made responsible for adaptation processes "on the ground," adaptation politics strategically disconnect levels such as "the local," the "regional," from the "national." This disconnection effectively assigns responsibilities for adaptation to local entities ill-equipped to challenge capitalism, patriarchy, and other hegemonic hierarchies of power.

The choice of scale and the politics it implies is inconsistent within much of the transformations literature as well (Feola, 2015). Some conceptual work focuses on structural processes such as political economies, infrastructures, and governance systems that serve to stagnate efforts at radical change (Scoones et al., 2020), while others have postulated how collective action can transform these processes (Fazey et al., 2018). Overall however, the literature has largely emphasized individual and local scales as the locus of radical change (Fernandes-Jesus et al., 2017; Holland, 2017). Conceptual work argues for individual behavioral change and the role of values, cognitive processes, and meaning-making as keys to transforming how people engage with climate change and sustainability (Adger et al., 2009; O'Brien & Sygna, 2013; Wolf et al., 2010). Empirical studies probe how people's values can be shifted through education, or the contradictions between values, beliefs, and actions (Hochachka, 2019; Sharma, 2017; Wolf & Moser, 2011). While in part promising forays into the inter-personal and political spheres of transformation, work in this vein continues to build from a cognitive, individualized understanding of society and looks to individuals to enact change. It fails to take account of how subjectivities that underpin values, beliefs, and behaviors are always embedded within the circuits of power, politics, political economies, and socionatural change. As a result, individual action always contains an element of ambiguity and unpredictability, and frankly, is not enough.

These divergent approaches to transformation need to come closer together, but we take this critique one-step further. When vulnerability and values are engaged with as if they are an individual trait (or a trait shared by the majority within a collective) the local level gains too much importance (Brown & Purcell, 2005; Catney et al., 2014). Focus is displaced from interconnected, cross-scalar processes, and visions of radical, systemic transformations (Nightingale et al., 2020). But rather than overly emphasizing structural processes, our concern is with the collective subjectivities necessary for triggering wide spread change, and affects that flow from such collective action. As others have pointed out, adaptation responses are shaped by the scale at which problems are conceptualized and the scale at which responses are assumed to be necessary (Bulkeley, 2012; Hulme, 2010). Specific scalar choices and the contradictions they raise can create or unmake affective relations, influencing adaptation processes as much as pre-existing structural conditions.

2.3 | Co-production of knowledge

The final analytical domain in which we find potential, but also a few shortcomings in the politics of adaptation literature, is knowledge politics. Most work that has taken up the issue of knowledge in a relational manner focuses on

deliberation and social learning (Ojha et al., 2010). This work emphasizes how groups of people can come together to manage the uncertainties and complexities of adaptation dynamics through ongoing learning, iterative reflection, and tracking responses over time (Fisher & Dodman, 2019; Scoville-Simonds, 2018). Deliberation in particular has been used as a means for negotiating priorities across differently positioned stakeholders and for encouraging debate about differing values and trade-offs (Klenk et al., 2017; Ojha et al., 2020; Tschakert et al., 2016). However, social learning has insufficiently taken into account the relationships and knowledge politics across scales that underpin adaptation processes because its conceptualization of relationality remains too focused on the dynamics of the learning process itself. It fails to bridge into how the learning process—not to mention climate change and its effects—are themselves underpinned by the uncertain and aleatory scalar complexities of socionatural relations and affects.

Work on deliberation and co-learning processes also remain firmly embedded within a cognitive understanding of learning. Co-learning is poorly equipped to work productively with affective relations which are often not conscious (Maiese, 2017), or at least uncertain, not only within the group, but also within the wider environmental change processes under consideration. Therefore, our consideration of knowledge politics draws from Science and Technology Studies and the insistence by Jasanoff (2004) and others (Forsyth, 2020; Miller & Wyborn, 2020) that co-production signals how knowledge creation itself is always embedded within societal political economies, values, and relations. Here we expand that to include the more-than-human. In deliberative processes, this means allowing more space for affect and emotions to be valid forms of knowledge, and to promote the development of methodologies that better capture embodied, lived and affective understandings of the socionatural world. We contend that embracing affect can enhance our well-honed techniques for learning on a cognitive level.

Thus, we argue that the relationships which drive transformation remain insufficiently theorized, despite these advancements in climate change adaptation politics and scholarship. In the two sections that follow, we show how engaging with affective and political relationships in scalar and knowledge politics can open up conceptual and material possibilities for envisioning transformation.

3 | AFFECTIVE ADAPTATION

The above review has elucidated two main insights from which we build our notion of "affective adaptation." First, adaptation outcomes are never guaranteed. Rather, emphasis needs to shift to how power operates through socionatural circuits and subjectivities to shape *processes* of change. Second, cognitive efforts at transformation, while necessary, will always be inadequate. We use affect and emotions analytically in order to capture three key aspects of effective transformation that we believe explain some of the contradictions and failures, but also possibilities for adaptation. (i) Affect opens up ways of knowing that are relational, embodied, and experiential allowing us to go beyond (only) cognitive learning in adaptation processes. We argue these ways of knowing are crucial as a basis for transformative change. (ii) Affect draws attention to the social and natural relations through which climate change effects emerge, allowing us to conceptually focus on socionatures without separating them ontologically. And (iii) by focusing on the emotional outcomes of affects, we are able to connect thought and action in new ways that similarly link cognitive learning to experiential ways of knowing.

Before elaborating on these points, we first clarify our interpretation of two issues that are ambiguous within the affect literature itself: whether affects are conscious and whether they are individual or shared. First, there is a debate about whether affect is by definition precognitive, and if these affects do come into consciousness, how to represent them. Many insist that affect is nonrepresentational: that is in fact its point (Anderson, 2012). But other scholars have pointed out it would be impossible to do research on affect without relying on some forms of representation (Pile, 2010, 2011; Thien, 2005). For Ahmed (2014), the cultural politics of emotions create "others" by including some bodies within a community and marginalizing other bodies, processes which can be brought into view cognitively. Further, affects are most often described as either individualized bodily reactions (churning stomach, dry throat, etc.), or emotions (fear, anger, joy, etc.) (Dawney, 2018). This ambiguity between affective and emotional responses is why we reject the notion that affect cannot be brought into consciousness through reflection and observation.

Second, theorists insist that affect is what flows in encounters, implying it is shared, yet descriptions of it are most often about individual experiences. We are more interested in how affects serve to shape collectives (Nightingale, 2013; Singh, 2017). Affective adaptation pushes forward recent work on the importance of emotion in adaptation and sustainability (Bond & Barth, 2020; Brown et al., 2019) by probing how affect, emotions and so-called "inner worlds"[1] Ives et al., 2020) must not be seen as individual traits, but distinctly relational and underpinning the politics of adaptation.

For us, if affects are the result of encounters between bodies, they help elucidate how emotions translate into actions. In climate negotiations, for example, affective relations are part of the explanation for how and why discussions on the need for systemic changes tend to be avoided, even when at the individual level, people are convinced about their necessity. Affect and emotions need to be understood as ways of learning, experiencing, and responding to socionatural change and adaptation efforts. Such an understanding shifts the analysis from individual responsibilities to re-focus on the relations that constitute or de-constitute human and more than human collectives and their responsibilities—without losing sight that collectives are never homogeneous, and the relations within them always embedded in and imbued by power.

3.1 | Affect and knowledge politics

Above we argued that by focusing on affective relations, we gain access to experiential and emotive ways of knowing. Society ultimately understands climate change both cognitively and through the reactions of our bodies and the human and nonhuman affects that flow from encounters with (for example) extreme weather events, new patterns of seasonality and eroding coastlines, as well as new institutions, technologies, and procedures designed to mitigate against climate impacts. There remains the sticky question of how emotions and affects are interrelated in our analysis. Instead of thinking about "what are emotions?" or in a climate change transformation context, "what emotions can we cultivate?," we follow Ahmed (2014) and ask, "what do emotions do?" This is a different take from psychology's view of emotions as something one can feel inside and express. For us, emotions are "social and cultural practices" (Ahmed, 2014, p. 9) linked to the performance of subjectivities, rendering the distinction between "inside" and "outside" not useful. "Rather, it is through emotional and affective relations, or how we respond to objects and others, that surfaces and boundaries are made: the 'I' and the 'we' are shaped by, and even take the shape of, contact with others" (Ahmed, 2014, p. 9). It is precisely at this interface where the boundary is made between the "we," the "I" and the more-than-human, that affects flow, and where possibilities for transformation open up or close down (see also Nightingale, 2018).

Affect and emotions therefore help to know the socionatural in a different way. Atmospheres are both climatic and affective (in an entangled manner), which helps explain why and how people do or do not engage with climate change, "including through consideration of how everyday affective practices and relations co-create climate change; that is, how the affective is climatic" (Verlie, 2019, p. 3). Solidarity and conditions of empathy and compassion among humans and more-than-humans become central to the climate problem itself when more focus is placed on the affective and the interrelated, ever-changing risks for collectives.

For example, when interviewing in 2014 about changes in the climate, a Nicaraguan smallholder farmer of the municipality of El Rama immediately recounted memories of the 1988 hurricane Joan. Then, he had recently buried on his land one of his young daughters who died unexpectedly. The hurricane's high-speed winds wrenched the coffin from the soil and took it hundreds of meters away. Afterward, he managed to find the broken coffin, but the corpse of his daughter had disappeared forever, something he extensively elaborated on when asked about his experiences of climate change. For him, the pain of losing his daughter's grave, as well as the other effects it had on his agricultural land and livelihood, and "climate change" are not separable. (Interview with Don Adalberto, El Pijibay, 27/02/2014[2]). Acknowledging the sorrow of this man and how his tragic experience of hurricane Joan shapes his relation to future climatic events can prompt empathy and collective action that builds on compassion to engage with situated and embodied vulnerabilities. For example, other research shows that this type of experience can lead to engagement in community efforts at shifting livelihoods to be less vulnerable to future events (González-Hidalgo & Zografos, 2019), sometimes in more effective ways than when prompted by external adaptation projects.

Emotions and affect in these ways are central to the processes through which both individual and collective adaptation responses emerge. Building effective politics around climate action therefore needs to focus on experiential and emotional ways of knowing and experiencing climate change. This means a drastic shift in climate change knowledge politics. Rather than relying exclusively on "hard" scientific data a means to "tame" uncertainty and unknowability, we need affective knowing to transform current inaction and promote effective climate action.

3.2 | Aleatory affects of socionatural relations

This second point is closely related to our first point: that affect helps us to understand the aleatory—uncertain and chancy—socionatural relations that underpin climate change. Because these relations to date have been conceptualized

through latent Enlightenment ontologies (Klenk et al., 2017), the result has been separate analyses of biophysical change and more limited emphasis on social impacts. The politics of adaptation debate, however, has shown why this kind of conceptualization is problematic (Dolšak & Prakash, 2018; Lövbrand et al., 2015; Warner et al., 2018). It blinds us to the way that attempts at mitigating climate change always involve significant realignments of human and more-than-human relations. The building of new infrastructures for adaptation or carbon mitigation, for example, usually focus on technological and ecosystem dimensions. When people fail to cooperate or redeploy new infrastructures according to their own needs and visions, projects are seen to be derailed by politics.

Turning to affect is one way of challenging this kind of anthropocentrism in climate change politics as it "... enables us to a-tune to the intimate, surprising, unpredictable and never-fully-re-presentable ways humans are themselves shaped by climate. It thus helps to decentre humans—including those who conduct research—from our understandings and studies of climate change" (Verlie, 2019, p. 6). Affect draws attention to the way these dynamics contain strong elements of uncertainty and unpredictability. The affects of socionatural entanglements will always have a degree of ambiguity and unknowability, and as such the focus needs to be on the relations that are formed, the affects that flow from encounters, and a big dose of humility when we attempt to model or predict them.[3] Infrastructural responses can be part of that reframing. The affects flowing within and from infrastructures contribute to the realignments of people and nonhumans. Research needs to focus on *these* dynamics rather than technologies. For transformation to occur, affects must be taken seriously in adaptation politics.

In Nepal, for example, an adaptation project brought irrigation to cardamom crops weakened by winter drying and an invasive caterpillar (Nightingale, 2017). The socionatural affects of the project were profound and not straightforward. Many people saw the irrigation lines as recognition of their plight by the state and the international community, while at the same time, landless people were excluded from any benefits, reinforcing local exclusions. Irrigating did not mitigate the caterpillar problem and rather, served to bolster cardamom as the main cash crop, locking people and the landscape into a trajectory that likely cannot be sustained into the future. Other project activities established community-based income initiatives (tea, a paper factory), bringing people into relation with each other and more-than humans in new ways. On the one hand, local young farmers who bitterly decried their lack of education due to the civil war (1996–2006), passionately embraced these projects as giving them new opportunities. On the other, we heard angry tales of local elites siphoning funds and we witnessed first-hand their control over project activities. These new socionatural entanglements do not have one outcome. They are likely to both help and hinder future transformations, and the failure to engage with the *affects* of changing agriculture—which are linked to the civil war, ideas of development and progress away from agriculture, the emotions and aspirations of young people, and landlessness, as well as climate change—mean the project is unlikely to transform political or socionatural relations in the ways imagined by the project.

Yet, we must be careful: emotions can be used to maintain the status quo. For example, narratives of uncertainty and emergency draw attention to the immediate rather than the long-term, or to local impacts which are linked to global change but disconnected from regional scales. In adaptation politics, people may feel helpless when uncertainty is framed as a risk that has to (and can be) reduced, rather than an aspect that can generate uncomfortable emotions such as anxiety and despair (O'Neill & Nicholson-Cole, 2009). This has deep political and ethical ramifications. It is also fundamentally emotional as people grapple with not only evolving socionatures, but also conflicting messages about climate change (Moser, 2020). Fearful messages attract people's attention, but at the same time, fear is an ineffective tool for motivating genuine personal and community engagement, because it focuses on the individual level. Affects which can trigger a sense of collective need or connection are more likely to generate collective action. The relationship between a sense of urgency and action are thus ultimately contradictory (Orlove et al., 2021), and can justify particular types of action, or remove actions from scrutiny (Hulme, 2020). These outcomes in turn delegitimize the knowledge and strategies of populations, while legitimizing knowledges of those already in authority to act, such as the political elite (Klenk et al., 2017). In contrast to urgency, a focus on relationality helps to decentre from negative, individualized emotions and replace them with collective, multi-scalar emotional and affective relationships with other humans and more-than-humans that have the potential to be transformative instead of paralyzing.

3.3 | Affect as a basis for transformational change

Our third point is the contribution of affect and emotions to understanding action for change. Here we want to be clear that we are not offering a formula or blueprint. Instead, we argue that research, policy, and action need to focus on the

affects (inherently uncertain, unpredictable and ambiguous) that flow when climate change entangles humans and more-than-humans in new ways—whether that be through extreme weather events, through adaptation projects, or through geoengineering for carbon mitigation. Any of these "effects" create new socionatural relations and thus "affects." In adaptation politics, affect and emotions can be mobilized for their possible contribution to processes of social change (Ahmed, 2004): to not only understand the world, but also to imagine something better (Laliberté & Schurr, 2016) and to offer possible responses beyond technological transitions.

The question remains of how to analytically and empirically gain access to affect. The conceptualization of affect as nonrepresentational, causes this literature to be criticized for being too abstract and inadequately political (Anderson, 2012; Pile, 2010, 2011; Thien, 2005). Here we overcome this criticism by drawing on our work on subjectivities as a way to link the operation of power to relational affects between bodies. In adaptation politics, affect is directly linked to subjectivities, or the ways in which people are brought into relations of power (Butler, 1997; Gonda, 2019; Nightingale, 2011; Tschakert & Tuana, 2013). As discussed above, most often subjects are essentialised as groups of "vulnerable," "adapted," or "resilient" people within adaptation debates and programs. This static reading of subjectivity is problematic because one, it neglects the ambiguous and uncertain outcomes of climate change encounters, as per above. In an affective reading, being a "vulnerable person" is always a dynamic, performative, political, and socionatural construction, which is not obligatorily negative, and always relational to the wider, dynamic context. So because vulnerability is an active becoming, we argue that being a vulnerable person is analytically meaningless unless it refers to a specific time, place, and understanding. And two, a static reading of subjectivity fails to account for the ambivalence of the subject, or the moments of often contradictory, internalization and resistance to hegemonic power described in the literature (Butler, 1997; Gonda, 2019; Nightingale, 2011). Affect and subjectivation processes are therefore intimately linked (González-Hidalgo & Zografos, 2017; Nightingale, 2013; Sultana, 2011), but in a nonessentialising manner (Moore, 2008). Apprehending subjectivities through affective relations helps to avoid creating categories of people, and shifts our attention to how power operates to subject humans and more-than-humans in ways that are always relational, uncertain and ambivalent due to the refusal of the subject to simply accept domination. Affect goes beyond understandings of vulnerability as simply a descriptive category and helps to conceptualize how individualized, "vulnerable" subjectivities may decompose and re-form new, collective subjectivities that can sometimes act for change (Bee et al., 2015; Verlie, 2019; Singh, 2017).

Affect, by making us focus on how climate change creates particular, aleatory entanglements of humans and more-than-humans, also allows us to understand better the nuances and paradoxes underpinning adaptation outcomes. An example of such ambivalence and paradox is well known: many adaptation strategies persist that are not tied to tangible material outcomes (Carr, 2008, 2019; Tschakert et al., 2019). For example, in rural Nicaragua, male cattle ranchers desire to have more cattle despite the fact that land is scarce, deforestation is a problem, and possibilities to develop economically more interesting activities than cattle-ranching exist (Gonda, 2017). Yet unsustainable cattle-ranching endures because it relies on hegemonic masculinities whereby men need to engage in various ranching activities to become "real men." Emotions such as pride, and belonging to a collective masculine subjectivity, hook cattle ranchers into damaging activities despite cognitively knowing that they are contributing to climate change. Conceptualizing adaptation as affective helps explain the persistence of environmentally and economically unsustainable activities. Adaptation interventions need to explore how affective relations and emotions can re-construct a collective on different terms that are similarly recognized by the local society and that generate pride among men.

Such an alternative vision of transformation rethinks adaptation as emerging through the entanglements of men's desire to maintain authority in the household, the broader social-political processes at play, and environmental change. Hegemonic masculinity in Nicaragua and beyond is constituted in socionatural relations, creating processes that may render humans and more-than-humans vulnerable. Masculinity impacts other humans and more-than-humans, as well as ranchers' ability to feel the ways that it impacts the self. Our analytical lens goes beyond work on gender and climate change (e.g., Bradshaw, 2016; Hultman, 2017; Pease, 2016) by highlighting the affective dimension of hegemonic masculinities (see also Hultman & Pulé, 2018). This focus unmasks the entanglements between, for example, livelihood security and affective bonds within and beyond households. It also helps to hold in tension how these bonds are affective and political at the same time (e.g., authority is exercised through them). In that sense, affective responsibility entangled with political responsibility—inherent in the way that gender relations place responsibility on certain household members to care for children, the household, and so on—has the potential to harm both men and the environment. Our relational ontology opens up for new questions related to transformation: in particular, how hegemonic masculinities can transform into ecological masculinities (Hultman & Pulé, 2018); masculinities that support environmental sustainability and adaptation to environmental changes. Discussion then shifts from whether certain types of

masculinities are good or bad, to the conditions of care and responsibility toward other humans and nonhumans (e.g., animals, the environment) and the new affective entanglements that can result.

Thinking through affect in this way helps us to understand the catalysts for change; to imagine new deliberative processes that embrace not only politics, but also the affective and more-than-human dynamics that allow new futures.

4 | AFFECTIVE ADAPTATION = EFFECTIVE TRANSFORMATION

So far we have shown how affect opens up new ontologies of transformation to give access to socionatural and other ways of knowing. But what would affective adaptation look like in practice? Our concern, after all, is to understand how to imagine *effective* transformation, changes that result in the just, socionatural worlds that are desired by different collectives.

Understanding adaptation through affective relations can give birth to a totally new scale of data generation and corresponding politics of knowledge. This is well illustrated by drawing on another example from Nicaragua. A 2007 International Centre for Tropical Agriculture (CIAT) study showed that two thirds of the Nicaraguan territories appropriate for coffee production would not be suitable by 2050 due to increasing average temperatures (Zelaya, 2014). A CIAT expert recalled the reactions of the representatives of the Nicaraguan coffee producers' organizations:

> the initial reaction [of the coffee producers] was that... well... by the year 2050 ... [they] would no longer be alive, but then they started to think about it a little bit more... 'well, but if my children will be here on the same farm, what will they produce?' ... [this study], had an important impact and other producers' associations joined because they wanted to know what will happen ... Until that date, normal studies on climate change were done through running the [climate change] models, but there was a need to have studies on its impacts on different sectors (Interview, Managua, 28/10/2014).

The deliberative process culminated with the coffee producers pushing CIAT to generate knowledge about projected future growing conditions that was directly relevant to them, rather than the usual more abstract projections of climate change. In 2012, CIAT's research initiatives fed into the National Adaptation Plan to Climate Change and Variability in the Agriculture, Husbandry, Forestry, and Fisheries Sectors in Nicaragua (GoN, 2013). the Plan incorporated CIAT's sectoral studies demanded by the producers referred to in the quote. These producers represented the coffee and the animal husbandry sectors, which are the most powerful ones. These were the ones who had a seat at the same negotiating table as the policy-makers and the researchers.

The Nicaraguan example shows unsurprisingly how existing relations and economic interests of the most powerful (majority male) actors affect whose uncertainties should be addressed by climate change policies and research. The affective and political framing of uncertainty in adaptation politics shapes in turn affective socionatural relations. In this case, hard data and modeling are not the only tools recognized to tame uncertainty (Bahadur et al., 2013). The deliberative process generated the demand by Nicaraguan coffee producers and cattle ranchers to be part of the decision-making processes in relation to their own and their children's futures, and their insistence that possibilities to stay and work on their ancestral land are important. Affective and emotional relations to other humans and nonhumans shaped how adaptation was envisioned in this case, even if on the surface the politics reflected embedded relations of power. The manifestation of these entanglements will be different in other contexts. The general point, however, remains relevant: affects explain the ambiguous and somewhat surprising shifts in how adaptation dynamics play out.

To give birth to new scalar and knowledge politics in adaptation, affective and emotional relations need to be on the frontline. In the Nicaraguan case, this kind of focus would open up space for smallholder (e.g., less powerful) subsistence producers' interests in the debate. Taking affect as a starting point can draw attention to the emotional and embodied experiences they share with politically and economically powerful producers; in Nicaragua, anxiety for the future of their children, and their emotional ties with ancestral lands and modes of producing. These shared experiences can help create common ground from which to act collectively.

We want to be clear: affective adaptation represents a different ontological take on transformation. Its roots are in interpretations of transformation that insist on opening up political space for contestation of subjectivities, authority, and dominant knowledges (Blythe et al., 2018; Eriksen et al., 2015; Forsyth, 2020; Leach et al., 2020), and that explore how individuals emotional reactions to climate change effect outcomes. (Brown et al., 2019; Tschakert et al., 2019) It

departs from them by reframing the socionatural, normative, and ethical aspects of transformation as relational, aleatory, and performative, directing analytical attention to processes rather than outcomes.

An affective take on adaptation helps understand how the space for affective and embodied knowledge to generate action is *limited* by the politics of knowledge. Emotions and affect are key ingredients of relations through which the status quo is either reinforced (by circumscribing our perception of alternatives, or whose authority we recognize), or resisted; sometimes both at the same time. The affective can therefore explain why the Fridays for Future movement[4] gained such traction, but also the dismissive reactions to it. Outrage among youth—a group typically devoid of political authority—precipitated collective action with significant international traction. The force of this movement might seem surprising from a traditional ontologies of climate (in)action perspective, but looked at through an affective lens, space for change was opened up in the relations that flow between generations, between everyday patterns of living and prospects of a climate insecure future, and between people's different experiences of the socionatural effects of climate change. In keeping with the aleatory nature of affect, some of these same relations underpinned the virulent reactions to the movement, albeit with different emotional reactions on the part of some. For us, it is the affective which creates space for dialogue and change. While as authors deeply invested in climate change debates, we might be disappointed by the malicious responses to Fridays for Future, the fact that contestations have emerged and engendered such strong emotions offers promising prospects for changing the status quo.

5 | CONCLUSION

Affective adaptation is a term we have coined to capture the parallel goals of transformative, climate change adaptation that is effective in producing just, equitable processes, and that transforms embodied, emotional relations between humans and nonhumans. Through a relational ontology, it builds upon transformation literatures that open up political space for shifting subjectivities, authority, scalar assumptions, and dominant knowledges in order to explore how emotional reactions to climate change shape processes of change. It is novel in reframing the socionatural, normative, and ethical aspects of transformation as relational, aleatory, and performative. It insists on processes, rather than outcomes. New possibilities and relations emerge when the focus turns to the *affects* of such encounters, not just *effects*. It gives people (and scientists) a different understanding of their relation to the community and world around them.

While we understand adaptation as a normative outcome, it is not a desired state, but rather relations and processes through which change can be enabled. We draw from work on the politics of adaptation to understand how contested politics, uncertainty, knowledges and subjectivities *constitute* transformation, but depart from it in insisting on the importance of affective knowledge and relations for opening up new ways of being.

Affect captures the aleatory, or uncertain and chancy nature of encounters with environmental change and helps expand conceptually both temporal and spatial scales. Analytically it focuses on three aspects of transformation: (i) the uncertain relations that constitute socionatures, (ii) other ways of knowing, and (iii) the affective and emotional relations that form a basis for action. It allows us to conceptually highlight how change always happens simultaneously *within* (individuals, collectives, societies, and socionatures) and *in relation to* (other humans, groups of humans and nonhumans)—the ability to affect and of being affected. It is rooted in our critique of modern ontologies of environment and society and mind-body, reason-emotion dualisms, which hold them as separate, interacting domains. We replace such binary thinking with concepts capable of conceptualizing the world as socionatural and which hold in view the affective, more-than-human dimensions of all our political and scientific engagements with environmental change.

We are not offering a formula or blueprint. Rather we are arguing that research, policy, and action need to focus on the affects, inherently uncertain and unpredictable, that flow when climate change entangles humans and more-than-humans in particular ways—whether that be through extreme weather events or through adaptation projects or through geoengineering for carbon mitigation. Transformation must operate from the scale of the body to the scale of the body politic if it is to succeed in changing not only human-environment relations, but also in producing more equitable social relations in the face of climatic change. Allowing a focus on affect to permeate our research, education, policies and projects on climate change, and embracing how changes in the atmosphere can never be separated from affective relations of the everyday at an ontological level, can challenge the status quo.

CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

AUTHOR CONTRIBUTIONS

Andrea Nightingale: Conceptualization (lead); data curation (supporting); formal analysis (equal); funding acquisition (lead); investigation (equal); methodology (lead); project administration (equal); supervision (lead); writing – original draft (lead); writing – review and editing (lead). **Noémi Gonda:** Conceptualization (supporting); data curation (lead); formal analysis (equal); funding acquisition (equal); investigation (equal); methodology (supporting); project administration (equal); resources (supporting); supervision (supporting); visualization (lead); writing – original draft (equal); writing – review and editing (equal). **Siri H Eriksen:** Conceptualization (supporting); data curation (supporting); funding acquisition (supporting); writing – original draft (supporting); writing – review and editing (supporting).

DATA AVAILABILITY STATEMENT

Data sharing not applicable, no new data was created for this study.

ORCID

Andrea J. Nightingale https://orcid.org/0000-0001-5343-9576
Noémi Gonda https://orcid.org/0000-0002-1261-8380
Siri H. Eriksen https://orcid.org/0000-0002-6594-2758

ENDNOTES

[1] We disagree with the framing of inner and outer worlds because we understand emotion and affect to always be relational—what flows between.

[2] Names and places have been changed.

[3] We are not rejecting efforts at modeling and prediction, rather suggesting their results need to be used in deliberative processes rather than taken as the only "reality."

[4] Fridays For Future is a youth movement that began in August 2018, after Greta Thunberg and other young activists sat in front of the Swedish parliament every school day for three weeks, to protest against the lack of action on the climate crisis. The movement soon went viral and students around the world left school to protest on a weekly basis.

RELATED WIREs ARTICLES

Contrasting frames in policy debates on climate change adaptation
Community-based adaptation: a review of past and future challenges
Addressing the risk of maladaptation to climate change
The IPCC and the new map of science and politics
The political impacts of adaptation actions: Social contracts, a research agenda
Responsibility for climate change adaptation
The framing of power in climate change adaptation research
Global adaptation governance: An emerging but contested domain

REFERENCES

Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., Naess, L. O., Wolf, J., & Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, *93*(3–4), 335–354. https://doi.org/10.1007/s10584-008-9520-z

Ahmed, S. (2004). Collective feelings: Or, the impressions left by others. *Theory, Culture & Society*, *21*(2), 25–42. https://doi.org/10.1177/0263276404042133

Ahmed, S. (2014). *The cultural politics of emotion* (2nd ed.). Edinburgh University Press.

Ajibade, I. (2017). Can a future city enhance urban resilience and sustainability? A political ecology analysis of Eko Atlantic city, Nigeria. *International Journal of Disaster Risk Reduction*, *26*, 85–92. https://doi.org/10.1016/j.ijdrr.2017.09.029

Anderson, B. (2005). Practices of judgement and domestic geographies of affect. *Social & Cultural Geography*, *6*(5), 645–659. https://doi.org/10.1080/14649360500298308

Anderson, B. (2009). Affective atmospheres. *Emotion, Space and Society*, *2*(2), 77–81. https://doi.org/10.1016/j.emospa.2009.08.005

Anderson, B. (2012). Affect and biopower: Towards a politics of life. *Transactions of the Institute of British Geographers*, *37*(1), 28–43. https://doi.org/10.1111/j.1475-5661.2011.00441.x

Antwi-Agyei, P., Dougill, A. J., Stringer, L. C., & Codjoe, S. N. A. (2018). Adaptation opportunities and maladaptive outcomes in climate vulnerability hotspots of northern Ghana. *Climate Risk Management*, *19*, 83–93. https://doi.org/10.1016/j.crm.2017.11.003

Arifeen, A., & Eriksen, S. (2020). The politics of disaster vulnerability: Flooding, post-disaster interventions and water governance in Baltistan, Pakistan. *Environment and Planning E: Nature and Space*, *3*(4), 1137–1157.

Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. *Global Environmental Change*, *21*(2), 744–751. https://doi.org/10.1016/j.gloenvcha.2011.01.005

Atteridge, A., & Remling, E. (2018). Is adaptation reducing vulnerability or redistributing it? *Wiley interdisciplinary Reviews: Climate Change*, *9*(1), e500. https://doi.org/10.1002/wcc.500

Bahadur, A. V., Ibrahim, M., & Tanner, T. (2013). Characterising resilience: Unpacking the concept for tackling climate change and development. *Climate and Development*, *5*(1), 55–65. https://doi.org/10.1080/17565529.2012.762334

Bee, B. A., Rice, J., & Trauger, A. (2015). A feminist approach to climate change governance: Everyday and intimate politics. *Geography Compass*, *9*(6), 339–350.

Blackburn, S. (2018). What does transformation look like? Post-disaster politics and the case for progressive rehabilitation. *Sustainability*, *10*(7), 2317.

Blackburn, S., & Pelling, M. (2018). The political impacts of adaptation actions: Social contracts, a research agenda. *Wiley Interdisciplinary Reviews: Climate Change*, *9*(6), e549. https://doi.org/10.1002/wcc.549

Blythe, J., Silver, J., Evans, L., Armitage, D., Bennett, N. J., Moore, M.-L., Morrison, T. H., & Brown, K. (2018). The dark side of transformation: Latent risks in contemporary sustainability discourse. *Antipode*, *50*(5), 1206–1223. https://doi.org/10.1111/anti.12405

Bond, S., & Barth, J. (2020). Care-full and just: Making a difference through climate change adaptation. *Cities*, *102*, 102734. https://doi.org/10.1016/j.cities.2020.102734

Bradshaw, S. (2016). Rereading gender and patriarchy through a "lens of masculinity". The "known" story and new narratives from post-Mitch Nicaragua. In E. Enarson & B. Pease (Eds.), *Men, masculinities and disaster* (pp. 56–65). Routledge.

Brown, J. C., & Purcell, M. (2005). There's nothing inherent about scale: Political ecology, the local trap, and the politics of development in the Brazilian Amazon. *Geoforum*, *36*(5), 607–624.

Brown, K., Adger, W. N., Devine-Wright, P., Anderies, J. M., Barr, S., Bousquet, F., Butler, C., Evans, L., Marshall, N., & Quinn, T. (2019). Empathy, place and identity interactions for sustainability. *Global Environmental Change*, *56*, 11–17. https://doi.org/10.1016/j.gloenvcha.2019.03.003

Bulkeley, H. (2012). Governance and the geography of authority: Modalities of authorisation and the transnational governing of climate. *Environment and Planning A*, *44*, 2428–2444.

Butler, J. (1997). *The psychic life of power: Theories in subjection*. Stanford University Press.

Butler, J. (2009). *Frames of war: When is life grievable?* Verso Books.

Carr, E. R. (2008). Between structure and agency: Livelihoods and adaptation in Ghana's Central Region. *Global Environmental Change*, *18*(4), 689–699. https://doi.org/10.1016/j.gloenvcha.2008.06.004

Carr, E. R. (2019). Properties and projects: Reconciling resilience and transformation for adaptation and development. *World Development*, *122*, 70–84. https://doi.org/10.1016/j.worlddev.2019.05.011

Catney, P., MacGregor, S., Dobson, A., Hall, S. M., Royston, S., Robinson, Z., Ormerod, M., & Ross, S. (2014). Big society, little justice? Community renewable energy and the politics of localism. *Local Environment*, *19*(7), 715–730.

Clayton, S., Warden, L., & Opotow, S. (2003). *Identity and the natural environment: The psychological significance of nature*. MIT Press.

Cote, M., & Nightingale, A. J. (2012). Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research. *Progress in Human Geography*, *36*(4), 475–489. https://doi.org/10.1177/0309132511425708

Curti, G. H., Aitken, S. C., Bosco, F. J., & Goerisch, D. D. (2011). For not limiting emotional and affectual geographies: A collective critique of Steve Pile's' emotions and affect in recent human geography. *Transactions of the Institute of British Geographers*, *36*(4), 590–594.

Dawney, L. (2013). The interruption: Investigating subjectivation and affect. *Environment and Planning D: Society and Space*, *31*(4), 628–644. https://doi.org/10.1068/d9712

Dawney, L. (2018). *The affective life of power*. SAGE Publications.

Dolšak, N., & Prakash, A. (2018). The politics of climate change adaptation. *Annual Review of Environment and Resources*, *43*(1), 317–341. https://doi.org/10.1146/annurev-environ-102017-025739

Edensor, T. (2012). Illuminated atmospheres: Anticipating and reproducing the flow of affective experience in Blackpool. *Environment and Planning D: Society and Space*, *30*(6), 1103–1122. https://doi.org/10.1068/d12211

Eriksen, S., Schipper, E. L. F., Scoville-Simonds, M., Vincent, K., Adam, H. N., Brooks, N., Harding, B., Khatri, D., Lenaerts, L., Liverman, D., Mills-Novoa, M., Mosberg, M., Movik, S., Muok, B., Nightingale, A., Ojha, H., Sygna, L., Taylor, M., Vogel, C., & West, J. J. (2021). Adaptation interventions and their effect on vulnerability in developing countries: Help, hindrance or irrelevance? *World Development*, *141*, 105383. https://doi.org/10.1016/j.worlddev.2020.105383

Eriksen, S. H., Nightingale, A. J., & Eakin, H. (2015). Reframing adaptation: The political nature of climate change adaptation. *Global Environmental Change*, *35*, 523–533. https://doi.org/10.1016/j.gloenvcha.2015.09.014

Fazey, I., Moug, P., Allen, S., Beckmann, K., Blackwood, D., Bonaventura, M., Burnett, K., Danson, M., Falconer, R., Gagnon, A. S., Harkness, R., Hodgson, A., Holm, L., Irvine, K. N., Low, R., Lyon, C., Moss, A., Moran, C., Naylor, L., ... Wolstenholme, R. (2018). Transformation in a changing climate: A research agenda. *Climate and Development*, *10*(3), 197–217. https://doi.org/10.1080/17565529.2017.1301864

Feola, G. (2015). Societal transformation in response to global environmental change: A review of emerging concepts. *AMBIO*, *44*(5), 376–390. https://doi.org/10.1007/s13280-014-0582-z

Fernandes-Jesus, M., Carvalho, A., Fernandes, L., & Bento, S. (2017). Community engagement in the transition movement: Views and practices in Portuguese initiatives. *Local Environment*, *22*(12), 1546–1562. https://doi.org/10.1080/13549839.2017.1379477

Fisher, S., & Dodman, D. (2019). Urban climate change adaptation as social learning: Exploring the process and politics. *Environmental Policy and Governance*, *29*(3), 235–247. https://doi.org/10.1002/eet.1851

Forsyth, T. (2020). Who shapes the politics of expertise? Co-production and authoritative knowledge in Thailand's political forests. *Antipode*, *52*(4), 1039–1059.

Ginn, F. (2014). Sticky lives: Slugs, detachment and more-than-human ethics in the garden. *Transactions of the Institute of British Geographers*, *39*(4), 532–544.

Goldman, M. J., Daly, M., & Lovell, E. J. (2016). Exploring multiple ontologies of drought in agro-pastoral regions of northern Tanzania: A topological approach. *Area*, *48*(1), 27–33. https://doi.org/10.1111/area.12212

Goldman, M. J., & Riosmena, F. (2013). Adaptive capacity in Tanzanian Maasailand: Changing strategies to cope with drought in fragmented landscapes. *Global Environmental Change*, *23*(3), 588–597. https://doi.org/10.1016/j.gloenvcha.2013.02.010

GoN. (2013). Plan de Adaptación a la Variabilidad y El Cambio Climático en el Sector Agropecuario, Forestal y Pesca En Nicaragua [Adaptation Plan to Climate Change and Climate Variability in the Agriculture, Husbandry, Forestry and Fisheries Sectors in Nicaragua]." Retrieved from Managua, Nicaragua

Gonda, N. (2016). Climate change "technology" and gender: Adapting women to climate change with cooking stoves and water reservoirs. *Gender, Technology and Development*, *20*(2), 1–20.

Gonda, N. (2017). Rural masculinities in tension: Barriers to climate change adaptation in Nicaragua. In S. MacGregor & N. Seymour (Eds.), *RCC perspectives: Transformations in environment and society 2017* (Vol. 4, pp. 69–76). Rachel Carson Centre.

Gonda, N. (2019). Re-politicizing the gender and climate change debate: The potential of feminist political ecology to engage with power in action in adaptation policies and projects in Nicaragua. *Geoforum*, *106*, 87–96. https://doi.org/10.1016/j.geoforum.2019.07.020

González-Hidalgo, M. (2020). The ambivalent political work of emotions in the defence of territory, life and the commons. *Environment and Planning E: Nature and Space*, 2514848620961737. https://doi.org/10.1177/2514848620961737

González-Hidalgo, M., & Zografos, C. (2017). How sovereignty claims and "negative" emotions influence the process of subject-making: Evidence from a case of conflict over tree plantations from southern Chile. *Geoforum*, *78*, 61–73. https://doi.org/10.1016/j.geoforum.2016.11.012

González-Hidalgo, M., & Zografos, C. (2019). Emotions, power, and environmental conflict: Expanding the 'emotional turn' in political ecology. *Progress in Human Geography*, *44*(2), 235–255. https://doi.org/10.1177/0309132518824644

Haraway, D. J. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press.

Hardt, M. (1999). Affective labor. *Boundary 2*, *26*(2), 89–100.

Hochachka, G. (2019). On matryoshkas and meaning-making: Understanding the plasticity of climate change. *Global Environmental Change*, *57*, 101917.

Holland, B. (2017). Procedural justice in local climate adaptation: Political capabilities and transformational change. *Environmental Politics*, *26*(3), 391–412. https://doi.org/10.1080/09644016.2017.1287625

Hulme, M. (2010). Problems with making and governing global kinds of knowledge. *Global Environmental Change*, *20*(4), 558–564. https://doi.org/10.1016/j.gloenvcha.2010.07.005

Hulme, M. (2011). Reducing the future to climate: A story of climate determinism and reductionism. *Osiris*, *26*(1), 245–266.

Hulme, M. (2018). "Gaps" in climate change knowledge: Do they exist? Can they be filled? *Environmental Humanities*, *10*(1), 330–337. https://doi.org/10.1215/22011919-4385599

Hulme, M. (2020). Is it too late (to stop dangerous climate change)? An editorial. *Wiley Interdisciplinary Reviews: Climate Change*, *11*(1), e619.

Hultman, M. (2017). Natures of masculinities. Conceptualising industrial, ecomodern and ecological masculinities. In S. Buckingham & V. Le Masson (Eds.), *Understanding climate change through gender relations* (pp. 87–103). Routledge.

Hultman, M., & Pulé, P. M. (2018). *Ecological masculinities: Theoretical foundations and practical guidance*. Routledge.

Ives, C. D., Freeth, R., & Fischer, J. (2020). Inside-out sustainability: The neglect of inner worlds. *Ambio*, *49*(1), 208–217.

Jasanoff, S. (2004). *States of knowledge: The co-production of science and the social order*. Routledge.

Klenk, N., Fiume, A., Meehan, K., & Gibbes, C. (2017). Local knowledge in climate adaptation research: Moving knowledge frameworks from extraction to co-production. *Wiley Interdisciplinary Reviews: Climate Change*, *8*(5), e475. https://doi.org/10.1002/wcc.475

Kmoch, L., Pagella, T., Palm, M., & Sinclair, F. (2018). Using local Agroecological knowledge in climate change adaptation: A study of tree-based options in northern Morocco. *Sustainability*, *10*(10). https://doi.org/10.3390/su10103719

Laliberté, N., & Schurr, C. (2016). Introduction. *Gender, Place & Culture*, *23*(1), 72–78. https://doi.org/10.1080/0966369X.2014.992117

Leach, M., MacGregor, H., Scoones, I., & Wilkinson, A. (2020). Post-pandemic transformations: How and why COVID-19 requires us to rethink development. *World Development*, *138*, 105233. https://doi.org/10.1016/j.worlddev.2020.105233

Lorimer, H. (2008). Cultural geography: Non-representational conditions and concerns. *Progress in Human Geography*, *32*(4), 551–559. https://doi.org/10.1177/0309132507086882

Lövbrand, E., Beck, S., Chilvers, J., Forsyth, T., Hedrén, J., Hulme, M., Lidskog, R., & Vasileiadou, E. (2015). Who speaks for the future of earth? How critical social science can extend the conversation on the Anthropocene. *Global Environmental Change*, *32*, 211–218. https://doi.org/10.1016/j.gloenvcha.2015.03.012

MacGregor, S. (2010). 'Gender and climate change': From impacts to discourses. *Journal of the Indian Ocean Region*, *6*(2), 223–238. https://doi.org/10.1080/19480881.2010.536669

Magnan, A. K., Schipper, E. L. F., Burkett, M., Bharwani, S., Burton, I., Eriksen, S., Gemenne, F., Schaar, J., & Ziervogel, G. (2016). Addressing the risk of maladaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, *7*(5), 646–665. https://doi.org/10.1002/wcc.409

Maiese, M. (2017). Transformative learning, enactivism, and affectivity. *Studies in Philosophy and Education*, *36*(2), 197–216.

Mikulewicz, M. (2021). Disintegrating labour relations and depoliticised adaptation to climate change in rural São Tomé and Príncipe. *Area*, *53*, 422–430. https://doi.org/10.1111/area.12630

Miller, C. A., & Wyborn, C. (2020). Co-production in global sustainability: Histories and theories. *Environmental Science & Policy*, *113*, 88–95. https://doi.org/10.1016/j.envsci.2018.01.016

Moore, N. (2008). The rise and rise of ecofeminism as a development fable: A response to Melissa Leach's 'earth mothers and other ecofeminist fables: How a strategic notion rose and fell'. *Development and Change*, *39*(3), 461–475. https://doi.org/10.1111/j.1467-7660.2008.00488.x

Moser, S. C. (2020). The work after "It's too late" (to prevent dangerous climate change). *WIREs Climate Change*, *11*(1), e606. https://doi.org/10.1002/wcc.606

Murtinho, F., Eakin, H., López-Carr, D., & Hayes, T. M. (2013). Does external funding help adaptation? Evidence from community-based water Management in the Colombian Andes. *Environmental Management*, *52*(5), 1103–1114. https://doi.org/10.1007/s00267-013-0156-z

Nightingale, A. J. (2011). Bounding difference: Intersectionality and the material production of gender, caste, class and environment in Nepal. *Geoforum*, *42*(2), 153–162.

Nightingale, A. J. (2013). Fishing for nature: The politics of subjectivity and emotion in Scottish inshore fisheries management. *Environment and Planning A*, *45*(10), 2362–2378 Retrieved from http://www.envplan.com/abstract.cgi?id=a45340

Nightingale, A. J. (2017). Power and politics in climate change adaptation efforts: Struggles over authority and recognition in the context of political instability. *Geoforum*, *84*(August), 11–20. https://doi.org/10.1016/j.geoforum.2017.05.011

Nightingale, A. J. (2018). The socioenvironmental state: Political authority, subjects, and transformative socionatural change in an uncertain world. *Environment and Planning E: Nature and Space*, *1*(4), 688–711. https://doi.org/10.1177/2514848618816467

Nightingale, A. J., Eriksen, S. H., Taylor, M., Forsyth, T., Pelling, M., Newsham, A., Boyd, E., Brown, K., Harvey, B., Jones, L., Bezner Kerr, R., Mehta, L., Naess, L. O., Ockwell, D., Scoones, I., Tanner, T., & Whitfield, S. (2020). Beyond technical fixes: Climate solutions and the great derangement. *Climate and Development*, *12*(4), 343–352. https://doi.org/10.1080/17565529.2019.1624495

O'Brien, K. (2018). Is the 1.5°C target possible? Exploring the three spheres of transformation. *Current Opinion in Environmental Sustainability*, *31*, 153–160. https://doi.org/10.1016/j.cosust.2018.04.010

O'Brien, K., & Sygna, L. (2013). Responding to climate change: The three spheres of transformation. *Proceedings of Transformation in a Changing Climate*, 19–21.

Ojha, H. R., Paudel, N. S., Banjade, M. R., McDougall, C., & Cameron, J. (2010). The deliberative scientist: Integrating science and politics in forest resource governance in Nepal. In *Beyond the biophysical* (pp. 167–191). Springer.

Ojha, H. R., Regmi, U., Shrestha, K. K., Paudel, N. S., Amatya, S. M., Zwi, A. B., Nuberg, I., Cedamon, E., & Banjade, M. R. (2020). Improving science-policy interface: Lessons from the policy lab methodology in Nepal's community forest governance. *Forest Policy and Economics*, *114*, 101997. https://doi.org/10.1016/j.forpol.2019.101997

O'Lear, S. (2016). Climate science and slow violence: A view from political geography and STS on mobilizing technoscientific ontologies of climate change. *Political Geography*, *52*, 4–13. https://doi.org/10.1016/j.polgeo.2015.01.004

O'Neill, S., & Nicholson-Cole, S. (2009). "Fear won't do it" promoting positive engagement with climate change through visual and iconic representations. *Science Communication*, *30*(3), 355–379.

Orlove, B., Shwom, R., Markowitz, E., & Cheong, S.-M. (2021). Climate decision-making. *Annual Review of Environment and Resources*, *45*(1), 271–303. https://doi.org/10.1146/annurev-environ-012320-085130

Pease, B. (2016). Masculinism, climate change and "man-made" disasters: Toward and environmental profeminist response. In E. Enarson & B. Pease (Eds.), *Men, masculinities and disaster* (pp. 21–33). Routledge.

Pelling, M. (2011). *Adaptation to climate change, from resilience to adaptation* (Vol. XIV, p. 203). Routledge.

Pelling, M., O'Brien, K., & Matyas, D. (2015). Adaptation and transformation. *Climatic Change*, *133*(1), 113–127. https://doi.org/10.1007/s10584-014-1303-0

Pieck, S. K. (2013). Transnational activist networks: Mobilization between emotion and bureaucracy. *Social Movement Studies*, *12*(2), 121–137. https://doi.org/10.1080/14742837.2012.664423

Pile, S. (2010). Emotions and affect in recent human geography. *Transactions of the Institute of British Geographers*, *35*(1), 5–20. https://doi.org/10.1111/j.1475-5661.2009.00368.x

Pile, S. (2011). For a geographical understanding of affect and emotions. *Transactions of the Institute of British Geographers*, *36*(4), 603–606. https://doi.org/10.1111/j.1475-5661.2011.00463.x

Ruddick, S. (2010). The politics of affect: Spinoza in the work of Negri and Deleuze. *Theory, Culture & Society*, *27*(4), 21–45.

Schipper, E. L. F., Ayers, J., Reid, H., Huq, S., & Rahman, A. (2014). *Community-based adaptation to climate change: scaling it up*. Routledge.

Schipper, E. L. F., Eriksen, S. H., Fernandez Carril, L. R., Glavovic, B. C., & Shawoo, Z. (2021). Turbulent transformation: Abrupt societal disruption and climate resilient development. *Climate and Development*, *13*(6), 467–474. https://doi.org/10.1080/17565529.2020.1799738

Scoones, I., Stirling, A., Abrol, D., Atela, J., Charli-Joseph, L., Eakin, H., Ely, A., Olsson, P., Pereira, L., Priya, R., van Zwanenberg, P., & Yang, L. (2020). Transformations to sustainability: Combining structural, systemic and enabling approaches. *Current Opinion in Environmental Sustainability*, *42*, 65–75. https://doi.org/10.1016/j.cosust.2019.12.004

Scoville-Simonds, M. (2018). Climate, the earth, and god–entangled narratives of cultural and climatic change in the Peruvian Andes. *World Development*, *110*, 345–359. https://doi.org/10.1016/j.worlddev.2018.06.012

Sharma, M. (2017). *Radical transformational leadership: Strategic action for change agents*. North Atlantic Books.

Singh, N. M. (2013). The affective labor of growing forests and the becoming of environmental subjects: Rethinking environmentality in Odisha, India. *Geoforum*, *47*, 189–198. https://doi.org/10.1016/j.geoforum.2013.01.010

Singh, N. M. (2017). Becoming a commoner: The commons as sites for affective socio-nature encounters and co-becomings. *Ephemera: Theory & Politics in Organization*, *17*(4), 1–17.

Sultana, F. (2011). Suffering for water, suffering from water: Emotional geographies of resource access, control and conflict. *Geoforum*, *42*(2), 163–172. https://doi.org/10.1016/j.geoforum.2010.12.002

Taylor, M. (2014). *The political ecology of climate change adaptation: Livelihoods, agrarian change and the conflicts of development*. London and New York: Routledge.

Thien, D. (2005). After or beyond feeling? A consideration of affect and emotion in geography. *Area*, *37*(4), 450–454 Retrieved from http://www.jstor.org/stable/20004485

Thrift, N. (2008). *Non-representational theory: Space, politics, affect*. Routledge.

Tschakert, P., Ellis, N. R., Anderson, C., Kelly, A., & Obeng, J. (2019). One thousand ways to experience loss: A systematic analysis of climate-related intangible harm from around the world. *Global Environmental Change*, *55*, 58–72.

Tschakert, P., & Tuana, N. (2013). Situated resilience: Reframing vulnerability and security in the context of climate change. In J. Dugard, A. L. S. Clair, & S. Gloppen (Eds.), *Climate change talk: Rights, poverty and justice* (pp. 75–96). Juta Press.

Tschakert, P., Tuana, N., Westskog, H., Koelle, B., & Afrika, A. (2016). TCHANGE: The role of values and visioning in transformation science. *Current Opinion in Environmental Sustainability*, *20*, 21–25. https://doi.org/10.1016/j.cosust.2016.04.003

Verlie, B. (2019). "Climatic-affective atmospheres": A conceptual tool for affective scholarship in a changing climate. *Emotion, Space and Society*, *33*, 100623. https://doi.org/10.1016/j.emospa.2019.100623

Vermeulen, S. J., Dinesh, D., Howden, S. M., Cramer, L., & Thornton, P. K. (2018). Transformation in practice: A review of empirical cases of transformational adaptation in agriculture under climate change. *Frontiers in Sustainable Food Systems*, *2*, 65. https://doi.org/10.3389/fsufs.2018.00065

Warner, J. F., Wesselink, A. J., & Geldof, G. D. (2018). The politics of adaptive climate management: Scientific recipes and lived reality. *Wiley Interdisciplinary Reviews: Climate Change*, *9*(3), e515.

Wijsman, K., & Feagan, M. (2019). Rethinking knowledge systems for urban resilience: Feminist and decolonial contributions to just transformations. *Environmental Science & Policy*, *98*, 70–76. https://doi.org/10.1016/j.envsci.2019.04.017

Wolf, J., Adger, W. N., Lorenzoni, I., Abrahamson, V., & Raine, R. (2010). Social capital, individual responses to heat waves and climate change adaptation: An empirical study of two UK cities. *Global Environmental Change*, *20*(1), 44–52.

Wolf, J., & Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: Insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change*, *2*(4), 547–569.

Ziervogel, G., Pelling, M., Cartwright, A., Chu, E., Deshpande, T., Harris, L., Hyams, K., Kaunda, J., Klaus, B., & Michael, K. (2017). Inserting rights and justice into urban resilience: A focus on everyday risk. *Environment and Urbanization*, *29*(1), 123–138.

How to cite this article: Nightingale, A. J., Gonda, N., & Eriksen, S. H. (2022). Affective adaptation = effective transformation? Shifting the politics of climate change adaptation and transformation from the status quo. *Wiley Interdisciplinary Reviews: Climate Change*, *13*(1), e740. https://doi.org/10.1002/wcc.740