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Climate Change Adaptation: New Vistas for Management Research

Mirko H. Benischke[a], Beatrice D'Ippolito[b], Garima Sharma[c] and Christopher Wickert[d]

[a]Erasmus University; [b]University of York; [c]American University; [d]Vrije Universiteit Amsterdam

ABSTRACT Climate change adaptation has for a long time been the neglected half of the climate equation, as most attention has been directed toward mitigation. Yet, the catastrophic effects of a changing climate are already occurring, unavoidable, and in many cases irreversible. Organizations need to identify ways of adapting to present and future climatic conditions. In this editorial, we make the case for climate change adaptation as a research topic on par with mitigation. We outline how and why management and organizational scholarship should work toward an integrated approach of mitigation and adaptation in responding to climate change, suggesting three key avenues of research for future inquiry. In so doing, we encourage more impactful and ecologically relevant management research that will make a difference to society at large.

Keywords: adaptation, climate change, management theory, mitigation, organization theory, sustainability

INTRODUCTION

> *As current weather events already show, mitigation is not enough. The climate emergency is already here, and people are already suffering. We must get ready, be ready*. UN Climate Change Executive Secretary, Patricia Espinosa.

Our planet is warming. People are facing new realities of extreme heat and other turbulent weather conditions, including organizations and managers. Businesses and industries have begun to reorganize how they manage their workforce, produce goods and services, such as flood-resistant varieties of crops (Wallace-Wells, 2024),

Address for reprints: Mirko H. Benischke, Department of Strategic Management and Entrepreneurship, Rotterdam School of Management, Erasmus University, Burgemeester Oudlaan 50, Rotterdam 3042 NA, The Netherlands (benischke@rsm.nl).

and construct buildings, infrastructure, and supply chains to be more resilient to natural disasters (Clément and Rivera, 2017; Flavelle, 2024); this is known as 'climate change adaptation' (CCA) and is defined as harm-moderating 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects' (IPCC, 2001, p. 982). According to Schipper, 'adapting to climate change is necessary to ensure that the impacts will not overwhelm societies and ecosystems around the world' (Schipper, 2020, p. 409).

Even though climate change as a phenomenon has found its way into mainstream management research, much of the work has focused on organizations' efforts to *mitigate* climate change (Bansal and Hoffman, 2011; Doh et al., 2019; for notable exceptions, see Linnenluecke and Griffiths, 2010, 2012; Meijerink and Stiller, 2013; Nyberg and Wright, 2024; Scholten et al., 2015; Tashman and Rivera, 2016; Wissman et al., 2024). The IPCC describes mitigation as an intervention 'to reduce the sources or enhance the sinks of greenhouse gases' (2001, p. 990), and the reduction of organizations' greenhouse gas emissions has indeed been the focus of most management research (Berrone et al., 2013; Hoffman, 2005; Kolk and Pinkse, 2005; Reid and Toffel, 2009). As a result of this overwhelming focus on mitigation-related questions, our understanding of what will be needed to successfully facilitate organizational climate change *adaptation* strategies, practices, and procedures remains critically underdeveloped.

Lack of understanding of the managerial implications of CCA is problematic, as CCA is fast becoming a necessity for many organizations. Indeed, while efforts to mitigate climate change will undoubtedly remain critical, there is an understanding that the likelihood of these endeavours being completely successful is low (UNFCCC, 2022). Adapting to the new realities of climate change is something most if not all organizations cannot avoid or escape if they intend to remain viable. CCA is not an alternative to climate change mitigation, but must, according to UN Secretary General Antonio Guterres, be seen as the other 'half of the climate equation' (UNFCCC, 2021) of organizational responses to changing environmental conditions due to global warming.

For management scholars to stay relevant in conversations on the 'greatest challenge we confront in the 21st century' (Howard-Grenville et al., 2014, p. 615; see also Buckley et al., 2017; Fernhaber and Zou, 2022; Howard-Grenville and Lahneman, 2021; Rivera et al., 2022; Whiteman et al., 2013; Williams et al., 2024), we argue that it is critical to develop a model that more accurately explains organizational CCA and reflects on the strategies, practices, and procedures that may unfold in managerial and organizational contexts, most prominently business and policy. Although scholars have started to highlight the unique challenges associated with the management of CCA (e.g., Doh et al., 2019; Linnenluecke and Griffiths, 2010, 2012; Tashman and Rivera, 2016; Winn et al., 2011), we lack a research program that systematically addresses CCA (Howard-Grenville and Lahneman, 2021). As a result, management scholars and business decision-makers, as well as societal stakeholders, currently lack clear insight and guidance as to which evidence-based practices can help in the effective management of the CCA process.

One possible explanation for the lack of dedicated CCA research in management could be that there is already a large body of research on *organizational adaptation*. Adaptation is recognized as 'intentional decision making undertaken by organizational members,

leading to observable actions that aim to reduce the distance between an organization and its economic and institutional environments' (Sarta et al., 2021, p. 43). This body of work assumes that existing ways of decision-making suffice to accomplish CCA, converting climate change issues 'into the mundane and comfortable concerns of business as usual' (Wright and Nyberg, 2017, p. 1633). However, climate change-related shocks are unique and do not follow typical behaviours organizations have had to adapt to in the past (Doh et al., 2019; Yoon et al., 2024). These shocks are interdependent with the natural environment and are systematic such that they are only to some extent predictable. Specifically, some types of climate shock will happen with increased likelihood and frequency, but we do not know where, when, and how severe.

For example, consistent with traditional organizational adaptation literature, the few studies that address CCA-related questions have conceptualized CCA as a problem of a misfit between an organization's internal arrangements and the demands of the external environment, which in this case is the natural environment (e.g., Linnenluecke and Griffiths, 2010; Tashman and Rivera, 2016). What is problematic is that in these studies, the natural environment is often assumed away and the focus is on the adaptive response by the organization. However, in the climate change context, it is essential to consider that organizations are not only affected by changes in the natural environment, but organizational adaptation to climate change will itself influence the natural environment (Tashman, 2021). Not considering this recursive feedback loop increases the risk of maladaptation, 'where exposure and sensitivity to climate change impacts are instead increased as a result of action taken' (Schipper, 2020, p. 409). For example, firms having operations in contexts of extreme heat may adapt by equipping buildings with enhanced cooling technologies but, in return, consume more energy and other resources than before. The result is an even greater contribution and therefore vulnerability to climate change than before, as well as greater sunk and opportunity costs. The question, therefore, is not only *whether* organizations should adapt to climate change, but more importantly *how* they should adapt.

Likewise, management scholars interested in climate change research may have sidestepped a deeper engagement with CCA because of the increasing interest in organizational *resilience* (e.g., Hernes et al., 2025). However, while we acknowledge that prior management research has attempted to accommodate CCA in the concept of resilience (e.g., Linnenluecke et al., 2012; Tashman, 2021), these studies take for granted many of the same assumptions inherent in the traditional adaptation literature. Consequently, some argue that '[r]esilience and adaptation are distinct, though related, however, in that resilience is the outcome of effective adaptation' (Howard-Grenville and Lahneman, 2021, p. 479), and so adaptation is worthy of its own investigation.

In light of these complications and the limited attention to CCA, the objective of our editorial is to urge and inspire management scholars interested in studying CCA to build a robust body of knowledge in the subject with a view not only to theoretical advancement, but also to more impactful and ecologically relevant research. Such research can yield not only practical implications for management and organizations, but also policy implications for decision-making bodies such as the IPCC who struggle to translate science-based climate targets into real-world organizational goals and strategies.

Even though not a focus of this editorial, it is important to acknowledge that work in other scientific disciplines – such as engineering, environmental studies, natural sciences, and political sciences – has examined the interaction between biophysical and social systems, including organizations (e.g., Adger et al., 2009; Baer and Risbey, 2009; Keskitalo and Preston, 2019; Linham and Nicholls, 2010). The focus of much of this research has been on identifying the human and organizational interventions that shape the adaptability and resilience of biophysical systems. Building on this body of work, management scholars – through a focus on the role of business and organizations – have the unique opportunity to enhance these insights, especially the role of the organizational and social contexts in which CCA decisions take place.

In what follows, we begin by clarifying what CCA is (and is not) and move on to build an agenda around key research themes that we hope will inspire new investigations into CCA. Our aim is to move the conversation forward on CCA in managerial and organizational contexts.

CLARIFYING THE PHENOMENON: WHAT CLIMATE CHANGE ADAPTATION IS (NOT)

Management scholars may experience several challenges when studying CCA, leading to barriers in publishing research on CCA in mainstream journals. For example, when CCA is considered as an easy and less costly alternative to mitigation, it can be a controversial idea within policy and NGO circles. The concern is that advances in CCA may signal to businesses that they can avoid meaningful mitigation strategies and continue with business as usual (Wright and Nyberg, 2017), believing technological advancements are sufficient for adapting to climate change-related consequences, which in turn could thwart the impetus to mitigate climate change (Pielke Jr. et al., 2007). Relatedly, management scholars interested in CCA may find themselves cited for the wrong reasons, namely, to justify a practitioner's focus on methods of accommodating a warming planet rather than on solving the underlying problem of climate change (Giddens, 2009). These concerns are certainly valid but assume a unidimensional view of CCA as if the choice were either mitigation *or* adaptation and, as such, come in the way of proactive solution-making.

Furthermore, management scholars pursuing research questions related to CCA may find it difficult to differentiate their work from research – often with a long history – that addresses related phenomena such as organizational adaptation and crisis management. This is a missed opportunity. There is momentum for management scholars to leverage the unique features of CCA and advance the broad research on climate change within management studies (Von Krogh et al., 2012), bolstering both rigorous research and impact on policy and practice.

Organizational Climate Change Adaptation Is Not Organizational Adaptation

One major challenge relates to the blurred lines between CCA and other organizational phenomena related to adaptation. Organizational adaptation literature has been around for

a long time and the phenomenon is well studied (Sarta et al., 2021). Because of this, many view CCA as a variation of organizational adaptation, meaning that only minor modifications or extensions to existing theories of organizational adaptation are needed to explain CCA antecedents, processes, and outcomes. However, this view is problematic; CCA is a theoretically distinct case which must not be forced into pre-existing frameworks of organizational adaptation. Table I summarizes the key differences between traditional organizational adaptation and CCA, analysing their unique focus, drivers, objectives and outcomes, limits, and key risks addressed. These differences reflect the interaction between the biophysical and socio-economic environments in which CCA decisions take place (Tashman, 2021). Due to these differences, existing theories of organizational adaptation are ill-adapted to guide organizational CCA (Howard-Grenville and Lahneman, 2021).

For the most part, research on organizational adaptation views natural resources in the context of their impact on organizational processes but ignores important issues such as negative externalities that their exploitation can have for society at large (e.g., Bansal et al., 2024). One of the reasons why these externalities are often underemphasized is that it is assumed that policy will address them by adapting regulatory frameworks;

Table I. Differences between traditional organizational adaptation and climate change adaptation

	Traditional organizational adaptation	*Organizational climate change adaptation*
Focus	*Inward-looking*, that is, organization-centric; focus on changing internal processes, structures, and strategies within an organization to respond to external market forces, technological changes, or shifts in consumer demand	*Outward looking*, that is, multi-stakeholder centric; focus on reevaluating interactions with the external natural environment, such as ecological impact and community involvement
Drivers	*Misfit* between the organization's internal activities, resources and capabilities, and the evolving demands of the external competitive and market environment	*Loss of access* to ecological goods and services due to disruptions in natural processes producing them, or the absence of technological alternatives
Objectives and outcomes	*Improving efficiency and competitiveness* eventually resulting in improved organizational performance	*Reducing vulnerability* to the negative effects of climate change, resulting in greater resilience
Limits	*Within the direct control of the organization*; technological and financial constraints, market dynamics and competition, and organizational structures and culture	*Outside the control of the organization*; absolute physical and ecological boundaries, societal and cultural barriers, and global governance constraints
Key risks	*Reduced competitiveness*, financial losses, or reputational damage due to misjudgments relating to market trends, technological developments, or stakeholder expectations	*Exacerbate vulnerability to climate change*, for example by focusing on short-term resilience without considering long-term climate trends or contributing to greenhouse gas emissions or ecological degradation to adapt, thus worsening the underlying problem of climate change

an assumption which has proven unrealistic (Helm, 2010). Nonetheless, this view is also implicitly or explicitly reflected in existing theories of organizational adaptation. Considering the uniqueness of CCA, we argue that prior organizational adaptation literature is limited for four key reasons.

First, research on organizational adaptation tends to build on traditional models of how organizations and environments relate to each other over time (Astley and Van de Ven, 1983). Specifically, research grounded in structural contingency theories (e.g., Lawrence and Lorsch, 1967; Thompson, 1967) has argued that organizational behaviour is largely shaped by external constraints (DiMaggio and Powell, 1983; Hannan and Freeman, 1984). These external constraints, however, are dynamic, and organizations may have to adapt to their resulting shifts. These shifts may include disruptions caused by market forces (e.g., Flammer and Ioannou, 2021), policy changes (e.g., Fox-Wolfgramm et al., 1998), technological change (e.g., Tushman and Anderson, 1986), or shifts in consumer demand (e.g., Hoffman, 1999).

Much of the adaptation literature is based on the notion that the external environment is a constraint that *can* be managed; that is, it tends to be inward-looking, assuming that the external environment is constant and focusing on questions such as 'How can organizations adapt by changing internal processes, structures, or strategies?' rather than 'How can organizations and the external environment co-exist and co-adapt?' In contrast, CCA requires researchers to consider potential feedback loops such that the external environment cannot be assumed to be constant. Specifically, poorly executed CCA not only will increase the organization's vulnerability to climate change, but can also generate repercussions on climate change itself, for instance due to increased levels of GHG emissions, in turn making the need to adapt more salient.

Organizations cannot be inward-looking in addressing CCA. CCA requires localized solutions, given the idiosyncratic needs of an organization and its dependence on the natural environment. These needs are informed by interactions between the organization and local primary or secondary stakeholders, who are directly or indirectly affected by climate change, for example, by threatened critical infrastructure or considerations for employees' physical wellbeing. Thus, CCA requires a multi-stakeholder approach that engages internal and external stakeholders at all levels of the organization. This would allow for a better analysis and assessment of the fallout from this co-dependent relationship between the organization and the environment, as well as enable the provision of on-the-ground localized solutions (Doh et al., 2019).

Second, the organizational adaptation literature assumes that organizations respond to exogenous shifts in their environment because these shifts result in a misfit between the organization's internal activities, resources, and capabilities and the evolving demands of the external environment (Tushman and Anderson, 1986; Van de Ven et al., 2013). Fit was initially conceptualized as a static state, that is, either present or absent (Lawrence and Lorsch, 1967). More recent work, however, considers fit a dynamic process, which addresses the possibility of a coevolutionary relationship between organizations and their environments. This more recent work has modified existing theories to take into consideration less traditional and more persistent external shocks (e.g., Brown and Eisenhardt, 1997; Cantwell et al., 2010). A rich body of research has emerged as a result, but even so, a lot of literature continues to conceptualize exogenous shocks as a

temporary state of disequilibrium that can be managed. However, this may not be the case in the context of climate change. Many organizations may not be able to enjoy a recovery from climate change shocks and do not return to a state of stability but instead are forced to move to a new regime with a new equilibrium (Linnenluecke and Griffiths, 2010). In sum, the notions of fit and a single equilibrium point to which organizations return to are problematic in the context of CCA.

Third, the objective of adaptation in much of the adaptation literature is to re-establish an organization's competitiveness. External shifts in an organization's environment can negatively affect its competitive position. Indeed, they can decrease an organization's internal operating efficiency, for example by increasing the organization's cost structure or lowering demand for its products. Moreover, they can cause resource issues, for instance, due to limited access to or availability of relevant factor markets (Chakrabarti, 2015). Hence, the objective of more traditional adaptation is to reestablish the organization's competitive position through reestablishing a state of fit which can be maintained going forward. In contrast, CCA instead focuses on reducing initial vulnerability to the physical impacts that climate change can cause (Tashman, 2021), and to which the organization is directly or indirectly exposed. That is, the objective of CCA is not necessarily to return to a state of stability and to maintain or improve competitiveness, but instead to pre-emptively build adaptive capacity, defined as 'the vector of resources that represent the resource base from which adaptation actions can be made' (Vincent, 2007, p. 13). These capacities are needed to withstand worsening climate change shocks over time (Smit and Wandel, 2006). In this regard, an organization's adaptive needs are for managing the ongoing process of climate change rather than a one-time shock to organizations' access to (natural) resources.

Fourth, the adaptation literature assumes that limits to adaptation are within the direct control of the organization, for example discussing the role of technological, organizational, or economic constraints (Sarta et al., 2021). However, limits to adaptation in the CCA context are exogenous to the organization and often beyond its control (Barnett et al., 2015; Morrison and Pickering, 2013). Constraints may also be biophysical or societal (Adger et al., 2009). For example, once ecological thresholds have been reached, organizations will lose access to critical natural resources in the future (Tashman, 2021). Hence, CCA will require approaches that may be different from what we know of adaptation, and unlike adaptation, which has a clear end point, CCA approaches may often require ongoing navigation within dynamically evolving limits.

Organizational Climate Change Adaptation Versus Crisis Management

A second literature which could be seen as adjacent to the CCA phenomenon is the literature on crisis management. A crisis is an event or series of events that halts, shifts, or renders ineffective the work of an organization (Feldman et al., 2021). Examples of crises are 'a severe global economic downturn; an increasing number of climatic episodes, natural catastrophes, and industrial accidents; devastating product recalls; information technology breaches and data security violations; virally disruptive social media trends; and the threat of terrorism' (Williams et al., 2017, p. 733). Moreover, crises are sudden and unexpected events, from local to global in scale, and their effects

may unfold over time, such as the Haiti earthquake, COVID-19 pandemic, or wildfires (Majchrzak et al., 2007). Some of these events may be climate-related, but some are not, which begs the question of how crisis or disaster management differs from CCA.

Crisis management is the 'attempt to bring a disrupted or weakened system at any stage of crisis back into alignment to achieve normal functioning' (Williams et al., 2017, p. 740). The rich literature on crisis management offers insights on pre-, mid-, and post-event crisis management. For example, Williams and Shepherd (2016) describe crisis management in terms of local ventures that emerged in response to the 2010 Haiti earthquake. One group of ventures focused on building resilience for the long term, and the other on providing sustenance. Similarly, Feldman et al. (2021) describe the aftermath of Hurricane Katrina and show how mental health professionals created new routines by combining old and new ones for continuity of their work after the crisis. Despite the clear similarities between crisis management and CCA, some important differences are evident.

First, climate change adaptation is about climate change and not *all* crises. 'Standard' crises are more predictable and therefore easier to adapt to, whereas climate change disasters are highly unpredictable, despite new scientific methods of generating data-based predictions (e.g., Falcke et al., 2024).

Second, both crisis management and CCA can be seen as responses, but their objectives are different. Crisis management is about an immediate response to a sudden and unfolding event in order to continue business-as-usual, which Williams et al. (2017) describe as 'crisis-as-event' ontology. In contrast, as noted above, CCA is about changing in the long term to the new realities of climate change. The temporality underlying both concepts is unique to each phenomenon, offering different ways to understand them (see, e.g., Blagoev and Schreyögg, 2025; Hernes et al., 2025).

Third, CCA could, in some cases, be proactive, such as when, in anticipation of more frequent natural disasters, an insurance company changes its products or the construction industry begins using climate-resilient materials (Bansal et al., 2025). However, crisis management is largely about getting the crisis under control and finding safety for the victims, with relatively less attention to pre-event anticipation and detection capacities to reduce vulnerabilities to crisis (Williams et al., 2017), or post-event capacity building to avoid future crises (Christianson et al., 2009).

A RESEARCH AGENDA FOR STUDYING CLIMATE CHANGE ADAPTATION: PREMISES AND GUIDING QUESTIONS

CCA is an empirical reality that calls for phenomenon- and problem-driven approaches to research. Scholars will need to approach CCA with an open mind regarding methodological and theoretical choices, as well as careful reflection on their onto-epistemological assumptions and values (e.g., Wickert et al., 2021). We take the opportunity to highlight some promising – albeit by no means exhaustive – areas for research, including methodological and theoretical suggestions. Our hope is that these suggestions foster research that not only advances our theoretical understanding of CCA but also helps build a body of work that sheds light on CCA as a phenomenon that requires urgent attention in practice.

First, we argue that the relationship between adaptation and mitigation needs to be explored further. Mitigation and adaptation can cross-fertilize but also antagonize each other. A systems perspective can be one way forward for researchers to fully understand this relationship. Second, the temporal and spatial dynamics of CCA remain poorly understood, especially when it comes to the somewhat counterintuitive idea of 'proactive adaptation' Proactive adaptation provides a new way to understand time and space in the context of climate change and sustainability. Third, CCA can be both a risk and an opportunity, and these facets of CCA can intertwine dynamically, yet remain poorly understood.

How Do Climate Change Adaptation and Mitigation Interact?

The relationship between climate change mitigation and adaptation is far from linear (Tashman, 2021). It is highly dynamic, time-lagged, emergent or causally ambiguous, may manifest across spatiotemporal scales, and in the form of multiple interdependent configurations (Bansal et al., 2021; Grewatsch et al., 2023; Williams et al., 2021). It is important to understand the relationship between adaptation and mitigation so that effective adaptation can break through a potentially dangerous cycle whereby it undermines mitigation efforts or exposes organizations to greater climate risks in the future (Schipper, 2020).

A positive relationship between mitigation and adaptation implies that existing and new organizational strategies, practices, and procedures for CCA can be leveraged for more effective mitigation strategies and vice versa. For example, a new way of building climate-resilient homes (adaptation) may require the use of materials that reduce emissions (mitigation) (e.g., McGahan and Pongeluppe, 2023). Such a relationship would be based on aspects including but not limited to efficiencies and economies of scale and scope in developing such strategies, synergies when it comes to strategy implementation, openness of stakeholders to adaptation efforts because of mitigation projects, and possible (self-reinforcing) effects of resources, knowledge, and other input factors needed for adaptation (Schipper, 2020). To illustrate, businesses facing adaptation needs – such as ski resorts having to adapt their business models due to lower annual snowfall – may be more open to mitigation efforts such as a reducing their supply chain footprint (Rivera and Clement, 2019). More generally, and taking a long-term perspective, effective mitigation may reduce the need for adaptation, while effective adaptation may lead to better functioning ecosystems as well and thus lead to mitigation.

A negative relationship between adaptation and mitigation, in contrast, refers to the aspects including but not limited to potential (un)intended consequences of adaptation strategies on an organization's – or other organizations' – approaches to mitigation. Mitigation and adaptation can be detrimental and crowd out each other's effects. While mitigation could be undertaken with all the good intentions, adaptation may override such positive effects, for instance because of a failure in the chosen business model (Bocken et al., 2016; Sabaruddin et al., 2023) and related forms of intentional or unintentional means–ends decoupling (e.g., Athanasopoulou et al., 2025; Callery and Kim, 2024). Other examples could include adaptation undermining motivation for mitigation because adaptation may be seen as a less costly substitute for mitigation and hence business-as-usual (Wright and Nyberg, 2017).

Adaptation can also trade off mitigation efforts over time and space. For example, adaptive technologies (e.g., climate resilient homes or recycling) may be seen as the solution that does not require lifestyle changes for mitigation (e.g., smaller footprint of built environment or use of plastic). Likewise, increasing the use of artificial snow in ski resorts, as a way for the resorts to adapt to less snowfall, can help safeguard reasonable skiing conditions in the short term and locally, but it would most likely accelerate rather than slow down global warming in the longer run due to excessive water and energy use, not even taking into account the destruction of the local natural environment. As such, researchers can explore when, where, how, and why CCA has (what one might call) a 'positive' or 'negative' influence on mitigation, and vice versa (e.g., Nadegger and Wegerer, 2024).

Similarly, the absence of evidence-based insights into the management of CCA may have further limited our understanding of the relationship between adaptation and mitigation. This could happen, for example, in the context of maladaptation where CCA strategies are poorly designed; both adaptation and mitigation are not aligned (Wickert et al., 2016); or when organizations deliberately delay substantive action (e.g., Endenich et al., 2023; Schipper, 2020). The theoretically interesting aspect here is the time lag, potentially across scales, in the consequences of maladaptation for mitigation (see, e.g., Blagoev and Schreyögg, 2025; Feuls et al., 2024; Hernes et al., 2025). For example, a business operating at a lower spatiotemporal scale than the local government can adapt by exiting a region that is prone to floods (e.g., Boe-Lillegraven et al., 2024). Such an action can benefit the business but reduce the resources that the local government has available for mitigating climate change in the long term, illustrating the lagged effect of business actions (operating at a lower scale) on a region (operating at a higher scale). Research should explore how and when certain adaptation actions (including maladaptation) may increase exposure and sensitivity to climate change impacts rather than reducing them (Schipper, 2020) and investigate the phenomenon across scales (Howard-Grenville and Lahneman, 2021).

These phenomena can – and should – be explored from a broad array of theoretical perspectives as well as different ontologies (i.e., CCA as an objective and measurable reality vs. how it is subjectively experienced by actors in different contexts) and epistemologies (i.e., identifying CCA-related cause-effect relationships vs. processes of sensemaking and mutual understanding). Yet, to inspire future research, we outline a theoretical avenue we regard as currently under-mobilized but particularly promising to the empirical realities we have outlined. That is, we encourage scholars to take a systems perspective, which has recently gained traction in the management field (Bansal et al., 2021; Grewatsch et al., 2023; Williams et al., 2021). A system has elements connected by a variety of relationships and held together by a common purpose (Meadows, 2008). For example, a car is a system that is made of elements such as tires, the engine, and steering wheel, with a purpose of taking a person from one point to another. Similarly, climate is a system and so is a business. Smaller systems, such as a business, are nested in larger systems, such as a local community and climate. As a result, a change in one part of the system reverberates to another but cannot be predicted in a linear cause-effect relationship. A systems perspective puts the necessary emphasis on the recursive, dynamic, and cross-scale nature of mitigation and adaptation effects (Allen et al., 2014; Bansal et al., 2018; Holling and Gunderson, 2002).

In adopting a systems ontology, researchers can break out of dichotomies such as local adaptation–global mitigation, or 'adaptation as risk management' versus 'mitigation as leveraging opportunity' Instead, a systems perspective allows for understanding adaptation and mitigation as efforts within the broader climate system such that each could be a leverage point for change. Adaptation and mitigation efforts may have reinforcing (or balancing) effects at one point in time and scale (e.g., an insurance company's climate mitigation efforts that can support the adaptation efforts of other businesses in the area) and across scales, (e.g., a city's adaptation efforts in building dikes and rerouting water to prevent flooding, which can support a business's mitigation efforts such as reusing water for production processes). Researchers can zoom in and out of spatiotemporal scales to craft questions related to the relationship between adaptation and mitigation using a systems perspective. Table II provides illustrative research questions which can further this line of inquiry.

How to Adapt Proactively: Exploring the Role of Time and Space in Climate Change Adaptation

Adaptation presents an interesting puzzle. At the surface, adaptation is reactive. An entity facing challenges related to climate change adapts to address these challenges. However,

Table II. Guiding questions for studying climate change adaptation

Research agenda theme	*Guiding research questions*
How do climate change adaptation and mitigation interact? A view from a systems perspective	• What is the nature and scope of the mitigation-adaptation relationship? • What are the determinants and consequences of a generative adaptation-mitigation relationship? • How can organizations effectively combine adaptation and mitigation such that positive effects are reinforced and negative ones, including trade-offs, are avoided? • How can organizations recognize and overcome maladaptation? • How can a systems perspective inform the cross-scale nature of adaptation-mitigation relationship?
How to adapt proactively: Exploring the role of time and space in climate change adaptation	• How do organizational actors recognize and deal with the temporal and spatial properties of climate change adaptation? • How do the properties of climate change adaptation change over time and space? • How do proactive and reactive climate change adaptation relate to each other? • How can proactive adaptation inform our current understanding of time in sustainability? • What role does AI and other advanced data management systems play in helping organizations adapt proactively to climate change?
How climate change adaptation can be both risk and opportunity	• How do actors recognize and deal with the double-edged sword of climate change adaptation-related risks and opportunities? • How might climate change adaptation-related risks turn into opportunities and vice-versa? • How can business models be designed to align with the formulation of climate change adaptation measures? • How can the involvement of multiple stakeholders in climate change adaptation create synergies that feed into the business' value creation activities?

not all adaptation can be reactive, given that climate change consequences are often time-lagged. Communities, cities, and businesses often adapt in anticipation of changes. As a result, we 'need to be prepared for eventualities that may not even be conceived as possible under existing conditions, yet imaginable and plausible under others' (Gümüsay and Reinecke, 2024, p. 5). Adapting to eventualities (Feuls et al., 2024) and possible or 'desirable' (Gümüsay and Reinecke, 2024) futures that are yet to manifest is an interesting opportunity for theorizing the role of time and space in CCA. One cannot always use the past to predict the future, and in some cases, it is even harmful to attempt to do so (Augustine et al., 2019).

In proactively adapting, businesses and other entities engage in adaptation as 'anticipatory action' 'foreseeing, foreshadowing, or forecasting future events (…) to engage with far-reaching societal challenges, such as the Anthropocene, and climate change' (Flyverbom and Garsten, 2021, p. 1). The notion of proactive adaptation can open several new avenues of research around hope, dystopia (Hjerpe and Linnér, 2009), anticipation (Tavory and Eliasoph, 2013) and projection (Mische, 2014) related to CCA. For example, researchers may explore how adaptation looks different when business leaders hold an ontology of the future in which the future can be predicted and controlled versus one in which the future is co-constructed and imagined (Sharma et al., 2022; Wickert and Muzio, 2025), and how this may or may not be influenced by future-oriented scenarios of climate change, such as global temperature projections that often span several decades (e.g., IPCC, 2023).

Similarly, place plays an important role in understanding adaptation, especially one that is proactive (Wilbanks, 2015). At first glance, mitigation is about actions and benefits that are global and nonexcludable, and adaptation is about actions and benefits that are local and contextual (Dolšak and Prakash, 2018). Proactive adaptation, instead, challenges this dichotomy. It asks us to look at adaptation as a configuration of local and global approaches, where, for instance, globally devised solutions need to be adapted to the needs, resources, and affordances of local actors (Cutter et al., 2008) without losing the principles underlying the global approaches (Howard-Grenville and Spengler, 2022; Tashman and Rivera, 2016).

Further, both the positive consequences of adaptation (e.g., on organizational resilience) and the negative ones of maladaptation (e.g., increased exposure to climate change risks) can accrue at different locations than where they have been implemented, given the interconnectedness and interdependency of ecological systems. For example, the Global South faces the brunt of climate-related disasters such as water scarcity and desertification because of the lack of adaptation capabilities to navigate these disasters (e.g., Wickert et al., 2024). A study by The World Bank predicts that by 2050, 143 million people from the regions of Sub-Saharan Africa, South Asia, and Latin America will be displaced from their homes (Rigaud et al., 2018). However, the resources for adaptation lie in other parts of the world that are more developed, especially when it comes to adapting proactively because there is less immediate disaster, relatively speaking, facing the Global North. This mismatch between adaptation needs in one place and resources in another create several questions of equity and justice related to CCA, and challenge the dichotomies related to place in mitigation-adaptation.

In sum, future research should take as a theoretical anchor studies that have theorized how time (Bansal et al., 2018; Hernes et al., 2025), space (Nyberg et al., 2022;

Stephenson et al., 2020; Whiteman and Cooper, 2011), as well as imaginaries of desirable futures (e.g., Gümüsay and Reinecke, 2024; Wenzel et al., 2020) influence how actors see and make sense of phenomena, and how this influences the adaptation solutions they devise. Time and space could also be integrated into the exploration of how adaptation solutions are designed such that they incorporate the temporal and spatial separation of actions and outcomes, and the general difficulty of establishing clear cause-effect relationships between CCA efforts and outcomes. Table II provides additional illustrative research questions which can further this line of inquiry.

How Climate Change Adaptation Can be both Risk and Opportunity

CCA is often seen as a strategic action for managing risk. Yet, the complexities related to CCA can help researchers tug at the separation between risk and opportunities (Simonet and Fatorić, 2016). This, in turn, could speak to a variety of scholars interested not only in how to tackle grand challenges linked, for instance, to circular economy or business model innovation (Averina et al., 2022; Murray et al., 2017; Yang et al., 2023), but more generally in examining the complexity of what organizational scholars define as wicked problems (Grewatsch et al., 2023; Jarzabkowski et al., 2019; Reinecke and Ansari, 2016).

As a first pathway toward examining CCA as both risk and opportunity, we suggest future research to examine how the physical and social impacts of climate change affect organizations directly, for example by threatening their business models, as well as indirectly, as their value chains and global production networks also grapple with similar challenges. Within this context, adopting a circular approach to managing value chains – that is, one driven by a logic whereby value creation utilizes economic value retained in products after their focal use – may help mitigate risks and foster innovation (De Angelis, 2021; Suchek et al., 2021). In terms of risk management, circular economy can help a business adapt to the increasing volatility of raw materials prices (Heyes et al., 2018), select resilient suppliers, or (co-)invest with other value chain actors in infrastructures that can protect assets from climate change (Averchenkova et al., 2016). In terms of opportunity, circular economy opens an industry to a new set of practices and business models (Cantzler et al., 2020). For example, it allows for entry of new players into the value chain, such as the company Captain Fresh, which helps minimize the spoilage of seafood shipments and connects different players that can foster the seafood industry's circularity (Shum et al., 2022). Future research can investigate how value chain processes enact CCA strategies to foster new innovations and adaptive business models, as well as production networks, on the way to adapting to climate risks.

A second pathway through which businesses engage in CCA and which can break the dichotomy between risk and opportunity is by involving a variety of actors within and outside their organizations (Bendito and Barrios, 2016; Stablein et al., 2022). Within the organization, Linnenluecke et al. (2013) suggest that key decision makers such as executives and managers, along with change agents at lower organizational levels, can influence an organization's pro-environmental behaviour (e.g., Heucher et al., 2024; Wickert and de Bakker, 2018). Cross-functional teams, for example, are uniquely suited to traverse risks and identify opportunities in CCA. The variety of skill sets of individual actors and the diversity in their points of view can help identify current and potential

risks related to CCA. The differences and even contradictions in their interests and focus can be generative in identifying new opportunities related to CCA.

Outside the organization, climate change affects an organization's primary and secondary stakeholders, for example by threatening critical infrastructure or community wellbeing. A CCA response from a business requires infrastructure investment but the benefit is accrued by all, yielding a collective action problem (Ostrom, 2010). For example, electric vehicles are an adaptive response to emissions from the car industry. And yet, no one actor is fully incentivized to invest in the charging infrastructure because costs are singular while benefits are shared. To navigate such problems, CCA efforts will require private sector investments in public goods, such as in infrastructure, and public sector investment in private innovations, such as those related to electric vehicles. To illustrate, Finnish SME's are transitioning to circular bioeconomy through innovative business models, such as 'creating value from waste' or 'developing scale-up solutions'. However, circular products and services are not yet profitable. Policies such as financial stimulation or technological modernization are needed to address such 'hard barriers' (D'Amato et al., 2020, p. 8). Such public-private response to CCA lends itself to important questions for future research, such as examining the tensions and interplay between private and public interests in managing the risks and opportunities associated with CCA (e.g., Kourula et al., 2019).

Sustainable business models constitute a third pathway that we contend can facilitate bridging the divide between conceiving adaptation as a risk or an opportunity. First, efforts toward CCA can encourage organizations to interrogate how their existing business models capture and create value or avoid risk. In so doing, organizations may have to balance ecological demands with elements of strategy, structure, and procedures (Obel and Kallehave, 2022). Such new calibration could potentially create synergies between CCA demands and business model elements that yield new and more adaptive business models (Schaltegger and Wagner, 2011). Second, the conventional understanding of business models as being centred on individual firms can be elevated toward a more pluralistic conception of the term, one that opens up a discussion on how multiple firms might align to create value in inter-organizational contexts (Falcke et al., 2024; Sabaruddin et al., 2023). Research that is exploring open and/or collaborative modes of innovation elucidates how organizations can collaborate together to deal with a dynamic environment (Grodal and O'Mahony, 2017; Porter et al., 2020) and, we contend, inspires future theoretical exploration of how business models can facilitate CCA. Overall, CCA presents an important topic for scholars of innovation and business models, as effective approaches to CCA will require sincere efforts not only of regulators but also of businesses and entrepreneurial ventures.

CONCLUDING REMARKS

In this editorial, we advocate for management scholars to adopt a more holistic perspective when studying climate change, one that includes examining how organizations adapt to changing climatic conditions. CCA must not remain the forgotten half of the climate equation. We have tried to illustrate above that there is much work to do for management scholars, both in terms of tackling interesting research questions

and disseminating ecologically relevant research that can move forward the CCA conversation. Specifically, we suggest there is potential in exploring: (1) the interactions between climate change adaptation and mitigation, (2) how organizations can proactively adapt, with particular attention to the role of time and space in these efforts, and (3) how climate change adaptation presents both risks and opportunities for developing adaptive business models which do not undermine efforts to mitigate climate change.

Our call to action is based on a strong view that management scholars have the toolbox to make meaningful contributions to the discourse on CCA, beyond the important insights that have already been offered by researchers in other disciplines. Indeed, while climate change can be seen as a physical phenomenon which unfolds over time and space, organizations' adaptive responses to it are the result of social construction, such as the underlying decision-making processes, perceptions of risks and opportunities, and the strategies that organizations devise in response. Considering the theories and constructs which have guided much of management research in the past, it is evident that management scholars should draw on these rich theoretical insights to inform discussions on CCA. Management and organization scholars are well positioned to advance our understanding of the phenomenon, including policy implications, and in doing so could link to conversations taking place in other disciplines, such as economic geography (Bansal et al., 2025).

When moving CCA into the mainstream of research in areas such as strategy, sustainability, business model innovation, or organization theory, we also urge management scholars to consider the social justice dimension and the risk of perpetuating inequalities in CCA. In this respect, researchers can draw on a rich body of knowledge in management and organization studies so far unrelated to CCA. An obvious question relates to the accessibility of the resources necessary to adapt to climate change (Nyiwul, 2021). This question is particularly salient given that most devastating effects will likely be observed in the Global South (e.g., Wickert et al., 2024), a region which is already characterized by inequalities and lack of resources. At the same time, the lack of CCA itself perpetuates existing inequalities (Cevik and Jalles, 2023). Moreover, what may be good for organizations and even societies from a system-level perspective may have devastating effects on individuals. For example, the large upfront investments needed to participate in forest protection initiatives in developing countries mean that only a few – already wealthy – individuals and organizations have access to associated subsidies, further cementing economic inequalities in these contexts (Markkanen and Anger-Kraavi, 2019). Therefore, regardless of which aspect of CCA management scholars address, considering the risk of perpetuating inequalities or creating new ones is one that should be central to all studies.

To conclude, CCA will become a necessity for many, if not all, organizations. With this editorial, our hope is to open a conversation for management scholars seeking to contribute to a better understanding of this challenge, especially at a time when the discourse is starting to shift from mitigation to adaptation. We hope to encourage management scholarship that makes a difference to theoretical advancement and to society at large.

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