

## Editorial

# Riskscales and the socio-spatial challenges of climate change

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Received on May 16, 2020; editorial decision on May 22, 2020; accepted on May 22, 2020

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**Anthropogenic climate change is increasing the frequency and severity of the physical threats to human and planetary wellbeing. However, climate change risks, and their inter-connections with other “riskscales”, remain understudied. Riskscales encompass different viewpoints on the threat of loss across space, time, individuals and collectives. This Special Issue of the *Cambridge Journal of Regions, Economy, and Society* enhances our understanding of the multifaceted and interlocking dimensions of climate change and riskscales. It brings together rigorous and critical international scholarship across diverse realms on inquiry under two, interlinked, themes: (i) governance and institutional responses and (ii) vulnerabilities and inequalities. The contributors offer a forceful reminder that when considering climate change, social justice principles cannot be appended after the fact. Climate change adaptation and mitigation pose complex and interdependent social and ethical dilemmas that will need to be explicitly confronted in any activation of “Green New Deal” strategies currently being developed internationally. Such critical insights about the layered, unequal and institutional dimensions of risks are of paramount import when considering other riskscales pertaining to conflict and war, displaced people and pandemics like the 2019–2020 global COVID-19 pandemic.**

*Keywords:* riskscales, climate change, governance, institutions, vulnerabilities, inequalities

*JEL Classifications:* A13, D7, D81, D63, Q54

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## Introduction

This Special Issue of the *Cambridge Journal of Regions, Economy, and Society* expands and enhances our understanding of the spatial,

temporal, economic and sociological dimensions of climate change and riskscales. Riskscales “play out in time and space” (Müller-Mahn and Everts, 2018, 87), encompassing different points

of view on risk that highlight the “real-and-imagined geographies based on individual and collective experience, tradition and knowledge” (Müller-Mahn et al., 2013, 2025). These articulations of riskscapes were preceded by theorists examining the social forces giving rise to diffuse risk distribution and contestation in modernity (see Rosa et al., 2014). By 2001, empirically inclined social scientists in the USA argued “social, economic, and political forces inevitably create myriad [environmental] riskscapes in which overlapping air pollution plumes emitted by [various sources]...lead to cumulative exposures that pose health risks to diverse communities” (Morello-Frosch et al., 2001, 572; see also Fitzpatrick and LaGory, 2003).

The ‘riskscape’ concept has subsequently been applied in a range of other contexts beyond air quality (Müller-Mahn and Everts, 2018). However, explicit examinations of climate change riskscapes and their interaction with other riskscapes remain comparatively understudied (cf. Gebreyes and Theodory, 2018). This is surprising, given the attention to climate change risks and their configuration by leading international agencies, including the Intergovernmental Panel on Climate Change (IPCC). In its 2012 Special Report ‘*Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*’ (IPCC, 2012), for example, the IPCC acknowledges the challenges of understanding and managing the risks related to climate change. In particular, they emphasise that climate change impacts have social and economic as well as physical dimensions. So, while changes in the frequency and severity of the physical events generated by climate change will affect risk, the spatially diverse and temporally dynamic patterns of exposure and vulnerability also need to be considered. Indeed, they recognise that differences in vulnerability and exposure can arise from non-climatic factors and from multidimensional inequalities that are produced by uneven development processes. Alongside this, the IPCC conclude, with a high degree of confidence, that

climate-related hazards can exacerbate other stressors, often with negative outcomes for livelihoods, especially for those living in poverty.

Contemporary events, like the 2019–2020 global COVID-19 pandemic, underscore the importance of understanding the layered dimensions of risks. As with climate vulnerabilities and public and environmental health (Faber, 2015; Gebreyes and Theodory, 2018; Klinenberg, 2002; Solomon et al., 2016), emerging accounts of the COVID-19 pandemic indicate that communities facing elevated threats to their lives and livelihoods are those who are elderly, experience chronic medical conditions, and are socially, politically and economically marginalised (CDC, 2020; Manderson and Levine, 2020; Raffaetà, 2020).

This Special Issue demonstrates how analysing riskscapes can advance our understanding of climate change dynamics. These insights can be extended to anticipate dynamics at work on the COVID-19 pandemic. Physically, climate change will have greatest effect on communities with high population density. These communities are often near coastlines and in flood plains where they may face vulnerabilities of exposure to rising sea levels and other threats (see Liévanos, 2020), or have overbuilt environments to a degree that greater meteorological variability has outsized effect (for example, Superstorm Sandy in New York) (Faber, 2015; see also Taylor and Weinkle, 2020). The high density of people in such spaces also make these communities more vulnerable to pandemics like COVID-19. Indeed, as of 1 May 2020, confirmed COVID-19 cases (167,478) and associated deaths (18,069) within the USA were concentrated in the major population centre of New York City (Dong et al., 2020). In both the case of climate and COVID-19 vulnerability, the local overbearance of human settlements on the environment makes adaptation and mitigation still more difficult.

Overlap in terms of community economic risk and resilience between COVID-19 and climate

change is also substantial, highlighting the kind of ‘double exposure’ risks initially flagged by O’Brien and Leichenko (2000) and elaborated in Leichenko and O’Brien (2008). Cascading economic effects from COVID-19 (lockdowns) and climate change have the greatest effect on the poorest and socially marginalised communities. Similar to the realm of climate-related inequalities in the USA (Faber, 2015; Klinenberg, 2002), the disparate impact of COVID-19 on low income and under-represented minority communities has been extreme, with some states in the US reporting up to a third of deaths being among racial and ethnic minorities, and projections that the economic implications of the pandemic will also hit minority communities the hardest (CDC, 2020; Hale, 2020). The disparate outcomes from underlying inequalities are projected to extend across the Global South (Wood, 2020).

In separate realms of inquiry (for example, environmental studies, health disparities, economic geography, criminology, security and terrorism, disasters and spatial inequality), scholars have already documented that place matters when considering risk. Exposure to risk and its consequences varies by where a social actor lives, works and the multiplicity of other contexts in which they engage in social interaction. Too often, however, these risks have been studied in isolation, for example, heightened environmental exposure studied in isolation of elevated exposure to crime, elevated exposure to health risks without concern for heightened economic risks and so forth (Muller et al., 2018). The ramifications of this approach have been laid bare and not least during the COVID-19 crisis, which has had substantial interwoven health, economic, political and social implications. In the reshaped world responding to this crisis, considering the complexities, nuances and place-specificities of risksapes and climate change is now more important than ever.

Using the concept of risksapes highlights the social, temporal and spatial texture of risk (Neisser and Müller-Mahn, 2018) and calls

attention to interactions among risks and their “cumulative impact” across several dimensions of human life and the biophysical environment (Renn, 2008; Solomon et al., 2016). Entire nations—concentrated in the Global South—are at heightened risk of repeated cycles of war (Collier, 2008). These conflicts scar the environment in profound and enduring ways (Smith et al., 2014); these wars are often precipitated by environmental dislocation, with climate change playing an increasingly prominent role (Dunlap and Brulle, 2015). Whether internally displaced or migrating across national borders, those forced to flee violence live with multiple risks and face an uncertain future (Hooks, 2020; United Nations High Commissioner for Refugees, 2017). These communities are also at risk of comparable long-term impacts (stalled economies, overtaxed medical systems and nutritional shortages) of pandemics like COVID-19. The origins of these risks and the forces that sustain them often operate on and across multiple spatial scales—from the local to the global. By studying climate change and risksapes, it becomes possible to understand the “interdependencies and spillovers between risk clusters” (Renn, 2008, 5; see also Beck, 2009; Neisser and Müller-Mahn, 2018).

Prominent social theorists—most notably Beck ([1986] 2005) and Giddens (2015)—have drawn attention to the pervasive and growing importance of risk in contemporary societies. This concern extends beyond the academy—it is of concern to the general public and policy makers. The growing reflexivity of late-modernity—made possible by an unprecedented capacity to gather, analyse and share information—not only creates unprecedented opportunities, it also creates unprecedented threats to individuals and entire societies. Moreover, this capacity to compile and analyse information allows for a discourse centred on identifying, mapping and managing risks (Beck, [1986] 2005, 2009; Giddens, 2015).

Efforts to identify, avoid, mitigate and manage risks are transforming political and

social institutions. Building on his earlier work (Beck, [1986] 2005), Beck's (2009) "world risk society" thesis highlights the growing prominence of large-scale technological and industrial processes in modernity that has given rise to unstable global financial markets and climate change and associated threats for the broader public. Extant social and political institutions are not equipped to manage such risks. These trends pose threats to the legitimacy of science and of political institutions because accurate risk analysis is often hindered by the indeterminate and uninsurable nature of human "manufactured" risks. Because the "dangers posed by global warming aren't tangible, immediate or visible in the course of day-to-day life", our collective response will be halting and insufficient (Giddens, 2009, 2). Furthermore, the physical, social, political and economic risks are fundamentally interwoven together. Communities with lower social resilience—for example, those divided by substantial class, racial, ethnic, gender or cultural cleavages that undermine shared trust—lack the cohesion to effectively understand and respond to crisis (Gotham and Greenberg, 2014).

The identification and response to risk occurs in an institutional context. Experts and political economic elites are often entrusted with the authority to classify and organise risk for the broader public (Beck, [1986] 2005, 2009; Clarke, 1989; Freudenburg et al., 2009; Perrow, [1984] 1999). In the context of environmental risk, it has been shown that scientific, corporate and state actors are tightly coupled in decision-making processes that are predicated on the dynamics of maintaining the prestige and objectivity of scientific inquiry, capital accumulation and state legitimacy (Beck, 2009). Furthermore, the institutional context of government policy and professional associations "incubate" the expert and elite organisation of risk in taken-for-granted norms of safety and "acceptable" codes of conduct—all of which are monitored and enforced by experts and elites (Beamish, 2002; Clarke, 1989; Perrow,

[1984] 1999; Turner, 1978). For example, political and economic actors and institutions across the world are refashioning previous capital accumulation strategies and their spatial and ecological "fixes" through financial instruments and market-based mechanisms that seek to mitigate against and adapt people and places to environmental disasters, terrorist threats and the climate crisis (Castree and Christophers, 2015; Gotham and Greenberg, 2014; Knox-Hayes, 2013; Ouma et al., 2018). These dynamics—that is, elite domination and the downplaying, normalising and obscuring of environmental risks—extends to military organisations and warfare (Bonds, 2011).

Risk is culturally embedded. Research into this aspect of risk illustrates the importance of attending to the local "historical legacy and interpretive contexts to perceptions of risk" (Beamish, 2001, 11). Auyero and Swistun's (2009) ethnographic and historical study of *Flammable*, a poor and heavily contaminated Argentine shantytown, is instructive for understanding how the normalisation of risk can shape how it is subsequently understood and responded to. In this case, the normalisation of exposure to environmental health risk was associated with an institutionally organised confusion over the cause of environmental contamination and how to motivate and articulate collective solutions to that contamination. Alternatively, as Norgaard (2011) illustrates in the context of local responses to climate change, normative modes of thought and practice normalise risk-perpetuating practices even in the face of mounting evidence of the dangers of climate change. Similarly, in her work, Knox-Hayes (2014, 2016) demonstrates that cultural knowledge and practice shape the adoption of universalistic solutions to climate mitigation, even in economic domains such as with the creation of emissions markets. In order to be more effective, policy makers must consider the way different communities and societies make value judgements, assess risks and devise strategies to respond (Knox-Hayes, 2016).

This Special Issue brings together international scholars at the forefront of empirical and conceptual thinking about risksapes. Their research refines and sharpens our understanding of climate change risk and risksapes, integrating understandings of risk from across diverse realms on inquiry under two, inter-linked, themes: governance and institutional responses and vulnerabilities and inequalities. This also acknowledges how governance and state in/action can exacerbate risks, a theme that is addressed by several of the articles in this issue.

### **Governance and institutional responses to risksapes**

It is no surprise to find a strong focus across the articles in this Special Issue on how different locations and communities attempt to manage the sum of complex combinations of risks. Understanding the form, dynamics and impacts of governing risksapes lies at the heart of much intellectual inquiry and practical action.

Ravi Raman's tightly contextualised article is focussed on the rebuilding of post-flood Kerala, India (Raman, 2020). The physical scars of flood events are visible reminders of not only risks and their spatiality, but also of how institutions respond to that spatiality. Raman documents how various agencies, including local people and state and non-state actors, influence each phase of rescue, relief and rebuilding. Local fisher-folk communities, for example, draw on their cultural knowledge of climate change and risk to rescue flood victims just as others have done elsewhere (see Knox-Hayes, 2016). In addition to these local governing alliances, Raman also flags the role of international institutional alliances—for example with the UN agencies—in supporting humanitarian interventions. He argues these diverse but coordinated responses create a state–society synergy sensitised to the “ecospatiality” of risksapes in Kerala. The ecospatiality concept recognises that building resilience in the aftermath of an

extreme event requires new consideration of the arrangement and assemblage of spaces that make dwelling and habitation more attuned to the specific geographical features and potential risks of a region. Rather than relying on rehabilitation and restoration to previous conditions, the goal of the ecospatiality state–society synergy is to redevelop while laying the foundation for a more resilient, egalitarian and ethical society. Raman's article has broader implications, as its findings align with the broader suggestion that the COVID-19 pandemic, for example, presents societies with the opportunity to move forward with new technologies for enhanced energy efficiency and resilience (invest away from fossil fuels where markets have experienced collapse) rather than to return to the old normal (Worldand, 2020).

Meanwhile, Iain White and Judy Lawrence explicitly focus on the governance challenges posed by climate change in New Zealand (White and Lawrence, 2020). They emphasise that as climate change impacts are dynamic, uncertain and contested, they pose significant challenges to the ways in which policy actors imagine and manage risks across space and time. Identifying and applauding major efforts to reflect the latest insights from risk research in national policy in New Zealand, they nonetheless find significant challenges remain to be resolved if appropriate governance and implementation strategies are to be successfully designed and implemented. White and Lawrence demonstrate how tensions emerge between the theory of risksapes, which emphasises that risks are always in a state of becoming, and the practices of risk management which seek to periodically “fix” risks, through plans, for example, in order to address them. While this process is a familiar feature of public policy design and implementation in many arenas, time lags between establishing scientific consensus for a particular course of action, developing policy and implementing that policy tend to be extensive with respect to climate change. Positively, White and Lawrence's historically situated

paper identifies a greater impetus for policy development, more extensive political consensus on action and widespread use of the language of contingency, uncertainty and dynamism in New Zealand now than ever before. While this is narrowing the gap between riskscape theory and climate change policy practice, issues remain with regard to connecting complex climate change riskscape imaginaries—comprised of an assemblage of biophysical, social, economic or political forces—to governance arrangements that are able to address them. There have long been academic calls for anticipatory risk governance (see [Fuerth, 2009](#); [Rosa et al., 2014](#); [Quay, 2010](#)) that can recognise and address the dynamism and uncertainty of climate change riskscapes. However, the means and mechanisms for operationalising anticipatory governance remain unclear.

Nowhere is the art of anticipation more foregrounded than within the realm of re/insurance. In their paper examining the riskscapes of re/insurance in Florida, [Zac Taylor and Jessica Weinkle](#) use riskscapes theory to draw critical insights from existing re/insurance debates ([Taylor and Weinkle, 2020](#)). They extend [Müller-Mahn et al.'s \(2018\)](#) argument that riskscape thinking must directly contend with machinations of power, working to reveal the asymmetrical, ongoing and always-political nature of re/insurance. Ultimately, Taylor and Weinkle argue against the expansion of re/insurance markets to govern climate risks precisely because the riskscapes approach demonstrates the importance of geographical contingencies and the limits to marketisation given the contested and shifting nature of “extra-market” considerations.

[Jonathon Everts and Katja Müller](#) reveal the pivotal role that extra-market considerations played in the dynamic German coal industry ([Everts and Müller, 2020](#)) while building on recent calls to bridge conceptualisations of riskscapes and scale ([Aalders, 2018](#); [Müller-Mahn et al., 2018](#)). Climate change appears more and more like a “boundary object” ([Star and Griesemer, 1989](#)), a common

reference point for conflicting parties who invoke different meanings about climate change for different reasons. In this article, the authors examine the intertwined scales of riskscapes of coal mining, regional economic development and climate change in Germany. The authors bring [Brenner's \(2001\)](#) notion of “politics of scaling” into the analysis of riskscapes and look at the ways in which coal mining structures and embeds deep socio-ecological vulnerabilities across time. They argue that understanding the intricate relationship within and between different riskscapes and practices of scaling (from the local to the global) provides us with an analytical handle for deciphering the complexities of economic and environmental politics. Further, they argue that doing so points us toward the transformative potential that lies within rescaling risks. Risk has temporal implications through the politics of scaling.

[Detlef Müller-Mahn, Mar Moure and Million Gebreyes](#) also take on the themes of multiscale politics and anticipation within governance in their study of riskscapes and climate change in the African cases of Ethiopia and Côte D'Ivoire ([Müller-Mahn et al., 2020](#)). They argue for greater scrutiny of how space is structured by multiscale connections and uneven power relations. In particular, they urge practitioners and scholars to give increased consideration to how the future is made present through risk management. This includes taking into account how futures are envisioned differently by diverse actors both substantially and in terms of time horizons, the extent to which different visions incorporate risk (or not), and ultimately, how visions and risk assessments translate into agency. Comparing and contrasting the politics of anticipation with a riskscapes framing, Müller-Mahn and colleagues conclude that thinking in terms of riskscapes with its focus on the nested and contested nature of the future, better acknowledges the diversity of material conditions, discourses and practices. The work is particularly trenchant for efforts to address climate change. To succeed, communities will

need to adapt governance frameworks and social policies to address present conditions.

The structure, distribution and flexibility of governance have a profound impact on the capacity of communities to conduct successful climate change mitigation and adaptation. Governance must be attentive to the social, political, economic and environmental dimensions of crises like climate change to assess the risks that these bring and to generate integrated responses. The capacity of governing institutions to think systematically and holistically in rapidly evolving situations and to do so across a range of socially and politically constructed temporal and spatial scales is also critical. The successes and failures of governing structures are addressed throughout the above articles in this Special Issue. However, the efficacy of various responses must be evaluated holistically and across different dimensions of risk, and for different groups given their relation to a given risk. Here the human and social dynamics of risksapes come to the fore.

### **The peopled nature of risksapes: vulnerability and inequalities**

Prior research debates the nature and durability of vulnerable social and spatial positions within climate change risksapes and other socio-spatial manifestations of risk. Models of the “world risk society” (Beck, 2009) or analogous “urban risk societies” (Elliott and Frickel, 2013; Romero-Lankao et al., 2013) posit and observe a “social boomerang” dynamic of diffuse risk distribution in the post-war era. In contrast, five contributions to this Special Issue illuminate the significance of local and regional “risk settings” (Müller-Mahn and Everts, 2013) or “contextual environments” (Leichenko and O’Brien, 2008) that structure and interlock multiple exposures to climate change-related risks and other risks over time. These articles highlight the stark inequalities and differentiated vulnerabilities that individuals and communities face from climate change risksapes.

Ann Tickamyer and Siti Kusujarti interrogate three disasters experienced in Indonesia to identify how socio-spatial risks are differentiated within particular contexts (Tickamyer and Kusujarti, 2020). Power and gender roles, relations and practices are shown to be significant in mapping the socio-spatial relations of the resulting risksapes. Tickamyer and Kusujarti use their empirical analysis to demonstrate how such insights might inform plans for climate resilience in Indonesia. Using three case studies from Indonesia, the 2004 Aceh tsunami, the 2006 Bantul earthquake and the 2010 Merapi eruption, the authors illustrate how spatial, social, cultural, religious and political structures affect the experience of disaster. Across the cases, gender relations, social capital and community resources are intertwined as drivers of risk and resilience across varying risksapes. In particular, where women are empowered, have greater equality and participation in public spheres as well as opportunities to develop social capital and leadership, their families and communities have greater response and resilience to hazards. Building resilience therefore requires great social and gender equality. From the standpoint of governance, it also requires a shift from market-based policies with hierarchical and predatory political systems to systems immersed in civic engagement and community cohesion.

In a similarly nuanced fashion, Jesse DiValli and Tracy Perkins analyse neighbourhoods in Southwest Washington, DC, USA as sites of disparate expert and lay risk identification and mitigation practice (DiValli and Perkins, 2020). They find that this context results in what Müller-Mahn and Everts (2013) describe as a “space of tension”. Highlighting the disproportionate power held by the city, which has resulted in development plans that rarely account for residents’ visions for their homes, DiValli and Perkins argue that the neoliberal growth strategy is being resolved largely in favour of the District and developers the District favours. While this effort is likely to produce a

more resilient city in some ways, according to certain metrics they may also displace many current residents in the process; perhaps illustrating the birth of a new form of climate-proofed gentrification. As documented widely within climate change policy (see Húgel and Davies, 2020), DiValli and Perkins find tensions between the rhetoric of planning strategies that claim to speak for all residents and the reality of limited public participation and engagement within them. This is particularly the case for low income, residents of colour who have long experienced disadvantage in other contexts. A false picture of increased resilience will be generated as people become displaced through the District's strategies, pushing vulnerable residents beyond their administrative borders through what DiValli and Perkins call "resilience through attrition." Conceptualising resilience-related redevelopment as a risk to vulnerable populations in this way pushes considerations of climate change and riskscape into social interactions at the neighbourhood scale.

Policy and design professionals are increasingly urged to consider and mitigate these risks within resilience planning as is seen in the Metro Vancouver region in Canada examined by Lily Yumagulova in this Special Issue (Yumagulova, 2020). This article uncovers barriers and enablers for resilience planning across Canada's multiscale governance systems. In particular, Yumagulova uses empirical material to unpack the underlying mechanisms for producing, reproducing and disrupting unequal patterns of risk across the region in British Columbia. She does this by examining the role of the historic and existing flood management regimes in enabling and constraining collaborative planning capacities to address future climate risks such as sea-level rise. Yumagulova finds clear evidence of historically differentiated treatment of Indigenous communities in terms of flood risk transfer in the area. In particular, the analysis shows that the flood management regime favoured investments in

structural flood protection (such as dykes) for colonial settlements, while leaving Indigenous communities exposed to flood risk. These historical decisions left a legacy of underdevelopment for contemporary Indigenous residents that led to further inequalities. Yumagulova makes a strong call for a greater presence of Indigenous voices in future risk and resilience planning in the region if these inequalities are to be addressed.

Raoul Liévanos's case study of Stockton, California, USA offers three main contributions to the climate change and riskscape literature (Liévanos, 2020). First, it synthesises a conceptual framework from prior research that attends to how elites' use of racial categories and racist real estate investment and development patterns structure the spatial concentration of separate and interlocking climate, environmental and economic risk exposures over time in what he calls "high-risk neighbourhoods." The study conceptualises climate, environmental and economic riskscape, respectively, "as spatially varying vulnerabilities of exposure to sea-level rise, flooding, and adverse housing market incorporation and displacement." Liévanos draws on archival sources spanning 1930–2010 and an innovative coupling of geographic information systems and qualitative comparative analysis. He uncovers how different "configurations" or "recipes of risk" (Grant et al., 2010, 480) involve the devaluation of particular racial groups and racially classified spaces, threatening housing market positions, unequal flood protections and elevated risk of exposure to climate-related sea-level rise in Stockton's high-risk neighbourhoods.

Moving continents, but staying with the theme of vulnerability and inequalities, Yvonne Braun draws on the concepts of riskscape and "syndemics" (De Waal and Whiteside, 2003; Singer, 2011) to explore the (un)intended consequences of development, which can exacerbate existing vulnerabilities for communities in the southern African country of Lesotho (Braun, 2020). Braun finds that poverty, food security,



inequality and health risks co-occur, particularly in relation to regional climate stressors and to the impacts of large-scale infrastructural development such as the Lesotho Highlands Water Project (LHWP), one of the five largest transnational construction projects active in the world. In Lesotho, it was largely small-scale farming families who absorbed the most direct losses and stresses to their livelihoods from the LHWP project, and yet it is these same people who experience the greatest risk from current and future climate changes (Twomlow et al., 2008). Braun argues that it is international and national development agendas which have created a series of displacements to increase rather than reduce vulnerability and risks. Instead she urges those who govern to adopt a more holistic approach to their work; an approach that deliberately seeks to anticipate and mitigate interactive, syndemic relationships and their consequences.

Even as we applaud the contributions of this Special Issue, we recognise gaps and challenges. Some of the most daunting challenges and disruptive changes that are being set in motion by climate change and the arc of human history have received too little attention.

### **Climate change risksapes: considering conflict and war, displaced people and pandemics**

While climate change is a central theme throughout this Special Issue, several topics associated with it are not fully addressed. In this section, we consider connections between climate change risksapes and three of these: conflict and warfare; migration and displacement; and pandemics.

#### **Conflict and warfare**

In the first decades of the 21st century, wars have been fought by and in middle income countries (for example, Iraq, Colombia and Syria) and among the world's least developed countries (for example, central and eastern

Africa) (Collier, 2008; Hooks, 2020; Kaldor, 2012; Mann, 2018). There is a growing body of literature which identifies the risks of climate change as a threat multiplier, linking the onset and dissemination of warfare and conflict with rapid environmental change (Barnett and Adger, 2007; Gleick, 2014; Kelley et al., 2015).

Beyond the human suffering and infrastructural damage, wars degrade the social capital and institutional integrity needed to secure the peace. As a result, cycles of violence bring repeated bouts of conflict to people and places who can least afford it (Collier, 2008; Hooks, 2016). Multi-sided wars and conflict among irregular armed forces create overlapping risks, including (but not limited to) environmental degradation, predatory commandeering of the economy, gender and age-related coerced labour and enslavement, and systematic degradation of the infrastructure (health, transportation and communication). These threats intersect with existing risksapes, amplifying risks, heightening inequality and crippling efforts to mitigate risks.

To be sure, the risk society literature has focussed on the social, political and economic dynamics of war, militaristic, and terrorist threats and risk management strategies (for example, Amoores and de Goede, 2008; Beck, 2009; Heng, 2006; Rasmussen, 2006; Rosa et al., 2012; Williams, 2008). In addition, recent riskscape literature has begun to illuminate the reproduction of social vulnerabilities and ensuing uneven redevelopment trajectories following terrorist attacks (Gotham and Greenberg, 2014), and it features propositions about the salience of war games and analogous performative exercises and simulations for making future risksapes present and the target of anticipatory action (Neisser and Runkel, 2017). Yet the riskscape literature has not explicitly addressed war and conflict. Because risksapes highlight the temporal and spatial texture of risk and because they shed light on the multiplicity of perceptions and meaning assigned to these risks, adapting the

riskscape framework to the study of war and conflict offers great potential. This is particularly the case in the context of climate change, as there is widespread concern and mounting evidence that climate change stresses will exacerbate distributional and political tensions, making wars more likely still (see [Dunlap and Brulle, 2015](#)).

### **Displacement and migration**

A second gap centres on the issues of displacement and migration. People are on the move. In sympathetic accounts of globalisation, this mobility allows migrants to seek out economic opportunities and more hospitable political contexts to pursue their aspirations. But this geographic mobility reveals the darker side of globalisation. In the first decades of the 21st century, many migrants have been forced to migrate, are fleeing intolerable oppression and are escaping dangerous war zones ([Hooks, 2020](#)). The United Nations High Commissioner for Refugees (UNHCR) reports an alarming increase in the total number and a rapid increase of “people of concern.” From 1993 to 2003, there were approximately 20 million persons of concern, but this number more than tripled by 2017. As of 2018, there were more than 71 million persons of concern ([United Nations High Commissioner for Refugees, 2017](#)). The rate of growth is not only striking but the total now represents a significant share of the world’s population. If displaced persons constituted a country, it would rank as the 20th most populous in the world.

For both scholarly and substantive reasons, it is unfortunate that the riskscape literature has not been deployed to understand this humanitarian challenge. These mass migrations pose conceptual challenges that the concept of riskscape is well-suited to address. In the riskscape literature—including the contributions to this Special Issue—there is a strong tendency to focus on a specific geographic area, the people who reside there, and/or institutional

dynamics that contribute to the displacement of people from those areas. Displaced people (internal and external) and migrants are moving across riskscape at a variety of scales across the globe. What risks do they perceive? How do they (attempt to) cope with them? What voice do they have in identifying risks and institutionalising mitigation? How and why do elites, experts and risk management institutions respond to such migrants?

Taking full advantage of the fluidity and flexibility of the riskscape concept, and its attention to multiple and interlocking risks, would help us better understand this startling increase in displacement and forced migration on their own terms and in relation to climate-induced displacement and migration. Indeed, sea-level rise is displacing vulnerable social groups and coastal settlements ([Hardy et al., 2017](#); [Maldonado et al., 2013](#); [Shearer, 2012](#)). Further, overtly and covertly racist and nativist state policies, organisations and narratives threaten the lives and livelihoods of climate-change migrants, particularly from the Global South, sometimes under the guise of resilience-based climate change adaptation and mitigation ([Baldwin, 2016](#); [Methmann, 2014](#)). Because it is likely that the number of climate refugees will continue to grow in coming decades, these contributions will be all the more valuable in coming years.

For example, the Amazon rainforest is a riskscape. The Indigenous peoples who have long lived in the rainforest are being displaced. These encroachments impose multiple layers of vulnerabilities, threatening their culture, their livelihood and the health. The risks are perceived and can be examined—as the contributors to this Special Issue have done in a range of settings. But the Amazon rainforest is a riskscape with global implications. In the riskscape literature, including several contributors to this Special Issue, emphasis is placed on the varied meanings and perceptions of risk. In the case of climate change and pandemics, these differences can have global implications.

In the Amazon rainforest, cutting a tree or clear-cutting a hectare of forest may seem insignificant in the context of a vast—seemingly endless—rainforest. On the grounds that it is emblematic of and a requisite for progress, Brazil's President, Jair Bolsonaro, aggressively promotes and defends this clear-cutting. This clear-cutting may push the deforestation to a tipping point that changes regional weather patterns and the global climate (Piotrowski, 2019).

Furthermore, in the Anthropocene epoch, just as climate change can be attributed to human activities, so human activity accounts for the increasing rate of zoonotic spillover (Wood et al., 2012). And, if these practices lead to zoonotic spillover, they could set in motion one or more global pandemics. Current risk management organisations and institutions cannot see viruses and cannot detect the spillover from one host to the next. Nor can these organisations and institutions immediately perceive the connection between individual acts and the global climate. For both climate change and pandemics, we are at risk of calamity. By the time that the effects are sufficiently “visible and acute” to spur concerted action, “it will, by definition, be too late” (Giddens, 2009, 2).

### **Pandemics**

The events of Spring 2020 bring to the fore the dynamics and disruption of pandemics. The emergence, impact and aftermath of pandemics intersect with and transform existing risksapes and the people who navigate them. In her contribution to this Special Issue, Braun (2020) discusses syndemics (a concept emerging from the public health literature) and explores implications for risksapes. Syndemics draws attention to the multiple and overlapping factors that shape health disparities. By weaving in the concept of riskscape, she highlights spatial and temporal processes that reinforce and exacerbate syndemics. While Braun's focus was on a

megadevelopment project, the theoretical synthesis that she advances provides guidance for understanding the origins, context and aftermath of the COVID-19 pandemic.

The spillover of viruses from animal to human populations is and has been a threat to human health. Before the COVID-19 pandemic, this threat was accelerating. Over the many millennia that the human species has existed, there were 219 viruses known to infect humans, as of 2012 (Woolhouse et al., 2012). Given this modest total, the rate of novel infections in recent years is striking. As reported by the World Health Organization (2020) a number of dangerous infections have emerged in the 20th and early 21st centuries: HIV/AIDS (first detected in the mid-20th century, worldwide infections since 1980s), Zika (first detected in 1940, major outbreaks since 2007), Ebola (first detected in the 1940s, major outbreak in 2014), SARS coronavirus (2003), H1N1 influenza (2009) and Middle East Respiratory Syndrome (MERS 2012). There is every reason to believe that this alarming rate of novel disease emergence will continue and may well accelerate. It is estimated that there are over 1.5 million unknown viruses in animal reservoirs; it is believed that over 600,000 (perhaps as many as 850,000) of these viruses have the potential to infect humans (Carroll et al., 2018).

Various social, political and economic activities are encroaching on and destroying fragile ecologies around the globe, and in so doing, they are at the same time, (i) stressing mammalian and bird populations that are host to hundreds of thousands of viruses, (ii) dramatically increasing interactions between domesticated animals and these mammalian and bird populations and (iii) increasing direct human interactions with these animals and the viruses they host (Carroll et al., 2018).

Consider the dynamics underway in the Amazon Basin. Vast tracts of the Amazon forest are being cleared (often burnt) to make way for large agricultural operations—ranching prominent among them. The Amazon rainforest is

an ecological hotspot, thousands of species are found in this forest—and only in this forest. As their unique ecosystem shrinks or disappears altogether, animals will be stressed (many will go extinct) and they (and the tens of thousands of viruses they host) will come into sustained contact with livestock and with people. Since so few of these viruses have been identified and studied, it is impossible to predict the potential for zoonotic spillover and the emergence of a dangerous pandemic (Carroll et al., 2018)—but it is certain that the risk of spillover is heightened by the destruction of the rainforests and other such biodiverse habitats. Moreover, these encroachments and destructive practices—and the associated risks—are taking place around the globe.

As with climate change, pandemics such as COVID-19 tend to bring less attention to the destructive practices and behavioural changes needed to shift course, and instead draw attention towards technological solutions. Managing COVID-19, including the closure and reopening of communities, depends on the rate and capacity to develop, manufacture and disseminate technologies including testing capabilities and vaccines. Shortages in critical medical equipment like personal protective equipment including N95 masks and respirators exacerbated the medical crisis in countries like Italy, and these shortages forced reconsideration of the operation of global supply chains (Raffaetà, 2020; Zhou, 2020). While in some instances, political, economic and social institutions may be adequate, the COVID-19 pandemic has shed light on the areas where social, political and economic institutions need improvement. Further, the COVID-19 pandemic may illuminate how communities with low levels of trust and social solidarity may not sustain lockdowns, allowing the virus to spread or rebound (Manderson and Levine, 2020; Raffaetà, 2020). In the case of climate change, low levels of trust and an inability to commit to and implement shared sacrifice will impede

or delay the painful physical (energy transition, re-zoning) and economic measures necessary for mitigation and adaptation.

The poor and socially marginalised also have least capacity to work remotely or relocate. Further, they have limited financial reserves to overcome the effects of COVID-19 (for example, purchase staple goods at inflated prices) and climate change (repair buildings after harsh storms). These concerns are particularly daunting for the communities around the globe that are, (i) currently locked down in response to the COVID-19 crisis and (ii) also exposed to overlapping climate-related environmental risks such as flooding, fires, hurricanes and extreme heat events. These events will require considerable institutional flexibility and rapid political response. From the political standpoint, resilience is not an attribute possessed by a community in isolation. In the context of these multiple challenges, resilience will likely depend on communities gaining access to state resources and their needs being anticipated and addressed in state policies.

Community resilience is of decisive importance. Where the challenge is of a global scale—as is the case with COVID-19 and climate change—community resilience can be magnified or undermined by the larger state. In the case of COVID-19, hard-hit communities cannot secure the inflow of needed medical equipment on their own. In some instances, national-level responses have exacerbated these shortages. In other instances, the national response has procured needed supplies and bolstered local efforts, thereby strengthening community resilience. As effective countermeasures (testing regimes, lockdowns and contact tracing) must be organised at higher levels (state/province or national), community resilience will be amplified or undermined by the larger political context. In a similar fashion, those communities experiencing the worst effects of climate change may well lack the ability to secure the inflow of resources needed for mitigation (energy reduction and shifts to renewables) and

adaptation (anti-flood measures, increased water storage capacity). Community resilience can minimise these shortfalls. But, once again, community-level options will be limited or augmented by the larger political context and the state's commitment to systematically address climate effects. As such, the concern for risk goes well beyond the realms of environmental issues and climate change, issues of crime, terrorism, economic (in)security and health equity are increasingly framed in terms of risk, and efforts to mitigate risk.

In the immediate context of the COVID-19 pandemic, the biomedical impact of the pandemic is transforming riskscapes around the globe. The facility of contagion, the severity of illness and likelihood of death vary by where one lives, who one is, and one's socioeconomic resources. Writing in the Spring of 2020, it is impossible to predict the long-term impacts of the pandemic (assuming optimistically that a vaccine successfully tamps down infection in 2021 and thereafter). Businesses will fail, unemployment has soared and may remain extremely high, the food supply and household-level food security are at risk, and global trade and travel may fall precipitously. Each of these developments will play out unevenly across human societies; each will heighten vulnerabilities for many people.

### **Conclusion**

Together this collection demonstrates, both empirically and conceptually, the relevance of adopting a riskscapes frame when considering climate change risks and their governance. It extends our understanding of riskscapes with respect to territorial coverage, with articles focussing on case studies drawn from diverse territories including India, New Zealand, USA, Indonesia, Canada, Germany and Lesthoto. Conceptually, in several respects, contributors have critically engaged with and have extended the riskscape concept. First, contributors

have developed explicit connections between the temporality and spatiality of riskscapes (Everts and Müller, Muller-Mann, Moure and Gebreyes, and White and Lawrence). Second, they have displayed a concern with social inequalities and pushed the riskscape literature to come to terms with gender (Tickamyer and Kusujarti), race (DiValli and Perkins, Liévanos), Indigeneity (Yumagulova) and class (DiValli and Perkins, Liévanos, Braun). Third, in different ways, each contributor to this Special Issue displayed a concern for power differences, highlighting the manner in which some individuals, social groups and organisations exert disproportionate influence in the definition of risk and characterisation of risk in time and space. Fourth, they have drawn out the linkages between and among understandings of riskscapes, imagining alternatives and social justice.

These insights include envisioning a more equitable and more inclusive planning of: (re)insurance markets in Florida (Taylor and Weinkle), megadevelopment projects in Africa (Braun; Muller-Mann, Moure and Gebreyes), climate change mitigation in British Columbia (Yumagulova), efforts to anticipate and “fix” climate change risks in New Zealand (White and Lawrence), urban renewal and gentrification in Washington, DC (DiValli and Perkins), understanding the layers of risks in Stockton (California) (Liévanos), coming to terms with climate change risks for small-scale agriculture (Braun; Müller-Mann et al.; Tickamyer and Kusujarti) and energy transition challenges (Everts and Müller). These insights into social justice further enrich and add texture to the concept of riskscapes. The riskscape literature in general—and contributors to this issue specifically—have emphasised social justice. It is not simply the case that there are distinct, at times incompatible, interpretations of risks and riskscapes. Social justice focuses on the institutionalised recognition of risks, steps taken (if any) to mitigate risks and imposition of costs for these mitigation efforts.

The articles in the issue draw together lessons from cases around the globe. Although riskscape highlight the unique characteristics and the context of specific places, they also draw together important lessons of governance, planning and socio-ecological engagement that are critical to building resilience at the local, regional, national and global scales. Communities need governance structures that are adaptive, inclusive and forward thinking to build resilient systems. They also require economies that empower different segments of society and build long-term value across multiple domains. These systems are essential for crises arising from issues such as climate change, war, displacement and migration or the current COVID-19 pandemic. They bring to bear considerations of risk and resilience not only across space, but also layered through time.

The contributors offer a forceful reminder that social justice principles cannot be appended after the fact. The COVID-19 pandemic is creating and will leave multiple, profound and overlapping scars. Recovering from this pandemic will require biomedical reforms, health care enhancements, job creation and economic renewal. As this Special Issue has emphasised, the recovery from this pandemic will play out across time and space—amplifying or dampening vulnerabilities of extant riskscape. If these efforts are inclusive and infused with social justice, the post-pandemic social world could be marked by greater resiliency and enhanced social wellbeing. In a similar vein, climate change adaptation and mitigation pose complex and interdependent social and ethical dilemmas. If megadevelopment projects create winners and losers—and they do—global climate change mitigation and adaptation will do likewise, on a much larger scale. Calls for “Green New Deal” resonate because the term references both the environmental (green) and the social justice dimensions (new deal). Examining and advocating a calls for a “Green New Deal” through the lens of riskscape offers a reminder and a tool to consider the interplay

between environmental and social justice interventions across space and time, and from the individual to the national and global scales.

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