

Climate Justice in the Arctic: A Critical and Interdisciplinary Climate Research Agenda

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Apart from rapidly affecting the Arctic environment, climate change poses significant societal challenges in the region, as well. However, compared to the impacts of rising temperatures on local ecosystems, our understanding of the social dimensions of climate change in the Arctic appears limited. In this article, we respond to this knowledge gap and to the recent calls for reorienting climate research in the region towards people and ethics. We do so by charting a climate research agenda for the Arctic guided by climate justice – a framework we use to examine the unevenness of climate impacts and the responses to them in the region.

We begin by providing an overview of current climate-related social science research in the Arctic with a focus on adaptation, mitigation, health, Indigenous studies, security, and governance. We note the scarcity of works focused explicitly on equity or justice in this context. After briefly outlining key relevant climate justice approaches, we propose a critical and interdisciplinary manifesto for climate scholarship in the Arctic centred on research focus and scale, knowledge decolonisation and co-production, new methodologies and solutions. We also discuss its practical implications for researchers and policymakers centred around non-Western frameworks of climate justice, communities' own stories of climate injustice, and using climate justice as a bridge to interdisciplinarity. We conclude by arguing that climate justice offers to align research in humanities, social sciences and natural sciences to successfully inform policymakers on the true costs of and the 'real' solutions for climate change issues in the Arctic.

Introduction: Reorienting climate research in the Arctic

The well-documented impacts of climate change on the Arctic's physical environment are not only disrupting the local ecosystems but pose significant *societal* challenges in the region, as well (Jafry, Mikulewicz, et al., 2019; WMO, 2019). Despite the severity of these societal challenges, however, social science research in the Arctic has yet to match the regional influence of natural sciences (Hua et al., 2012). This disciplinary imbalance was recognized as early as 1989 and has over the years continued to be reiterated as a critical gap in knowledge for Arctic research, policy and governance (Adger et al., 2011; Ford & Smit, 2004; Long, 2018; National Research Council, 1989; Petrov et al., 2016). While some progress has been made to address this imbalance, conceptual and

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funding challenges for promoting interdisciplinary or even multidisciplinary research in the region remain (Ford et al., 2013).

Nonetheless, social science research on climate change in the Arctic has grown in recent years (Huntington et al., 2019; Stephen, 2018), particularly within the fields of climate change adaptation and vulnerability, which began shifting from largely observational studies of physical environments towards co-productive and participatory research with those affected (Champalle et al., 2015; Petrov et al., 2016). A critical observation is that, regardless of disciplinary origin, studies on the region can frequently take an overly descriptive or even essentialist approach towards the Arctic and those who inhabit it, particularly in relation to Indigenous people (Stephen, 2018). Additionally, it has been suggested that social science research should look to situate the challenges of climate change in the Arctic within a broader historical and geopolitical context because many climatic challenges faced by Arctic communities have roots beyond the Arctic itself, such as the legacy of settler colonialism in undermining Indigenous adaptive capacity (Whyte, 2018), as well as the growing influence of global politics in shaping Arctic governance (Greaves, 2019). In this article, we respond to these critiques and the recent calls to reorient climate action and research in the Arctic towards people and ethics (Jourdan & Wertin, 2020; Palosaari, 2020; Whyte, 2020). In doing so, we chart an Arctic research agenda guided by the principles of climate justice.

Researchers use climate justice as a framework to identify and help address the unevenness of human experiences of, and responses to, climate change. Climate justice research frequently combines climate science with insights from social justice, arguing that climate change is a social rather than a natural issue that both breeds new social inequalities (e.g. uneven adaptation outcomes) and exacerbates long-standing ones (e.g. coloniality) (Bond, 2012; Foran et al., 2019; Forsyth, 2014). We propose that a climate justice-oriented research agenda can successfully bridge different scientific and traditional Indigenous knowledge traditions, as well as foreground the needs, perspectives, knowledges of those affected by climate change impacts, and ultimately lead to 'real' solutions to climate-related challenges in the Arctic that address social injustices.

The rest of the article comprises four sections. First, we provide an overview of social science research in the Arctic from an equity and justice perspective by focusing on academic work related to adaptation, mitigation, Indigenous studies, health, security, and governance. Second, we outline the key perspectives within climate justice research and their applicability to the Arctic context. Third, we propose a manifesto for climate change studies in the region pertaining to research focus and scale, knowledge base, methodologies and solutions. In the fourth and final section, we make some practical recommendations for pursuing interdisciplinary, climate justice-oriented research in the Arctic based on this manifesto which focuses on embracing non-Western justice frameworks, foregrounding the lived experiences of climate change in the region, and using climate justice to address the interdisciplinarity gap.

Social science research on climate change in the Arctic: An equity and justice perspective

The following section is a summary of social science research on climate change in the Arctic which focuses on studies concerned with equity and social justice issues.

Adaptation

Adaptation has long been viewed as a detractor to mitigation in the debate on climate action – but Ford (2009) argues adaptation planning is necessary for Arctic residents, particularly in remote and Indigenous communities. Despite this, there are doubts on whether current research methodologies, employed by social scientists, are able to properly identify and characterise vulnerability and adaptive capacity of Indigenous communities (Ford et al., 2013).

Studies on forced migration in the Arctic illustrate the importance of social science research in the region for informing adaptation policy. Marino (2012) and Knodel (2014) found how the relocation of Arctic communities due to climate change is an injustice borne from an unequal distribution of climate burdens – and the authors argue this must be accounted for in resource allocation and community participation in decision-making. The lack of preparedness and understanding by governments to the plight of relocated communities is emphasised here (Knodel, 2014; Marino, 2012). Yet, rather than a recent development, the forced relocation of Indigenous communities, such as through reservations and boarding schools in USA from the 19th century onwards, and the destruction indigenous institutions and cultural practices, notably the maintaining of interdependence between communities and their ecosystems, is a legacy of settler colonialism and an underlying cause of vulnerability in Indigenous communities to climate change (Whyte, 2018).

Adaptation studies in the Arctic have increasingly advocated for community-engagement and participation in research design and knowledge production (Cochran et al., 2013). Berkes and Jolly (2002: 1) were an early adopter of co-producing knowledge in adaptations studies with the concept of “social-ecological resilience” that was informed by an Inuvialuit community. Adger et al. (2011) call for Arctic policymakers to use approaches that incorporate local social and cultural factors into the analysis of climate change impacts, because awareness of climate change will happen through peoples’ lived experiences. Ford et al. (2010) exemplified this emerging approach when concluding climate change will negatively impact housing and roads of an Inuit community based on interviews, as well as geomorphological observations. A central point highlighted by Ford et al (2013) is that vulnerability and adaptative capacity are closely tied to socio-economic conditions, for example, the level of marginalisation, social networks and resource management. Arguably, the aforementioned studies yielded insights that more accurately depicted specific vulnerabilities of Arctic communities and illustrated the need for similar approaches in future research.

Mitigation

More studies have emerged in recent years on the topic of mitigation in the Arctic as the concept of sustainable development has found itself at odds with those Arctic communities dependent on natural resources and tourism (Chen, 2015; Kaján, 2014). The ‘opening’ of the Arctic has sparked debate on climate action in the context of exploitation of natural resources and new freight shipping routes (Dobson & Trevisanut, 2018; Lindstad et al., 2016). There is also a growing focus on equity issues that arise from development of infrastructure in regions with marginalised communities (Everett & Nicol, 2014; Loring, 2013; McCauley et al., 2016). For example, the encroachment of wind farms on Saami grazing land in the name of sustainable development is problematic (Vars, 2019), namely because the ability to migrate reindeer is considered one of the key adaptation strategies of Saami herders to climate change (Tyler et al., 2007).

The debate on natural resource exploitation in the Arctic has largely focused on the challenges of environmental protection (e.g. Dobson & Trevisanut, 2018; Trump et al., 2018; Turati et al., 2014). However, there is concern that development driven by fossil fuel industries will not achieve energy self-sufficiency for Arctic communities (Dalessandri, 2018). Further, benefit sharing agreements in the Arctic have rarely produced benefits for Indigenous communities or prevented conflict between communities and extractive industries, and even caused conflict within communities (Petrov & Tysiachniouk, 2019; Tysiachniouk & Petrov, 2018). For example, the Gáλλok mining project has largely ignored Indigenous land rights and is located on traditional grazing land (Berger, 2019).

Against this background, McCauley et al. (2016) pose energy justice as a framework for infrastructure development in the Arctic to address the injustices often suffered by underrepresented communities. More studies are emerging on the social injustices experienced by Indigenous communities in the Arctic as infrastructure is developed (Berger, 2019), though these accounts likely represent the tip of the iceberg.

Indigenous studies

The early and mid-2000s saw an emerging narrative among researchers that Indigenous communities in the Arctic would be disproportionately impacted by climate change and this would undermine any claims to and for sustainable development in the region (Craig, 2009). For instance, Trainor et al. (2007) found Indigenous communities in Canada and northern USA faced an environmental injustice due to historical discrimination and were disproportionately impacted by climate change. At the same time, it has been suggested that Indigenous communities are least able to cope with such impacts (Crate, 2008; PFII, 2008).

This narrative corresponded with calls for greater political representation of Arctic communities vulnerable to climate change in international forums (Brigham, 2007; Crump, 2008). The participation of Indigenous organisations through international governance bodies, such as the Arctic Council, has influenced research projects and governance in the region (Koivurova & Heinämäki, 2006). Notably, an outcome of closer engagement between researchers and Indigenous communities is the recent acknowledgement ‘traditional knowledge’ in natural science studies (Alexander et al., 2019; Huntington et al., 2011). For example, Parrotta and Agnoletti (2012: 525) describe how insight from Indigenous communities on good practice in forest management can be useful to “complement formal science”. However, researchers have increasingly focused on wider political and historical contexts underpinning climate change impacts in the Arctic (Cameron, 2012; Huntington et al., 2019). For example, Wilson (2014) argues an Indigenous community in Alaska was made vulnerable to climate change due to a legacy of colonialism undermining the agency of Indigenous people – and this legacy impeded their adaptive capacity to environmental changes by disrupting their ability to choose the manner in which they adapt, namely through constraints on subsistence livelihoods.

Health

Climate change threatens the health of Arctic communities both directly (e.g. via increased injury and mortality rates from extreme weather and unpredictable ice conditions) and indirectly (e.g. via increased mental and social stress caused by disruption of traditional lifestyles and loss of culture) (Parkinson & Berner, 2009). However, Ford (2012) argues that in order to truly understand and

address the health impacts of climate change, analyses must consider both climatic and non-climatic factors and involve the affected communities in the shaping of research and policy. For example, Ford et al. (2010) found climate change and socio-economic inequality were linked with poorer health outcomes for Indigenous Canadians. The coronavirus pandemic is particularly dangerous to Indigenous communities as lockdowns threaten to cause food insecurity and malnutrition, for example, by disrupting supply networks and delivery of food to remote Inuit communities (Zavaleta-Cortijo et al., 2020).

A consideration of socio-economic factors and community participation in research has long been recommended as a necessary step to understand the impacts of climate change on health in the Arctic (Harper et al., 2012). Ebi and Semenza (2008) argue public health programmes require a greater focus on improving community adaptive capacity to tackle climate-sensitive health issues. Relatedly, Parkinson and Berner (2009) strongly recommend the community-based monitoring of groups vulnerable to climate change. The aforementioned studies represent early examples of the increasingly recognised need among health researchers to involve communities in building a meaningful evidence-base of the climate-related public health risks, vulnerabilities and adaptabilities of Arctic communities (Ford et al., 2018; Akearok et al., 2019; Ruscio et al., 2015).

Additionally, there is a growing consensus that climate change can impact mental health. For example, Bell et al. (2010) postulate rapid environmental change affects the traditional culture of Alaskan Natives, and this may cause trauma through forced adaptation. In another example, Willox et al. (2013) found an Inuit community in Canada reported their mental health and wellbeing was impacted by environmental changes – and this manifested through stress, increased drug and alcohol use, enhancement of previous trauma, and the potential for suicide. However, there are few studies exploring climate change and mental health in the Arctic, demonstrating more research is needed on this link.

Security studies

Security studies in the Arctic have evolved beyond the traditional focus on defence and borders, and towards concepts of socio-economic crisis management and environmental protection (Heininen & Exner-Pirot, 2020; Lukovich & McBean, 2009). This broadened dialogue on security reflects the largely positive view of international cooperation in Arctic governance held by researchers during the 2000s and 2010s, particularly thanks to governments having deferred to research-led decision-making processes (Palosaari, 2012). For example, coastal Arctic nations are collecting scientific evidence on their geographical placement within the continental shelf as part of the United Nation's process for determining maritime boundaries – in spite of widely reported concerns that interstate security objectives would dominate the process (Palosaari, 2020). However, it should be noted that military concerns have re-emerged in the Arctic following the annexation of Crimea in 2014 by Russia, shifts in China's Arctic policy, and subsequent reactions by USA and NATO countries, and the American government, in particular, has purposely omitted climate change from any security debate (Lanteigne, 2019).

That said, some researchers suggest the autonomy of small actors could be affected by the growing interest in the Arctic (Shadian, 2010). Climate change is increasing the accessibility of a region with natural resources that has been historically difficult to navigate, as well as largely disconnected from the strategic concerns of Arctic and non-Arctic states (Lanteigne, 2019). Small actors will likely review their security policies in response to the 'opening' of the Arctic (Bailes, 2014).

However, international commitments to peaceful governance in the region mean interstate conflict over natural resource extraction is unlikely because most reserves are found in undisputed sovereign territory (Heininen, 2012; Keil, 2014).

Regardless, climate change has catalysed the Arctic to become geopolitically integrated with neighbouring regions and marked the end of the “Arctic exceptionalism” i.e. the conceptualisation of the Arctic as geopolitically distinct from the neighbouring regions and largely detached from interstate competition (Greaves, 2019: 11). Ultimately, new security discourses have emerged because of climate change, highlighting the need for a paradigm shift in how we understand security in the region (Heininen & Exner-Pirot, 2020).

Arctic governance

Inclusivity is increasingly considered vital for governance in the Arctic in response to climate change (Adger et al., 2011; Champalle et al., 2015). However, there is concern methodologies and conceptual frameworks used in Arctic research are still unable to effectively inform regional governance on the social impacts of climate change. Forbes (2007) argues resource management in the Arctic has historically been dominated by natural scientists within governing bodies which, in turn, have been resistant, or perceived little reason, to engage with participatory approaches. Forbes (2007) concluded top-down approaches have undermined resilience-building by not effectively understanding community needs and vulnerabilities.

Further, O’Brien et al. (2009) argue historical power structures have made some disenfranchised communities’ security and wellbeing vulnerable to the impacts of climate change. They emphasise that the socio-political factors between different social actors must be understood to detect barriers to resilience-building among certain groups. This raises important questions on the social contract where the debate on rights and responsibilities between the State and its citizens have resulted in new discourses on litigation and human rights, as in the case of Indigenous organisations in the Arctic taking legal action on the basis of concepts such as environmental and climate justice (Warner & Abate, 2014). Ristroph (2019) found Alaskan Indigenous communities expected federal and local governments to hold some responsibility for assisting them with adaptation. Relatedly, Indigenous activists protesting against oil drilling in the Arctic because it was considered to infringe on their human rights and customs is an example where the concept of inherent legal protections from climate change has been pursued (Norman, 2017).

A common theme of governance studies and social science research on climate change in the Arctic is the growing emphasis on new methodologies and ways to produce knowledge to achieve insights on equity issues. Yet, there are few examples of climate change research using participatory research methods and/or equity-centred approaches. Against this background, there is a pressing need for a climate justice research agenda to understand the social impacts of climate change in the Arctic.

Climate justice and Arctic issues: An overview

Over the years, researchers in the field developed a number of analytical frameworks highlighting different aspects of climate-related injustices. While a comprehensive review of these is beyond the scope of this article, here we provide a selection of the most salient approaches to studying

climate justice and the ways they may apply to the Arctic context. It should be underscored that most of these are of an explicitly Western origin.

One of the dominant frameworks of climate justice is based on its deconstruction into different ‘aspects’ or ‘components’, including recognition, procedural justice and distributive justice, all of which need to be satisfied to ensure justice can be achieved (Adger, 2006; Bulkeley et al., 2014; Gardiner, 2011; Schlosberg & Collins, 2014). First, the need for *recognition* stems from the persistent inability of societal structures to identify and adequately include historically marginalised groups or individuals in decision-making processes (Jenkins et al., 2016; Ryder, 2018; Tomlinson, 2015). This can take the form of disregarding local knowledge or underappreciating the ability of certain communities or individuals to participate in high-level decision-making due to their perceived low level of education or expertise (Medby, 2019). For example, Johnsen et al. (2015) found that the dominant narrative of Norwegian media and governance bodies present the viewpoints of Saami reindeer herders as irrational and ignorant, while lending legitimacy to scientific measurements considered apolitical and objective.

Second, *procedural justice* aims to ensure “fairness in access to democratic decision-making by individuals, groups and nations” (Adger, 2006: 14) and is concerned with including all parties affected by or involved in a given issue, such as marginalised groups, non-humans, or future generations (Gardiner, 2011). Emphasis is placed on the quality of participation, which should be deliberative (reached through discussions that address power imbalances and divergent interests) rather than simply aggregative (e.g. reached by voting) (Hilde, 2012). Building on this argument, Sovacool (2016) underscores the importance of giving communities the ability to say ‘No’ if they feel that their interests are not addressed. In general, procedural justice is essential for securing legitimacy of the decisions taken. As an example, political efforts to reform decision-making processes within Arctic intergovernmental bodies have sought to boost representation of vulnerable groups and Indigenous populations (Arruda & Krutkowski, 2017; Atapattu, 2013; Berkes & Armitage, 2011; Martello, 2008).

Finally, *distributive justice* is most commonly concerned with the material implications in the aftermath of the deliberations among the parties. That is, what is to be distributed, among whom and how (Grasso, 2010). In practical terms, this means ensuring that both the costs and the benefits (more than just financial ones) related to climate change impacts, adaptation and mitigation are shared in a fair manner and do not place a disproportionate burden on certain individuals, communities and nations. An example of distributive injustice in the context of mitigation is wind power development in the Saami traditional grazing lands in Scandinavia, as in the case of the Storheia wind park in Fosen, Norway (Vars, 2019).

Recognition, procedural justice and distributive justice are sometimes complemented with *compensatory justice* (also referred to as restorative or transitional justice), which aims to redress the injustices experienced as a result of past decisions and processes. In this context, climate justice activists and scholars frequently invoke arguments on historical responsibility for causing climate change (Gardiner, 2011; Klinsky & Brankovic, 2018; Vanderheiden, 2008). Initially, this was often debated at the international level with various degrees of responsibility assigned to entire nation states, but critical research has suggested that responsibilities for climate change within countries can vary greatly. An example of this is to consider the Indigenous peoples in the Arctic as co-responsible for causing climate change by virtue of them living in states historically responsible for

high greenhouse gas emissions (e.g. Norway, Canada, United States), which fails to recognize their minuscule role in the process.

Rather than deconstructing its different components, other climate justice-centred approaches are based on the aggrieved parties or actors. For instance, *intergenerational climate justice* is concerned with ensuring that young or future generations can live lives free from climate change and its negative impacts (Gibbons, 2014; McKinnon, 2012; Roser & Seidel, 2017). The Arctic's young (and not to mention yet unborn) residents, for instance, are likely to witness life and livelihood changes that are more rapid and severe compared to the experience of their parents. Relatedly, *interspecies justice*, or justice for non-humans, considers the ethical and material implications of climate change impacts on non-human animals (Palmer, 2011). This is of particular significance to Arctic biodiversity and the region's relatively fragile ecosystems (Pörtner et al., 2014). It is also relevant for the crucial importance of kinship and reciprocity relationships with non-humans for many Indigenous peoples in the region (Whyte, 2020).

Another widely-used approach in climate justice scholarship is climate litigation (or jurisprudence), wherein the effects of climate change are seen as violating certain rights that people possess. Here, legal scholars and practitioners mobilize arguments rooted in both international and national law (Chamberlain, 2012; Craig, 2009; Jodoin et al., 2020; Knodel, 2014; Kronk Warner & Abate, 2014; Nilssen, 2019). With regards to the former, human rights are often used as a basis for seeking redress for climate injustice (Craig, 2009). A prominent example of this is the petition of the Inuit Circumpolar Conference filed against the United States to the Inter-American Commission on Human Rights (Kronk Warner & Abate, 2014), which argued that climate change violates petitioners' human rights, and more specifically their climate rights or their "right to be cold" (Jodoin et al., 2020: 1). At the national level, two of the most well-known instances of climate litigation are the Kivulina case brought forth by an Alaskan village against coal, oil and power companies (Knodel, 2014) and the Saami legal argument against a wind farm development sited on their grazing lands in Norway (Nilssen, 2019). However, none of these cases were decided in the plaintiffs' favour, demonstrating litigation channels' limited effectiveness in redressing climate injustice in the Arctic, particularly concerning legal action by Indigenous groups against historical colonial states.

A manifesto for climate change research in the Arctic

It is evident that social science research in the Arctic has to some extent appreciated the inherent inequalities of global climate change. At the same time, however, the field is highly fragmented, with studies frequently eschewing an explicitly equity- or justice-centred approach. We consider this a central barrier to long-term social and environmental sustainability in the region. With this in mind, below we propose a number of benchmarks which social scientific scholarship on climate change in the Arctic (and elsewhere) should meet based on the insights of currently available climate justice literature.¹

Research focus and scales

The most commonly invoked argument for applying a climate justice-focused framework is the need to reorient climate research towards people, and specifically towards those who are disproportionately affected by its impacts while bearing little historical responsibility for causing it (Jafry, Helwig, & Mikulewicz, 2019). In this context, narrowing the research focus to groups such

as Indigenous people, women, the elderly, young people, persons with disabilities or the poor is suggested as a remedy for this historical marginalisation in research and practice (Rochette, 2016; Sellers, 2018). More contemporary approaches apply the concept of intersectionality to investigate how various axes of social difference determine people's experiences of climate change (Kajiser & Kronsell, 2014; Ryder, 2017).

At the same time, however, these calls run the risk of portraying Arctic people and the Arctic itself (Stephen, 2018) as extremely vulnerable – a problematic framing for emancipatory research. Climate justice scholarship must be conscious of this risk, and build from the bottom-up by following in the footsteps of the climate justice movement which has sought to empower, rather than stereotype, those who are often described as 'the victims of climate change'. Ecofeminist and post-colonial research, for instance, has demonstrated how women and people in former colonies can easily be subject to this kind of discursive violence (or violence that occurs in written, spoken or representational form) (Gaard, 2015; Mikulewicz, 2020a). The Arctic's widespread portrayal as fighting on the frontlines of climate change amplifies the need for this awareness even further (Jafry, Mikulewicz, et al., 2019). Therefore, climate justice research should stand for a representational reorienting of the Arctic and its residents, and seek to convey their agency and resourcefulness in the context of climate change adaptation and mitigation.

Moreover, there are evident tensions when it comes to the appropriate scale of analysis. Early climate justice research was largely entrenched at the international level, making little sense of the 'smaller' injustices happening locally (Fisher, 2015). However, the last few years have seen a proliferation of local analyses of climate injustice, including in the Arctic (Berger, 2019; Knodel, 2014), reflecting the widely recognized need to counterbalance the quantitative studies on climate change by putting a 'human face' on the issue – and foregrounding local people's lived experiences. There is still much to achieve here. For example, Stoddart and Smith (2016) demonstrate how Canadian media portray climate change in the Arctic as a national rather than a local matter, therefore ignoring the subnational aspects of the problem.

In addition, we argue, somewhat counterintuitively, that climate justice research in the Arctic and elsewhere should not limit its focus to climate change alone. Effective climate justice analyses will extend their scope to other societal issues such as poverty, health, education and political inclusion that determine people's experiences of climate impacts, adaptation and mitigation (Huntington et al., 2019). This includes broadening not just the spatial but also temporal scales to investigate the historical and systemic causes of certain groups' vulnerabilities (Huntington et al., 2019). For example, the current high level of vulnerability of many Indigenous communities in Canada to environmental change in the Arctic stems from centuries-long political, social and economic marginalisation of Indigenous Canadians (Cameron, 2012). Conversely, analyses that foreground climate change in an excessive manner can inadvertently result in obscuring these fundamental determinants of vulnerability which frequently precede the era of industrialisation and greenhouse gas emissions.

New knowledges

There are important ontological implications for emancipatory climate change research in the Arctic and elsewhere. Notably, climate justice research must strive to decolonize the current knowledge base on climate change in the Arctic. Here, lessons can be learnt from the climate justice movement which often, though by no means exclusively, draws from non-Western

philosophies (Nuñez, 2019). This is to counterbalance ethnocentric ontologies (which view Western approaches to knowledge production as superior) currently dominating research on climate change in the Arctic (Cochran et al., 2013; Knodel, 2014; Whyte, 2013). For instance, Indigenous scholars have written on the need to reorient environmental justice research away from the focus on the ecological and towards the relational, stressing the importance of relationships of kinship with both humans and non-humans (Whyte, 2020).

Moreover, the issues of who ‘studies’ the Arctic versus who is ‘studied’ and the problematic framing of Indigenous knowledge as ‘local knowledge’ (Cameron, 2012) should also be scrutinized. For instance, there are relatively few studies exploring the legacy of colonialism on the adaptive capacity of Indigenous populations in the Arctic, despite extensive scholarly research on similar topics in other parts of the world (e.g. Mikulewicz, 2020b; Reo & Parker, 2013). In general, the relegation of input from Indigenous communities to ‘traditional knowledge’ as opposed to ‘formal’ science (e.g. Parrotta & Agnoletti, 2012) risks perpetuating colonial relations by putting the responsibility for the lives of Indigenous communities exclusively in the hands of external actors. Meanwhile, beyond the ethical implications of foregrounding ethnocentric ontologies to studying climate change in the Arctic, climate research and policy can, and does, benefit from Indigenous knowledge (e.g. Huggel et al., 2015).

New methodologies

The calls for participatory research and a focus on equity issues in the Arctic have grown louder in recent years (Stephen, 2018). Petrov et al. (2016: 176) point out that more studies are needed on “equity, agency, power and justice” in the region. Yet, a review on methodologies for adaptation planning in the Canadian Arctic found that common methods included assessment of current and future vulnerabilities, potential adaptation pathways and monitoring, but did not always incorporate a participatory element in data collection (Champalle et al., 2015). This is considered a shortcoming in current research on adaptation in the Arctic and elsewhere, which has stressed the need to involve those affected by climate change in the selection of adaptive strategies, for instance by the use of community-based adaptation (CBA) approaches (Ensor et al., 2018). Moreover, Stephen (2018) observes that social scientific studies in the Arctic are often tailored for policymakers (a symptom of the push for research relevance beyond academia) which may end up producing research that frequently is less “curiosity-driven, independent, and theoretically and methodologically aware” (230).

These critiques provide cues for what a climate-justice-oriented research in the Arctic should look like from a methodological point of view. This includes developing proven frameworks with a more explicit participatory approach to data collection and featuring equity as a criterion for assessing priorities in adaptation planning, allowing a greater focus on vulnerable groups (Champalle et al., 2015). There is also a clear need for collaborative and co-productive approaches between Indigenous communities and researchers to allow participants-turned-researchers to play an active part in contextualizing the wider societal issues and decolonise current research methods (Huntington et al., 2019). What we would add to this is the need to open up our knowledge horizons (as discussed above) and to involve local and Indigenous people in the Arctic in research design, data collection and analysis, monitoring and evaluation, the selection of recommendations and research dissemination. Ethnographic and participatory action research (PAR) of this kind – while certainly more involved in terms of time and financial resources – holds promise for the

pursuit of the difficult goal of decolonizing our knowledge on climate change in the Arctic and the associated knowledge production processes (Crang & Cook, 2007; Henderson et al., 2017; Johnston-Goodstar, 2013; Reitan & Gibson, 2012; Ryder, 2018; Stoudt et al., 2012). Ultimately, this pursuit of new methodologies is to generate new thinking and narratives on what climate justice means for different Arctic communities.

Focus on ‘real’ solutions to climate change and climate injustice

Finally, we stress the need for Arctic climate scholars to be wary of ‘false’ solutions often touted as panacea for the Arctic’s climate ills. These frequently come from ecological modernization proponents who advocate for a sustainable stewardship of the Arctic to ensure its socio-environmental integrity, as in the case of oil and gas development in the region which is to be managed in an environmentally-friendly way (Palosaari, 2020). However, these arguments miss the ‘big picture’. There are important ethical implications of continuing fossil fuel extraction in the Arctic, with not just local but global consequences (Palosaari, 2020). Preventing oil spills and protecting Arctic biodiversity, while certainly important, will not solve these ethical quandaries. Therefore, climate justice research needs to ensure that the solutions it proposes do not fall into the trap of giving false hopes, as in the case of carbon markets and integrated natural resource management (Gardiner, 2011; Taylor, 2018). Instead, and drawing from political ecology, for instance, recommendations should always be situated within the context of the global system of production and consumption, and therefore stretch beyond the analytical constraints of the ‘Arctic bubble’. Research on transformational adaptation – highly sceptical of resilience-focused approaches considered as inherently lacking in ambition (Gillard et al., 2016; Nightingale et al., 2019) – can signpost the way for ‘real’ solutions for climate change and climate injustice that fully embrace the socio-political nature of climate change and its impacts.

Conclusion and priorities for future research

We move to the concluding section of our paper where we detail three key implications for future research on climate change and climate justice in the Arctic.

Embracing non-Western frameworks of climate justice

The North American origins of climate justice (see Schlosberg & Collins, 2014) mean that the frameworks are inherently constructed for a Western audience. The justice conceptualisations that have developed throughout the past 50 years have been by Western, or European and American thinkers (Meyer & Sanklecha, 2017; Routledge et al., 2018). One common feature is the focus on Western forms of justice on human dimensions (Kortetmäki, 2016). A brief overview of competing non-Western philosophies (see Table 1 below) reveals that non-human life takes a more prominent role. There have been calls to catalogue, or even summarise, alternative approaches to conceptual frameworks that can allow us to unearth bottom-up non-Western understandings of justice (McCauley et al., 2019; Sovacool et al., 2017). A starting point for Arctic research are the non-anthropocentric concepts of justice, especially animism (Loukacheva, 2012).

Table 1: Summary of non-Western and non-anthropocentric philosophies and applications for climate justice research in the Arctic. Adapted from McCauley et al. (2019) and Sovacool et al. (2017).

Concept	Definition	Application to climate justice
Ubuntu	The act of building community, friendship and oneness with the larger humanity	Neighbourhood efforts to promote efficiency, decisions about energy resources within a community
Taoism and Confucianism	The Tao or Dao emphasizes the virtuous path that leads to greater harmony amongst humanity. It assumes a universal nature and the Means to an end is more important than the end itself	Respecting due process in decisions, adhering to human rights protections when implementing climate related projects
Hinduism and Dharma	Dharma carries the notion of righteousness and moral duty and is always intended to achieve order, longevity and collective well-being. It is context specific and does not render itself to universalization. Gandhi is a prominent example that espoused and practiced Dharma	Seeking to minimize the extent and distribution of externalities, offering access to help address poverty
Buddhism	Expounds the notion of selflessness and compassion, the pursuit of individual salvation or nirvana. Often criticized for its inability to deal with real social issues	Respecting present and future generations with climate related decisions, minimizing harm to the environment and society
Indigenous Perspectives of the Americas	Cultivation of a cultural mindset that recognizes interdependence of all life and enables good living through responsibility and respect for oneself and the natural world, including other people	Systems developed cautiously through long-term experience and sovereign cultural protocols, avoiding dramatic transformation of ecosystems, requiring restoration
Animal-centrism / animism	Difference in degree but not in kind between humans and all other animals. Valuing and recognizing rights of all sentient life	Development avoids harm and provides benefits to all sentient animals
Biocentrism	Valuing all living beings based on a reverence for life that stems from recognition of the will to live and the basic interest to survive and flourish	Decisions guiding by consideration of competing claims to a fair share of environmental resources among all living beings, where basic welfare interests outweigh non-basic welfare interests

Ecocentrism	Moral consideration for human and nonhuman communities and the basic functioning and interdependence of the ecological community as a whole	A system is just when it tends to preserve the integrity, diversity, resilience, and flourishing of the whole community, involving direct caring relationships and formal rights of nature
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This difference in justice conceptualisations can be easily seen when exploring the Arctic strategies of the Inuit Circumpolar Council (ICC). In a recent report, the ICC observed that “for Inuit, the Arctic defines who we are” (2018: 7), while the Utqiagvik Declaration states that “Our culture is dependent on the land and sea” (ICC, 2018: 8). These quotes directly underscore why demands for justice are culturally embedded within the Arctic environment. A previous report by ICC (2015: 14) notes that “for over fifty years, Arctic regions have been depositories, analogous to sinks for many pollutants emanating from around the world”. This sense of injustice is driven by a connection to nature, but further systematic work is needed to begin to untangle the implications of non-Western understandings of justice for the Arctic.

Inspire, reveal and share experiences of climate injustice in the Arctic

In referring to Indigenous storytelling, Reed and George (2011) remind us that readers need to adopt new ways of listening in order to understand not only senses of justice but also injustice. This paper challenges academics to similarly adopt, or as in several instances continue, an approach predicated on ‘listening’ to how injustices are experienced. Houston (2013) calls on scholars to explore the imaginative practices of how stories are performed in justice struggles in shaping alternative imaginations of place. Storytelling can be a powerful tool. It produces different environmental imaginaries about the kinds of worlds people want (or not) to live in. In so doing, such stories can act as a sort of mobile repertoire for combating injustices in other places. They can effectively inspire the construction of justice frames based on success elsewhere. Walker (2009: 622) comments, for example, that “as we move from concern to concern and from context to context, we can expect shifts in both the spatial relations that are seen to be significant and in the nature of justice claims being made”. Therefore, it is important that climate justice research in the Arctic examine multiple reasons for the “construction of *injustice*” (Schlosberg, 2013: 37, emphasis in original). In this paper, we call for an exploration of the construction of multiple injustices through activism-based research for Arctic regions

Climate justice as a bridge to interdisciplinarity

Sustainable development has been a central focal point for both social science and natural science researchers in the Arctic (Afenyo et al., 2019; Andreassen, 2016; Hilbert & Werner, 2016; Tysiachniouk & Petrov, 2018). It has been a common discourse that has allowed the humanities to engage in a meaningful manner in Arctic related research (Aporta, 2009). So, what does this mean for climate justice? As a recent study by Overland and Sovacool (2020) detailed, climate change research is still heavily dominated by natural science interests. A wider rebalancing is urgently needed, but in the interim period, there is an opportunity for climate justice to offer a much needed normative framework for interdisciplinary research (Heffron & McCauley, 2017). The cornerstone of interdisciplinary research is when disciplines work in an integrated way (Boylan

et al., 2019). As such, we advocate that climate justice scholars are at the forefront of not just problem definition, but also crucially, their solution.

This has real practical implications. Let us consider the problem of redistributing the burdens of climate action. Scholars would normally reflect on problem definition. This is a necessary process to allow cross-disciplinary scholars to develop tools, mechanisms and outputs that lead to meaningful solutions. Three mechanisms immediately emerge in relation to justice research. The use of a “justice matrix” can allow for the input of natural and social science research to demonstrate the trade-offs involved in making a policy decision, for instance helping to identify particular regions that should be targeted for redistribution of resources (Heffron et al., 2015, 2018). Similarly, a “justice-based economic valuation” can reveal the true costs of decisions (Sayegh, 2019). A justice-based approach to mapping decisions through GIS, for instance, can force policy-makers to consider the physical, cultural and social implications of their policy (Chang et al., 2015; Eisner et al., 2012). These examples of shared tools are the real delivery mechanisms of an interdisciplinary project.

In conclusion, approaches rooted in climate justice can push the boundaries of current research on climate change in the Arctic. Climate justice strongly aligns with the pursuit of sustainable development as the impacts of climate change in the region pose challenges to Arctic ecosystems, biodiversity, human development, and livelihoods, most notably in remote and Indigenous communities (Jafry, Mikulewicz, et al., 2019; Jourdan & Wertin, 2020). This new research direction comes with the recognition of the uneven distribution of climate change impacts and the damaging legacy of colonialism on Indigenous and remote communities’ ability to mitigate and adapt to its impacts (Huntington et al., 2019; Whyte, 2020), and advocates a critical reflection on the role of these communities in knowledge production processes (Cameron, 2012). In addition, the equitable application of climate-related policy and the involvement of the most affected communities in the decision-making process and co-producing solutions is a procedural step towards reaching transformative solutions to societal inequalities (Jafry & Platje, 2016; Verbitsky, 2014; P. Wilson, 2016). There are parallels to be drawn here with the Arctic Circle’s mission to facilitate dialogue and strengthen decision-making processes in Arctic governance (Arctic Portal, 2013), and the unique status given to Indigenous representatives in the Arctic Council (Koivurova & Stępień, 2011). In sum, climate justice-centred frameworks provide an opportunity to incorporate humanities, social and natural sciences through strongly aligned interdisciplinary research capable of informing policymakers on the true cost of and the ‘real’ solutions for climate change and our response to it.

Notes

1. This review was complemented by feedback obtained as part of a webinar on integrating climate justice into Arctic research and policy. The event took place on June 10, 2020 and was hosted by the Centre for Climate Justice at Glasgow Caledonian University. It included an audience of over 95 academics, practitioners, decision-makers and members of the public who were asked to provide feedback on promoting climate justice within the fields of Arctic research and policy.

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