Chapter 9
Arctic Disaster Risk Reduction and Response as Triumph?

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Abstract Disaster risks and disasters are frequent around the Arctic. Hazards range from the usual sudden-onset suspects—such as earthquakes, avalanches, landslides, floods, and meteorites - to long(er)-term or less familiar changes such as climate change impacts, including sea level rise or microbes unleashed by melting permafrost. Simultaneously, the Arctic region has experienced changes to vulnerabilities – especially the growth and development of the energy, shipping, resource extraction, and tourism industries – increasing the potential of further disasters. That is, with more people and infrastructure potentially affected by hazards, disaster risks rise, especially if vulnerabilities are not counteracted or if they are created through unsustainable development practices. However, while much discourse tends to view Arctic populations as passive players experiencing the consequences of environmental hazard influencers, including but not limited to climate change, in reality, Arctic populations have been actively tackling disaster risks and response. This chapter establishes this point by focusing on the region's existing disaster risk reduction and response (DRR/R) efforts as demonstrated by the wide range of bi- and multilateral cooperative agreements created to contribute to a less vulnerable Arctic. By analysing them in the context of DRR/R, this chapter highlights that, while unique cooperative measures are in place to address disasters when they occur, these efforts are insufficient to manage the dynamic challenges the Arctic is facing. A shift to a focus on reducing disaster vulnerabilities in the first place is as necessary in the Arctic as it is elsewhere.

Keywords Disasters · Disaster risk reduction and response · Search and rescue · Arctic cooperation · Paradiplomacy

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9.1 Introduction

Operating on the premise that what happens in the Arctic has global effects—and vice versa—outsiders are showing a growing interest in disasters and disaster risk reduction and response (DRR/R) in the Arctic. These outside perceptions of the Arctic are fraught with misconceptions. Often, these can be found on either extreme of the 'wild paradise vs. disaster area' spectrum. According to the former, the Arctic is still perceived as a feral, pristine, untouched expanse; a view that evokes public dreams of escape and adventure that the marketing teams of many Arctic tourism vendors are all too keen to promote (Wang et al. 2018).

On the other hand, climate change discussions and images of ice-free Arctic waters, starving polar bears and, more recently, doomsday scenarios of pandemics induced by thawing permafrost (as has been popularised by the successful television show 'Fortitude') are increasingly creating the perception of an 'Arctic of disasters'. This notion dominates much of the international political, environmental and legal discourse and it is readily repeated and sensationalised by international media coverage (Grant 1998; Young 2011; Fjellestad 2016; Loftsdóttir 2015; Pincus and Ali 2016). Coupled with often insufficient knowledge of Arctic populations and cultures, we suggest that this damning picture is mostly seen through guilty, post-colonial eyes emphasising this tragic situation to be one to which Arctic populations have only minimally contributed (e.g. Downie and Fenge 2003). In the context of DRR/R, the resulting image often portrays Arctic populations as passive victims of a situation that is not of their own making while their ability to properly react to the changing Arctic is supposedly compromised.

Yet even a cursory look at discourses coming from within the Arctic region suffices to reveal the acute awareness of the problems — on local, sub-national, national and international levels — as well as the ideas, will, and subsequent initiatives to tackle them. What is more, while disaster researchers generally bemoan the lack of much-needed cooperation on DRR/R as an apparently general feature (Ansell et al. 2010; Boin and Lagadec 2000; Perrow 2007), in the Arctic, cooperation appears to be a cornerstone of everyday life, including on disaster-related matters (Huppert and Chuffart 2017; Byers 2017). Thus, at least in the case of DRR/R, the reality on the ground in the Arctic is such that we might need to adjust or balance the victimising view of the Arctic, and instead look to the region for lessons of value to DRR/R globally (Marsden 2017).

Against this background, this chapter provides an overview of the disasters and disaster risks faced by Arctic populations and the resulting need for DRR/R. Search and Rescue (SAR) in the Barents and the surrounding region provides an illustrative example of DRR/R cooperation leading to Arctic triumph. This chapter begins by introducing the concepts of disasters and DRR/R. It then briefly explores the various hazards, vulnerabilities and disasters around the Arctic together with their unique challenges and opportunities, before turning to SAR as an example of Arctic DRR/R which might turn potential disasters into potential triumphs. The chapter concludes with a critical discussion of Arctic DRR/R suggesting key future directions on this subject.

9.2 Understanding Disasters and Disaster Risk Reduction

What is a disaster? Intuitively, we tend to recognise and accept the impacts of the 1931 China floods, the 1986 Chernobyl reactor meltdown or the 2004 Indian Ocean earthquake and tsunami as disasters. Often, these fit one or more of the characteristics of fast-onset, large, visible, deadly, destructive and/or costly 'extreme events', usually demonstrating either nature's force or human-induced events with major consequences.

Defining other events as disasters results in more controversy. Financial crises or 'fuzzy' events and developments such as failed states/regions, perhaps even the "environmental consequences of modernity" (York et al. 2003, p. 279) might be classified as disasters, too. When compared to the first examples, they often cost as many or even more lives, resources and the lost promise of individual opportunities. Terrorist attacks should also be included in disaster studies (Alexander 2005, p. 43; Perrow 2007) as well as, more controversially, (creeping) political and social choices that impact society such as austerity ideology (Hiam et al. 2017a, b). Consequently, it can be difficult to define disasters as, depending on one's perspective, everything from individual calamities to incremental historical developments lasting centuries can ultimately be defined as disastrous.

Scholars agree that disasters are in fact easier to recognise than to define (Barkun 1974, p. 51; Britton 1986, p. 255; Kreps 1985; Quarantelli 1998, p. 236). The field of disaster studies has been at pains to define disasters since its formal beginning in contemporary times with Prince's study of the 1917 Halifax explosion (Prince 1920). To date, no universally accepted definition of what constitutes a disaster, with regards to both characteristics and consequences, exists (Mohamed Shaluf 2007, p. 24). The linked references to disaster agents, physical impacts and their evaluation or social disruption when using the term makes it somewhat of a 'sponge' concept (Quarantelli and Dynes 1970, p. 328) with most scholars not having done enough to clarify the term (Quarantelli 1985).

Over time, one of the most important contributions has been the 'vulnerability approach', which includes not only social vulnerabilities, but also technological and systemic ones resulting from interdependencies. It thus advances two of the most useful propositions in the search for a definition of disaster. The first emphasises that, without appropriate action, disasters are 'normal' or 'inevitable' elements of life rather than being events, extremes, or one-off phenomena (Hewitt 1983; Kousky and Zeckhauser 2006; Mileti 1999; Perrow 1999; Wisner et al. 2004). Seen this way, disasters do not necessarily display a well-defined beginning, middle and end. That is, neither onset nor consequences may be clear. Instead, they are viewed as deeply complex and inherently "episodic, foreseeable manifestations of the broader forces that shape societies" (Tierney 2007, p. 509). Among others, this view brings often ignored slow-onset phenomena such as famines, epidemics, and involuntary mass migrations, into the disaster realm (Kreps and Drabek 1996, p. 132).

Second, with the acceptance of the vulnerability paradigm, scholars have articulated a clearer focus on human responsibility for driving disaster vulnerability,

which is of particular pertinence to the Arctic region. This has led to increased efforts for disaster risk reduction, and the more recent conception of 'disaster risk creation' (Lewis and Kelman 2012), or 'disaster risk production' (Chmutina and Bosher 2015). Including this component in disaster definitions emphasises not only agents of disasters but also considers the social and physical preconditions (namely vulnerability) that serve as causes of disasters (Britton 1986, p. 259). Specifically, these formulations adopt a sustainable development perspective by arguing that factors such as globalisation or unsustainable development decisions can produce disasters which must be then explained by reference to those forces (Kousky and Zeckhauser 2006; Mileti 1999; Wisner et al. 2004). According to Tierney, this focus is a necessary step to move beyond the disasters-as-events notion and instead put greater emphasis on the "decisions and actions of government, elites and their financial supporters, and global industries and financial institutions that make disasters inevitable" (Tierney 2007, p. 510).

However, "the proposition of disaster as a social product should not be regarded as an end-product in the quest for a definitive identification of a disaster. Rather, this approach is illustrative of the continuing maturation and the widening understanding of this field of research" (Britton 1986, p. 260). Thus, in parallel with the various attempts and developments to define disasters, some scholars have discussed whether these attempts are at all feasible or even desirable (Alexander 2005; Al-Madhari and Keller 1997, p. 19–20; Kreps 1989; Oliver-Smith 1999). Others have pointed to the abundance of discussions as to what qualifies as a disaster and the lack of discourse on disaster-related decision-making processes, such as the importance of who identifies a disaster and why (Stallings 1991). Often, disasters are declared on political grounds with vast implications for resource allocation. Kirschenbaum (2003), in examining the political dimension of the field, states, "[i]n the United States, a disaster has occurred when the president says it has" (Kirschenbaum 2003, p. 7–8). In fact, much of what is declared a disaster today is defined "to fit bureaucratic organizational survival needs [in which] disaster parameters are to a large extent an artificial, bureaucratic 'make-work' definition [and would by many] not even be considered or scrutinized as a potential disaster [but] accommodated by various means to assure survival" (Ibid., p. 26–27).

Indeed, the term disaster is highly contextual and relative. What constitutes a disaster lies often in the eye of the beholder (Collins et al. 2014, p. 2) making the need to 'define' disasters through local eyes acutely clear. A disaster will always mean different things to different people based on their varied backgrounds and experiences. For instance, disasters in Bangladesh will "almost invariably will be associated with the word 'flooding'; on the other hand, when one thinks of disaster in the context of Ethiopia, 'famine' immediately comes to mind" (Al-Madhari and Keller 1997, p. 18). This approach not only conflates hazard and disaster at times, but also creates and perpetuates stereotypes and misnomers.

Thus, and following from the United Nations International Strategy for Disaster Reduction (UNISDR) annotated definition ("UNISDR", 2017), a broader concept of disasters and subsequent DRR/R measures is necessary which, among others:

- emphasises a wide conception of disasters including a host of natural- and human-induced 'hazard agents' (Burton and Hewitt 1974), events and inherent societal processes;
- views disasters as "collective stress situations" (Barton 1969, p. 38) that are an "expression of the vulnerability of human society" (Britton 1986, p. 254) and driven by issues of power, class, gender and other "axes of inequality" (Bradshaw and Fordham 2014; Tierney 2007, p. 503). Thus, a disaster is "primarily a social phenomenon" (Quarantelli and Dynes 1970, p. 24), yet, with strong interdependencies between social and physical systems (Wisner et al. 2004), making disasters an inevitable part of life in the absence of appropriate action;
- is aware of wide-reaching spatial or longitudinal/inter-generational effects;
- accepts that what constitutes a disaster is often local, contextual and/or subjective. Thus, disasters are not always visible to everyone and likely subject to biases, such as from media or externals' viewpoints.

As such, disasters are phenomena that are more complex than the above-stated 'obvious' examples may have us realise. They move well beyond the assumption that the hazard – e.g. an earthquake, flood, or avalanche – is the disaster. Against this background, decades of disaster research emphasise the need to better understand and invest more resources into the many and often indirect ways by which disaster risks can be reduced; i.e., DRR.

9.3 Hazards, Vulnerabilities, Disasters and DRR/R Challenges in the Arctic

Hazards around the Arctic include earthquakes, tsunamis, landslides, avalanches, epidemics, wildfires, extreme weather, pollution from afar such as persistent organic pollutants, spills from local industries such as fossil fuels and mining, nuclear material, and climate change impacts including ocean acidification, permafrost thaw, and changing ecosystems (Antonovskaya et al. 2015; Bronen 2014; Bronen and Chapin 2013; Brunner et al. 2004; Buchwał et al. 2015; Clark and Ford 2017; Duerden 2004; Fraser et al. 2014; Fritz et al. 2017; Jones et al. 2015; Kanao et al. 2015; Law et al. 2014; Marchenko et al. 2012; Mileski et al. 2018; Müller and Jokat 2000; Tolstoy et al. 2001; Pincus 2015).

Not all these hazards are necessarily viewed as entirely negative. Climate change is seen by some as a force positively affecting economic development and opportunities around the region. For instance, the Arctic is experiencing a sharp increase in tourism which is expected to rise even further due to factors such as increased accessibility following warmer temperatures, infrastructure expansion, and the decline in snowfall levels in traditional European ski areas. Adding to that are the clever marketing strategies positioning Arctic and sub-Arctic destinations as new and exciting tourist destinations, as has been the case with Lapland, Iceland and Svalbard (Chen and Chen 2016; Lasserre and Têtu 2015; Lee et al. 2017; Loftsdóttir

2015; Ojanlatva 2008; Saarinen and Tervo 2006). From an extractive industries perspective, the region is thought to contain a significant amount of the world's remaining untapped oil and gas resources, with rising temperatures presumed to increase their accessibility (Mileski et al. 2018; Wilson and Stammler 2016). This said, the implications of changing storm regimes on industry safety have not yet been fully considered. Meanwhile, the melting of sea ice seems to promise reduced shipping distances via increased and potentially year-long accessibility of northern routes, yielding significant reductions in shipping costs (Eguíluz et al. 2016; Mileski et al. 2018). Again, though, changing storm regimes have not been fully investigated.

However positively these changes may be viewed, they also have the potential to significantly increase disaster risks by amplifying vulnerabilities. These developments not only add strain on current DRR/R efforts but also add unique challenges of their own, generating concerns about insufficient prevention, response, and SAR (Mileski et al. 2018). With rapidly changing weather, often limited resources and preparation, scarce physical and communications infrastructure, technology and physical infrastructure not adjusted to the changing conditions, and often long distances to the next point of help, even minor incidents can quickly become major disasters. In other words, when vulnerable people follow opportunities to high-hazard areas without adequate measures, disaster risk increases (Bankoff 2003; Bankoff et al. 2004; Edwards 2009).

Thus, the challenges to DRR/R for Arctic communities are immense in terms of the plethora of hazards, difficulties in accepting the implications of these hazards, limited preparation and response capability, reluctance to tackle vulnerabilities such as huge inequities, and conflicting perspectives of risks versus opportunities. In particular on the vulnerabilities side, Arctic communities have often suffered from political, geographical and institutional isolation and marginalisation. While the most presumed difficulties for Arctic DRR/R are often articulated as being distance, the lack of infrastructure and so-called harsh environmental conditions, more important factors – typically not admitted, yet, standard vulnerabilities which are the root causes of disaster – are political will, inequity, marginalisation, inadequate governance, and disrespect for Arctic populations. In other words, disaster risk and disasters around the Arctic have not necessarily been recognised or acknowledged by political leadership, most notably the governance centres generally more to the south.

Disasters in the Arctic tend to be marginalised or misrepresented for at least two more reasons. First, there is a general tendency amongst media, politicians and institutions (including DRR/R-tasked non-governmental organisations) to ignore disasters with low casualty numbers, especially creeping vulnerabilities such as poverty and poor development. These are often less visible or less attractive to donors and media alike, rarely making it onto the front pages (Wisner and Gaillard 2009; Von Meding et al. 2013). The cumulative effect of disasters involving only slow-onset changes (i.e. no rapid-onset hazard) or disasters with smaller scales of impacts can be higher in terms of destruction, casualties, and disruption than those involving high-impact, fast-onset hazards (Below et al. 2007; Lewis 1984; Marulanda et al. 2010). Thus, with the Arctic constituting a periphery in most peo-

ples' minds in terms of geography and population, disasters in the Arctic – despite their prevalence – rarely make it beyond local or regional media outlets.

Second, the Arctic usually experiences a situation whereby DRR/R needs and foci are hijacked, so to say, by the 'best paying clients'. That is, much of the contemporary disaster-related discourse focuses on the safety and security of the industries driving economic developments externally, notably shipping, resource extraction, and tourism. Much has been afforded to think about what measures to take to prevent or respond to oil spills; the possibility of cruise ships sinking or experiencing epidemics while in Arctic waters; and how to establish mechanisms to make cross-Arctic industrial shipping viable and safe. In short, the DRR/R needs of local peoples are often invisible (compare with Lewis 1984) unless connected to the 'best paying clients', so that these industry-related safety concerns tend to take priority (Arbo et al. 2013; Ellis and Brigham 2009; Loe and Kelman 2016). As is typical within the DRR/R field, hazards and external interests are given much more attention and prominence than vulnerabilities and local perspectives and needs.

9.4 Cooperation for Arctic DRR/R: The Example of Search-and-Rescue

The challenges outlined above show that DRR/R—whether in the Arctic or elsewhere—is a multifaceted and dynamic cross-boundary activity, that involves joined efforts of various players and pooling of diverse resources (Sydnes et al. 2017, p. 109). In the Arctic, where access to resources and infrastructure is often limited, distances between settlements may be long and environmental conditions often require a fast response to ensure survival of those affected by difficulties, the importance of cross-border and often international cooperation and coordination is particularly clear.

Arctic populations have been active players in this regard. Around the Arctic, settlements, peoples, and communities have been actively and cooperatively pursuing DRR/R initiatives. Examples include flood-related cooperation in the form of knowledge exchange between North American and Russian communities (Bodony 2016), paradiplomacy on environmental and related issues between cross-border Arctic settlements such as Nickel and Kirkenes (Joenniemi 2014; Eliasson 2015; Joenniemi and Sergunin 2013; Kireeva 2017), and the paradiplomatic relations between Greenland's community and non-Arctic actors (Ackrén 2014).

These cases are of immense importance. To scope this section into an illustrative example for discussing DRR/R as 'Arctic Triumph', it explores what has emerged as one of the most visible and dominant aspects of Arctic cooperation for DRR/R: bi- and multilateral agreements such as the Arctic Council's Search-and-Rescue-(SAR)-related agreements, the Norwegian-Russian Oil Spill Response regime, the 2015-initiated Arctic Coast Guard, and Barents Regional Cooperation. All these are of particular prominence and are a testament to the perception of cooperation as a

fundamental principle of Arctic DRR/R. While their mandates and foci differ, they all deal in one way or another with preventing or responding to disasters, often through the lens of SAR or advancing (technical) progress on environmental protection and related issues. Developed through formal and informal relations, the high volume of dialogue, joint exercises, and other operative cooperation demonstrate the every-day importance placed on these agreements and cooperative regimes.

For instance, since the initiation of dialogue on different levels led to the relatively recently founded Arctic Council (1996), comprising a collection of Arctic states and indigenous representatives (Permanent Participants) not all of whom are necessarily allies or seek cooperation, a gradual (albeit deemed as insufficient) increase in Arctic SAR and environmental cooperation has been observed (Sydnes et al. 2017; Graczyk and Koivurova 2015; Kankaanpää and Young 2012; Kao et al. 2012; Huebert et al. 2012). Whether or not such changes can be directly or indirectly attributed to the Arctic Council is a challenging question. Nonetheless, with its six working groups[1] tasked with different aspects of cooperation on SAR, environmental protection and sustainable development, the Arctic Council is creating webs of dialogue and cooperation, whilst embedding DRR/R (in the form of SAR) into various international/regional systems and so potentially even influencing regional stability (Exner-Pirot 2013). Thus, the Arctic Council demonstrates the importance of cooperation in the region and Arctic states' and peoples' rising tendency for cooperation at the multilateral level. This success was illustrated especially through the achievements of the 2011 first-ever binding "Arctic Search and Rescue Agreement" and the 2013 "Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic". The former especially can be considered a major multilateral step in the realm of Arctic DRR/R, deriving success from establishing norms of cooperation and joint SAR strategy in the region (Sydnes et al. 2017).

A similarly wide approach has been taken by the 1993 initiated cooperation in the Barents region, the Barents Euro-Arctic Region (BEAR) (Hønneland 2017). BEAR is divided into two levels: the Barents Regional Cooperation (BRC) and the Barents Euro-Arctic Cooperation (BEAC). Consisting of thirteen counties/subregional entities in Finland, Norway, Russia and Sweden, the Barents Cooperation's primary task is to promote sustainable development in the Arctic. This is done by encouraging cooperation and interregional exchange through people-to-people contacts and economic development on numerous issues including culture, development, health and environment ("Barents Cooperation", 2018a). A focal point of the BEAR are the biennial rescue exercises organised in the country of the respective BEAC Chair. In 2017, this aspect was further strengthened by the initiation of the "Joint Committee on Rescue Cooperation". Its mandate is to provide operational guidance with regards to the "Agreement on Cooperation within the field of

[1] Arctic Contaminants Action Program (ACAP); Arctic Monitoring and Assessment Programme (AMAP); Conservation of Arctic Flora and Fauna (CAFF); Emergency Prevention, Preparedness and Response (EPPR); Protection of the Arctic Marine Environment (PAME); and Sustainable Development Working Group (SDWG)

Emergency Prevention, Preparedness and Response" to respond effectively and in concert to emergencies such as vehicle crashes, forest fires, tourism-related incidents, floods, ice plugs, and industrial and chemical accidents, all while making the most of the scarce resources available ("Barents Cooperation", 2018b).

Outside of BEAR but adjacent to the region, Svalbard provides an operational example of Arctic SAR cooperation in action. In October 2017, a MI-8 helicopter crashed 2–3 km off the coast of the Russian settlement of Barentsburg. Authorities in the neighbouring settlement of Longyearbyen were informed almost immediately, but none of the eight passengers on board survived. In fact, efforts to find the helicopter lasted several days and, after 5 days, only one body was recovered. Various Russian and Norwegian agencies and rescue personnel were involved in the SAR effort (Sabbatini 2017), leading to uncertainty and differences of opinion regarding the division of authority and responsibilities. Sure enough, on the national and sub-national levels, both sides used the disaster to flex at least some political muscle (Staalesen 2017a, b). In spite of the emphasis on cooperation on both sides, the SAR effort proved difficult on account of both operational capabilities and de facto cooperation. The apparent lack of preparedness is surprising not only given the region's strong emphasis on operational capacity and cross-border cooperation, but also since Svalbard's SAR authorities can be reasonably expected to be prepared. This is especially true given that a similar helicopter crash occurred in the almost same location in March 2008 killing three people and yet another one near Pyramiden which left two dead in 1991.

The Arctic provides plenty of similar examples from across the region. Perhaps the most high-profile recent incident is the sinking of the Russian submarine *Kursk* in 2000. Despite international offers to assist in the SAR effort, Russia's authorities reacted with lethargy, giving the impression of being more interested in Russian pride than in saving the lives of the 118-person crew on board, all of whom perished due to SAR failures (Mikes and Migdal 2014). Evidently, while Arctic SAR cooperation and agreements are indicative of, for the most part, positive and evolving Arctic geopolitical relations, they are not free from political intrigue and organisational challenges, thereby hampering SAR efforts (Wood-Donnelly 2013).

In the Arctic context, SAR is an illustrative cooperative facet of DRR/R that relates to cooperative thinking regarding needs, best practices, and local interests while extending to operative elements including common SAR exercises and sharing of information and resources. The increase in Arctic tourism, shipping and resource extraction highlights the continuing need, and the changing needs, for Arctic SAR cooperation, covering not only response after something has happened, but also using SAR principles for DRR/R to encourage training, prevention, preparedness and risk reduction. The examples here focus on the Barents and surrounding region but these successes do not always translate beyond SAR or outside the area covered. They can be used as a baseline for developing, testing and implementing other cooperative approaches aiming for success in Arctic DRR/R.

9.5 Arctic Cooperation as DRR/R Triumph?

In this chapter, we addressed the issue of DRR/R in the Arctic, demonstrating that despite the challenges and difficulties, Arctic DRR/R efforts provide scope for success, optimism and triumph. While outsiders' perceptions can paint a picture of the Arctic as a region of disasters, this image is unjustly victimising. Our chapter shows Arctic populations as active players in shaping and determining their future by keenly engaging in DRR/R issues and actions. This is particularly visible in the case of SAR activities, illustrated by the Barents and surrounding region, where local Arctic players have shown immense progress. In doing so, cooperation is, and in many ways should be, the cornerstone of DRR/R.

Against this background, can we call these cooperative regimes really 'triumphs' in Arctic DRR/R? How far are mechanisms that predominantly focus on operative cooperation to respond to emergencies and disasters capable of truly reducing disaster risks? Could the successes in Arctic SAR leave major gaps in wider Arctic DRR/R through hampering deeper thinking about DRR/R? The answer seems to be that although SAR activities and cooperation in the Arctic are significant, so are the challenges faced. There is effectiveness in formalised, classic, top-down, command-and-control-based mechanisms, but they cannot provide everything, especially when there is the need to deal not only with anticipated emergencies but also those that are more complex, interconnected or supposedly 'unexpected' (Alexander 2014).

Pooling information, resources and response efforts have often proven more challenging than expected, as the 2017 helicopter crash on Svalbard shows. Some difficult operating conditions might simply not be possible to overcome, such as remoteness for SAR vehicles, fog, darkness, ice, and large distances between settlements and fuel dumps (Mileski et al. 2018). Relying on SAR mechanisms without accepting their limitations could generate a false sense of security. Indeed, some professionals in this field are "divided in their views regarding whether the regime is capable of handling joint SAR operations in a sharp situation" due to the uncertainties and complexities involved with respect to, for instance, the availability of SAR resources or complications related to transnational DRR/R (Sydnes et al. 2017, p. 129).

The sinking of the South Korean trawler *Oryong 501* in the Bering Sea in December 2014 supports these concerns. Longstanding cooperation and agreements existed for such an instance. Nevertheless, Russia did not accept help until the next day and provided neither base or aircraft support to assist with what should have been a joint international SAR effort (Klint, 2014; Pincus 2015). Out of at least five dozen crew members, only seven survived and, ironically in the context of DRR/R, the body identification – when people are dead already, rather than averting fatalities – was highlighted as a good example of international disaster-related cooperation (Chung et al. 2017).

Despite uncertainties regarding SAR capabilities, this disaster demonstrated that despite ostensible cooperative preparedness on paper and exercises between nations, the unpredictability of institutional and political dimensions can hinder success

(Pincus 2015, p. 7). With respect to the former, this is especially true when we consider the increased activities across the Arctic, exacerbating the already present lack of SAR capabilities within the individual mandate areas. Though both SAR activities and cooperation have been extensively highlighted in Arctic literature and practice, "[c]urrently there is no one organization of voluntary cooperation that exists to address the problem of mishaps in the Arctic" (Mileski et al. 2018, p. 135), limiting the efficiency and effectiveness of such initiatives. In short, individual historical and cultural legacies coupled with contemporary economic and political interests can lead to situations such as with the *Oryong 501*.

This, in turn, is intimately linked to disaster researchers' calls for going beyond establishing operational and technological capabilities and ensuring a vulnerability focus. As per the earlier discussion regarding the definition of disasters, the field of disaster research has long identified vulnerabilities as causing disasters rather than hazards or environmental conditions (Hewitt 1983; Wisner et al. 2004). Vulnerabilities within Arctic communities are rarely admitted and redressed within DRR/R, because the preference instead continues to be highlighting hazards and hazard influencers. This phenomenon is demonstrated by the plethora of literature dealing with the hazard influencer of climate change on Arctic populations, covering all eight Arctic countries, compared to the dearth of material on vulnerabilities of Arctic populations to hazards such as earthquakes, tsunamis, and epidemics. Irrespective of the triumphs evident in Arctic DRR/R such as through SAR in the Barents and surrounding region, a significant gap remains in terms of analysing Arctic DRR/R from a vulnerability perspective, as the decades of disaster studies literature dictate.

Nonetheless, Arctic communities have long had and continue to have control over aspects of their own DRR/R actions, especially through recently developing and implementing cooperative approaches to DRR/R that could serve as examples to the rest of the world. DRR/R efforts in the Arctic have a long way to go and, to build on known successes and triumphs, should focus on (1) broader inclusion of people and institutions to be actively involved in DRR/R, and (2) a broader and deeper view on disasters going beyond (mass) emergencies and the most immediate climate change effects, in order to fully embrace the wide-ranging and long-standing definitions and causes of disasters promoted by the scientific literature.

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