On Thin Ice: Exploring Solutions for Climate-Induced Displacement in the Face of Disappearing Permafrost

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Arctic security dialogues have increasingly featured nontraditional topics such as climate change and maritime safety. Many people around the world have only recently started seeing the effects of climate change in their own communities, however, this is not the case for many Arctic peoples, whom climate change has been affecting for decades, and on a much larger scale. As polar temperatures reach new highs, human security is becoming a larger issue. Over eighty-five percent of Alaska Native villages are experiencing increased erosion and flooding, as well as melting of the permafrost that makes up their land. The stories of Newtok and Shismaref are better known, but many villages are still grappling with decisions over relocation and dealing with government inaction. This article provides an overview of the choices at-risk Arctic communities have by looking at existing government procedures. The governments of the United States, Norway and Russia will be highlighted, and this article will analyze their existing policies. This article will also look at options that are available for villages opposed to uprooting their communities. Indigenous communities located on or near unstable permafrost have a right to decide if, when and where to move. They deserve dignity and choices, and states' actions and policies will set a precedent for how future communities facing climate migration will be treated.

Introduction

For coastal and island communities, climate change will affect more than their daily life. It is causing the destruction of the lands they have inhabited, some for centuries, leaving them to deal with possible displacement and relocation. Communities from Louisiana, United States to Vunidogoloa, Fiji, have begun moving their people and infrastructure to higher ground, and as ice melts and sea levels continue to rise, millions of people will be facing the same decisions. Those that have already made efforts to move have done so mainly as pioneers, without funding designated for relocation or strategic plans.

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Arctic Indigenous peoples comprise less than two percent of the world's Indigenous population (Ferris, 2013: 1). However, the rapid rate of environmental change in the High North is disproportionately impacting their ways of life, occasionally requiring them to relocate away from their traditional or seasonally inhabited villages. Indigenous Arctic peoples are not strangers to voluntary migration. Their traditional and customary lifestyles have long required movement. The decisions about moving many communities are not ones they will make lightly, as they are a result of the environmental changes produced by the industrialization and destruction of the natural world, largely by non-Indigenous people. They are on the front lines of climate migration and the responses of local and state governments' will set the stage for how future communities will be assisted.

This paper discusses climate-related threats and potential displacement of the Sámi people in Norway, Alaska Natives, and the Indigenous people of Russia, focusing on three key elements: 1) current climate-related threats 2) government policies and attitudes toward Indigenous populations, and 3) recommendations and possible solutions.

Background

Terminology

In order to ensure clarity and understanding, several terms will be defined ahead of the discussion of the climate-related threats to three Arctic Indigenous communities.

Outdated language

Although often referred to as "climate refugees", the Indigenous nations battling loss of their ancestral lands are not a helpless people as the label suggests. This characterization has a similar connotation as the defining of certain Indigenous groups as "vulnerable", which can evoke "outdated and racist stereotypes of Indigenous peoples needing the help of white outsiders," (Marino, 2015). This paper elects not to use these terms in order to maintain the dignity and agency of the people discussed.

Indigenous

This paper makes use of the word "Indigenous" using the definition from the "Convention concerning Indigenous and Tribal Peoples in Independent Countries" (ILO, 1989) from the International Labor Organization (ILO):

> "People are regarded Indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present State boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural, and political institutions."

Alaska Native

Many tribes call the US state of Alaska their home, including but not limited to the Yupiit, Eyak, Iñupiat, Aleut, and Gwich'in peoples. Several of these peoples reside in both Alaska and parts of Canada, though the focus in this paper will be on those living in Alaska who are affected by US policies. As such, the general term "Alaska Native" will be used to refer to all Arctic Indigenous individuals in Alaska.

Climate change

While 2019 was the second warmest year on record with a global temperature of 1.15° Celsius higher than the pre-industrial average, the Arctic and Antarctic are experiencing an increase in temperature twice as fast as a result of the albedo effect (NOAA, 2019). As snow and ice melts at higher rates, more solar energy is absorbed into the newly exposed darker surface, which in turn leads to more melt. Sea ice is declining at a rate of 12.85% per decade, as compared to the 1981-2010 average (NASA, 2019).

Norway

Between 1838-2012, Norway has experienced an increase in annual mean temperature of 1.5° Celsius (Norwegian Polar Institute, 2019). All seasons have seen warmer weather, though winter and spring tend to have higher increases in temperature. Climate models predict that by the end of the century, parts of Norway will see a 2.5-3.5° Celsius increase in average temperature, with more drastic temperature increases occurring in the northeast (ibid). The warmer temperatures are causing snow to thaw and freeze regularly, which creates thick layers of ice. The lichen that reindeer depend upon usually resides beneath easily penetrable snow, but now is often covered by several feet of ice (Little, 2020). Heavier precipitation, mainly in the form of rain, has the potential to increase overall biological productivity, though the humidity is likely to benefit fungi and mold species rather than native plant species. Erosion and lost sea ice will lead to greater destruction of coastlines, especially when combined with larger storms. Norway's largest Arctic city, Tromsø, is expected to experience a 5-7 cm sea level rise by 2050 and a 23-36 cm rise by 2100 (Norwegian Polar Institute, 2019).

Alaska

Alaska, the US's Arctic state, has experienced a 1.6° Celsius temperature increase on average, with winter temperatures 3.33° Celsius higher above average, according to the Environmental Protection Agency (EPA) (2016). The ramifications of this greatly impact not only the wildlife and the communities that live there, but threaten the very ground that makes up the state. Rates of eroding shorelines, melting glaciers, and thawing permafrost are increasing. Drier, hotter summers are causing the drying out of wetlands, destroying habitats for migrating birds. Wildfires in the forests and tundra are expected to burn twice the amount of land by 2050 and triple by 2100. The ocean acidification that is resulting from higher levels of atmospheric carbon dioxide is harmful for shellfish and the plankton that other fish rely on. Disappearing sea ice leaves fewer habitats for larger mammals like walruses and polar bears and hunting grounds for Alaska Native communities (USGCRP, 2018).

Northern Russia

The Russian Arctic covers more than five million square kilometers, or just over thirty percent of Russia's territory (Laverov, 2009: 87). With annual regional temperatures being 6° Celsius higher on average, the permafrost that covers almost 90 percent of Russia's north is melting at an accelerated rate. This permafrost is also much of the most southern permafrost in the world, rendering it especially vulnerable to warmer temperatures. The top layer of ground that freezes and thaws with the seasons every year that used to be around three feet thick (~1m) is now ten feet (3m) deep in some places (Macfarquhar & Ducke, 2019).

Like other Arctic states, northern Russia is seeing longer summers and warmer winters, along with the extreme climate events of floods and devastating wildfires (ibid). Over 4.8 million hectares in Siberia were ravaged by wildfires between January and mid-May 2020, with 1.1 million hectares of it being high-latitude boreal forest. The Russian government has been reluctant to take action to fight the fires, citing the large expense of sending people and resources to the remote regions (Ягодина & Аллахвердов, 2020). The swamps and lakes created by the permafrost melt serve as prime breeding grounds for mosquitoes, already notoriously ferocious, and the longer summers mean they are breeding earlier and longer. The threat to Russia's trees is twofold. Half of the world's boreal forests are located in the Russian Arctic, but they are shrinking as deciduous forests move farther north. These trees are also experiencing widespread wildfires. Higher rates of Siberian silk moths and bark beetles that specialize in eating needles and boring into trunks, respectively, are causing the trees to be more susceptible to fire (Pleitgen, 2019). Underneath Russia's northern permafrost reside vast stores of methane deposits. As the permafrost melts, these will be released and will lead to intensified climate change in the region and globally.

Norway et al.

This paper will include discussion of the Sámi (or Saami) people who live mainly in Norway, Sweden and Finland, with a few thousand living in Russia. Because over half of Sámi reside in Norway, the discussion of the potential for their migration due to climate change will focus on the situation and policies in Norway. Norway is the only Scandinavian country that has a portion of its coastline above the Arctic Circle. Rossøya, Svalbard is Norway's most northern part, however, it will not be included in this discussion, as it has never been inhabited by Indigenous peoples.

The Sámi people have continuously lived in the Scandinavian Peninsula since the arrival of people following the last ice age. Traditionally a nomadic people, the Sámi practice reindeer husbandry, as well as fishing and farming. During the mid-1880s to mid-1900s, the Norwegian government engaged in fornorsking, or "Norwegianization". Sámi children were made to learn, speak, read and write in Norwegian, and the Sámi language was eventually banned in 1898. Later government policies during the 1960-70s made modern living more desirable and necessary. The county of Finnmark, now Troms og Finnmark, made houses more affordable for Sámi, while a national policy requiring children to be in school for at least nine years made constant migration throughout the year unmanageable (Riseth & Vatn, 2009).

Because of the assimilation efforts in Norway it is difficult to determine the true number of Sámi people today. The total population in Norway is thought to be around 55,000 today, though censuses often do not include those who identify ethnically as Sámi, but refer to people who speak or have ancestors who spoke Sámi. Norway also generates demographic statistics based on geographic area that has been designated for jurisdiction under the Sámi Parliament. As a result, the statistics count both Sámi and non-Sámi residents in the area (Kelman & Næss, 2013).

Traditionally, the Sámi made their livelihoods by herding reindeer, supplemented with fishing and farming. Though reindeer husbandry remains an important part of Sámi history and culture, today only around 2,800 individuals are actively practicing the customary livelihood. That being said, some Sámi have developed a semi-nomadic lifestyle. For example, Sámi may choose to jointly care for reindeer herds with multiple families in partnerships called "siidas". Others may choose to live in a larger town and make regular excursions to check on their herd (ibid). Tourism has increased

all around the Arctic, and many people are interested in seeing what traditional Arctic life looks like. Tourism generates a portion of income for some Sámi and may encourage some to maintain traditional Sámi livelihoods. However, some tourist attractions are not associated with Sámi heritage or modern Sámi life, and the absence of statistics on Sámi numbers and livelihoods makes it difficult to know the true economic impact of tourism. Sámi have lived both in and outside of the Arctic for decades, and this paper does not make the assumption that Sámi choosing to live farther south will lose touch with their identity or never return to the Arctic.

There's no question that the Sámi people are being directly affected by their changing environment, from experiencing greater difficulty finding enough food and grazing grounds for their reindeer to seeing new fish species along the coastlines. Open lands for grazing and migration for centuries are being privatized and segmented. Though the number of individuals practicing reindeer husbandry as their livelihood is shrinking, the practice remains an important part of Sámi culture. Reindeer husbandry is still taught in schools, and it is important for the transfer of traditional environmental knowledge from generation to generation. As the environment continues to grow less familiar, Sámi are relying on their traditional knowledge more than ever to adapt their customs (Little, 2020). Resource conflicts are also expected to become more common as the Arctic's climate tempers and more people are willing to live farther north. Sámi lands are highly desired for mining and logging, and Sámi are already struggling against these industries to protect their lands from extraction and pollution. Sámi in Sweden, Finland, and Norway have also been forcibly relocated to make way for mines, hydroelectric development, and the damming of the Alta-Kautokeino watercourse, respectively (Briggs 2006). The Arctic territories contain much of the world's remaining and untapped oil and natural gas reserves. As these industries grow in northern Norway, Sámi may see the economic opportunity and choose to leave their traditional lives. These resource development projects are often proposed with the good intention of harnessing renewable energy. Abstractly, the Sámi are supportive of green energy projects, but when they are put into practice, they are usually done so without regard to how they will affect Sámi migration patterns. Norwegian Sámi have vocally opposed several plans for development, though the government does not adequately address these concerns and the plans have been implemented regardless. In April 2016, the Norwegian government supported what became Europe's largest onshore wind farm in the heart of South Sámi land. The Gáldu Resource Center for the Rights of Indigenous Peoples has worked to provide Sámi and other Indigenous groups resources for handling resources conflicts.

The Sámi have access to the Norwegian government through the Sámi Parliament. The parliament works with the Department of Sámi and Minority Affairs in the Ministry of Labour and Social Inclusion. The government is supposed to consult with the Parliament if its affairs affect Sámi interests, but it is unclear to what extent Sámi concerns are truly taken into account. The Sámi Parliament has additional representatives that serve as board members on the Finnmarkeiendom, the legal body that presides over the people and resources of Finnmark. As of January 2020, Finnmark has merged with Troms, a neighboring county, forming Troms og Finnmark. Three Sámi representatives and three Finnmark county government representatives run the Finnmarkeiendom. This equal representation is significant as the Sámi make up 25 percent of the county's population (Kelman & Næss, 2013).

Norway's green development is largely supported by non-Sámi, as it is helping the country reduce its carbon footprint. Better education of Sámi culture and the effects of infrastructure development

on Sámi lands can help bring awareness to non-Sámi people (Wing, 2017). In order to manage land use conflicts, a platform should be created to bring together Sámi and industry representatives, along with local government officials. Together, they can address potential concerns Sámi may have over any proposed development, and the Sámi will be able to act in a consulting role to ensure proper environmental protections are adhered to.

Alaska

Alaska is home to over 100,000 Indigenous people, or around 15.4% of the state's population (Alaska Census, 2019). Because of the diversity of the Alaskan nations, this portion of the paper will focus less on the history and livelihoods of various tribes and more on the state and federal government's responses to climate-based migration.

The US has not set a precedent of respecting its Indigenous populations. The US purchased Alaska in 1867 without consulting the Indigenous communities already living there. From that time until 1924, Alaska Natives were not considered US citizens, and couldn't own their ancestral land or have jurisdiction over their natural resources, unless they demonstrated that they had left their Native lifestyle and identity behind. Today, Alaska's constitution lacks recognition of its Indigenous peoples right to hunt and fish in their homelands, only stipulating that they have equal access to the resources.

At least eighty-five percent of Alaska's Native communities are experiencing increased erosion and flooding, as well as melting of the permafrost that makes up their land (USGCRP, 2018). Some villages have moved homes and buildings away from the coastline, while others have elected to relocate completely. Alaska Native communities have been documenting environmental changes such as erosion for decades. A Yup'ik village relocated itself due to climate change from Kayalavik to Newtok as early as 1949 (McDermott, 2015).

The Alaska Natives that inhabit the northwestern coast of Alaska historically did not rely on built infrastructure. These communities were able to move away from areas experiencing coastal erosion or sinking ground. It was the imposition of a formal educational requirement by the United States government that forced Yup'ik and other Indigenous communities to become sedentary, a break from their nomadic past. In the case of Shishmaref, a village considering relocating from a barrier island 120 miles from Nome to Mertarvik on the mainland, the issue of education became an obstacle to receiving government funding. Ironically, in order for the Alaskan government to provide funding for a new school, there must be at least 10 children residing there, but few parents were interested in taking their children out of school in Newtok and moving them to Mertarvik where there wasn't a school (ibid).

Often, Indigenous communities are described as having a double bind, stuck between wanting independence from Western, non-Indigenous institutions and being able to use those same institutions (such as international law) to uphold their rights to land, resources and freedom. Alaska Natives could potentially benefit from collaboration with the United States government for relocation, but may risk sacrificing their complete freedom to set up a new village in a way that fits their community. This double bind is important to mention, as some communities may be reluctant to work with governmental institutions for fear of losing their autonomy or being forced to leave their homelands as in their ancestral histories. Another double bind is the relocation itself. Once the government is aware that members of a village have begun discussing the process of relocation,

they are less inclined to finance the infrastructure in a town that may be nonexistent in the next few years. For example, once the Newtok community began debating moving their village, the government divested in its infrastructure, leading to the shut down of an entire power plant. This divestment from Newtok did not mean an investment in the proposed village, Mertarvik (ibid).

Since the early 2000s, several government bodies including the US Government Accountability Office (GAO), the Alaska Sub-Cabinet on Climate Change Intermediate Action Workgroup (IAWG), and the US Army Corps of Engineers have been documenting environmental threats to Alaska Native villages. The IAWG was intended to bring together stakeholders and government officials who could work with communities experiencing the impacts of climate change and considering relocation. The IAWG was successful in creating spaces for representatives from Alaska Native communities to voice their concerns and opinions to government officials and to aid in the drafting of strategic plans for mitigating climate change-induced risks. The IAWG was the first step toward finding solutions for Alaska's native populations: it identified communities in areas already greatly affected by climate change, and it voiced concerns and recommendations for funding and community response to the Alaska State Legislature. For reasons not made public, the IAWG was not given approval to continue its work from Governor Parnell nor the Subcabinet on Climate Change in 2011 (Bronen, 2013: 18).

The IAWG was successful in getting the Alaskan Legislature to establish the Alaska Climate Change Impact Migration Program (ACCIMP) in 2008. The AACIMP mainly conducts Hazard Impact Assessments and doles out Community Planning Grants so that the recommendations from the impact assessments may be carried out. The Alaska Division of Community and Regional Affairs (DCRA) is funded by the US Fish and Wildlife Coastal Impact Assistance Program. It was under DCRA that the Newtok Planning Group was formed, which includes stakeholders from the federal, state, regional, local and tribal levels. It has been instrumental in aiding the Newtok community work through the relocation process, though it has taken over twenty years for the proposed site to become habitable. In October 2019, a third of Newtok's residents made the move to Mertarvik creating a new problem. The 2020 Census will count the two halves of the community separately. Additionally, due to climate change, some residents have moved either temporarily or permanently to live with relatives in other parts of the state. Future population-based funding, like that for housing, schools and other infrastructure, will be lower for both Newtok and Mertarvik (Wang, 2020).

The US currently does not have sufficient federal money designated for Alaska Native communities to adequately relocate their communities and adapt to climate change. The US Army Corps of Engineers has estimated that the relocation cost for one village in Alaska would cost between 100-200 million USD. Though at least thirty Alaskan towns are expected to relocate in the next ten years, only 2 million USD was promised in 2015 by President Obama to the Denali Commission, the independent federal agency mandated to manage climate-related displacement in Alaska (Herrmann, 2017). Since then, the current Trump administration has put climate change denial into practice and has worked to slash the funding of the Denali Commission and similar agencies. For the 2019 fiscal year, the Commission had just $13 million available for program activities, with only $5 million allocated to village infrastructure protection (Neimeyer, 2018). In February 2020, President Trump's budget proposal included the elimination of the Denali Commission, stating that Alaska is a wealthy enough state to pay for the rural infrastructure

projects that are usually federally funded (ibid). Alaska's congressional delegation pledged to protect the Commission as in previous years, though it remains to be seen whether they will be successful (DeMarban, 2020).

The Stafford Act serves as an outline of the federal government's main actions triggered during a natural or major disaster. It classifies these as "any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity." The Act, and other Federal Emergency Management Agency (FEMA) disaster relief programs, have only been applied in short-term catastrophe scenarios and notably do not mention slower destructive natural processes like erosion or permafrost melt (Gómez, 2019) Additionally, any funding given out must be spent on repairs and rebuilding efforts at the site of the disaster. This has meant that Alaskan communities must rely on smaller and more specific grants to fund both their adaptive measures and relocation efforts (Herrmann, 2017). The Arctic Monitoring and Assessment Programme (AMAP) includes sustainable livelihoods as a provision of a climate resilience plan. Any relocation that creates poverty is not considered to be climate resilient (AMAP, 2017). In the case of Newtok and Mertarvik, the residents of both communities faced economic hardships after the government's divestment. This is not a case of true climate resilience, and future government actions related to climate resilience should be preceded by an assessment determining the ability of the residents to continue their sustainable livelihoods based on the effects of said actions.

Creating better climate relocation policies and funding pools is just the first step for the US. The Alaskan communities highlighted in this paper are only a portion of the US coastal populations that will face similar decisions. In 2019 the US Government Accountability Office (GAO) proposed two funding options for climate resilience: 1) "a federal financial assistance program that could provide grants, loans, or loan guarantees to nonfederal entities implementing high-priority climate resilience projects; or 2) a climate resilience infrastructure bank that could combine federal funds with funds from other sources to provide funding to nonfederal entities for implementing high-priority climate resilience projects" (Gómez, 2019). Both of these options are tenable and the time to enact these is now. With the current administration slashing funding for environmental agencies and social services, it is unlikely that these will occur without a change in the White House. As more coastal communities become threatened, competition for relief resources will also increase. This paper recommends that Congress amend the Stafford Act to include erosion and permafrost under the definition of what qualifies as a disaster, and that allows for the spending of disaster relief funding in areas not within range of the disaster.

Northern Russia

Russia is home to almost 200 different ethnic groups, with 41 of them being legally recognized as Indigenous. Russia's Indigenous groups, including those that live in Northern Russia, Siberia, and the Far East, make up less than 0.2% of its total population (Rohr, 2014). Today's numbers estimate that there are 250-300,000 individuals identifying as or falling under the classification of Indigenous (ibid). These northern communities are widely spread between the western Kola Peninsula to the eastern Bering Strait, covering around two-thirds of Russia's land (Berezhkov & Sulyandziga, 2019). In addition to the way these communities' livelihoods are threatened by climate

change, other dangers to their existence come in the forms of an absence of legal rights, and a lack of adequate and enforced environmental standards.

Many of Russia's Indigenous groups have ties to their homelands that date back to before the 17th century. Since Russia's colonization in the 17th century, they experienced forced relocation and attempts at 'Russification' (Crate, 2013). Under the rule of the Soviet Union, years of collectivization and industrialization worked to create a socialist system out of the previous feudal one. This change included displacement and forced resettlement, condensing rural populations into centralized production areas. Indigenous groups were mainly nomadic or semi-nomadic and relied on the migration of reindeer, fishing, hunting and gathering. Their traditional lifestyles built around ecology, movement, and environmental processes were put on hold as they were forced into static lives. Soviet settlement and collectivization policies were designed to boost and regulate agricultural and industrial production. Children were often separated from their families and sent to boarding schools away from their traditional lives. The fallout from the collapse of the Soviet Union has left Indigenous people poorer than ever and underserved by the Russian government.

The continual permafrost melt and subsequent flooding in much of the territory inhabited by Indigenous peoples has already caused several communities to explore options for relocation. Beryozovka, a village of around 300 residents, has experienced extreme flood events for about a decade. This village, home to the only settlement of Even people, struggled with whether to move to higher ground or risk losing their community (Macfarquhar & Ducke, 2019). Most of the Indigenous communities still reside in rural regions of northern Russia today, though their modes of survival have changed slightly. Communities like the Viliui Sakha traditionally practiced reindeer husbandry, hunting and gathering, though through the Soviet collectivization policies, several of these communities were wiped out. The increasingly unpredictable seasonal weather and extreme climate events, coupled with a documented decline in native wildlife, led the remaining Viliui Sakha to retain the cow farming lifestyle after the fall of the Soviet Union into which they had been forced. More recent trends of permafrost melt and softening ground are now putting their farming practices at risk. The Viliui Sakha have considered relocating but for now, the majority of them prefer to remain in their ancestral homeland and again adapt, rather than move in order to maintain practicing cattle and horse raising (Crate, 2013: 9).

The Indigenous peoples of Russia that still continue their customary practices of reindeer herding and migrating are running into other problems similar to the Norwegian Sámi. Reindeer are suffering from higher rates of disease and starvation as their food sources stop growing as far south and are taken over by new lichens and plants. Migration patterns of the animals are becoming more unpredictable due to the equally unpredictable climate and weather events. The traditional and experiential knowledge that Indigenous peoples have is becoming less useful and relevant, and is in danger of being lost.

In addition to the already shrinking numbers of mammals and growing number of insect pests, Indigenous peoples in Russia also have to deal with barriers to other resources like fish. According to the law, Indigenous people are allowed to fish without first obtaining a permit. However, in 2017, the Russian government began requiring Indigenous people to complete a lengthy application process in order to fish. If their application is accepted, they are limited by the amount of fish they can collect, as well as the specific dates and times they are allowed to fish (Rohr, 2014). To make matters worse, Indigenous peoples frequently get in trouble when hunting and fishing

because they must provide documentation of their status as Indigenous. However, this can be more difficult for Indigenous peoples as Russia has removed the portion of its passports that denotes nationality.

The Russian constitution and national legislation does little to protect the rights of its Indigenous populations. Many of its laws are incomplete or intentionally vague. The laws outlining basic rights of Indigenous peoples only apply to populations fewer than 50,000 individuals and do not identify who classifies as Indigenous (ibid). In 2001, the federal law on Territories of Traditional Nature Use (TTNU) was passed, which was intended to officially recognize Indigenous land ownership. Though this law sounds constructive in theory, it is not enforced. The hundreds of territories outlined by Indigenous communities along with relevant regional government bodies have not been acknowledged by the federal government. Thus these territories have no official legal status. In addition, under current legislation, Russia's Indigenous peoples are only granted usufruct rights for fishing and hunting. Their inherent right to their ancestral lands remains unrecognized. The TTNU originally defined the territories as environmentally protected territories, but the word "environment" was removed in 2013. This, in conjunction with the fact that in 2015 the portion of the law delineating the authority of the local authorities was repealed, makes Indigenous lands more susceptible than ever to resource plundering and business development (ibid).

The Russian Association of Indigenous Peoples of the North (RAIPON) was originally created to be an advocacy organization, supporting the voices of Russia's Indigenous peoples both domestically and internationally. Pavel Sulyandziga, the first vice president of RAIPON from 1997-2010, has been vocal in international conventions about the poor treatment of Indigenous peoples in Russia. A confidential Russian report states that Sulyandziga was difficult to control, just one of many cases in which the Russian government has attempted to intimidate Indigenous rights' activists. RAIPON's activities were suspended in 2012 by the Russian government over allegedly receiving foreign funding. In 2013, RAIPON was taken over by new staff with Ledkov Grigory Petrovich as president. RAIPON has since openly supported government positions that oppose what Indigenous and environmental activists are fighting for.

As countries around the world try to squeeze out the last drop of oil from their lands and extract minerals at rates higher than ever before, Russia is doing its part to keep up and stay competitive. Russia's Arctic is not only home to the majority of its Indigenous populations, but also 80 percent of its natural resources by value. Most of its oil and natural gas is produced in the North, as are most of its gold, diamonds, platinum, nickel and other minerals (Berezhkov & Sulyandziga, 2019). The large-scale mining and energy projects are heavily damaging the environment and have displaced Indigenous communities. Northern Russia has seen thousands of pipeline spills, including the largest ever on-land oil spill in 1994. Rivers, swamps and the unique ecosystem of the taiga are consistently contaminated. In May 2020, more than 6,000 tons of diesel oil from the Norilsk-Taymyr Energy Company was spilled across the Taymyr tundra. The company reported that the spill was likely due to the ground underneath its reservoir sinking and causing damage to the foundation. Permafrost melt has caused a lot of infrastructure destruction, and as the rate of melt and frequency of oil projects both increase, there are likely to be more accidents. Furthermore, these accidents are difficult to clean up because of their remote locations. Lastly, not only are Indigenous peoples required to rent out the territories theoretically set aside under the TTNU, but

also the territories are often rented out to companies wishing to extract natural resources from the land (Rohr, 2014).

Like the Sámi and Alaska Natives, the Indigenous peoples living in the Russian Arctic are struggling to adapt to the environmental changes of permafrost melt, erosion and flooding occurring in their land. The threats to their existence from their government and from the extractive industries are just as great, if not greater. The Russian government should officially recognize the inalienable rights its Indigenous peoples have as listed by the United Nations Declaration on the Rights of Indigenous Peoples (UN General Assembly, 2007). It must develop protective legislation for the ancestral lands of its Indigenous groups and give greater autonomy to the local bodies that have the power to enforce them. Russia's Indigenous peoples are some of the poorest people in the republic, and their communities may require greater assistance as their lands become increasingly inhabitable. Moscow must end the smear campaigns against Indigenous activists and allow Indigenous organizations like RAIPON and the Centre for the Support of Indigenous Peoples of the North to remain independent. International bodies such as the UN Economic and Social Council must continue to support Russian Indigenous individuals and organizations. While these actions are unlikely to be undertaken by the Russian government, human rights organizations around the world have the ability to highlight the voices of Russian Indigenous peoples and to call on Russia to better protect its citizens.

Challenges of relocation

Traditional knowledge

The changing temperatures in the Arctic threaten the threads of the fabric that make up Indigenous peoples' lives and cultures. One of the less obvious issues with relocation is the threat to traditional knowledge. Many Indigenous cultures are strongly tied to the microclimate they live in, with their history, forms of transportation, clothing and environmental knowledge being dependent on the Arctic climate. The effects of rising temperatures are already very apparent, with the increase in average Arctic temperature expected to range from 2.5 to 7.5° Celsius by the end of the 21st century (Hassol, 2004). Landfast sea ice, or ice that is attached to the coastline, is crucial to the survival of Indigenous communities, as it increases their access to open water and icebergs where the animals they hunt such as seals and polar bears reside (Aporta, 2010). In fact, some Indigenous peoples, such as the Inuit, dwell and hunt on the ice for two-thirds of the year, making it a large part of their cultural memory (Aporta, 2010). Physical characteristics of ice floes and coastlines have been utilized by the Inuit for navigational purposes and in storytelling. For communities that move farther inland, away from coastlines and permafrost, any traditional knowledge about fishing, hunting or even using permafrost for building on has the potential to be lost with the move. As the warming of the climate causes large-scale changes to centuries-old glaciers and the ecosystem, they are at risk for losing part of their knowledge and culture.

Culture and family

For some Indigenous groups, their ancestral home is located completely in areas that are at risk for becoming inhabitable due to climate change. If these communities choose to move to stable ground, this may come at the cost of leaving their spiritual sites and deceased family members behind. Elders may also choose to remain in the ancestral home, leading to greater fragmentation of the communities and loss of environmental and linguistic knowledge (Gerlach, 2017).

Choices

There are so many questions involved when a community is deciding whether to relocate. Do they move as a whole community? Will individuals and families choose to move to larger cities? Will they risk being forced into displacement camps if they can't relocate in time or choose to stay in their homeland? How can they ensure that their community receives enough support and funding for their new settlement to avoid impoverishment that may result from a lag in social services? How can they maintain their cultural identity and heritage as individuals and as a community, which is so often tied closely to the land? And how can the non-Indigenous people whose industrialization has caused climate-induced relocations support these communities?

General recommendations

The myriad of Indigenous groups in Alaska, Norway, and Russia mentioned in this paper are dealing with radically different government bodies and a range of relocation options. However, the methods they use to gain access to the resources of government agencies, non-governmental organizations (NGOs) and philanthropies may prove insightful to each other and for other communities in the future. Several Indigenous peoples' organizations are Permanent Participants to the Arctic Council including the Sámi Council, the Inuit Circumpolar Council, and RAIPON. As Permanent Participants, these organizations have influence when the Council negotiates and makes decisions. This status gives Indigenous peoples a platform for direct communication with the highest-level government officials of the countries in which they reside. The Arctic Council has the potential to be an effective platform for vocalizing concerns and drawing greater international attention to the climate change relocation they are facing.

Support network

Because a successful climate resilience and adaptation plan will have to take into account both climate change and non-environmental factors, AMAP recommends that plans include: 1) processes for learning, 2) holistic understanding, and 3) conflict resolution methods (AMAP, 2017). The people going through climate-induced relocation today will be able to serve as resources for future populations, sharing information and bringing up aspects of adaptation that might have been otherwise forgotten. As each community works through their options, it would be useful to have a space for them to document their process and avenues tried so that others may see an example of a successful or unsuccessful relocation.

A platform exists that fosters networking and the sharing of problems, ideas and innovative solutions for stakeholders across the United States, called Adaptation Clearinghouse. This organization has resources including funding options, climate modeling, current laws, and networks for local government officials, and partnerships with the Urban Sustainability Directors Network and American Society of Adaptation Professionals. Stakeholders from Alaska are able to join various networks, though the resources are to "assist policymakers, resource managers, academics, and others who are working to help communities adapt to climate change" (Adaptation Clearinghouse, 2020). The organization is aimed at engaging professionals from many sectors, but lacks a network for the Indigenous communities experiencing climate change in or outside of the Arctic.

A similar but more inclusively structured international system could be valuable for sharing information, as well as building support on an international level. The proposed organization would allow community members and leaders, government officials, NGO workers, prospective donors, and all of the stakeholders in between to communicate and better understand each other's interest and concerns. The platform can include resources by country such as available funding, current policies, case examples, and other helpful resources. There can also be resources for individuals or organizations interested in getting involved on the international level.

Conclusion

There is no doubt that the climate of the Arctic will continue to change rapidly. The region that is already known for its extreme temperatures and weather will become an increasingly difficult place to survive for the people that call it home. As the permafrost melts and the coastlines erode, it is imperative that the governments of the United States, Norway, Russia and the rest of the Arctic nations step up their efforts to support their Indigenous peoples both domestically and internationally, in addition to more generally combating climate change. The communities discussed in this paper are threatened by climate change directly and indirectly from loss of ancestral land and inability to practice customary livelihoods to pollution from resource extraction industries and government crackdowns on human rights activists. And they require varying solutions. Alaska Natives may have the greatest success in lobbying for better disaster relief and legislation, while Norwegian Sámi might find their energy is better spent advocating for better conflict resolution strategies between themselves and industries. Russian Indigenous communities may choose to continue their fight against their governments' suppressions, and all Indigenous peoples can benefit from each other's experiences and support.

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