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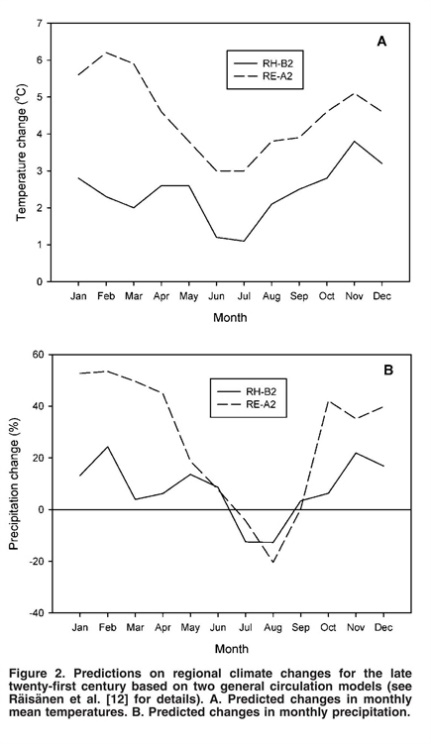
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The Effects of Climate Change on the Sami

Climate change can have negative effects on people all over the world, but indigenous peoples are among the most vulnerable. One such group is the Sami people indigenous to the Sápmi region in northern Europe (“Saami People”). The Sami (also spelled Saami) heavily rely on the practice of reindeer herding for as a unifying culture, but the effects of climate change can disrupt the entire ecosystem, and the Samis’ entire lives (Nakkalajarvi) According to Olav Mathis-Eira, the vice-chair of the executive board of the Sami Council, his people began to notice signs of climate change in the mid-1980s when they received an increased amount of rain during the winter (Baird). This is dangerous because this rain can then freeze on the ground, preventing animals from being able to forage for food (Baird).

In this region, the temperature and precipitation continue to become more extreme and unpredictable (“Saami People”). The Arctic is warming at twice the global rate (“Saami People”). Because of the rising temperatures, ice sheets melt and can become unsafe. (“Saami People”). Thinner sheets are more likely to break under the weight of people and animals, causing them to perish in the water below. (“Saami People”). In Finnish Sápmi, the average temperature has risen by 2.3°C since the post-industrial period (Nakkalajarvi). At this warming rate, Finland Sápmi’s climate will resemble that of southern Finland by the end of the century (Nakkalajarvi). Relating to the increased temperatures, snow arrives later in the winter and the snow-free season grows longer each year (Nakkalajarvi). When it does snow, it varies in amount and structure (Nakkalajarvi). These details can seem small one year at a time, but as a whole, they can threaten the Sami way of life. (Nakkalajarvi).

In the Arctic, temperatures are rising at twice the rate of the global average (Moen). Climate change also causes an onslaught of other climate and environmental issues (Moen). This graph shows predictions of temperature and precipitation change in northern Sweden in the year 2100 compared to 1990 (Moen).



*Figure 1*. Predictions on regional climate changes for the late twenty-first century based on two general circulation models. A. Predicted changes in monthly mean temperatures. B. Predicted changes in monthly precipitation. Each general circulation model used has a short strand of numbers and letters to differentiate between the two models.

Moen, J. (2008). Predictions on regional climate changes for the late twenty-first century based on two general circulation models. Graph. *Ambio: A Journal of the Human Environment,* *37*(4), 304-311. doi:10.1579/0044-7447(2008)37[304:CCEOTE]2.0.CO;2

As is mentioned in the graph’s description, two general circulation models are used in each graphic (Figure 1). This research contains two different general circulation models because, when predicting future climate change, it is unlikely to be completely sure of one method. The models for both temperature and precipitation have a lot of variation during the first few months, but the values become closer by April and May (Figure 1). Although these models differ in the exact change, they have generally similar outcomes; temperatures will rise year-round but will have a larger increase during the winter (Figure 1). Precipitation will increase during most of the year, especially in the winter months, but during the summer, precipitation will decrease if anything (Figure 1). In addition to raising mean temperatures, climate change will affect climate variability and increase the probability of extreme weather events (Moen). More specifically, extreme cold periods will be less likely, but extreme heat events will be much more common (Moen).

Mean winter temperatures are predicted to increase by 4–6°C in northern Sweden, while summer temperatures are likely to increase by only about 2°C (Moen). These increased temperatures will lead to an overall decrease in the snow-covered period of about 2 months (Moen). Winter precipitation will also increase by 30%–50%, and it is likely that this increase will be mainly through heavier precipitation during each occasion rather than lengthier periods of precipitation during this season (Moen). Summer precipitation, however, will either remain unchanged or even decrease slightly (Moen). These changes, higher temperatures and lower precipitation, will cause a decrease in soil moisture during the summer months (Moen). The new climate in the winter can also have negative effects on the ecosystem. As previously stated, these months will see more precipitation (Figure 1). Also, with the rising temperatures during the winter, it is likely that there will be less snow and more rain. Any snow is also likely to melt because of these rising temperatures (Moen). All of the water on the ground will then freeze, creating a barrier on the earth between animals and their food on the ground (Moen).

Snow is incredibly important to the Sami people, as it covers the region for roughly a third of the year and is a large factor in how successful the year will be for reindeer herders (Nakkalajarvi). In fact, snow is so important that Sami culture has at least 360 words for snow (Nakkalajarvi). “Guohtun”, for example, describes not only the snow itself but nutrition conditions for reindeer (Nakkalajarvi). Unfortunately, guohtun conditions are becoming less predictable and can negatively impact the reindeer population (Nakkalajarvi). The main issue is increased rainfall which, as previously mentioned, freezes over the ground and makes it impossible for reindeer to reach lichen, their main source of food (“Climate change could end”). This used to be a rare occurrence in the area but is now unfortunately a normal issue the Sami people must consider while tending to their reindeer (“Climate change could end”).

Alternate food sources for the reindeer exist, but there is no easy solution (“Saami people on the frontlines”). According to a Sami reindeer herder named Jonas Vanaar, if ice forms a barrier between the reindeer and the lichen on the ground, “the reindeer then start looking for lichen hanging from trees. […] It makes the conflict with the forestry industry worse because these mostly grow on old trees. When you cut down the forest, the hanging lichen also disappears” (“Saami people on the frontlines”). Herders could alternatively keep the reindeer in corrals and feed the animals other materials, such as hay, but that is not financially possible for many of the Sami people (“Climate change could end”). It would also affect the cultural identity of the people, as it is not their natural way to care for the reindeer (“Climate change could end”). In addition to the increasingly extreme weather causing more ice in the winter, droughts and wildfires affect the ecosystem during the summer (“Saami people on the frontlines”). Each summer, wildfires destroy much of the reindeers’ winter grazing lands; these lands can take decades to recover (“Saami people on the frontlines”).

Reindeer husbandry is a “meat-producing industry” and is under exclusive rights of the indigenous Sami people (Moen). Because of how big of a role reindeer herding plays in this indigenous peoples’ lives, the threat climate change has toward the reindeer population is also a threat toward the Sami people (Moen). In Sweden, where many of the Sami people live, reindeer husbandry covers nearly 40% of the country and is made up of roughly 225,000 animals (Moen). The lives of the Sami people revolve around the reindeer and their needs. Jannie Staffansson, a climate activist and a Sami from a long line of reindeer herders, has stated, “I was brought up to always [think] that the reindeer comes first … and when the reindeer has a good life, we will have a good life” (“Climate change could end”). But because of recent environmental developments, some Sami are no longer able to live off of the reindeer and must give up their nomadic ways. As the lands change, the Sami’s livelihoods, language, and cultural identity is altered (“Climate change could end”). Reindeer slaughtering and butchering has been industrialized and, in many areas, the Sami language has been completely lost (“Climate change could end”). Unless swift action is taken to fight climate change, future generations of Sami people will likely never be able to experience this unique culture.

As a mitigation strategy to reduce the causes of climate change, many places around the world are switching to renewable, carbon-free energy sources. And the governments of the countries the Sami people call home (Norway, Sweden, Finland, and Russia) are also trying to do their part (“Will this be”). In these areas, the most common carbon-free energy sources are hydropower dams and wind farms (“Saami people”). Unfortunately, despite the good these sources do for climate change, they also have negative effects on the Sami people (“Saami people”). The reindeer naturally run along the river valleys, but the hydroelectric dams block the animals’ paths (“Saami people”). The dams also collect water in the summer to release during the winter, which worsens the thinning of the ice sheets and makes it more dangerous for the Sami people (“Saami people”). Wind farms, another popular renewable energy source, are often built on reindeer grazing land and disrupt the reindeer’s migration routes (“Saami people”). Even though these indigenous people suffer because energy sources, the governments themselves seem to have little sympathy and continue to allow Sami land to become altered (“Saami people”).

The Sami people have had to find ways to adapt to the effects of climate change, but sadly, everything is a temporary fix. As a last resort to keep the reindeer from dying of starvation, herders have begun to buy feed, which is an added expense not everyone is able to afford (“Climate justice”). Some herders have also decided to keep their reindeer in corrals for extended periods of time to watch over them but having too many reindeer too close together can cause illness to spread (“Climate justice”). In the end, many Sami people have had to make the difficult decision to give up their nomadic lifestyle as herders (“Climate change could end”). Reindeer herding has been part of the Sami culture since 800 CE; now, fewer than 10% of Sami people still herd reindeer (“Will this be”).

The hydropower dams and windfarms are a useful strategy in helping mitigate the effects of climate change, but in order to not harm the Sami people and other underrepresented indigenous peoples to a greater extent, but government officials must be more thoughtful when be in favor of for such disruptive developments on and near their land (Saami People”). In fact, I believe the pressure on controlling carbon dioxide emissions should not be reliant on these countries, rather it be a global issue. While saying this, the countries producing the most carbon dioxide, such as the United States, China, and India, must do more to mitigate the issue. Combined, these three countries make up nearly half of global carbon dioxide emissions (“Each Country’s Share”). Seeing as how some areas are not suited for certain sources of alternative energy, such as areas with little direct sunlight for solar panels or indigenous peoples’ lands for wind energy, it is important for climate change to continue to be a global conversation to figure out the best solutions.

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