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Tanguy Sandré, Arjan Wardekker, and Jeanne Gherardi

7 While waiting for the sea ice: Stories of changes from Ittoqqortoormiit (Kalaallit Nunaat)

For me, the sea ice actually brings thoughts of warmth and light. Not the frozen nothingness as it is often portrayed. There is one tool especially that helped Inuit survive, the qulleq, the oil lamp, which the women tended. Ikummataa is what feeds the light in the qulleq – fuel from the fat of seals, walrus, whales, and other animals; those animals that come from the sea ice. And in traditional times that light meant warmth and it provided a light by which families shared their stories, their knowledge, and much laughter (1).

Changing sea ice

For many small communities in the Arctic, climate change-driven variations in the sea-ice thickness and extent are a central experience of recent environmental transformations. In Ittoqqortoormiit (Box 1), Kalaallit Nunaat (Greenland), sea ice is a ‘character’ that featured in many stories we were told. Discrepancies and mismatches between sea ice conditions and those expected based on local knowledge and recent memories were often described. Together with the community, we¹ have been exploring how these modifications have impacted on local people, through their stories of changes. How do sea ice changes reframe the way this *kalaaleq* (sing. ‘Greenlandic’) community experiences seasonality, resilience, and environmental and climate change?

¹ Tanguy Sandré and Jeanne Gherardi have both conducted repetitive fieldworks within the community from three weeks to two months in autumn 2021, summer 2022 and autumn 2022. Together with Arjan Wardekker, we have explored how resilience and challenges to the community’s resilience are expressed in our ethnographic materials and experiences.

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Box 1: Ittoqqortoormiit (Tunu, Kalaallit Nunaat).

Ittoqqortoormiit is the northernmost community on the east coast of Kalaallit Nunaat (Greenland), located at the mouth of Kangertittivaq. The town was founded in 1924–1925 by Ejnar Mikkelsen mainly to reaffirm the Danish sovereignty and block further Norwegian claims on the east coast. The community has long relied on subsistence hunting as its principal source of livelihood. In recent years, Ittoqqortoormiit, the inhabitants of Ittoqqortoormiit, have been facing multidimensional transformations driven by: 1) increased institutional marginalisation: since the *Self-Government Act* (2009), Ittoqqortoormiit municipality was incorporated into a much larger unit of local government, named Kommuneqarfik Sermersooq, ruled from the capital Nuuk, at least two day’s travel away via Iceland, 2) decreasing population and services: 354 inhabitants in 2022 compared to 530 in 2005, and an absence of doctors, 3) ecological restrictions: more restrictive quotas for hunting, 4) changing climate and sea-ice conditions.

“*Naluarnga!*” (“I don’t know” in Tunumiisut/East Greenlandic). This is an uncommonly short *kalaalleq* word, performed as a refrain during the autumn 2021. The days were getting shorter at the mouth of Ugeer (‘Winter’ in Tunumiisut), and we were randomly asking locals: “When will the ice wrap itself again around the 350-inhabitant town?” I quickly understood that this question was heavily derived from a western worldview, one which aims to foresee and control. At the same time, convergent stories were told: “It was earlier before, we are now waiting a long while for the ice to be stable and thick enough to be safely covered by the tracks of sled dogs and snowmobiles.” In June 2022, the question could have been inverted: “When will the ice melt again around the 350-inhabitant town?” But we researchers have learnt. We already know that the question does not fit the context. We therefore pay further attention to new convergent stories: “This is very unusual that there is still ice now”; “we haven’t seen that for 20 years”; “it must be hard for the hunters all this ice.”

What do those recurrent and convergent stories tell us about the connectedness of a small community with the sea ice? How does it document changing sea ice conditions driven by a warmer climate? How does it help us to understand a cultural experience of seasonality and to grasp the “space between seasons”?

In recent years, in the Arctic as a whole, sea ice conditions have been particularly impacted by climate change. “Since the late 1970s, Arctic Sea ice area and thickness have decreased in both summer and winter, with sea ice becoming younger, thinner and more dynamic (very high confidence) (2, page 76)”. This statement from the Intergovernmental Panel on Climate Change (IPCC) seems to suggest linearity or a relative simplicity in describing observed changes. Discussions with community members in Ittoqqortoormiit were challenging this description and interrogating its local saliency. The framing of sea-ice evolution in these discussions was centred on anomalies and difficulties in apprehending the dynamic of experienced changes, rather than as a process of continual decline.

In Kalaallit Nunaat, especially for the community dwelling on the east (e.g. Ittoqqortoormiit) and the north-west coast (e.g. Qaanaaq), the conditions of ice are crucially linked to the practice of subsistence hunting. In Ittoqqortoormiit, except residual seasonal tourism, hunting is the only source of income for the town. Dogsledding and snowmobiles are used to hunt prey (polar bears, walrus, narwhals, muskox, seals, etc.) on the ice. A reduction in the length of the sea-ice season is strongly connected with a decline in the dog population in recent years: the shortening of the sea-ice season directly reduces the period of rentability of a large pack of dogs that are becoming too expensive to feed. If dogsled-based hunting is threatened by rapid changes, fishing, which is the first source of income in the country but has always been limited in the community, is seen as a potential opportunity (Figure 7.1). With changes in sea-ice conditions, the use of motorboats is growing in the fjord. Technological changes are thus combined with human/non-human reconfigurations: a shift in the relations between human and dogs, but also between humans and other species, such as the polar bear.

How sea ice changes affect inter-species relationships

The door shudders. The streets whitened by the arrival of winter contrast with the colourful houses that nestle the 350 inhabitants of the town. The darkness is receding, the northern lights erasing green clouds carefully intertwined during the night. Other tints will soon emerge. The shiver of the door stops. The handle creaks. The schedule is too early for each noise not to have its own meaning. His imposing frame appears and suddenly freezes. For a moment, the sounds fade away. Shortly afterwards, he evaluates: 'It's not cold.' Our eyes meet and talk to each other. It's six in the morning and the polar bears patrol sets off (fieldnotes, Tanguy Sandré, 2021).

Among the stories we were told in Ittoqqortoormiit, many were focused on polar bears. It was especially true in the autumn 2021, when polar bears were around the town, much closer than usual, and it was therefore a favourable season for polar bear stories. In recent years, changes in sea ice extent and thickness have been associated with an increase of visiting polar bears. As one community member underlined: “20–25 years ago, the hunters had to drive a longer way to hunt polar bears. Now, they’re coming inside the village.” It is also inconceivable now for Ittoqqortoormiit to venture outside the town without being armed. Being prepared for a random encounter appears to be a basic rule. A few years ago, a polar bear patrol was set up in Ittoqqortoormiit. The patrol consists of a single person who is charged with assuring the town is free of polar bears before the school opens. At six in the morning, the patroller drives around the town, slowing

down on spots where polar bears have been noticed in the past, for instance down the Kuuk (River), at the garbage dump or nearby Qinngaiva/Walrus Bay.

Changes in sea ice redesign relationships between inhabitants and polar bears, whose behaviour is affected by those sea ice conditions. Hence, it reframes the way polar bears are perceived among new generations (3), who now commonly perceive polar bears as a threat: “All the community is scared of meeting polar bears. They don’t want their kids to be outside after the weather gets dark because they’re afraid there might be a polar bear. It’s quite normal that we get visits from polar bears inside the town”; “it is very different now, when I was a kid, we used to go skiing on the ice and mountains everywhere, and now we cannot venture out there without a gun because there can be polar bears everywhere.” Both hunting practices and local leisure activities are impacted by this permanent threat.

Interstices and local experiences of seasonality

Another set of stories focused on how the sea ice determines local views on seasons and seasonality. Among most human groups, living conditions are strongly associated with seasonal calendars, which provide a common structure for community life. Under complex changes, notably co-driven by climate and environmental crises, cultural calendars have to be rearticulated to keep making sense of local experiences. The changing sea ice, and its practical local consequences, affect hunting activities. Hunting periods are framed at the intersection of biological and migration cycles, sea ice conditions, hunting and community practices, values, and knowledge, as well as institutional and environmental regulations. Seeing seasonality in this multifaceted way, as an intersection of rhythms, allows for a nuanced and local (and respectful) understanding of changing dwelling conditions. It goes beyond a ‘western’, science-based framing of seasonality, to see seasons as local frameworks and shed light on ways of navigating with the flow of seasons, rather than acting according to rigid calendars. Even if “seasonality is the most basic scaffolding of people’s sense of time, structuring fluctuations in resource availability and deployment of adaptive responses (4)”, a “neglected aspect of climate change adaptation is the role played by communities’ cultural relationship to seasons (5)”.

A dominant representation of seasons follows a four-season division of the year. In Tunumiisut, at first glance, the four-season categorisation appears relevant. Hence, winter (Ugeer) and summer (Mannginner) are extremely present in the narratives collected, with notable but less frequent occurrences of spring (Manngileqqaarner) and fall (Ugiatsar). Nevertheless, our observations and storylines from our interviews suggest that the life of the community is driven by a duality marked

by the presence or absence of sea ice.² The season – and the stories of these periods – determine what activities take place in the community. The interstices between those two sea ice seasons are characterised by lassitude, high unpredictability due to high year-to-year inconsistency, as well as more frequent winter-like storm events and hurricanes in autumn. Not much can be done in these ‘in between’ periods, and as our local conversation partners kept reminding us – ‘naluarnga’, I don’t know – it’s a fool’s errand to predict when the transition will happen. This attitude characterised how the community handled seasonal variability and change: they wholeheartedly accepted the inherent uncertainty, and the inability to reduce it, and trusted in the community’s resilience to weather the transition period. In-site observation suggests that this is more than an attitude, rather a way of being in the world. This provides an interesting contrast with Western perspectives and our work in climate science which is characterised by much more of a focus on predic-



Figure 7.1: A woman fishing on thin ice. Taken by Tanguy Sandré, June 2022, Ittoqqortoormiit. (Photo by: Tanguy Sandré).

² We cannot rule out that the timing of the repetitive fieldwork might influence our perspective on this duality.

tions and projections, and where irreducible uncertainties are associated with frustration. We might be able to learn much on Arctic resilience from how communities navigate these seasonal interstices. The local experience of seasonality also provides clues on how to deploy downscaling of science-based understandings to make climate science more locally meaningful to these communities.

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