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Working with and for Arctic communities on resilience enhancement

Anna Karlsdóttir, Jean-Michel Huctin, Jeanne-Marie Gherardi, Tanguy Sandré & Jean-Paul Vanderlinden

Concepts like knowledge co-production and narrative-centred approaches have become more prominent in place-based research in the Arctic. This article will share experiences from the Belmont Arctic II program's project "Sense Making, Place attachment, and Extended networks, as sources of Resilience in the Arctic" (SeMPER-Arctic, 2019-2023). Rooting our work in the Arctic, with and for Arctic communities, we collected local stories of changes, shocks, upheavals, and their aftermaths in three communities: Uummannaq and Ittoqqortoormiit (Greenland) and Tiksi (Sakha Republic, Russia). However, this article is primarily about our research in Greenland. We investigated the interactions between the local narratives of resilience and two broad categories of external narratives: environmental science, and public policy and regional development. We developed a narrative-centered, locally rooted, place-based understanding of resilience. This calls for developing tools and strategies to increase community resilience in other communities and for sharing the lessons learned with regional planners and policymakers. We contribute to the framing of global environmental change through respectful, non-prejudiced enquiry, deciphering what it means to be a resilient community. Therefore, the results of this analysis are meant to be translated into options for actions, at the local, regional, national and circumpolar levels. Working towards maximizing impacts or enhancing resilience from research conducted for the benefit of communities involved in the research requires reflexivity and relationship building. How did this commitment emerge in our research practices? How do we meet ethical considerations? How do we contribute to decolonizing research whose imperative is towards culturally responsive research? This article will discuss experiences, questions and tensions emerging from circumpolar fieldwork-grounded research.

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Introduction

Research in Arctic indigenous communities focusing on the effects of climate change is less than thirty years old (Folke et.al, 2002; Cruikshank, 2001, Gunn, 1994). Although natural science research on climate change is based on a tradition that goes back well over a century (Arrhenius, 1893), it is only in the last two decades that the wider world has become convinced that the Arctic is one of the regions of the world where the effects of climate change are visible to the naked eye, resulting in an unprecedented level of international interest. However, research that focuses on and works with communities has until not long ago been at the margins, especially related to knowledge co-production or transdisciplinary research (Vanderlinden et al., 2020). Grossly a decade ago, community adaptation to climate change had accelerated and concepts such as resilience and sustainability had come to the forefront (i.e., Folke et.al., 2002; Einarsson et.al., 2004; Rasmussen, 2011, Petrov et.al., 2016). Since then, a large body of literature focusing on Arctic communities has emerged.

Until recently there was little research on how co-production research works in practice and what its implications are, especially regarding how data collection and analysis can be developed to increase the quality and reliability of research. However, we currently need to foster our understanding on how Indigenous partners can be more deeply involved in other stages of research such as project design and dissemination of results, and more generally the roles that researchers themselves play in shaping research. A recent surge in this literature demonstrates co-productions' relevance to social science research. This is especially true to sustainability issues, which are characterized by extensive uncertainty and complexity (for example Wibeck, Eliasson & Neset, 2022; Yua et.al., 2022). In addition to this experience, in many cases, new demands from public administration on registering time reduce creativity and open repeated dialogues with communities, sometimes driven by financial resource constraints. Increased demands for ethical contracts when working in Indigenous communities have arisen from bitter experience of strong exploitation practices in the past among academics and other scholars. These demands have developed in different parts of the world over the past 15 years, although they appeared later in the Arctic (see for example among Inuit Nunaat: Inuit Tapiriit Kanatami, 2018; Inuit Circumpolar Council, 2021, Inuit Circumpolar Council, 2022).

This article presents important practical lessons drawn from the co-authors' experiences in several research projects in Inuit communities in Greenland, particularly during the *SeMPER-Arctic*¹ project. Many articles promote the co-production of knowledge, but at the level of principle, without always proposing concrete answers to the problems faced by researchers.

The three focus communities are quite different, but they share some common challenges due to adverse conditions related to remoteness. Remoteness from regional and national political centers reduces the power of local people to make decisions about their own present and future. Some of them have problems with dilapidated housing (whether due to weathering or lack of resources for maintenance); increased uncertainty about weather forecasts and ice conditions; and changing ecosystems due to challenging climate conditions. Towns are also losing population (with the exception of the population of Uummannaq, which has stopped decreasing due to the relocation of residents from two settlements that were evacuated after their definitive closure following a

¹ **Sense Making, Place attachment and Extended network as sources of Resilience in the Arctic**

tsunami in 2017). The level of development of social infrastructure is a constant challenge. While hunting is still a livelihood, commercial fisheries are of greater economic importance. These three communities are emblematic of the challenges of adapting to climate, economic, political, and cultural changes. While the weather has become warmer and more erratic, sea ice has tended to decrease in thickness and extent, at least over the past two decades. These three communities are striving to find ways to remain sustainable and attractive despite their remoteness at a time when urbanization is a megatrend (Rasmussen, 2011).

Initiation of Research Project and the Inclusion Process

The first challenge facing scientific projects is the search for funding, which raises the question of the possible involvement of local Indigenous partners in the preliminary co-design of projects. To avoid asking too much of them without any guarantee of success, or to avoid disappointing or fatiguing them in the event of repeated failure, it is often easier for researchers to involve them little or not at all in the writing phase of the application file intended to respond to the call for projects. However, if the application is selected, the lack of input from the local partner (or at least without validation of the project as written in the application) means that researchers run a great risk of having designed a project that is partly unfeasible, or of no real use to the community studied, or even not really wanted by the local partner. To avoid this often-unavoidable pitfall of most foreign projects, researchers need to have acquired some local knowledge and, of course, to have built up a solid relationship of trust with their partners. This is not a given for all teams of foreign researchers, especially those who are new to the field and have no previous experience of working in the community under study. In the case of our SeMPER-Arctic project, we relied on letters of support from local partners with whom we had previously discussed and agreed on the project's objectives. Our first Greenlandic partner, accustomed to working with researchers, had worked with one of us for many years, while the second partner had been met by a team member during an initial reconnaissance trip; as for the Yakut partner, we worked together into several projects (ARTisticc, Belmont Forum funding, and Nunataryuk, H2020 funding), this for now almost 10 years. Without these established professional relationships, some of which were also personal friendships, it would have been impossible to design a project that was in any way connected to the local community.

Like many other international projects focusing on the Arctic, we were funded through a large global or interregional initiative, in this case the Belmont Forum Arctic II initiative, which was supported by ten national research councils, for three years. The call aimed at bringing together researchers and other expertise across the globe to develop proposals from integrated teams of scientists and stakeholders to address key areas of Arctic resilience, from understanding to action. This collaboration of academic and non-academic knowledge systems constituted a transdisciplinary approach that would advance not only understanding of the fundamentals of Arctic resilience but also spur action, inform decision-making, and translate into solutions for resilience (Belmont Forum, 2019). The consortia had to address at least two of seven interconnected elements of resilience as described in the Arctic Resilience Report of the Arctic Council (2016): natural, social, financial, cultural, and human capitals; infrastructure; and knowledge.

SeMPER-Arctic was one of eight proposals awarded funding, which is provided through the national research councils of partners (Belmont Forum 2020). Many of us had experience from

conducting prior research within the circumpolar Arctic as human geographers, engineers, anthropologists, economists, and climatologists, to mention few of our disciplinary backgrounds. The integration across scientific disciplines enables us to consider multiple worldviews present in contemporary science (Mauser et.al., 2013). This interdisciplinary group was needed as the purpose of the project was to analyze how the two external narratives (environmental science and regional development policy ones) interact with local narratives of resilience to assess their impacts. The objective was to develop a narrative centered, locally rooted, place-based understanding of resilience within Arctic communities. As such resilience and narrative analysis were the central framework in SeMPER-Arctic, which was meant to contribute to the knowledge base on global environmental change through locally guided enquiry of what it means to be a resilient Arctic community in the 21st century.

As put forward in the Arctic Resilience Report synthesis (Arctic Council 2016, Arctic Council 2017), decisive action is needed to effectively navigate emerging conditions to avoid potentially negative social and ecological changes already emerging. One of the major statements not only in this report, but also echoed by various politicians and representatives in the Arctic Council, is that *“responses will be most effective if they build on a well-integrated, evidence based interdisciplinary understanding of Arctic social-ecological systems and their relationships with global processes and draw on Indigenous knowledge well-grounded in practical experience”* (Arctic Council, 2017; 2).

Research evidence shows that scientific representations and interpretations have emerged as dominating worldviews (Bremer et.al., 2017). While sciences are necessary, their research objectives and measurement tools can often be too abstract, and their metrics can be very unfamiliar to human populations in general. This domination of "western" science has created a significant undervaluing of the traditional knowledge perspective, which has demonstrated its effectiveness in assessing weather, climate, and navigating natural environments for human communities. Therefore, it has to be our common enterprise as researchers and population to rediscover the places we inhabit; it is not the responsibility of the expert community alone to reinterpret our places under a changing climate (Ibid, 2017).

The Way Knowledge Co-production has been Conceptualized

Many of the problems that societies around the world are currently facing need to be tackled with a different mindset from the ones that created them. Thus, there is an urgent need for new ways of thinking that go beyond dominant disciplines and paradigms, exploring contemporary issues, insights, and responses. In policy discussions as well as in research, there are increasing calls for societal transformations, which are-systemic, long-term, non-linear change that spans the different sectors of societies. Formal conventional knowledge systems like those practiced by universities and research institutes may be failing humanity. Especially when the impact of the research is measured against the level of progress in stimulating the societal changes needed to address challenges like climate change (Fazey, 2019, Fazey et.al, 2020). This urges researchers to have an integrity when conducting research to secure their work is relevant to the communities involved.

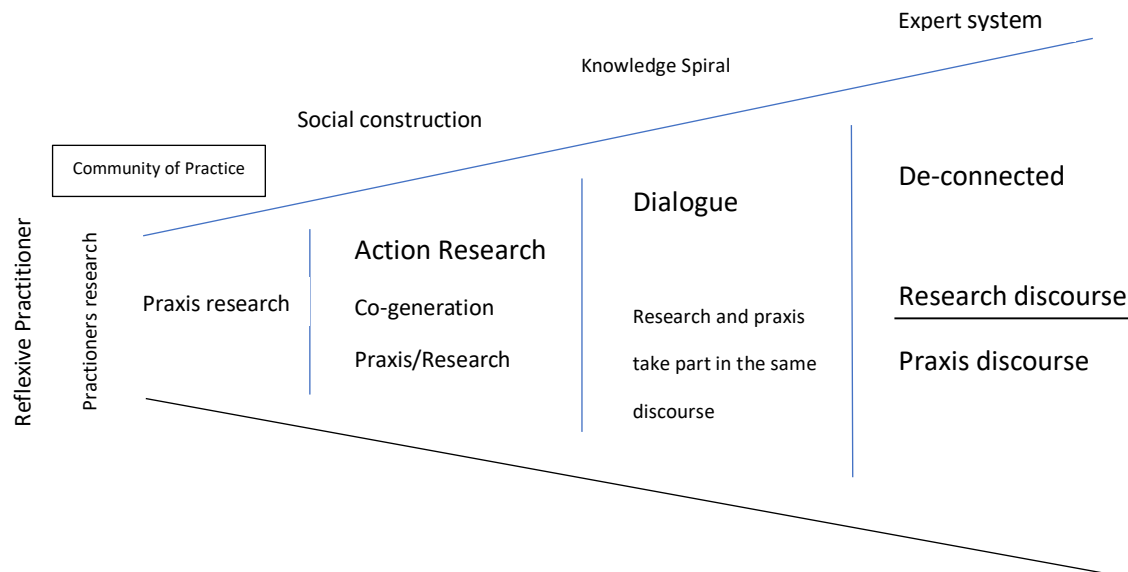


Figure 1. Degrees of Integration: Research & Praxis (Johnson, 2013).

Ideally, knowledge co-production is a demanding approach in conducting research that involves deep collaboration between researchers and stakeholders who have different types of knowledge, expertise, and perspectives. It recognizes that multiple forms of knowledge, including scientific, local, Indigenous, experiential, and contextual knowledge, can contribute to all stages of the research process, and aims to integrate these diverse forms of knowledge to generate more relevant, robust, and actionable research outcomes (Mauser et.al., 2013).

In knowledge co-production, researchers and stakeholders work together as equal partners, engaging in a process of co-design, co-implementation, and co-interpretation of research (Wibeck, Eliason & Neset, 2022). It may involve collaborative activities such as joint problem identification, research design, data collection, analysis, and interpretation of findings. This approach emphasizes the importance of mutual respect, shared decision-making, and open communication among all participants throughout the research process. It recognizes that stakeholders, who may include community members, policymakers, practitioners, or other end-users of research, are not just passive subjects or recipients of research findings, but active contributors who bring their own insights, experiences, and expertise to the table.

It often includes iterative feedback loops, where stakeholders provide ongoing input and guidance to researchers, and researchers respond by adjusting their research questions, refining their methods and their data analysis. It also includes their participation in field work, by helping researchers access observation situations or by facilitating the collection of oral data, sometimes by carrying out the collection itself as for example during the COVID-19 period in 2020-2021 in which researchers could hardly travel. The process aims to generate research outcomes that are contextually relevant, applicable, and useful for addressing real-world problems, and that reflect the perspectives and needs of diverse stakeholders.

Given the need for co-creation, surprisingly little discussion has evolved around its implications for research practices and knowledge co-production i.e., what challenges you meet in fulfilling the promise of co-creation (Ren, Johannesson & van der Duim, 2018). As mentioned before,

unnecessarily burdening local partners, and raising the expectations of research funding during proposal design and submission can lead to disappointment and deteriorate trust with the researchers if funding is not approved.

The question then is how can researchers contribute and impact the processes of, for example, enhancing resilience? One may expect that researchers wanting to increase impacts in or for communities need to become “insiders” to a higher degree (Hjemdal & Aas, 2018). However, this is complicated when international research teams are involved. This may also mean that knowledge transfer is more complex if researchers want to contribute with impacts which would require skills far beyond their disciplines. This also implies the more or less long time to build relationships of trust and the possibility or reciprocal desire to take time together, which is not given to everyone.

A major challenge with implementing Co-Production of Knowledge is mischaracterization (i.e. referring to collaborative work as CPK). For example, a researcher may identify a problem, develop research questions, and then invite Indigenous participation in the project. The project may result in Indigenous participation through collaboration on information collection or other aspects of the research process, or there may be a capacity building aspect to the work. This theoretical type of relationship, through the lens of our framework, would not be considered co-production because involvement or equity at all stages of the process was not the aim, methodology, or the outcome. The mischaracterization of CPK does not advance equity for Indigenous Peoples and their communities in research relationships, project outcomes and limits a fuller understanding of the world (Yua et.al., 2022).

Despite good intentions, the climate change knowledge co-production literature is a complex meeting place of several academic traditions and practices, introducing both ambiguity and creativity as scholars’ appropriate perspectives from neighboring disciplines. Scholars have thus used several ways in applying and understanding the term co-production. Of the eight ways identified by Bremer et al. (2018), our project includes perspectives to facilitate extended modes of science that integrate societal knowledge and values, building adaptive capacity in institutions and to empower traditional knowledge systems. Hence, we would ideally like the results of the work to find its way into a structured science-policy interface, but this is yet to be seen.

Ethics towards Community-Focused Research

Several different approaches stress the inclusion of local communities in research development and in dealing with the rapid environmental and social changes ongoing in the Arctic. Various methods may relate to climate change research (i.e. Hansen & Larsen, 2015) and seek to assess cross-regional societal development (i.e. Karlsdóttir et.al, 2017). Participatory scenario approaches have been credited with many positive outcomes that include identifying important benefits like social learning across different stakeholder groups, promoting community-owned solutions, and facilitating the sharing of experiences in a creative and collaborative way (Oteros-Rozas et al., 2015, Nilsson et.al, 2019).

We have, as an interdisciplinary team, varied experience of working in knowledge co-creation research. One of us has worked for three years with participatory foresight analysis in 12 communities in the Nordic Arctic where collected results were shared with local communities in citizen meetings, with regional and national authority representatives and with interregional bodies in special workshops (Karlsdóttir et.al, 2017). This methodology does not enhance a co-creative

knowledge approach and includes certain weaknesses, such as the research may lack diversity among the participants and lack follow-up on whether the process led to any action (Nilsson et.al, 2019). However, this form of action research was a collaborative process which required partnerships, dialogue, and cooperation with various actors on multiple local, regional, national, and inter-regional levels, and where results had the potential of being mobilized into policy actions.

We were challenged in the first 18 months of the three-year process due to consequences of the global pandemic and related sanitary policies and travel restrictions. For the most part, we could not visit the communities that were the focus. However, the partners doing fieldwork in Tiksi (Sakha Republic) collected instances of events that the local population found important, and gathered explanations that local people and authorities gave to these events, their origin, their management and their short- and long-term consequences (Nikulkina, Shadrova & Antonova, 2020, Nikulkina et.al., 2020). Then another shock hit us: we lost contact with our Russian partners after the war against Ukraine started in 2022. Yet we have proceeded with processing the data already collected in the Sakha republic (Doloisio, 2022), but it has truly affected reciprocity relations between the communities, and therefore knowledge co-production as well. Thus, our account in this article is primarily focusing on the Greenlandic research sites and communities.

Involved researchers and partners focusing on Greenland had to come up with alternative ways of conducting research in the first phases (luckily, we were granted an extension to 2024 due to the pandemic). This required, as all research endeavors, reflexive ways of conducting research. The consortium communicated for the first two years through TEAMS or Zoom and made a serious effort to build up collective reflexivity (Palaganas et.al., 2017) but also collected data (interviews conducted by local partners). One important point of departure was that you cannot do research only to benefit your own merit as a researcher if you engage with a community. This felt even more urgent since the focus of the project was on resilience in the wake of shocks, upheavals or incidences related to climate change driven effects.

SeMPER-Arctic works across disciplines and analytical levels in that it examines narratives driven by a natural science perspective, the political scene (manifesting in national and regional strategies and policies), and with three local communities in combination (Ummannaq, Ittoqqortoormiit and Tiksi). In all the research locations we had key local partners who proved crucial in making field research possible and without whom we would not have been able to do the work. Acknowledging their role is an important ethical aspect of community focused research. We stress an approach that fosters wellbeing and inclusive societies in an era of climate change and uncertainty; our project is fundamentally about the process of spatialization and becoming space as we adapt “a thinking that one cannot write sufficiently in the name of an outsider” (Deleuze & Guatarri 1987, in Huijbens, 2021). Thus, researching and understanding the process of the ongoing changes in the communities reveals how manifold the community is as well as the entities in it. By revealing how entities emerge from the relations that compose them, they are not to be pulled apart but seen in connection, which involves understanding and making sense of the community while recognizing how power relations are entangled into power geometries inherent in the transformation process (Huijbens, 2021).

Environmental changes make up space for stories. Our narrative-based research requires that it is grounded in the lived experience of communities.

Long term Relationships and Trust

One major factor in enabling participatory or co-production of knowledge in practice is to build trust through long-term relationships. Relationships are crucial for co-production (Kielsen Holm, 2016; UNESCO, 2009) and Indigenous research (Smith, 2021: 137). Building trust means sustaining long-term relationships that exceeds the demarcated period of funding for a research project, both prior and post research activity (Gearheard et.al., 2006; Mahoney et.al., 2009; Mahoney et.al., 2013).

Relationships and trust are needed in encounters with the community, especially to bridge the work **with** the community and **for** the community. One of the researchers had 18 years of research experience over 26 years of traveling to the community of Uummannaq and in Greenland which secured firm relationships with the key partners who conducted part of the data collection. With their deep insights and knowledge, we were better equipped to understand and mediate what stories of upheavals, shocks and transition were more important than others. Engaging with key partners who have 37 and 30 years of experience working with young people and children on empowering them in meaningful activities intersecting nature and culture helps to enable trust. Working with children and youth has also been important (Huctin & Andreasen, 2007; Huctin, 2016; Huctin et.al, 2021; Gregersen, 2010; Karlsdóttir & Jungsberg, 2015; Karlsdóttir et.al., 2019). “A key strategy for navigating the inevitable tensions that can arise in projects where research on resilience is in focus with natives is paying continual attention to relationship building and mutual acknowledgement of the value added by all the invested members” (Wexler et.al., 2020).

The relevance of addressing and acting upon decolonizing approaches to social science research with communities is important and relevant for Greenland. A prominent and vivid discussion expressed in music and arts, in public and social media forums and among contemporary Greenlanders is focused on the ails of colonialization implications and post-colonialism. With many Greenlanders being of mixed ethnicity, the discussion becomes even more complex (Thisted, 2022). When it comes to the need for political agency, it is evident that the majority looking for self-rule are of Greenlandic origin. However, the leading positions within society are still occupied by Danes, who thereby have a strong influence on the decision-making processes (Björklund, 2011, Grydehøj, 2016). Colonial identity forming of lived and imagined experience plays a role on many levels, but also breaking out of it, is both an important signifier and mindset for many young adult Greenlanders (i.e., Uyarakq’s “Move I’m Indigenous” provocative lyrics: *“Like a fire make your demands... we manifest your tears because we are the true pioneers...”* (Uyarakq, 2020). Greenlanders are well aware that they belong to a small community and self-determination is important for them, in being recognized as such and as people (Kleist in Björklund, 2011). They are proud of their heritage and have many reasons to be (Bjørst, 2018). In some cases, Greenlanders in power have struggled holding influence over the climate change debate touching Greenland in international settings. Thus, they have blamed global discourses as too academically constructed, leaving their role as limited to acting as victims of global climate change effects (Bjørst, 2012). This starkly contradicts many Greenlanders self-perceived role, as they express certain autonomy in their relationship to nature built on centuries long heritage of coping and adapting to a harsh climate (Abelsen in Bjørst, 2012). Mastering the environment may in some cases display Greenlanders' character (Beyer Broch, 2020). One of the critiques that have been linked with research conduct is that Greenland has been seen through Danish eyes. It is claimed that they see it to a greater extent as an empty terrain than

a populated nation when it comes to scientific research. Furthermore, that it is more important for Denmark, what they as a nation can get out of researching the ice sheet than thinking about involving the population to whom the ice belongs (Plank Sommer, 2016). This underpins the importance of recognizing multiple forms of knowledge in research conduct.

What do the Ethical Guidelines Require? Epistemologies that have Changed!

One of the papers guiding the ICC Ethical and Equitable Engagement Synthesis Report (2021) states that past inequities persist in the form of inequitable research processes and relationships across the Arctic (Yua et.al, 2022). These inequitable processes and relationships, which prioritize non-Indigenous ways of being and knowing, feed a structure of decision making that does not fully account for Indigenous Peoples' knowledge, perspectives, or needs (Yua et. al., 2022). From our point of view, scientific conduct needs to adapt to changing epistemologies where embedded practical experience is recognized as an important element in the knowledge generation.

'Nothing About Us Without Us' – Always Engage with Inuit

- Recognize Indigenous Knowledge in its Own Right
- Practice Good Governance
- Communication with Intent
- Exercising Accountability - Building Trust
- Building Meaningful Partnerships
- Information, Data Sharing, Ownership and Permissions
- Equitably Fund Inuit Representation and Knowledge

(Inuit Circumpolar Council, *Ethical and Equitable Engagement Synthesis Report*, 2021)

In the EU context, one particularly important recent step towards anchoring decolonial research in the Arctic is the new Roadmap to Decolonial Arctic Research (Herrmann et.al., 2023).

ICC encourages researchers to practice the co-production of knowledge and follow Inuit guided processes to successfully bring together Indigenous knowledge and science, while ensuring that our knowledge is trusted and respected as a unique knowledge system that comes with its own evaluating and validation processes. Of paramount importance in their guidelines is that research projects should avoid that results of their work burden the people in focus (ICC, 2021). ICC stresses eight ethical protocols for research conduct that they recommend as a good pathway, which we attempted to fulfill in our research practices (see text box above: Inuit Circumpolar Council, 2021). They warn about cherry-picking their protocols, but overall, they stress reciprocity in the cooperation process with Indigenous communities. ICC stresses that their guidelines should not overshadow national guidelines and that these protocols do not replace any local, regional, or national guidance provided by Inuit (Inuit Circumpolar Council, 2021: 13).

The Greenland Research Council was established in 2013 and started to function in 2014. One of their primary roles besides allocating funding is to improve and strengthen Greenlandic research embedded in Greenland and to strengthen research relations internationally and within the commonwealth (Inatsisilorneq, 2013; Mercer et.al., 2022). They have been working on developing ethical guidelines and recently published their National Research Strategy towards 2030 (Ministry for Education, culture, sport & church, 2023). Their approach involves being open to the international scientific community while safeguarding their own interests and values (Greenland Research Council, 2020). Their view is that more than ever, there is a need for a joint research effort that can address questions related to global processes, climate change and the green transition, which contributes to sustainable development in Greenland:

Unfortunately, we see examples of Greenlandic research institutions and other stakeholders being involved far too late in foreign research projects. It undermines the possibilities for a genuine, equally dignified cooperation for the benefit of both parties. It is crucial for good cooperation that all involved parties are involved from the start of a project, where the basis for ownership is established – ownership of the knowledge that is created and influence on and participation in how it is used. Therefore, the Greenland Research Council works purposefully to develop Greenlandic research policy and support network formation and other mechanisms through which Greenlandic and outside researchers can exchange ideas and interests, jointly develop research questions, and become familiar with institutions and infrastructure (Greenland Research Council, 2022; 4).

As described previously, we who are engaged in the SeMPER-Arctic project made the continuous effort to involve our local partners at an early stage and during the process of the work. We have also committed ourselves to the convening of discussions about emerging knowledge while we have been in the field. This has been our way of approaching equitable involvement and recognizing that people are part of the community and ecosystem. Being challenged by the pandemic made us even more reliant on our local partners who conducted part of the qualitative research.

In our case, it was pivotal to have the support, cooperation, and network of the Uummannaq Polar Institute before the work began. We also consulted experts from Ilisimatusarfik/University of Greenland researchers at early stages in the literary work phase when collecting public reports, strategies, and plans, to analyze and assess political narratives in Greenland related to climate change and resilience (Jungsberg et.al., forthcoming). At later stages, we consulted Greenland Research Council and various other stakeholders of knowledge generation in Greenland, as well as fellow researchers within social science and Circumpolar Arctic research activities. In this process it has been very important to get back and forth to our key partners in the communities to hear their opinions. In Ittoqqortoormiit, which was a new community for the project researchers, seven fieldwork trips of three to nine weeks were implemented by three of the co-authors between September 2021 to July 2023. Building strong trust was crucial for our research team, formal interviews (over 30), participant observation, and informal discussions have been sustained remotely and locally from 2020. This considerably extended the involvement of stakeholders and community members over the time, allowing to build community-based research. Even if we acknowledge the limits of the involvement of community members in the project design and in the research conduct itself, an important step towards inclusive and fair research practices has been reached. Using an inductive approach, the research team identifies central invisibility of narratives regarding the essential importance of narwhals for the community and the threat to the future of narwhals hunting. In June 2023, a 22-minute short film was coproduced in the native language (Tunumisut, Ittoqqortoormiit). Various community members have been involved at different stages (production, edition, story-making, translation/transcription, voice-over, and video caption). A first projection was held throughout a culturally relevant event (“kaffemik” or celebration party with coffee/tea/cakes). Additionally, a diffusion throughout local Facebook page was implemented. We reached at least a third of the community (cumulation of attendance to “kaffemik” and reactions on Facebook), while opening to comment and opinion. Among the main reactions that were generated, people expressed gratefulness, desire for the film to be spread out,

and happiness to see the story exposed. Ittoqqortoormiit's born community members who live abroad also expressed feelings of homesickness, which strongly resonate with the expression of place-attachment we frequently encountered during our time in Ittoqqortoormiit. Important work is also carried out towards reframing sea ice changes in a salient perspective for community members (Sandré et.al., forthcoming).

The Dialogue that Nuances our Knowledge

All these practices require dialogue with informants and partners in the community that in most cases is voluntary. So, we must respect their time and seasonal activities that may not correspond to our ideal needs, but we simply must adapt as researchers. Researchers who have been trained into certain terminologies and logics need to step up and widen their horizon and engage in meaningful partnerships for both parts. This can be challenging for some but liberating for others and requires skills beyond academic training. Intercultural competence in communication helps, as well as mastering the local language which in our case is only partly fulfilled (one researcher masters Greenlandic, two other master Danish, many master Norwegian and French, all including local partners communicate in English).

The knowledge co-production approach goes beyond “participatory” or collaborative research that could be limited in terms of involvement of local populations. Adopted by a small minority of researchers around the world, the knowledge coproduction approach has recently been on the increase. In addition, to be more respectful to studied people and to research partnership requirements advocated by Indigenous leaders, it would offer new sources of data and better analyses. It would also foster a deeper public awareness and hopefully inspire more effective public policies (Baztan et al., 2017).

We try to ensure that the knowledge gained is of value to the community – extending the meaning of research conduct to work *with* and *for* the communities. One aspect of that is being in contact with local and regional actors who make decisions or execute decisions and plans in the towns on behalf of the municipality in different fields.

As the project has not been completed at the time of writing this article, we still have much to do, in particular to ensure the most complete restitution of this co-produced knowledge to the communities involved who are most interested in it.

Meaningfulness for Communities - Conclusion and Discussion

In the early days of research on Indigenous communities, the rapid societal changes from hunter-gatherer lifestyles to modernity were prominent in the perspective of social scientists. The recognition of the power of traditional knowledge to understand the complex dynamics has been slow to emerge. While vulnerability to these changes was the forefront perspective to begin with, the focus shifted to trying to understand the adaptive capacities of communities and their ability to navigate and cope under changing circumstances. Pearce et.al. (2009), for example, have identified in a comprehensive review the importance of targeted vulnerability research that collaborates closely with community members and decision makers. This included understanding the interactions between current and projected climate change, as well as the factors which determine vulnerability and influence adaptation, identifying research gaps and making recommendations for advancing adaptation.

The commitment to work not only with the communities but also for communities in producing research-based knowledge can be seen as our small step in research based decolonialization and culturally responsive research. As proposed by Sultana (2022), we mobilised a narrative-based approach whereby lived experiences can counterbalance hegemonic framings that structures climate coloniality. Maximizing impacts or enhancing resilience is something that we promised in the research proposal.

Our good will, however, faces a dilemma. Do communities really benefit from our research? Translating results to business concepts may not necessarily be a useful outcome for the community. We should rather strive to translate these findings into a resilience enhancement framework where people with long-term knowledge from within the community are our best allies in interpreting what can be targeted and strengthened. It may be an emergency response framework, it may be social infrastructure, it may be improving port capacity and renovation of man-made structures, it may be recycling, it may be fair and environmentally friendly tourism, or it could be all of it.

With increasing research on how co-creation research plays out in practice and what its implications are, there are still important gaps in terms of how to equitably fund a project, conduct data collection and analysis, and disseminate results in full collaboration with community partners. These gaps must be addressed to increase the quality and reliability of the research, and to change the roles that researchers themselves play in shaping the research and its findings. We do not claim to have navigated perfectly but rather to have tried to set some examples in reciprocal encounters with the communities in question.

Our SeMPER-Arctic project comes to an end in 2024. We have therefore not reached the project completion and do not know if we will be able to translate our findings to something that can really be beneficial to communities in the long run. But we foresee that the relations with the communities will not be terminated by the formal termination date the research funders have set. Beyond co-producing knowledge and caring for local stories that we write in the accumulating literature on climate change and the impact on communities, time will tell how we succeed.

The idea and practice of knowledge coproduction has become an important and new perspective for Arctic research as a response to the recent increase of research projects with ethical rules and participatory/collaborative approaches. Furthermore, it is required by Indigenous leaders and recommended by organizations such as the Arctic Council, UNESCO, IPCC, and others. The immensity, speed and complexity of the ongoing challenges require the best available knowledge for decision-making and there is growing recognition that this can revitalize local culture, empower the community and foster sustainability. There is a greater understanding that traditional and scientific knowledge are complementary, or rather that they can be complementary.

We would like to argue that our work so far has been characterized as collaboration towards co-production (which means it is not full knowledge co-production but a sincere attempt to achieve fair collaboration). We are not insiders and cannot be because we are not part of the Arctic communities. But as researchers, we can collaborate with our Indigenous partners by finding the best possible form for each according to the conditions of the place and time in order to address complex issues and try to lead to innovative solutions. We have in our own work seen how it becomes easier with the development of information and digital technologies (photo, video, audio, internet, and social networks). Science can benefit from Indigenous Peoples' experience of their

own environment and in-depth understanding of the complexity and interconnected environmental systems. The collaboration provides another source of information and data: daily observations at the local scale all year round. It provides relevant information about livelihood, community concerns, needs and values. It offers the multiplication of perspectives. Research with knowledge co-production leads to information that meets users' needs and is considered salient, legitimate, and credible by them. Through the confidence it inspires in the communities, the co-production approach is more likely than other forms of research to have an impact on society. But it often remains more of an ideal towards which to strive throughout the entire research process than the form required at the start of this process.

To improve the movement from collaboration to co-production, we still need to answer some questions on challenges and potential conflicts. Before the research is kicked off, researchers must reflect on how they perceive the inclusion of Indigenous knowledge in their research work, which is sometimes constrained by administrative rules, and, for their part, Indigenous partners must reflect on what scientific knowledge can support their community. What are the expectations of both parties? How can they concretely share knowledge for their mutual benefit? It also remains a question how western scientists may choose such an approach when they know so little about Indigenous knowledge. Furthermore, one may wonder how Indigenous Peoples can be interested in collaborating with researchers if they do not know them well enough, when they are not familiar with the functioning of sciences as practiced by Western researchers and when there is a distrust of their effectiveness or their desire to bring a benefit?

On the other hand, researchers can do much to improve the trust placed in them during research. For example, what kind of relationships are needed to improve connections before and during fieldwork, as well as after? How can we connect the global scale (science knowledge and interest) with the local scale (Indigenous knowledge and needs)? We may also ask ourselves how to make sure that all partners respect all steps in the co-production process. When the research is completed, we need to ask ourselves how to involve and credit Indigenous partners in our dissemination work and what kind of knowledge should be returned to Indigenous communities. Finally, those essential questions remain food for thought to design better research in the future.

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