

LETTER • OPEN ACCESS

Improving the relationships between Indigenous rights holders and researchers in the Arctic: an invitation for change in funding and collaboration

To cite this article: Nina Nikola Doering *et al* 2022 *Environ. Res. Lett.* **17** 065014

View the [article online](#) for updates and enhancements.

You may also like

- [Climate change-related risks and adaptation potential in Central and South America during the 21st century](#)
I Hagen, C Huggel, L Ramajo *et al.*
- [100 years of California's water rights system: patterns, trends and uncertainty](#)
Theodore E Grantham and Joshua H Viers
- [LEARNING ENVIRONMENTAL LESSONS FROM INDEGENOUS AMMATOA KAJANG TO PRESERVE THE FOREST](#)
Irsyad Dhahri Samad, Risma Niswaty, Andi Aco Agus *et al.*

ENVIRONMENTAL RESEARCH
LETTERS

LETTER

OPEN ACCESS

RECEIVED
30 November 2021REVISED
4 May 2022ACCEPTED FOR PUBLICATION
24 May 2022PUBLISHED
10 June 2022

Original content from
this work may be used
under the terms of the
[Creative Commons
Attribution 4.0 licence](#).

Any further distribution
of this work must
maintain attribution to
the author(s) and the title
of the work, journal
citation and DOI.

Improving the relationships between Indigenous rights holders
and researchers in the Arctic: an invitation for change in funding
and collaborationNina Nikola Doering^{1,*} , Stephan Dudeck^{2,3} , Shelly Elverum⁴, Charleen Fisher⁵ , Jan Erik Henriksen⁶,
Thora Martina Herrmann^{7,8}, Britt Kramvig⁹ , Roza Laptander¹⁰, Justin Milton¹¹, Elle Merete Omma¹²,
Gertrude Saxinger^{13,14} , Annette J M Scheepstra¹⁵ and Katherine Wilson¹⁶ ¹ Institute for Advanced Sustainability Studies (IASS), 14467 Potsdam, Germany² Institute of Cultural Research, University of Tartu, 50090 Tartu, Estonia³ Foundation for Siberian Cultures, 16798 Fürstenberg/Havel, Germany⁴ Ikaarvik, Box 371 Pond Inlet, Nunavut X0A0S0, Canada⁵ University of Alaska Fairbanks, Fairbanks, Alaska 99775, United States of America⁶ The Arctic University of Norway (UiT), 9510 Alta, Norway⁷ Helmholtz Centre for Environmental Research -UFZ, Leipzig 04318, Germany⁸ German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Leipzig 04103, Germany⁹ The Arctic University of Norway, 9510 Alta, Norway¹⁰ University of Hamburg, 20146 Hamburg, Germany¹¹ Ikaarvik, Box 371 Pond Inlet, Nunavut X0A0S0, Canada¹² Sámiráđđi/Saami Council, 9735 Karasjok, Norway¹³ University of Vienna, 1010 Vienna, Austria¹⁴ University of Bern, 3012 Bern, Switzerland¹⁵ Arctic Centre, University of Groningen, 9718 CW Groningen, The Netherlands¹⁶ SmartICE Sea Ice Monitoring and Information Inc., St. John's A1E 1S6, Canada

* Author to whom any correspondence should be addressed.

E-mail: nina.doering@iass-potsdam.de**Keywords:** co-creation, collaboration, funding, Indigenous, Arctic, researchSupplementary material for this article is available [online](#)**Abstract**

Truly transdisciplinary approaches are needed to tackle the complex problems that the Arctic is facing at the moment. Collaboration between Indigenous rights holders and researchers through co-creative research approaches can result in high-quality research outcomes, but crucially also address colonial legacies and power imbalances, enhance mutual trust, and respect the rights of Indigenous Peoples. However, to be successful, collaborative research projects have specific requirements regarding research designs, timeframes, and dissemination of results, which often do not fit into the frameworks of academic calendars and funding guidelines. Funding agencies in particular play an important role in enabling (or disabling) meaningful collaboration between Indigenous rights holders and researchers. There is an urgent need to re-think existing funding-structures. This article will propose a new paradigm for the financing of Arctic research, which centres around the inclusion of Indigenous partners, researchers, and institutions from the initial planning stages of funding programmes to the final stages of research projects. These findings and recommendations have been contextualized based on critical reflections of the co-authors, a group of Indigenous and non-Indigenous partners, who have practiced their own collaborative work process, the challenges encountered, and lessons learned.

1. Introduction

There is a joke in Sápmi, saying that a reindeer herding family in the late 70s and early 80s used to consist of a mother, a father, their children AND a social

scientist¹⁷. The researcher often stayed for long periods of time, sharing many intimate moments with the

¹⁷ We find noteworthy that this joke is told also elsewhere across the Arctic and in other parts of the world.

Sámi family. These families rarely heard back from the researchers and were seldom credited for their knowledge. The findings were not peer reviewed by Indigenous People or institutions, to correct mistakes, misinterpretations or define knowledge gaps from a Sámi perspective. Instead, these misunderstandings became the ‘truth’ once published in journal articles. As in other Indigenous territories in the Arctic, the Sámi are still suffering from this misplaced ‘truth’. For instance, in the Røros region of Norway, Sámi rights holders have lost court cases on land-grabbing¹⁸. The courts based their decisions on incorrect research from ‘experts’ on Sámi culture, claiming that reindeer husbandry had not been traditionally practiced in the area (see also Tyler *et al* 2021).

Elle Merete Omma

In 1999, Māori scholar Linda Tuhiwai Smith published her seminal critique of Western academic research, exposing its racist and exploitative history and persistent colonial present and offering a vision for the decolonization¹⁹ of research methods (Smith 2021). Her work has inspired Indigenous scholars and their allies alike. Indigenous scholars from across the Circumpolar North (e.g. Buschman 2022, Porsanger 2004, Kuokkanen 2007, 2019, Guttorm 2011, Jernsletten and Storffjell 2017, Kassi *et al* 2017, Markussen 2017, Finbog 2021a, Guttorm *et al* 2021) and elsewhere (e.g. Mihesuah and Wilson 2004, Wilson 2008, Battiste and Henderson 2009, Kovach 2009, Absolon 2011, Todd 2016) have called for new and more respectful approaches to working with Indigenous knowledge, Indigenous knowledge holders, and Indigenous based research approaches for the benefit of Indigenous Peoples²⁰. In Sápmi, as in other Indigenous scholarly communities, Sámi scholars have brought decolonization into dialogue with Sámi concepts and practices (e.g. Guttorm *et al* 2021; see also Virtanen *et al* 2021) and have highlighted the transformative capacity of Indigenous ontologies [ways of knowing] and research methods (Virtanen *et al* 2021b, p 13). Still, Indigenous scholars continue to search for ways to practice research in ways that move beyond the conventional academic paradigm

¹⁸ Land grabbing refers to acquisition or appropriation of large amounts of land (legally or illegally/illegitimately) by international or domestic corporations, state actors, and private investors. An example is the construction of wind turbines on Sámi land in violation of the rights of the Sámi (HR-2021-1975S).

¹⁹ ‘Decolonization [...] is now recognized as a long term process involving the bureaucratic, cultural, linguistic and psychological divesting of colonial power’ (Smith 2021, p 112).

²⁰ There is no single understanding of ‘Indigenous Knowledge’, ‘Indigenous rights holders’, and other related terms. We acknowledge this and it is our intention to use these terms in a non-exclusive way. We also acknowledge that it is not always (and in all legal systems) clear who is ‘Indigenous’ and recognize the importance of self-identification (see also Kuokkanen 2019).

to celebrate Indigenous ways of knowing (e.g. Ravna 2019, Finbog 2021b).

Across the Arctic, a growing number of studies adopt decolonial, collaborative and co-creative approaches and methods (e.g. Chanteloup *et al* 2019, Henriksen *et al* 2019, Cooke *et al* 2020, Wilson *et al* 2020, Nilsson *et al* 2021), and the right of Indigenous Peoples ‘to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures [...]’ has been recognized, for instance, by the UN Declaration on the Rights of Indigenous Peoples (United Nations 2007, UNDRIP Article 31). Nevertheless, the field continues to be dominated by non-Indigenous researchers as funding structures marginalize Indigenous rights holders (Inuit Tapiriit Kanatami [ITK] 2018). The question of how Indigenous ways of knowing can be honored and respected also within academic institutions and programmes remains largely open.

In this paper, we highlight the current and often unintentional funding barriers in co-creating knowledge and supporting Indigenous self-determination in research and invite Arctic funding agencies to reframe and rethink how they fund research. With strong Indigenous political voices and a growing community of Indigenous researchers, the Arctic features at the forefront of the development of co-creation of knowledge between Indigenous and non-Indigenous researchers and Indigenous communities. We provide recommendations and discuss the benefits of co-creating research in equal partnerships. This can become a basis for more efficient and effective research that produces the best possible knowledge base for targeted decision-making in the Arctic. This paper contributes to the growing discussions on the changes needed in Arctic research practice and funding, acknowledging that the actions we propose are incomplete as decolonizing and Indigenizing Arctic research is still in its infancy. Our recommendations for concrete steps are summarized in table 1, to provide an easily accessible overview for practitioners and decision-makers.

We invite you to consider the role of funders in improving funding calls that meet the needs of researchers, Indigenous peoples, and decision makers. In re-thinking funding opportunities, we have the chance to lay a strong foundation for authentic, relevant and meaningful Arctic research. We also invite you to pause and consider the ways in which the current funding structures unintentionally perpetuate colonialism in the circumpolar world and beyond. We hope that by seeing this through our eyes, your awareness will inspire you to work with us to create the change that is needed to ensure that all parties throughout the research process are equally able to join forces to tackle the Arctic’s greatest issues.

2. Collaboration, co-creation and co-production in research

Strong links between colonialism and science have long dominated an assumption in the world of research that ‘Western methods and ways of knowing are the only objective, true science’ (Simonds and Christopher 2013, p 2185). Indigenous Peoples became ‘objects’ of research (Kovach 2009) and, in the words of Linda Tuhiwai Smith (2012), ‘research has not been neutral in its objectification of the Other [of Indigenous Peoples]. Objectification is a process of dehumanization’ (p 41). To address ‘Western academic oppression’ of Indigenous societies ‘in the name of science’ (Simonds and Christopher 2013, p 2185), Indigenous rights holders and Indigenous and non-Indigenous scholars increasingly emphasize the need to decolonize research (Wilson 2008). Smith (2012) argues for research design and protocols that incorporate Indigenous ways of knowing and being, and render ‘[Indigenous] values central to the research project’ (p 189).

Collaborative and partnership approaches to research, such as community-based participatory research, participatory action research, and Indigenous research methodologies, have been identified as a means of addressing colonial legacies (de Leeuw *et al* 2012, Sylvestre *et al* 2017, Saxinger and First Nation of Nacho Nyäk Dun 2018). In contrast to Western, independent, researcher-led approaches, participatory approaches aim to establish long-term engagement and commitment based on ‘a process by which decision-making power and ownership is shared between the researcher and the community involved; bi-directional research capacity and co-learning are promoted; and new knowledge is co-created and disseminated in a manner that is mutually beneficial.’ (Castleden *et al* 2012, p 162). Over the past decade, co-creative approaches have been implemented widely in the Arctic (e.g. Armitage *et al* 2011, Castleden *et al* 2012, Cooke *et al* 2020, Nilsson *et al* 2021). Greenhalgh *et al* (2016) define the ‘co-creation’ process as ‘the collaborative generation of knowledge by academics working alongside stakeholders from other sectors’ (p 393). According to Sherriff *et al* (2019), this process builds on collaborative research methods ‘that recognize power imbalances brought about by social inequities and use strength-based empowerment approaches to address community needs’ (p 372). The concept of co-creation refers to ‘the *active involvement* of end-users’ (Voorberg *et al* 2014, p 3). This resonates with numerous calls from across the Arctic for sincere collaboration (e.g. Fox *et al* 2020). Others employ the notion of ‘co-production’ of knowledge, aptly defined by Cooke *et al* (2020) as ‘the contribution of multiple knowledge sources, ways of knowing, and perspectives from different user groups with the goal of co-creating knowledge and information

[...]’ (pp 90–91), and call for moving beyond Indigenous ‘participation’ to partnership in research (Wilson *et al* 2020).

In this paper, we use the term ‘co-creation’, as it alludes to the making of something new out of a collaborative process. This links well with the idea of creating societal change via action-oriented research. Our experiences resonate with Greenhalgh *et al* (2016), who state that co-creation, operating at the science–policy–society interface, ‘has potential for ‘moving beyond the ivory towers’ to deliver significant societal impact via dynamic, locally adaptive community–academic partnerships’ (p 202). As noted by Voorberg *et al* (2014, p 3), we acknowledge that both terms (‘co-creation’ and ‘co-production’) are connected and relate to other terms such as ‘community involvement’. However, in our view, ‘community involvement’ expresses a less equal level of cooperation. Inuit frameworks, such as the Qaggiq Model or the Inuit Food Security Concept, illustrate how multiple ways of knowing may be supported (Healey and Tagak 2014, ICC-Alaska 2015, McGrath 2019).

A large body of empirical literature highlights the benefits that can emerge from co-creative partnerships between Indigenous rights holders and researchers. These include: relationships built on mutual understanding and respect, community empowerment, strong leadership, reciprocity and mutual learning, capacity building, and cultural safety (e.g. Castleden *et al* 2012, Lewis and Boyd 2012, Greenhalgh *et al* 2016, Scherriff *et al* 2019, Fox *et al* 2020, Wilson *et al* 2020). A precondition for positive outcomes is a research process guided by an inclusive, ‘respectful and engaged manner—from the identification of research needs to study design, data collection, interpretation, and application—with the idea of creating actionable science [...] and benefits to the partners involved’ (Cooke *et al* 2020, p 91).

Recent analyses also shed light on the challenges to co-creation, concerning, for example, time intensity, ownership and power sharing, frequency of communication, and continuous long-term capacity building (e.g. Ritchie *et al* 2013, Mitchell 2018, Scherriff *et al* 2019). In addition, institutional power constraints limit researchers: ‘as much as researchers work to be ‘community-based’ they are at the same time ‘university-based’, and universities are notorious for producing significant barriers and constraints to working with communities in general’ (Sylvestre *et al* 2017, p 753). For example, the amount of time and long-term commitment required by co-creative projects often are not recognized in performance evaluations (for tenure, or in releases from teaching requirements) (Chanteloup *et al* 2019, Cooke *et al* 2020, p 92).

Funding constitutes another important issue. Knowledge co-creation can be ‘less expensive than remote ship and land-based Arctic fieldwork’

(Wilson *et al* 2020, p 148), and requires a different allocation of financial resources. Cooke *et al* (2020, p 92) highlight that [in Canada] ‘funding cycles for grants are sometimes not well calibrated to the time it takes to develop relationships and engage in co-production. The deadline-driven culture of science (e.g. in academic or government environments) and funders may not align well with the time constraints, capacity, or interests of co-producers, especially in Indigenous communities.’ This is supported by Brunet, Hickey and Humphries (2017, p 354), who point out the need for better-focused and long-term funding structures and mechanisms that can facilitate the development of relational integration for Indigenous rights holders and non-Indigenous research partners. Similarly, Scherriff *et al* (2019, p 386) stress insufficient funding as an ongoing issue in Aboriginal health research. In a recent study, Sarkki *et al* (2021), find a significantly improved match between knowledge demand and supply and funding for reindeer management in Finland with the emergence of knowledge co-creation.

These challenges add to the general underfunding of Arctic research. Ibarguchi *et al* (2018) analyse trends in federal research funding in Canada, the USA and the EU between 2003 and 2014. They find that in any given year and discipline, less than 3% of overall budgets are allocated to research relevant to the Arctic, and call for ‘allocating resources and expertise to Arctic research in a more substantive way, and also investment in addressing Indigenous research priorities and information needs’ (Ibarguchi *et al* 2018, p 6). While the EU has increased its support for polar research in recent years, there is room for improvement and funding agencies can play an important role in enabling and supporting more just, relevant, and effective research processes and outcomes.

3. About this paper

This paper was written by a group of Indigenous rights holders and Indigenous and non-Indigenous researchers, who acknowledge the sovereignty of Indigenous Peoples in the Arctic and elsewhere²¹. We started the work on this paper from a shared position as human beings with a common care and concern for the Arctic. In the fall of 2020, we began to engage with relevant literature, met for weekly Zoom calls to share and discuss studies and experiences, reflected on our findings by working on draft guidelines and a joint statement addressed at funding agencies, and organized thematic conference sessions²². We sent out the draft statement for consultation to

²¹ Positionality statements of all authors are included in the supplementary materials (available online at stacks.iop.org/ERL/17/065014/mmedia).

²² At the Arctic Science Summit Week (ASSW21) and the International Congress of Arctic Social Sciences (ICASSX).

Indigenous Peoples Organizations (IPOs) and other relevant institutions and received invaluable feedback and insights from conference contributors. Building on this, we worked on this publication in a collaborative writing process. We created a shared document and began to draft, discuss, and comment, and kept up our weekly meetings to continue our conversation. This work was carried out without dedicated funding and often in the free-time of authors. Before submission, we reached out to the Arctic Council Indigenous Peoples Secretariat and colleagues to help us connect with potential Indigenous reviewers for this paper. Three Indigenous reviewers are included as co-authors in this paper. We also are grateful to Kim Flock (Weston Family Foundation) and Erica Hill (National Science Foundation) for helpful comments and thank three anonymous reviewers. Funding for open access publishing charges was provided by the Institute for Advanced Sustainability Studies (IASS).

4. Colonialism in research

Indigenous histories and cultures in the Arctic are diverse and Indigenous communities face different challenges, not least stemming from the varying legal and political systems of the nation states that exist on their territories today. At the same time, Indigenous Peoples across the Arctic share the experience of colonization, and thus a mutual understanding of how certain practices, such as research, often play out to exclude and dismiss their knowledge and experiences. Colonialism in the Arctic remains a reality of the present. For example, while their work may be well intentioned, scientists from academia and government agencies continue to create projects without consultation, lack awareness of or ignore Indigenous methodologies (such as storytelling, see e.g. Guttorm *et al* 2021), analyze data without collaboration, undertake ‘cherry picking’ of Indigenous knowledge, which often leads to misinterpretation, and treat Indigenous Peoples as subjects instead of equal partners in research. These issues also are expressed in the following paragraph by one of the co-authors of this paper:

What sticks out most is that Indigenous Peoples are almost powerless in which research happens in the Arctic and how Indigenous Peoples are involved. Most fieldwork is natural science, so you have to follow certain rules. Personal experience with research and being out on the land [for instance as a snowmobile driver in Mittimatalik (Pond Inlet), Nunavut] is being in a support role, being a sort of ‘intern’. **Justin Milton**

Many Indigenous scholars bring relational accountability between people, land, and other spiritual beings into the academic debate. Sámi scholars

Jernsletten and Storfjell (2017) argue that ‘our relationship to the landscape, plants, animals, people, and other beings of our place goes back many generations, millennia even; for us this relationship includes the ghosts and stories of those who walked, and still inhabit, our place. Place makes us who we are because we are, in fact, produced by its complex networks of relationships within which we are situated’ (p 87). Referring to Wilson (2008), they add: ‘Like so many Indigenous Peoples, we recognize that we are our relationships’ (p 87). As academics, we need to ask how all of these relations can be made visible within research papers; what would a collaborative research design look like that acknowledges these other presents and interests and what research methodologies bring the ghosts and stories of those who walked and inhabit places to be acknowledged within academic projects? Where stories, stones, mountains and lakes can be sacred and land alive. For these (Indigenous) others to be acknowledged as well as protected, an Indigenous paradigm more than Indigenous perspectives are needed (Keskitalo *et al* 2021).

Inuk Scholar Pitseolak Pfeifer (2018) speaks of the ‘credibility gap’ that continues to exist between so-called Western knowledge and Indigenous knowledge systems, as the latter ‘is only considered quasi-credible and quasi-legitimate in research [...]’ (p 31). He reminds us that ‘[...] in academic and research institutions, knowledge is divided into academic disciplines, producing and reproducing the objectification of the human and natural elements [...] which fundamentally ignores the holistic Inuit ontology [ways of knowing]. Because education and research institutions endorse this disciplinary mode of inquiry, anything different is necessarily less: Inuit knowledge ranks lower in the hierarchy of knowledge’ (p 31). In some academic circles, storytelling and oral knowledge are still not fully recognized as science but are seen (only) as a form of ‘art’, and thus are excluded from what is viewed as ‘good and true science’. Authors of this paper have experienced and witnessed first-hand how colonial perspectives still structure science systems. This has included lack of government recognition for academic institutions producing academic output in Indigenous languages, exclusion of Indigenous experts from academic positions based on a lack of academic credentials, and the failure to credit Indigenous partners in research projects for their contributions in a way that is recognized within the academic system. Current avenues of funding are only accessible to those with a specific level of literacy and numeracy, and evaluation criteria require expressions of confidence, clashing with social norms that place greater value on humility. Colonial continuities are visible in the lack of evaluation criteria and indicators for ‘co-creation’ defined and determined by Indigenous Peoples. The credibility

gap continues to underline Arctic science, strategy, and funding schemes.

A shift is needed in Arctic research. More and more young scholars are eager to learn about Indigenous life and how they can better understand Indigenous knowledge. We believe that it will be crucial for non-Indigenous researchers and institutions to acknowledge their roles within these colonial structures and to take up a responsibility for understanding and abandoning exploitative colonial practices, to behave as ‘allies’ to Indigenous Peoples (Brophey and Raptis 2016, Jaworski 2019). Positive examples, such as the Sikumiut model, which allows Inuit and their non-Inuit research partners to sustain Inuit self-determination in research (Wilson *et al* 2020), or Ikaarvik, where young Inuit take on the role as bridge-builders between communities and researchers (Pedersen *et al* 2020), demonstrate that it is possible to do things differently. As argued by Pitseolak Pfeifer (2018), ‘research and policy accountability to Inuit communities’—and other Indigenous communities—will require the ‘recognition of specific *in-situ* Northern capacity, rejection of knowledge hierarchies, practices of action research, reciprocity transparency, and research mobilization [...]’ (p 34). He brings it to the point: ‘We have seen research principles go from research on Inuit to research with Inuit, but it is high time we witnessed research by Inuit for Inuit’ (Pfeifer 2018, p 29).

It is alarming that while Indigenous Peoples have fought for change and academic discussions on decolonization have been on-going for decades, little structural change has been achieved. As the authors of this paper, we recognize that changes in funding structures cannot solve all problems. Our paper, and the issues it addresses, are embedded within global exploitative and colonial structures, and while we are witnessing a positive trend towards collaboration and recognition of Indigenous expertise in research projects, we remain at the very beginning of the decolonizing and Indigenizing of Arctic research. Funding agencies form an essential part of this system and can contribute in important ways to more just research practices and more relevant research outcomes.

5. How can funding agencies enable and support meaningful collaboration and co-creation?

Funding agencies can enable and support meaningful collaboration between Indigenous rights holders and Indigenous and non-Indigenous researchers by carefully considering what is needed for co-creation to function throughout the different phases of a research project. We want to emphasize that the actions proposed in this section must remain incomplete and should be understood as an invitation to

further engage with the power imbalances, historical inequalities, and political complexities that circumscribe research governance. Most importantly, it is our intention to contribute to, and not distract from, deeper reflections on the need to decolonize and Indigenize scientific institutions. Finances play an important, but not exclusive, role in this process.

5.1. Pre-funding call stage: Understanding Indigenous perspectives on collaborative research, and co-developing funding calls

To ensure that research is carried out *by, with and for* Indigenous peoples, funding agencies can take early steps by **working with Indigenous rights holders and IPOs to identify research needs (ITK 2018) and develop calls for funding** (see also Wong *et al* 2020). The key to doing this successfully will be to ensure that **the definitions of terms such as ‘collaboration’, ‘co-creation’, and ‘co-production’ are agreed upon by both funders and Indigenous rights holders**. There has been too much damage done by assuming we all have a common understanding of what these critically important words mean. Both content and phrasing of funding calls influence research processes and outcomes and can be an effective tool in working against exploitative research practices. By prioritizing collaboration and co-creation in funding calls, having Indigenous rights holders identify and clearly define exactly *what* collaboration and co-creation means to them as well as which research needs would benefit from co-creation²³, funding agencies are in a position to contribute fundamentally to the establishment of meaningful research relationships and ensure that research benefits Indigenous Peoples. In effect, we are asking funders to co-create funding calls with Indigenous rights holders (table 1(a)).

The preconditions for meaningful proposal and project evaluation also need to be established at this initial stage. This includes making **time, space and salaries available for IPOs and Indigenous rights holders to build capacity to take on leadership and decision-making roles throughout the funding and research process** (see also Bowman *et al* 2015). In co-developing funding calls, partners will need to agree on **indicators and processes for the evaluation of project proposals and the assessment of project implementation**. Such collaboration can lay the foundation to ensure that co-creation does not constitute mere box-ticking. Work on Indigenous project evaluation illustrates the importance of **understanding the cultural and historical context and accounting for the political and legal situation also in the development of effective and culturally responsive evaluation** approaches and procedures: ‘Cultural

incompetency or lack of a multicultural and contextual lens in evaluation leads to non-responsive evaluation designs and methods that can generate inaccurate, inappropriate, or even harmful findings’ (Bowman *et al* 2015, p 336) (tables 1(b)–(d)).

5.2. Pre-proposal stage: Funding and time to develop research relationships (minimum 1 year)

The **provision of seed funding** constitutes one of the key instruments of funding agencies to enable co-creation (Latola *et al* 2020). In order to ensure funding resources are spent in appropriate ways to meet the concrete needs of Indigenous communities, context-specific research questions need to be defined in collaboration between Indigenous rights holders and Indigenous and non-Indigenous researchers in responding to themes and issues determined in funding calls. Indigenous rights holders and researchers require **sufficient time and resources** to build relationships based on respect, empathy and reciprocity, define research questions, clarify expectations, agree on terms, ensure mutual understanding of concepts, develop methods, inform and involve community members, and collaboratively prepare a project proposal (Castleden *et al* 2012, Wilson *et al* 2020, Wong *et al* 2020). Travel funding constitutes an important, but not sufficient element of seed funding. By providing **funding for salaries at the pre-proposal stage**, funding agencies can enable true co-development of research proposals and ensure that funding goes towards research projects that meet concrete needs. By **not setting deadlines** for applications, funding agencies can ensure that future research partners have the possibility to take the time needed to truly co-create a proposal²⁴. Further empirical research into the financing of project development processes is needed to gain a better understanding of how the pre-proposal phase can be funded in meaningful ways without increasing pressure on the already limited capacity of IPOs (table 1.2(a)). We want to emphasize that it is not our intention to contribute to more complicated application processes. On the contrary, we suggest that it would be important to **rethink and simplify application procedures** to reduce the financial and administrative barriers for applicants (see also Wong *et al* 2020).

5.3. Funding call and review of proposals stage

Funding programmes that call for **collaboration and knowledge co-creation** can only be effective, if these also form **key criteria in the evaluation** of project proposals that are working with Indigenous

²³ We want to caution that research needs identified by Indigenous rights holders should not be viewed as lists of research topics for outside researchers to address by themselves.

²⁴ For an example of this, see the National Science Foundation (NSF) Arctic Research Funding Opportunities, NSF 21-526 (NSF 2021). Another example of a funding programme that supports Indigenous self-determination is Inuit Qaujissarnirmut Pilirijjuitit (IQP) (see ArcticNet 2021).

rights holders. Given their limited capacity, IPOs may need to decide between participation in co-creative projects and advancing their own research projects (Wheeler *et al* 2020). Funding agencies can contribute to easing this situation by ensuring that funding schemes and research projects contribute to **two-way capacity building** (Brunet *et al* 2017, p 482) and by **prioritizing Indigenous-led research** (Inuit Tapiriit Kanatami [ITK] 2018). By adjusting criteria applied to the **evaluation of formal qualifications and classification of eligible organizations and project leads** (Inuit Tapiriit Kanatami [ITK] 2018, Wong *et al* 2020), barriers to Indigenous-led research can be reduced. This could go hand in hand with the above described necessary transformative change of the wider academic system and will not only contribute to decolonization and Indigenous self-determination; given the multiple pressures the Arctic is facing, it is important not to dismiss urgently needed knowledge and insights (table 1.3(a)).

To solve current challenges in the Arctic and beyond, evaluation and selection processes need to acknowledge explicitly the importance of **Indigenous Knowledge and Indigenous research methodologies**. There is a need for better understanding and Indigenous-led development of **appropriate selection processes**. Bowman *et al* (2015) provide an overview of Indigenous evaluation theories and approaches, which highlight, amongst others, the importance of recognizing sovereignty and self-determination, acknowledgment of oral traditions, sustainability and usefulness of evaluation processes and outcomes for Indigenous communities, and authentic engagement. Proper representation of Indigenous rights holders with relevant expertise in review panels (see also Arctic Council Indigenous Peoples' Secretariat 1996, Inuit Tapiriit Kanatami [ITK] 2018) and Indigenous review boards (such as the newly established ethics committee for Sámi health research, Sámediggi 2021) constitute important steps, which can also help avoid funding spent on the unintentional duplication of research. Funding needs to be provided to avoid capacity problems for IPOs and Indigenous rights holders resulting from involvement in reviewing processes (Inuit Tapiriit Kanatami [ITK] 2018). Evaluation criteria and processes should be co-developed between funders and Indigenous rights holders to ensure selection and implementation of projects that are co-creative and support the goals of Indigenous communities (see also above and tables 1.1(c), (d)). However, some general criteria have been identified: Projects should follow **ethical standards and guidelines** (e.g. Gwich'in Tribal Council 2011, First Nations Information Governance Centre 1998; IARPC 2018; the five 'R's—Carjuzaa and Fenimore-Smith 2010, p 5, Sámediggi 2021b) and demonstrate an understanding that what is perceived as **ethically sound research is context dependent**. This also needs to be recognized

by funding agencies. Proposals should provide a clear plan to ensure true collaboration throughout the planned project. This includes sufficient time and focus allocated to relationship-building and Indigenous protocols²⁵ as well as broader outreach and engagement. **Pre-existing relationships can help ensure that co-creative projects are feasible and may therefore be evaluated favourably**. Funding needs to be allocated to activities (e.g. workshops) and travel to ensure the co-analysis, interpretation, validation and reflection of research results. **Indigenous research partners should govern the research process and carry out all or parts of the research**. **Everyone involved in a project needs to receive proper funding** (Latola *et al* 2020). Too often, there is an expectation that members of Indigenous communities volunteer their time and insights, while researchers receive salaries for their work. Non-Indigenous research partners should illustrate how they **contribute to Indigenous self-determination in research** (e.g. by providing mentoring and training to develop the capacity of Indigenous community researchers to carry out the research themselves; recruitment of Indigenous PhDs and postdocs). The likelihood of successful projects can be increased if **non-Indigenous researchers demonstrate expertise and experience with collaborative research as well as knowledge of the historical and cultural context**²⁶, and a plan is in place for non-experienced team members to receive relevant training. It is important to recognize that capacity building needs to go both ways, as expressed succinctly by Pfeifer (2018): 'We do not need Northerners to become better researchers, we need researchers to become better Northerners' (p 34). If non-Indigenous researchers do not understand the knowledge system and protocols of the Indigenous culture, their work cannot go beyond mere documentation. By favorably evaluating **two-way skills transfer** and by allocating funding to finance such activities, funders can support overall positive outcomes of research activities (table 1.3(b)).

To provide sufficient time to allow for true collaboration, to focus on relationships and learning, and adjust to the ebbs and flows of life in Indigenous communities, **funding timelines should be increased to 5 years and longer, regardless of the size of a project**. This will also provide time for the co-development of project results, data management and for the long-term maintenance of relationships (table 1.3(c)).

²⁵ If a researcher does not take the time to participate in the community, but instead practices Western understandings of 'getting to work' and having a 'strong work ethic', the Indigenous protocol will essentially be dismissed with lasting impacts on research.

²⁶ The new ethical guidelines for Sámi health research, for instance, ask for equal partnerships and require that 'It must be documented that the project group has sufficient knowledge of health, traditions, history, traditional knowledge and social conditions in Sápmi' (Sámediggi 2021b, translated by Jan Erik Henriksen).

Table 1. The stages of collaborative research: recommendations to research funders.
Collaborative research = Collaborative funding calls.

Recommendations to funders	Benefits
1 Pre-funding call stage: understanding Indigenous perspectives on collaborative research and co-developing funding calls	
<p>a Co-develop distinct funding calls to meet Indigenous Peoples needs Funding agencies need to understand and meet with the relevant indigenous partners and institutions to understand the diversity and distinct histories of Arctic Indigenous cultures. It is important to develop distinct funding calls in collaboration with Indigenous rights holders and institutions to determine context-specific research needs, themes and issues, rather than grouping all Arctic Indigenous Peoples together.</p>	Funding agencies normally develop distinct funding calls by scientific disciplines. However Indigenous Peoples do not separate by discipline, but by need. Co-developing distinct calls with Indigenous rights holders, institutions, and Indigenous researchers will ensure that funding resources are targeted and spent in appropriate ways to generate useful and meaningful results for communities.
<p>b Co-develop collaborative terms and their meaning The terms such as ‘collaboration’, ‘co-creation’, ‘co-production’ may have different meanings to funders and Indigenous Peoples representatives. The meaning of collaboration and co-creation may also differ amongst Indigenous Peoples. There has been much damage done by assuming we all have a common understanding of what these critically important words mean.</p>	Working collaboratively with Indigenous rights holders from the outset allows for: two-way skills transfer to develop relationships; to understand, and establish the language, values and processes needed to develop meaningful collaborative funding calls with Indigenous rights holders, institutions, and Indigenous researchers.
<p>c Co-develop funding process roles and responsibilities Often Indigenous Peoples have only an advisory role or no role at all in review panels. If these roles exist, due to resource constraints, they are often filled by non-Indigenous people who live and work in Arctic regions. Co-developing funding calls will require funding agencies to make time, space, and salaries available for Indigenous organizations and Indigenous rights holders to build this capacity to take on these leadership and decision-making roles throughout the process. This will require that funders understand who the potential Indigenous organizations, institutions, and researchers are to take up these roles.</p>	Having Indigenous Peoples in leadership and decision-making roles will ensure Indigenous voices and perspectives are heard throughout the funding cycle and will also support the greater goal of Indigenous self-determination in research.
<p>d Co-develop funding timelines and evaluation criteria for the letter of intent, funding call, annual and final reports Current timelines are based on fiscal year ends, cutting short important research collaboration. Funding evaluation criteria is based on western performance-based metrics that are not meaningful or relevant for Indigenous Peoples. Criteria needs to be co-developed to capture key indicators of meaningful collaborative research throughout the research life cycle.</p>	Time invested by funders to understand distinct Indigenous research perspectives and values will support the development of key criteria for co-evaluating collaboration research. Co-developing and co-evaluating the research throughout the funding cycle will lead to research that benefits and supports Indigenous Peoples and the larger research community.
2 Pre-proposal stage: funding and time to develop research relationships (minimum 1 year)	
<p>a Provide seed funding at the letter of intent stage Collaboration requires that researchers and Indigenous rights holders have sufficient time and resources to:</p> <ul style="list-style-type: none"> ● Identify relevant indigenous academic partners and partnership institutions ● build authentic relationships that proceed the funding timelines ● ensure mutual understanding of concepts ● define context-specific research needs and questions ● clarify expectations, roles, responsibilities and agree on terms ● develop methods, inform, and involve community members, and collaboratively prepare a project proposal. <p>At minimum, one year of seed funding is required for travel, salaries, honoraria, meeting space, interpretation, and translation services</p>	Seed funding will establish a foundation to ensure Indigenous partnerships from the beginning to meet the concrete needs of Indigenous communities. We still have little understanding of the financing needed during the pre-proposal phase. Supporting seed funding will allow partners to gain a better understanding of how the pre-proposal phase can be funded in meaningful ways to increase capacity of IPOs.

(Continued.)

Table 1. (Continued.)

Recommendations to funders	Benefits
3 Funding call and review of proposals stage	
<p>a Changing eligibility criteria for collaborative success Funding programmes that call for collaboration and knowledge co-creation can only be effective when:</p> <ul style="list-style-type: none"> • formal qualifications for Indigenous Peoples are based on relevant knowledge • financial requirements for Indigenous organizations to received funds are eased and supported • collaboration and co-creation form key criteria in the evaluation of project proposals that are working with Indigenous Peoples. 	<p>It is not just the topic of the call that is important, it is also how the call is framed to support collaborative research. Both the content and phrasing of funding calls will influence the collaborative research processes and outcomes and can be an effective tool in working against exploitative research practices.</p> <p>Adjusting the formal qualification requirements of Indigenous project leads and eligible organizations will reduce barriers to Indigenous-led research and contribute to decolonizing the power imbalance of who gets the research funding and leads research.</p>
<p>b Funding is allocated in all stages of the research Funds should go beyond collecting data to support:</p> <ul style="list-style-type: none"> • Indigenous Peoples for their knowledge and time to be partners and decision-makers throughout the research • mentoring and training to develop the capacity of Indigenous community researchers to do this research themselves • workshops and travel to ensure the co-analysis, interpretation, validation and reflection of research results • workshops to co-author annual research reports and articles throughout the project. 	<p>Providing adequate funding to pay Indigenous Peoples to partner and conduct their own research will not only ensure their collaboration throughout the research, but will also support innovative and new ways for co-developing research.</p> <p>Sharing authority and decision-making in the research, and taking the time to co-analyse the results will avoid knowledge production outside of Indigenous communities and give greater insights into the data.</p>
<p>c Increase funding timelines to 5 years and longer (see stages 4 and 5) Larger projects often receive longer funding timelines than smaller projects. Funding timelines should be increased regardless of the project size. Funding timelines of two or three years often constitute a barrier to meaningful collaboration during the lifetime of a project. Longer funding time periods are required to build relationships, follow-up, and evaluate outcomes (stage 4). Co-producing knowledge goes beyond collecting and analysing the data, it also includes co-authorship and communicating results (stage 5).</p>	<p>Providing sufficient time for collaborative research regardless of the size of the project will reduce this barrier. It allows time for true collaboration, to focus on relationships, and adjust to the ebbs and flows of life in Indigenous communities. It also provides time for the co-development of project results, data management and for the long-term maintenance of relationships.</p>
4 Funded research stage (minimum 4 years)	
<p>a Flexibility to adjust the research design, focus and allocation of funds The time between when a proposal is written and when the research is funded can often span an entire year. Situations in communities can change and flexibility in funding is needed across categories and years.</p>	<p>Flexibility to adjust the research design, focus and allocation of funds will help to ensure that time and funds spent are being used to meet the intended collaborative purposes and not driven by end of year financial deadlines.</p>
<p>b Co-develop annual project reporting to check-in on collaborative aspects Annual research funding reports tend to focus on achieving financial and research outputs and milestones. Reports do not normally include monitoring of collaborative research aspects or important Indigenous indicators of meaningful collaborative research.</p>	<p>The co-development and review of annual reports are a tool to:</p> <ul style="list-style-type: none"> • ensure that the intended new knowledge is being co-generated • check that the proper research ethics, community guidelines and licence processes were followed • document the challenges and benefits being experienced by Indigenous and non-Indigenous research partners during the research process • provide support to research partners (Indigenous and non-Indigenous) who are facing challenges and barriers.

(Continued.)

Table 1. (Continued.)

Recommendations to funders	Benefits
5 Responsibility and reflections stage (minimum 1 year)	
a Co-authorship and communicating results	
Funders can further support collaborative research partners by funding time and salaries for the co-production of journal articles, reports, and other forms of output that are relevant for Indigenous communities, and the communication of results.	Funding to support this stage will ensure that projects outputs are co-produced, culturally relevant, and that results are disseminated to the communities they were intended for. This process also supports the new research needs that arise, and the ongoing relationships that proceed and encourage future collaborative research.
b Create time for reflections and feedback	
Often final research results are written by non-Indigenous project leads, shared only with the funders, and evaluated based on the number of academic publications. To understand and learn from the collaborative research with Indigenous Peoples, Indigenous voices and perspectives need to be heard. For example, asking Indigenous partners questions such as:	We have no understanding of the financing needed for this final reporting stage. However, providing all research partners with opportunities to review the collaborative research relationships and the research process will only lead to improving the collaborating research process. Such a review process can reform evaluation criteria in academia by incorporating and following traditional protocols. This can achieve meaningful outcomes and benefits for Indigenous communities.
<ul style="list-style-type: none"> • was the knowledge co-generated and co-produced? • did the outcomes benefit Indigenous Peoples and were they shared in appropriate forms and language? • have the project results been stored in an accessible location for long-term access? 	
We expect one year of funding would be required by funders to co-facilitate these discussions.	

5.4. Funded research stage (minimum 4 years)

Collaboration means that the research project itself is co-constructed, that new knowledge is co-generated and that research outputs are co-produced. Funding processes are often ‘front-heavy’. However, to ensure that collaboration and co-creation extend throughout the entire life span of a project, all project phases need to be carefully considered. This requires **flexibility** on the part of all involved and **an openness to adjustments made to the research design and focus as well as the allocation of funds (across categories and years) throughout the research process**. Communities need to be able to review, validate and revise results and decide whether and how to share data and knowledge. **In a truly collaborative project, co-produced outputs will benefit Indigenous Peoples, be shared in appropriate forms and language, and correspond to Indigenous ways of transmitting knowledge**. Funding agencies can support this by allowing for **diverse forms of oral and written co-produced** research outputs, by evaluating projects not based on measurable academic publications (only), and by adjusting reporting requirements to account for limited capacity of IPOs (Wong *et al* 2020) (table 1.4(a)).

Funding agencies can take important steps to ensure that what was agreed upon is carried out in practice, by establishing **feedback and evaluation processes** consistently throughout the lifespan of a project, rather than relying solely on standard project reporting. By providing all research partners with consistent and **culturally appropriate** opportunities to review the research relationship, the research process and progress, the quality of collaborative

projects can be improved. This also includes a review and evaluation at the end of a project (table 1.4(b)).

5.5. Responsibility and reflections stage (minimum 1 year)

The time after a project has ended, the care for long-term use of project results and for long-term maintenance of relationships, constitutes another important phase of collaborative and co-creative research. Keskitalo *et al* (2021) argue that ‘giving back [...] does not stop when the research project comes to an end: The people we work with follow us. They remain a part of our lives as researchers, and we remain a part of their lives. We will meet them again at formal and informal occasions later in our lives’ (p 77). Funders can support collaborative research partners by funding time and salaries for the co-production of journal articles, reports, and other forms of output (e.g. exhibitions, community dialogues, films, etc), and the dissemination of results. While some outputs will most likely be produced and disseminated during the main project period, other outputs will require more time beyond this stage. This will ensure that project outputs are co-produced, culturally relevant, and that results are disseminated to the communities they were intended for. Importantly, this could also secure long-term accessibility of data and results and enable crucial reflections and feedback. By funding this final stage of a research project (or the ‘in-between stage’ of two research projects), funding agencies can support long-term research relationships and mentoring, and lay a solid foundation for future research projects (tables 1.5(a) and (b)).

6. Conclusion

Collaborative and co-creative research can produce high-quality outcomes of societal and scientific relevance, support Indigenous self-governance in research, build two-way capacity, support Indigenous methods in research, and ensure that funding is spent on projects that benefit Indigenous communities. This can only be achieved, if indicators of collaboration and co-creation are established through an Indigenous lens and Indigenous researchers and institutions have the necessary resources. Funding agencies play an important role in constraining or enabling co-creative processes. To contribute to positive change, funders need to ensure the inclusion of Indigenous partners, researchers, and institutions from the initial planning stages of funding programmes to the final stages of research projects. Collective, cross-cultural work on this paper serves as an illustration of conditions necessary for co-creation: To enable multiple experiences and voices to come together in a respectful way, we took the time needed to establish mutual understanding, share and reflect. We put emphasis on initiating an Indigenous review of the paper and its content before submission. Based on our experiences and the invaluable input we received, we formulated concrete recommendations that we invite funding agencies and other actors involved in Arctic research processes to engage with. If implemented, we believe that these recommendations can strengthen the decolonization of all phases of the research cycle. However, we acknowledge that truly co-creative research is challenging to undertake. Discussions on co-creation and decolonization of research are on the rise, and it will be important to take practice beyond the buzzwords. We need more knowledge about what co-creation can become, to avoid re-producing unequal relationships and practices in the name of an empty concept. Co-creation implies that communities have ownership over the entire research process, from beginning to end. Indigenous Peoples always have full rights to the knowledge as part of their heritage which was collected from them by non-Indigenous people and researchers. Remember the story of the family and the researcher at the beginning of this paper? Funding agencies have the power and ability to change this story.

Data availability statement

No new data were created or analysed in this study.

ORCID iDs

Nina Nikola Doering  <https://orcid.org/0000-0002-3444-5556>

Stephan Dudeck  <https://orcid.org/0000-0002-3883-1251>

Charleen Fisher  <https://orcid.org/0000-0001-5610-9951>

Britt Kramvig  <https://orcid.org/0000-0002-1598-5549>

Gertrude Saxinger  <https://orcid.org/0000-0003-1428-2689>

Katherine Wilson  <https://orcid.org/0000-0002-4246-3578>

References

- Absolon K E 2011 *Kaandossiwin: How We Come to Know* (Halifax: Fernwood Publishing)
- Arctic Council Indigenous Peoples' Secretariat 1996 Ottawa traditional knowledge principles (available at: https://static1.squarespace.com/static/58b6de9e414fb54d6c50134e/t/5dd4097576d4226b2a894337/1574177142813/Ottawa_TK_Principles.pdf)
- ArcticNet 2021 Inuit Qaujisarnirmut Pilirijjutit (available at: <https://arcticnet.ulaval.ca/inuit-qaujisarnirmut-pilirijjutit/>)
- Armitage D, Berkes F, Dale A, Kocho-Schellenberg E and Patton E 2011 Co-management and the co-production of knowledge: learning to adapt in Canada's Arctic *Glob. Environ. Change* **21** 995–1004
- Battiste M and Henderson J Y 2009 Naturalizing Indigenous knowledge in Eurocentric education *Can. J. Native Educ.* **32** 5–18
- Bowman N, Francis C and Tyndall M 2015 Culturally responsive Indigenous evaluation. A practical approach for evaluating Indigenous projects in tribal reservation contexts *Continuing the Journey to Reposition Culture and Cultural Context in Evaluation Theory and Practice* ed S Hood, R Hopson and H Frierson (Charlotte, NC: Information Age Publishing) pp 335–59
- Brophey A and Raptis H 2016 Preparing to be allies: narratives of non-Indigenous researchers working in Indigenous contexts *Alberta J. Educ. Res.* **62** 237–52
- Brunet N, Hickey G and Humphries M 2017 How can research partnerships better support local development? Stakeholder perceptions on an approach to understanding research partnership outcomes in the Canadian Arctic *Polar Rec.* **53** 479–88
- Buschman V 2022 Arctic conservation in the hands of Indigenous peoples (available at: www.wilsonquarterly.com/quarterly/the-new-north/arctic-conservation-in-the-hands-of-indigenous-peoples/)
- Carjuzaa J and Fenimore-Smith J K 2010 The give away spirit: reaching a shared vision of ethical Indigenous research relationships *J. Educ. Controversy* **5** 5
- Castleden H, Morgan V S and Lamb C 2012 "I spent the first year drinking tea": exploring Canadian university researchers' perspectives on community-based participatory research involving Indigenous peoples *Can. Geogr.* **56** 160–79
- Chanteloup L, Joliet F and Herrmann T M 2019 Learning and insights from a participatory photography project with Cree and Inuit about the land (Nunavik, Canada) *Polar Geogr.* **42** 125–43
- Cooke S J, Nguyen V M, Chapman J M, Reid A J, Landsman S J, Young N, Hinch S G, Schott S, Mandrak N E and Semeniuk C A 2020 Knowledge co-production: a pathway to effective fisheries management, conservation, and governance *Fisheries* **46** 89–97
- de Leeuw S, Cameron E S and Greenwood M L 2012 Participatory and community-based research, Indigenous geographies, and the spaces of friendship: a critical engagement *Can. Geogr.* **56** 180–94
- Finbog L 2021a The story of terra nullius—variations on the land[s] of Saepmie that nobody owned (available at:

- www.academia.edu/45570585/THE_STORY_OF_TERRA_NULLIUS_VARIATIONS_ON_THE_LAND_S_OF_SAEPMIE_1_THAT_NOBODY_OWNED)
- Finbog L 2021b It speaks to you: making kin of people, duodji and stories in Sámi museums (available at: www.hf.uio.no/ikos/english/research/news-and-events/events/disputations/2021/finbog.html)
- First Nations Information Governance Centre 1998 The first nations principles of OCAP® (available at: <https://fnigc.ca/ocap-training/>)
- Fox S, Qillaq E, Angutikjuak I, Tigullaraq D J, Kautuk R, Huntington H, Liston G E and Elder K 2020 Connecting understandings of weather and climate: steps towards co-production of knowledge and collaborative environmental management in Inuit Nunangat *Arct. Sci.* **6** 267–78
- Greenhalgh T, Jackson C, Shaw S and Janamian T 2016 Achieving research impact through co-creation in community-based health services: literature review and case study *Milbank Q.* **94** 392–429
- Guttorm G 2011 Árbediehtu (Sami traditional knowledge)—as a concept and in practice *Working with Traditional Knowledge: Communities, Institutions, Information Systems, Law and Ethics. Writings from the Arbediehtu Pilot Project on Documentation and Protection of Sami Traditional Knowledge* ed J Porsanger and G Guttorm (Sámi allaskuvla/Sámi University College) pp 59–76
- Guttorm H, Kantonen L, Kramvig B and Pyhälä A 2021 Decolonized research-storying: bringing Indigenous ontologies and care into the practices of research writing *Indigenous Research Methodologies in Sámi and Global Contexts* ed P K Virtanen, P Keskitalo and T Olsen (Leiden: Brill) pp 113–43
- Gwich'in Tribal Council 2011 Conducting traditional knowledge research in the Gwich'in settlement area—a guide for researchers (available at: https://nwtresearch.com/sites/default/files/gwich-in-social-and-cultural-institute_0.pdf)
- Healey G and Tagak S, A 2014 Piliriqatigiinniq 'Working in a collaborative way for the common good': a perspective on the space where health research methodology and Inuit epistemology come together *Int. J. Crit. Indigenous Stud.* **7** 1–15
- Henriksen J E, Hydle I and Kramvig B (eds) 2019 *Recognition, Reconciliation and Restoration: Applying a Decolonized Understanding in Social Work and Healing Processes* (Stamsund: Orkana Akademisk) (<https://doi.org/10.33673/OOA20201>)
- HR-2021-1975-S 2020 Anke over frostating lagmannsretts overskjønn 8. juni 2020 (available at: <https://perma.cc/H3TE-VYCG>)
- Hurley E S and Jackson M 2020 Msit No'kmaq: an exploration of positionality and identity in Indigenous research *Witness* **2** 39–50
- IARPC 2018 Principles for conducting research in the Arctic (available at: www.iarpcollaborations.org/uploads/cms/documents/principles_for_conducting_research_in_the_arctic_final_2018.pdf)
- Ibarguchi G, Rajdev V and Murray M S 2018 Are current research funding structures sufficient to address rapid Arctic change in a meaningful way? *Polar Res.* **37** 1540242
- ICC-Alaska 2015 Alaskan Inuit food security conceptual framework: how to assess the Arctic from an Inuit perspective. Summary and recommendations report (Anchorage: Inuit Circumpolar Council-Alaska) (available at: <https://iccalaska.org/wp-icc/wp-content/uploads/2016/03/Food-Security-Summary-and-Recommendations-Report.pdf>)
- Inuit Tapiriit Kanatami (ITK) 2018 *National Inuit Strategy on Research* (Ottawa: Inuit Tapiriit Kanatami) www.itk.ca/wp-content/uploads/2020/10/ITK-National-Inuit-Strategy-on-Research.pdf
- Jaworsky D 2019 An allied research paradigm for epidemiology research with Indigenous peoples *Arch. Public Health* **77** 22
- Jernsletten K and Storfjell T 2017 Re-reading Knut Hamsun in collaboration with place in Lule Sámi Nordlândia *Arctic Environmental Modernities* ed L A Körber, S MacKenzie and A Westerståhl Stenport (Cham: Palgrave Macmillan) pp 87–105
- Kassi N et al 2017 The partnerships, the productions and the people behind the lens. Promoting youth wellness through community-based research and filmmaking *North. Public Affairs* **5** 26–32
- Keskitalo P, Rasmussen T, Rahko-Ravanti R and Äärelä-Vihriälä R 2021 Gáfestallan talks of the Indigenous research paradigm in Sámi research *Indigenous Research Methodologies in Sámi and Global Contexts* ed P K Virtanen, P Keskitalo and T Olsen (Leiden: Brill) pp 65–83
- Kovach M 2009 *Indigenous Methodologies: Characteristics, Conversations, and Contexts* (Toronto: University of Toronto Press)
- Kuokkanen R 2007 *Reshaping the University: Responsibility, Indigenous Epistemes, and the Logic of the Gift* (Vancouver: UBC Press)
- Kuokkanen R 2019 *Restructuring Relations: Indigenous Self-determination, Governance, and Gender* (Oxford: Oxford University Press)
- Latola K, Scheepstra A, Pawlak J and Saxinger G 2020 White paper on status of stakeholder engagement EU-PolarNet (available at: https://docs.google.com/document/d/18WJ1Z_mLrvI1Y48zEkiGoshu_oROCWzKxfaEXdvWsK8/edit#)
- Lewis J P and Boyd K 2012 Determined by the community: CBPR in Alaska native communities building local control and self-determination *J. Indig. Res.* **1** 6
- Markussen U 2017 Towards and Arctic awakening: neocolonialism *Sustainable Development, Emancipatory Research, Collective Action, and Arctic Regional Policymaking. The Interconnected Arctic* ed K Latola and H Savela (Cham: Springer)
- McGrath J 2019 *The Qaggiq Model: Toward a Theory of Inuktit Knowledge Renewal* (Iqaluit: Nunavit Arctic College Media)
- Mihesuah D A and Wilson A C (eds) 2004 *Indigenizing the Academy: Transforming Scholarship and Empowering Communities* (Lincoln, NE: University of Nebraska Press)
- Mitchell F M 2018 Engaging in Indigenous CBPR within academia *Affilia* **33** 379–94
- National Science Foundation (NSF) 2021 Arctic research opportunities (available at: www.nsf.gov/pubs/2021/nsf21526/nsf21526.htm)
- Nilsson A E et al 2021 Towards improved participatory scenario methodologies in the Arctic *Polar Geogr.* **44** 75–89
- Pedersen C et al 2020 SciQ: an invitation and recommendations to combine science and Inuit Qaujimatjuqangit for meaningful engagement of Inuit communities in research *Arct. Sci.* **6** 326–39
- Pfeifer P 2018 From the credibility gap to capacity building: an Inuit critique of Canadian Arctic research *North. Public Affairs* **6** 29–34
- Porsanger J 2004 An essay about Indigenous methodology *Nordlit* **8** 105–20
- Ravna Z V 2019 The inter-generational transmission of Indigenous Knowledge by Nenets women: viewed in the context of the state educational system of Russia *Doctoral Thesis* Arctic University of Norway (available at: <https://munin.uit.no/handle/10037/18231>)
- Ritchie S D, Jo Wabano M, Beardy J, Curran J, Orkin A, Vanderburgh D and Young N L 2013 Community-based participatory research with Indigenous communities: the proximity paradox *Health Place* **24** 183–9
- Sámediggi 2021b Etsiske retningslinjer for samisk helseforskning (available at: https://sametinget.no/_f/p1/iab4f8a7f-1c05-4f9f-a5e2-1d4f6196671d/etsiske-retningslinjer-for-samisk-helseforskning-ny.pdf)
- Sámediggi 2021 Sakkyndig, etisk komité for samisk helseforskning (available at: <https://sametinget.no/barnevern-helse-og-social/etsiske-retningslinjer-for-samisk-helseforskning-og-kollektiv-samtykke/sakkyndig-etisk-komite-for-samisk-helseforskning/>)

- Sarkki S, Rasmus S, Landauer M, Lépy L and Heikkinen H I 2021 Matching societal knowledge demand, research funding and scientific knowledge supply: trends and co-creation dynamics around reindeer management in Finland *Polar Geogr.* **44** 90–111
- Saxinger G (First Nation of Na-Cho Nyäk Dun) 2018 Community based participatory research as a long-term process: reflections on becoming partners in understanding social dimensions of mining in the Yukon *North. Rev.* **47** 187–206
- Sherriff S L, Miller H, Tong A, Williamson A, Muthayya S, Redman S, Bailey S, Eades S and Haynes A 2019 Building trust and sharing power for co-creation in Aboriginal health research: a stakeholder interview study *Evid. Policy* **15** 371–92
- Simonds V W and Christopher S 2013 Adapting Western research methods to Indigenous ways of knowing *Am. J. Public Health* **103** 2185–92
- Smith L T 2012 *Decolonizing Methodologies: Research and Indigenous Peoples* 2nd edn (London: Zed Books Ltd)
- Smith L T 2021 *Decolonizing Methodologies: Research and Indigenous Peoples* 3rd edn (London: Zed Books Ltd)
- Sylvestre P, Castleden H, Martin D and McNally M 2017 “Thank you very much... You can leave our community now.”: geographies of responsibility, relational ethics, acts of refusal, and the conflicting requirements of academic localities in Indigenous research *ACME* **17** 750–79
- Todd Z 2016 An Indigenous feminist’s take on the ontological turn: ‘Ontology’ is just another word for colonialism *J. Hist. Sociol.* **29** 4–22
- Tyler N J, Hanssen-Bauer I, Førland E J and Nellemann C 2021 The shrinking resource base of pastoralism: saami reindeer husbandry in a climate of change *Front. Sustain. Food Syst.* **4** 274
- United Nations 2007 United nations declaration on the rights of Indigenous peoples A/RES/61/295 (available at: www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf)
- Virtanen P K, Keskitalo P and Olsen T (eds) 2021 *Indigenous Research Methodologies in Sámi and Global Contexts* (Leiden: Brill) (<https://doi.org/10.1163/j.ctv1v7zbnk4>)
- Virtanen P K, Olsen T and Keskitalo P 2021 Contemporary Indigenous research within Sámi and global Indigenous studies contexts *Indigenous Research Methodologies in Sámi and Global Contexts* ed P K Virtanen, P Keskitalo and T Olsen (Leiden: Brill) pp 7–32
- Voorberg W H, Bekkers V J J M and Tuffers L G 2014 A systematic review of co-creation and co-production: embarking on the social innovation journey *Public Manage. Rev.* **17** 1333–57
- Wheeler H C et al 2020 The need for transformative changes in the use of Indigenous knowledge along with science for environmental decision-making in the Arctic *People Nat.* **2** 544–56
- Wilson K J, Bell T, Arreak A, Koonoo B, Angnatsiak D and Ljubicic G J 2020 Changing the role of non-Indigenous research partners in practice to support Inuit self-determination in research *Arct. Sci.* **6** 127–53
- Wilson S 2008 *Research Is Ceremony: Indigenous Research Methods* (Halifax: Fernwood Publishing)
- Wong C, Ballegooyen K, Ignace L, Johnson M J and Swanson H 2020 Towards reconciliation: 10 Calls to action to natural scientists working in Canada *Facets* **5** 769–83