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THE POWER AND PRECARITY OF KNOWLEDGE CO-PRODUCTION

A case study of SakKijânginnaniattut Nunatsiavut Sivunitsangit (the Sustainable Nunatsiavut Futures Project)

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Introduction

Climate change and biodiversity loss are the most urgent and dire ecological threats to coastal and marine ecosystems and peoples worldwide (IPCC, 2022). The urgency of these threats is amplified by the reality that nearly three-quarters of the global population lives within 50 km of a coastline (Small and Nicholls, 2003) that is likely experiencing high human pressures and low levels of protection (Williams et al., 2021). Moreover, the magnitude of these threats and consequent societal responses are directly mediated by the social and cultural contexts in which they occur. For example, the risks posed by the climate and biodiversity crises are significantly pronounced in the Arctic, where temperatures are warming at the fastest rates globally due to Arctic amplification (Bekryaev et al., 2010). This, in turn, creates rapid and unpredictable shifts in wildlife populations and changes to sea- and lake-ice conditions that directly alter the ability of Indigenous Peoples and local communities to sustain their coastal cultures and livelihoods (Ford et al., 2012; Hauser et al., 2021; Hinzman et al., 2005; Yletyinen, 2019). Moreover, legacies and ongoing expressions of colonialism tend to privilege Western Scientific Knowledge (WSK) in decision making and policy formation, often overshadowing the rich and empowering history of Inuit Knowledge (IK). Therefore, there is a need for co-developing solutions to climate change with Indigenous communities in the Arctic, such as Labrador Inuit of Nunatsiavut, including mobilizing IK into decision making alongside WSK (Ford et al., 2012; Hirsch et al., 2016; Inuit Tapiriit Kanatami (ITK), 2018a). Climatic changes, long-term cultural shifts and

replacement, and histories of oppression and exclusion in Inuit Nunangat (the Inuit homeland within Canada, which means "the place where Inuit live" in Inuttitut) demand new research methods and frameworks that match the pace of climate change, recognize and redress colonial pasts, and bring together IK and WSK to navigate the varied cultural and institutional landscapes that mediate coastal and marine conservation in Inuit Nunangat (Alexander et al., 2019; Zurba et al., 2022).

The mutual interdependence of marine ecosystems and human societies indicates that innovative and *collaborative* approaches that bridge institutions, social spheres, and knowledge systems are required to achieve sustainable seas in the face of climate change. *Collaboration* among diverse actors at local to global scales is required to support innovative approaches to marine and coastal conservation and management (Hidalgo et al., 2022; Mazor et al., 2013). In its most fundamental form, collaboration refers to people and organizations coming together to solve a common problem. Given the high concentration of the human population that depends on oceans that cover over 70% of the Earth's surface, participants in collaborative research and management in the marine sciences must span multiple scales, institutions, and worldviews such as nation states, industries, academics, and local and Indigenous communities and their knowledges (Hind et al., 2015; Thornton and Scheer, 2012). Specifically, collaborative engagement with Indigenous peoples and local communities helps contextualize environmental concerns, enhance self-determination in research and governance, strengthen the effectiveness of environmental monitoring and management, and empower communities through equitable conservation (Dawson et al., 2021; *Ellam Yua* et al., 2022; *M'sit No'kmaq* et al., 2021). Moreover, collaboration facilitates the cross-fertilization of worldviews, values, and knowledges across academic disciplines, which allows researchers to leverage their disciplinary strengths towards addressing large-scale and complex global sustainability problems through integrative techniques, including those that account for the emotional and relational factors undergirding research (Pohl et al., 2021).

Yet collaboration embodies a concept that is neither simple nor uniform. The scope and success of collaborative approaches vary based on contextual factors such as levels of participation, governance arrangements, power dynamics, and historical legacies of resource use and cultural recognition (Adger et al., 2005; Alvarado et al., 2020; Armitage et al., 2011; Hill et al., 2012). Moreover, collaboration alone may not guarantee the effective integration, exchange, and recognition of different forms of knowledge required for successful conservation and management, adaptive governance, and policy innovation (Cvitanovic et al., 2015). For these reasons, collaboration is often one component of broader approaches to knowledge exchange and generation. Scholars and practitioners are therefore increasingly recommending and ground-truthing knowledge-related concepts and processes through reviews, frameworks, and case studies to fortify collaborative approaches in support of transformative solutions to social and environmental problems (Apetrei et al., 2021; Armitage et al., 2011; Cvitanovic et al., 2015; *Ellam Yua* et al., 2022). Of the many knowledge-related concepts guiding collaborations, knowledge co-production (KCP) is one of the most invoked and explored frames for engaging

and bridging different forms of knowledge in marine science, climate research, and sustainability research (Apetrei et al., 2021; Wyborn et al., 2019).

The purpose of this chapter is to critically reflect on KCP through a qualitative case study drawing from nearly two years of our shared experiences as collaborators in the Knowledge Co-Production and Transdisciplinary Approaches for Sustainable Nunatsiavut Futures project (shortened to *SakKijânginnaniattut Nunatsiavut Sivunitsangit* in Inuttitut, *Sustainable Nunatsiavut Futures* Project in English), a six-year multi-partner research programme focused on KCP for marine spatial planning with and for Nunatsiavut communities, Newfoundland and Labrador, Canada. We specifically turn our collective gaze towards the power and precarity of KCP, given both the potential benefits from its breadth of interpretations, concepts, and approaches and the uncertainties they may introduce to collaborations (see "Primer on KCP" below; *Ellam Yua* et al., 2022; Zurba et al., 2022). First, we will present the project background with a positionality statement about our relationships to the research. Second, we will briefly overview the many interpretations of KCP as an approach to transdisciplinary research and practice on the transformative road towards sustainable coexistence between the sea and society. Third, we will summarize and interrogate the origins, approaches, and interpretations of KCP in the project. In particular, we highlight how iterative reflection, critical analysis, relationship building, and trust *during* our KCP process, rather than solely before or after the project, allows partners to question and reassert the very foundations of their work, including the meaning and value of KCP itself. This chapter problematizes KCP to inform what collaboration means in a KCP context and how an emphasis on relationships and emotions can help build a foundation for future work in the Sustainable Nunatsiavut Futures Project and other co-production efforts.

The SakKijânginnaniattut Nunatsiavut Sivunitsangit project background

The region of Nunatsiavut ("Our beautiful land" in English) is 72,250 km^2 (27,896 mi^2) of land and freshwater, with an additional 48,690 km^2 (18,800 mi^2) of tidal waters, that make up the Labrador Inuit Settlement Area (LISA) (Labrador Inuit Land Claims Agreement (LILCA), 2005). The area is one of four Inuit regions in Inuit Nunangat, a term that encompasses the land, water, and ice at the foundation of Inuit culture in Canada (ITK, 2018b; LILCA, 2005). Within the LISA, Labrador Inuit have control over health, natural resources, education, culture, and development in 15,799 km^2 (6,100 mi^2) of land and water, known as Labrador Inuit Lands (LIL). Nunatsiavut is home to an estimated 2,560 residents (Statistics Canada, 2018) who live in five coastal communities (Nain, Hopedale, Postville, Makkovik, and Rigolet) dotting subarctic and post-glacial landscapes with complex and rocky coastlines, including bays, headlands, deep fjords, inland seas, offshore islands, and islets. English is the dominant language; 14% of the population speaks Inuttitut (Statistics Canada, 2018). A more comprehensive background is covered in a recent review (Zurba et al., 2022).

The seeds of the *SakKijânginnaniattut Nunatsiavut Sivunitsangit* project were germinated during a two-day workshop in summer 2019. The purpose of the workshop, which was co-organized by the Nunatsiavut Government (NG), Dalhousie University, and Memorial University of Newfoundland and Labrador, and attended by academics, government representatives, and non-government actors, was to co-develop a proposal for collaborative, community-engaged research that co-produced knowledge about Nunatsiavut's changing coastal ecosystem dynamics. The resulting SakKijânginnaniattut Nunatsiavut Sivunitsangit project focuses on three research themes: understanding environmental changes to the Nunatsiavut coasts, co-developing management planning efforts to confront and cope with these changes, and identifying and assessing KCP processes and outcomes within the project.

The three themes are pursued by four work packages (WPs) that are tasked with different yet interrelated responsibilities in the work system. Work Package 1 (WP 1) focuses on the development and evaluation of KCP processes and outcomes; WP 2 explores community-engaged ocean monitoring for the Nunatsiavut coast; WP 3 spatially maps Nunatsiavut coasts; and WP 4 analyses shifts in species distributions across the coasts. However, the project is pursuing changes to move beyond the current work package structure as of May 2022. Currently, the project brings together over 50 collaborators representing more than 18 partner organizations, including 4 Inuit Research Coordinators (IRCs). Please see our review (Zurba et al., 2022) for a more detailed project background statement.

Positionality

A note on names

Throughout this chapter, we refer to the project by its shortened formal title in Inuttitut, SakKijânginnaniattut Nunatsiavut Sivunitsangit, rather than the English translation "Sustainable Nunatsiavut Futures" or an initialism of the Inuttitut ("SNS") or English versions of the name ("SNF"). This purposeful choice stems from internal conversations about the overuse of abbreviations, initialisms and acronyms in science, which often aim to distil complex topics, ideas, and titles down to several letters for ease of use across the larger scientific community. More importantly, we aspire to recognize and respect the geographic, social, and historical context of our collective experience and attend to the inherently political nature of doing research in and with Indigenous communities. Critically, we are in the process of evaluating a new name for the project in either language. However, at the moment the use of "SNS" or "SNF" in our work context risks diminishing the purpose, place, and intent of our collective endeavour. The initialism reduces our focus on SakKijânginnaniattut (Sustainability) down to an "S", boils its place-based importance in "Nunatsiavut" down to an "N", and confines the temporal focus on Sivunitsangit (Futures) to a one-dimensional "S" or "F". Further, Inuit project partners have explicitly highlighted the importance of all project partners
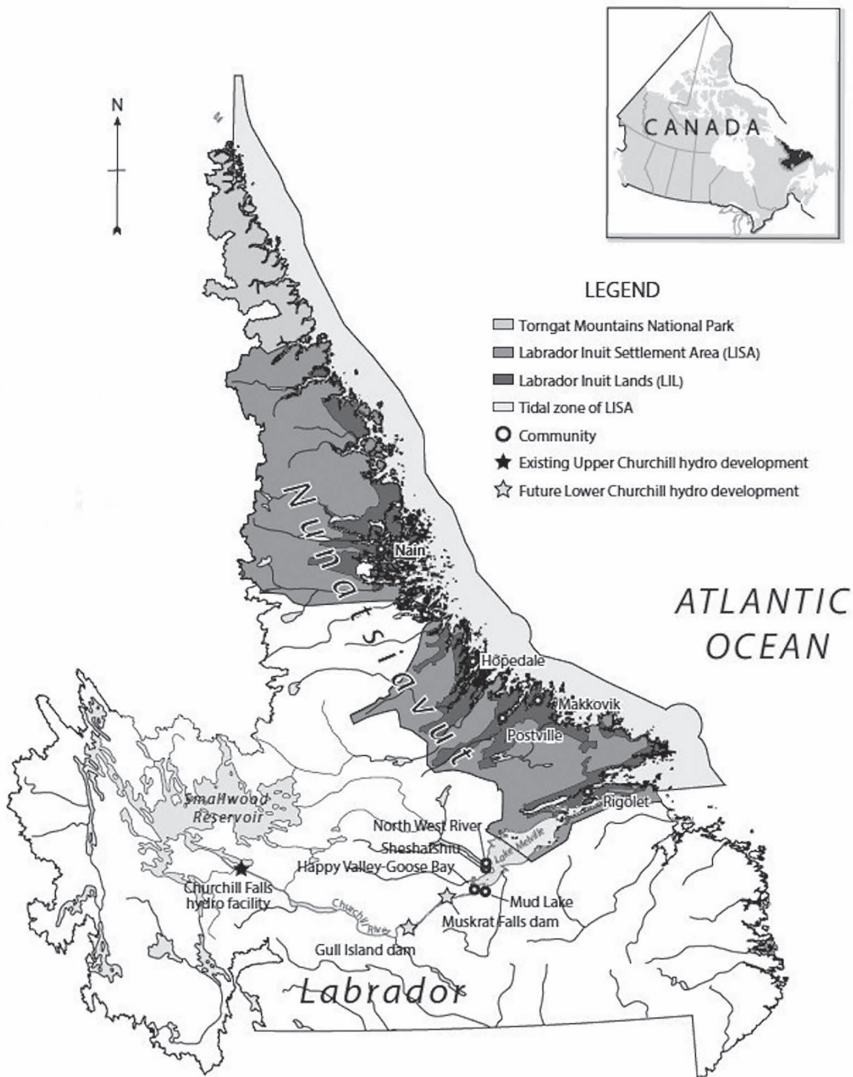
FIGURE 7.1   Map of Nunatsiavut, one of four regions of Inuit Nunangat.

Source: (Courtesy of the Nunatsiavut Government)

meaningfully engaging with correct and appropriate pronunciations of Inuttitut terms, including "Nunatsiavut". It is important that our project respect this request and that we contribute to increasing the normative goal of external researchers correctly referencing the cultural and geographic locations in which their work occurs. Using and always saying the place and name of the project in Inuttitut is also an actively anti–colonial act that recognizes how Indigenous communities have

always had names for their regions in Indigenous languages and that these names have been changed throughout history to words in colonizing or official state languages. Therefore, all references to our project in this chapter will use the Inuttitut project title.

SakKijânginnaniattut Nunatsiavut Sivunitsangit and researcher positionality

Research and authorship are relational processes that connect collaborators to one another and the context in which their work is embedded. Given that iterative reflection and context-dependency are two key principles underlying KCP, scholars and practitioners are frequently drawing on their positionality to iteratively refine project methods and goals, detail their individual and collective relationships to their work, cultivate trust among project partners, and enhance awareness of the impact and longevity of project outcomes (Carter et al., 2019; Maclean et al., 2022).

This narrative reflection extends from recurring conversations and activities attended by multiple project partners and hosted by WP 1. As such, our group of authors represents the geographic, professional, and cultural diversity of the overall project, such as IRCs in Nunatsiavut (Anthony, Nochasak, Winters, and Winters); university academics based in the United States, Canada, and Germany (Bailey, Bodwitch, McCarney, Oliver, Petriello, Schmidt, Zurba); doctoral students based in Canada (Bishop, Cadman); and project management based in Canada (McLaren). These roles put us in collaboration with other work packages. However, as members of WP 1, we are committed to understanding and exploring good practices and pathways for KCP in the contexts of SakKijânginnaniattut Nunatsiavut Sivunitsangit, Nunatsiavut, and Inuit Nunangat. Our commitment is underscored by the goal of equitable and respectful acknowledgement and engagement with the diverse backgrounds and knowledge systems represented in the project. Following Carter et al. (2019), the terms "we" and "our" are used to represent our shared experiences unless otherwise attributed to individual authors, which will be marked in the chapter. We additionally position this chapter as a reflexive counterpoint to our recently published inductive and deductive review of KCP studies and context-specific case studies in Nunatsiavut (Zurba et al., 2022).

Transdisciplinarity

As the long-form project title indicates, the project sits squarely within a transdisciplinary research model of KCP. For SakKijânginnaniattut Nunatsiavut Sivunitsangit, transdisciplinary research refers to

> collaborations between different disciplines (e.g. natural, health and social sciences) and academic institutions with communities and other non-academic institutions. [It] engages with multiple groups of people who hold a plurality of perspectives and addresses real-world problems relevant to society.

[It] aims to produce results that have value to communities, partners and broader audiences rather than a product that addresses problems from only one perspective.

(Sustainable Nunatsiavut Futures, 2020, p. 1)

In other words,

Transdisciplinarity occurs by the interaction of different disciplines, including many forms of collaboration among various sectors, groups and institutions. Transdisciplinary research can also be driven by community interests . . . provid[ing] an opportunity for communities and researchers to learn from each other.

(Sustainable Nunatsiavut Futures, 2020, p. v)

Philosophically, SakKijânginnaniattut Nunatsiavut Sivunitsangit is committed to a different paradigm of scientific research from the standard scientific model. We note that doing ethical science requires good research governance, and thus are building towards a governance model that adheres to shared "living" rules, norms, values, and principles that are collectively discussed and refined with all project partners in the context of Nunatsiavut marine spatial planning (Figure 7.2). The "living" values and principles (see KCP activities further in the chapter) filter into project objectives that are co-designed with input from different stakeholders and knowledge systems. The KCP principles, values, and objectives are pursued through the governance vision described in the project background and Figure 7.2.
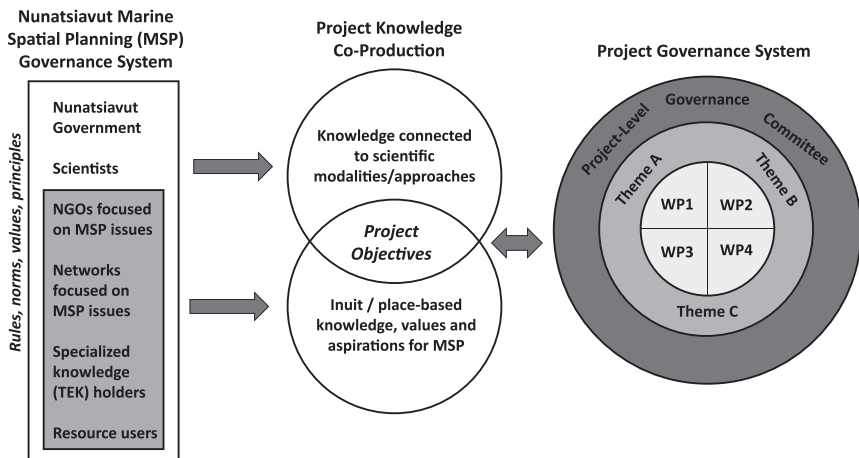
FIGURE 7.2   Conceptual working diagram of the governance framework guiding knowledge co-production (KCP) within the SakKijânginnaniattut Nunatsiavut Sivunitsangit project.

(SakKijânginnaniattut Nunatsiavut Sivunitsangit science meeting, June 8, 2021)

Primer on KCP

Definitions

The global push for community-engaged research and practice in sustainability-related fields has generated a kaleidoscope of KCP definitions, principles, frameworks, and nested concepts (Zurba et al., 2022). Although sorting through the many KCP domains is outside of the scope of this chapter, we first aim to dispel the conceptual fog of KCP definitions using three disciplinarily and contextually distinct definitions. First, in the context of marine science and co-management, Armitage et al. (2011) seminally defined KCP as "the collaborative process of bringing a plurality of knowledge sources and types together to address a defined problem and build an integrated or systems-oriented understanding of that problem" (p. 996). Second, others have drawn from interdisciplinary fields to define KCP as "processes that iteratively unite ways of knowing and acting – including ideas, norms, practices and discourses – leading to mutual reinforcement and reciprocal transformation of societal outcomes" (Wyborn et al., 2019, p. 320). Most recently, *Ellam Yua* et al. (2022) drew from the social-ecological context of Arctic research to define KCP as "a process that brings together Indigenous Peoples' knowledge systems and science to generate new knowledge and understandings of the world that would likely not be achieved through the application of one knowledge system". While distinct in origin and scope, the three definitions demonstrate that KCP definitions, across disciplines and contexts, often depict KCP as *collaborative* and *iterative processes* of uniting *multiple knowledge systems* in pursuit of *solutions-oriented outcomes* (e.g. knowledge and transformations) to *social and ecological problems* across *multiple scales*.

Approaches and tools

The aforementioned conceptual depiction of KCP provides a descriptive template for understanding, framing, and meeting sustainability goals. Many approaches and tools are adopted within the collaborative and iterative processes with the expressed goals of doing and generating science differently (Wyborn et al., 2019). The approaches frequently straddle knowledge divides and strive for cross-cultural and intergenerational knowledge exchange and integration through both remote and land-based activities, traditional knowledge interviews, focus groups, workshops, youth and Elder engagement, and participatory research methodologies (Carter et al., 2019; Zurba et al., 2022). By extension, academic knowledge co-producers are paying growing attention to boundary work in their endeavours because it "includes methodologies to support knowledge sharing and co-creation between research partners as well as work that can translate research outcomes into on-ground action" (Zurba et al., 2019, p. 1024). For example, research in the Indigenous Arctic, including Inuit Nunangat, shows that co-produced tools such as marine resource management indicators and maps can act as boundary

objects (i.e. items that facilitate discussion and other types of exchange between groups that are distinct, or even disparate) for bridging Inuit Knowledge and WSK (Bishop et al., 2022; Kourantidou et al., 2020). Importantly, during the formation and early execution of SakKijânginnaniattut Nunatsiavut Sivunitsangit, the use of the term "boundary object" became its own boundary object, whereby academics and practitioners were able to explore different conceptions of what boundaries are and why or why not a term like a boundary object makes sense to different groups. While no single approach is a panacea, they represent a larger toolkit of transformative approaches to ocean sustainability and climate change.

Higher-order domains and principles

KCP definitions, approaches, and tools are the starting and middle points of these efforts. Recent noteworthy syntheses have also aimed to move beyond the dizzying array of prescriptive definitions and approaches and toward higher-order guiding concepts, principles, and modes of KCP. Climate change and sustainability scholars have identified multiple lenses and models of co-production research, including an iterative lens, social learning lens, empowerment lens, social critique model and instrumental model for conceptualizing KCP (Apetrei et al., 2021; Bremer and Meisch, 2017). These higher-order academic frames are complemented by six modes of co-production in practice, of which *researching* solutions is just one (Chambers et al., 2021). Other modes deploy KCP to leverage power from dominant actors (brokering power), elevate marginalized groups through KCP (empowering voices and reframing power), and manage differences in relationships, empowerment, and agency among co-producers (navigating differences, reframing agency). Moreover, paths for carrying out KCP research and practice have been found to be guided by overarching principles such as context-specificity, pluralism, goal-orientation, and interactions among participants (Norström et al., 2020). Yet tensions still arise when adhering to higher-order principles, calling for novel conceptual contributions such as "co-productive agility", or the "willingness and ability of diverse actors to iteratively engage in reflexive dialogue to grow shared ideas and actions that would not have been possible from the outset" (Chambers et al., 2022, p. 2), to manoeuvre KCP landscapes in diverse contexts.

   In the context of this case study, SakKijânginnaniattut Nunatsiavut Sivunitsangit collaborators identified four principles for KCP work in Nunatsiavut (Zurba et al., 2022):(1) context dependency, (2) frequent, early, and sustained engagement with IK holders; (3) shared understanding and commitment to KCP and project goals; and (4) empowerment. These findings are buoyed by the recently proposed emphasis on equity in Indigenous Arctic KCP research and practice (*Ellam Yua* et al., 2022). In particular, some have called for scholars, practitioners, and policy makers to pay more attention to the emotional, relational, and trust-related aspects of KCP and knowledge exchange (Cvitanovic et al., 2021; Pohl et al., 2021). This call to action mirrors a recent increasing broader exploration of concepts and theories that frame the social, relational, and interpersonal dimensions of KCP in

climate and sustainability research, such as empowerment, equity, trust, and representation (Bremer and Meisch, 2017; Chambers et al., 2022; Chapman and Schott, 2020; Cvitanovic et al., 2021; Maclean et al., 2022, Zurba et al., 2022).

Despite the many forms of KCP referenced earlier, we are not defining KCP in this reflection for three reasons: (1) iterative conversations among our group have shown that there are concerns about the term KCP and its perceived benefits and limitations; (2) our project partners have made a shared commitment to leaving KCP undefined because of its multidimensional nature and multidisciplinary implications; and (3) the absence of a concrete definition of KCP facilitates flexible thinking, practical creativity, and values-based decision-making rather than rigid adherence to "one way" of pursuing KCP. Notably, KCP is not a means to an end; it is a process, and thus the principles that underpin that process instead of a singular definition may be more important in the outcomes KCP projects seek to achieve.

KCP in SakKijânginnaniattut Nunatsiavut Sivunitsangit

The origins and "power" of KCP

The first focused attempts to articulate a shared understanding of KCP in SakKijânginnaniattut Nunatsiavut Sivunitsangit are rooted in the project's 2020 kick-off workshop (Sustainable Nunatsiavut Futures, 2020). Along with the description and definition of transdisciplinarity presented earlier, the project at that time (2020) chose to describe and define KCP to foster and facilitate discussions within this broad conceptual arena. While the project intentionally leaves KCP undefined at this point in time (2022), it began from the viewpoint of KCP as

> a collaborative and social learning experience [that] may involve communities, governments and scientists. As an interactive process, it demands constant awareness of the plurality of perspectives held by actors (those involved in the knowledge co-production). Knowledge co-production can be readily applied to topics that are broad and can embody a range of world views and disciplines (e.g. local knowledge and academic disciplines).
>
> *(Sustainable Nunatsiavut Futures, 2020, p. v).*

This description was accompanied with the concise definition of KCP as "the collaborative and social learning process which involves communities, governments, scientists and institutional learning; this process embraces complexity and it does not classify knowledge into a hierarchy system" (Sustainable Nunatsiavut Futures, 2020, p. 1).

The nuanced yet contained description and definition of KCP provided a springboard for the project's 50 partners to begin interrogating, negotiating, and planning for the inherent complexities of transdisciplinary KCP in the context of rapid climate change in the Arctic and continual recognition of Inuit sovereignty. These processes involved overviews and panel discussions about the Nunatsiavut
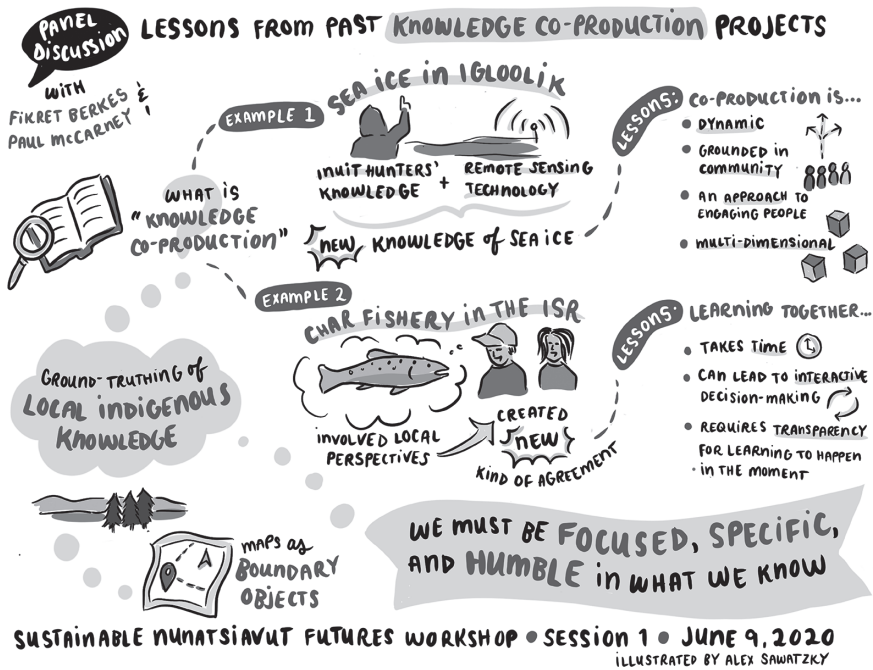
FIGURE 7.3   Graphic depiction of the lessons from past knowledge co-production projects from the SakKijânginnaniattut Nunatsiavut Sivunitsangit Kickoff Workshop panel discussion (June 9, 2020) (Artist: Alex Sawatzky).

context of the project, Indigenous research ethics, past KCP projects, the diversity of KCP tools and methods the project had and needed, and indicators of success (e.g. open communication) and failure (e.g. excessive objectives) in KCP endeavours. Critically, the fundamental question "What is knowledge co-production?" underscored each process (see Figure 7.3) and set the stage for iterative reflection on the meaning and purpose of KCP in SakKijânginnaniattut Nunatsiavut Sivunitsangit thereafter.

The importance of critical reflection on KCP was evident from the beginning of the project. Project partners started from different backgrounds with different levels and bodies of knowledge, such as diverse disciplines across the natural and social sciences (e.g. oceanography and geography), different scales of knowledge (e.g. individual and community knowledge), different institutional settings (e.g. non-governmental organizations, governments, and universities), different career stages (e.g. graduate students and tenured faculty), and different cultural contexts (e.g. Inuk, settler, and international). These diverse "starting points" highlighted the need for a process of mutual learning in which common understandings of KCP, its objectives, and the system in which it is taking place are developed. This process is ongoing and iterative, presenting partners with opportunities to constructively

and transparently grapple with KCP as a conceptually diffuse and ever-changing concept rather than as a rigid definition and set of ideas to which the project must strictly adhere. By casting aside static interpretations of KCP, partners are encouraged to question KCP as the foundation of this project. In this spirit, we interrogate the power and precarity of KCP in our project two years in.

Since summer 2020, the project has embarked on numerous formal and informal pathways to co-develop processes and goals around a shared understanding of KCP. The pathways have taken many forms, including values-elicitation exercises, literature reviews (Zurba et al., 2022) and synthesis (this chapter), KCP workshops, co-developed project guidelines, informal coffee chats and virtual get-togethers, and a working group for Early Career Researchers called *IlinniaKatigenniik* ("Learning together" in English). The activities allow project partners to account for the diversity of ways KCP is understood and challenged and how this diversity informs research by individuals in the project. In doing so, they have revealed the importance of relationships, reflection, ethics, respect, authenticity, and humanity to the project.

Through values-elicitation exercises led by Dr Max Liboiron, project members prioritized relational and reflective values such as *placing relationships first*, *open communication*, *being human*, *questioning assumptions*, *having fun*, and *ethical place-based engagement* as fundamental drivers of decision-making and collaboration in the project (Figure 7.4). Other activities, including a project-level KCP workshop led by Dr Matthew Wildcat, Renée Beausoleil, and Mandee McDonald, centred on crafting a vision of KCP for the project. This workshop produced seven KCP themes built on the meanings and aspirations that individual project members' ascribed to KCP (Figure 7.5). The

FIGURE 7.4   Graphic representation of the values guiding work package 1 in the Sak-Kijânginnaniattut Nunatsiavut Sivunitsangit (Sustainable Nunatsiavut Futures) Project as of January 19, 2021 (Artist: Ashton Rodenhiser, Minds Eye Creative).
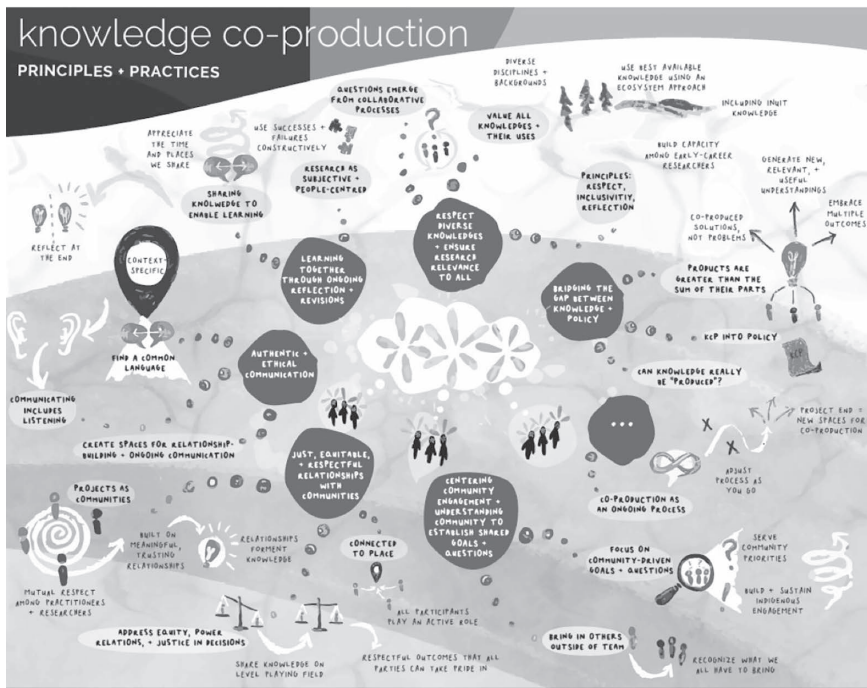
FIGURE 7.5   Graphic representation of the individual and collective vision for KCP in the SakKijânginnaniattut Nunatsiavut Sivunitsangit (Sustainable Nunatsiavut Future) Project as of May 4, 2021 (Artist: Alex Sawatzky).

workshop findings presented a multi-layered image of KCP that aligned with values identified by WP 1, shedding light on the critical role of relationships, learning, and transparency as core values and visions for KCP. Taken together, the values and visions expand the original conception of KCP in the project while reaffirming the philosophical commitment to questioning the concept in our work.

One path through which values and KCP themes are enacted and reaffirmed is through project engagement and support for Early Career Researchers. IlinniaKatigenniik was formed in 2020 flowing directly from these early conversations about the importance of trust and humanity for the project. The group is composed of Early Career Researchers such as students, postdoctoral fellows, and IRCs, including 9 of the 15 chapter co-authors, who focus on building relationships, seeking connections between research interests, and learning new skills together. The group was formed with two ideas in mind. The first was that forming relationships across the project, particularly in the era of COVID, would require a sustained and intentional effort. The second was an acknowledgement of existing and potential power dynamics within the project and a desire to identify clear actions to challenge and productively change power dynamics embedded in all research projects. For example, the group is also intended to frame a pathway

for Early Career Researchers to provide direct and collective input into the governance and design of the project in ways that meaningfully challenge traditional hierarchies of project governance that typically privilege the voices of senior faculty. Therefore, IlinniaKatigenniik is a space without hierarchy, where group members can share personal updates, explore their passions, and ask questions. As an active space of mutual learning that draws on the collective skills and interests of its members, IlinniaKatigenniik allows participants to anticipate, navigate, and proactively address the inherent challenges of KCP for Early Career Researchers in marine conservation (e.g. see Rölfer et al. [2022]).

The group's success is due in part to the fact that it has grown organically, with little attention to specific outcomes or "products" beyond creating a community for Early Career Researchers. The group has instead emphasized the process of relationship building by sharing vulnerabilities, personal experiences, humility, and humour. Group members experience the benefits of this process in real time. IlinniaKatigenniik member Rachael Cadman, a PhD candidate and chapter co-author, describes how the group has contributed to her work:

> *Every meeting enriches my work in a variety of ways. Hearing IRCs talk about hunting and traveling trips, or weekends spent with their family, recenters my mind in Nunatsiavut and I remember the real impact that our research has on people's lives. Hearing from group members out collecting data or formulating new ideas, I gain context for my own work. The group has sparked new ideas and given me new collaborators.*

Another group member, a PhD candidate and chapter co-author, Breanna Bishop describes arriving in Rigolet, Nunatsiavut, and meeting fellow IlinniaKatigenniik members Katrina Anthony and John Winters in person for the first time:

> *When I first saw them, I jumped up to hug them as if we had known each other for years. It took me a while to remember that we had never met in person before.*

The work accomplished in this group has enriched research and cultivated a sense of accountability and trust among group members. The group emphasizes the importance in seeing any process of knowledge production as a relational process that must both understand underlying relationships and actively work to establish new relationships suited to the particular context in which research occurs (e.g. defined by the actors, knowledge holders, histories, and places research takes place). While these activities may not traditionally be considered the "co-production of knowledge", our experience has been that they are the bedrock of working and *learning* together.

Reflections on "precarity" in KCP

The activities carried out so far capture momentary snapshots of "living" values, visions, and principles of KCP in SakKijânginnaniattut Nunatsiavut Sivunitsangit.

In other words, they may change and should be treated as embodying a specific moment in time in the project history.

Yet the values and visions also pinpoint key areas of critical analyses and uncertainty about KCP supported by collaborative relationships founded on trust, honesty, shared humanity, and communication.

First, within our efforts to generate, or co-produce, new knowledge, we have seen that these processes are informed by the different contexts and concepts we as individuals bring to the table. In turn, we have come to recognize the indispensable value of relationship building as a precursor to bridging, sharing and integrating individual experiences and knowledge in KCP spaces. For example, interpersonal dynamics and different cultural norms of communication may act as unseen barriers to "KCP". Caroline Nochasak, IRC and chapter co-author, noted that a "timid attitude" could be a weakness of KCP in that

> We can work more on not wavering if you have a question or if you have a point to bring up. We all want a supportive and growing environment. Asking/answering questions people have can help the greater group towards the main goal.

Observations about different forms of communication appear to stem from cultural and institutional differences between Inuit and non-Inuit partners and academic and non-academic perspectives. In traditional academic environments, scholars are often trained to assert their points through analytical dialogue and "expertise". This argumentative approach can be at odds with Inuit norms that may lean towards gentler or more understated forms of delivery and disagreement when asserting different views, particularly with respect to sensitive topics such as resource access that are rooted in colonial legacies. In turn, these realities risk inadvertently drowning out Inuit voices in the project when juxtaposed with academic jargon, such as the phrase "knowledge co-production".

Second, open and non-judgemental conversations about these cultural differences in workshops and informal group settings (e.g. coffee chats) have fostered significant levels of trust. This trust has led many partners to independently suggest the project may benefit from moving beyond KCP or substituting it with a new term to represent our form of collaboration. In particular, discussions about the name and meaning of KCP and analogous phrases have generated concerns and uncertainties with diverse project partners. These concerns have taken two forms: The phrases "knowledge co-production" and "co-production of knowledge" are inaccessible to many, whether academic or non-academic; and the phrases implicitly focus on an end product, rather than a commitment to a process of working together.

As phrases, "KCP" and its variations are often perceived as academic jargon. The term originates from the social sciences, meaning that a subset of academics in the project is comfortable discussing the KCP literature and discourse. On the one hand, the frequent references to, calls for, and in-depth conversations about KCP can be alienating for many project team members, such as natural scientists

who are eager to contribute to KCP but intimidated by its conceptual weight. On the other hand, social scientists may be assumed to have a full understanding of this transdisciplinary domain of social inquiry, placing its failure or success in the hands of few individuals who are equal members in the mutual learning processes framing the project. This tension is productive in that it catalyses ongoing and iterative reflection that is philosophically aligned with KCP as a normative stance and research process. Yet the tension similarly reveals how KCP can establish a precarious collaborative foundation when it is purposefully and iteratively invoked as a cornerstone of how and why we work together.

The collaborative barriers posed by "KCP" are also maintained by its focus on "production". As one of the keywords in this initialism, "production" elicits thoughts of a factory production line; it is very mechanical and exploitative. It also implicitly focuses on an end "product", rather than a commitment to a process of working together. Partners at multiple levels of the project have raised the question, "To what degree is new knowledge 'produced' through this process?", largely because many perceive our work as processes of weaving different knowledge systems. Dr Eric C. J. Oliver, a Labrador Inuk, professor of oceanography, and chapter co-author, noted:

> The "pointy end" of all this transdisciplinary/KCP work is the process, the hard work that we are all putting in and getting value from, is the process, not the product. If we get the process right, then the product/outcome should flow naturally from it.

Other Inuit project team members have stated that IK is not "produced" but an extension of worldviews and experiences built on the land, water, and ice they call home. For these reasons, some project members, such as Mary Denniston, NG Environmental Protection Analyst, project member, and Labrador Inuk, have suggested new terms such as "knowledge unification" may more appropriately depict the unique nature of our collaborative experience and goals.

Third, diverse communication styles and ambiguities around the term "KCP" and its focus on "products" are amplified by real-world time constraints, events, and different paces in which partners and sub-projects operate. The catalyst for SakKijânginnaniattut Nunatsiavut Sivunitsangit was to find new and transformative paths for science in Nunatsiavut. Yet the ambitious goals of sustainability transformations, transdisciplinary research, and broad structural change require substantial time investments that will likely surpass academic and government funding cycles and allotments. For example, this project is operating on a six-year timescale framed by the realities of the COVID-19 pandemic. As noted by Megan McLaren, project manager and co-author:

> A foundational aspect of KCP is having and developing solid relationships. Figuring out how to build new relationships, in the timescale of a research project, without having time face-to-face, is a huge challenge [due to travel restrictions, other logistic

constraints]. Even more so when many project team members are living in an area with poor internet connectivity, so video calls can be a challenge. This is a challenge both in relation to the core project team, but also in establishing community representation and voices in the project.

In other words, limited in-person communication and collaboration challenge the ability of team members to foster their aspired values for this KCP system, such as building trust and connection. A suite of geographic, seasonal, technological, and public health barriers (e.g. international team members and COVID-19) contribute to the inadvertent misalignment or purposeful reprioritization of work flows for concurrent projects, such as cancelled field visits to Nunatsiavut from COVID-19 (Petriello, Zurba) and prioritizing accelerated field schedules over other seasonally independent work to avoid unsafe ice conditions from climate change (Anthony, Nochasak, Winters, Winters). Taken together, these examples show how pluralism, "production", and real-world problems are both key components of KCP and challenges to enacting its potential.

Conclusion

Our case study does not prescribe a specific way of "doing" KCP. However, it demonstrates why KCP is a powerful yet precarious term and concept in collaborative spheres. We have shown that the SakKijânginnaniattut Nunatsiavut Sivunitsangit project has embarked on a KCP path paved with efforts to establish, maintain, and affirm relationships with project partners across social sectors and knowledge systems. This approach to KCP is similar to the recently proposed mode 5 of co-production (*Navigating differences*) in that this project has currently "placed a stronger emphasis on managing processes of relating together, learning and empowerment over producing and transferring scientific knowledge about human-ecosystem interactions" (Chambers et al., 2021). Furthermore, the processes of questioning the KCP assumptions to maximize the project contributions to community suggests the project is adopting an *empowerment lens* to frame its philosophy and objectives, which Bremer and Meisch (2017) describe as a lens that "looks at the ways co-production recognizes and empowers traditional environmental knowledge (TEK) systems" (p. 10). Lastly, the values, visions, approaches, and reflexivity outlined in our case study suggest that the multiple actors in this project support and reaffirm the importance of *co-productive agility* (Chambers et al., 2022) in KCP for sustainable seas.

Conversely, the case study also reveals that KCP may not be the most appropriate frame for all projects, even those that are founded on notions of co-producing knowledge, transdisciplinarity, and transformative solutions. At this stage in the project, we have found that "precarity" in KCP emerges through efforts to formulate shared understandings of its meanings, the social science lens and assumptions through which KCP is defined and operationalized, and the realities that place-based collaborative research does not occur in a vacuum sealed off from the world

around it. Our observations and experiences echo recent considerations for carrying out KCP through global networks, such as how team members are supported and convened through KCP (Schneider et al., 2021). Early Career Researchers, for example, may be more likely than other partners to confront distinct barriers to productive participation with knowledge co-production at different project scales, from individual to institutional levels (Rölfer et al., 2022). We recommend that research groups that are drawing from, or developing, KCP models leave room for deconstructing and/or reconstructing the term and its contributions to their collaborative efforts *during* their work together rather than as an afterthought. In this way, we aspire for our case study to be used to foster growth, reflexivity, and humanity in other collaborative projects.

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