



Community-led water governance: Meanings of drinking water governance within remote First Nations and Métis communities in Saskatchewan

John Bosco Acharibasam^{a,*}, Ranjan Datta^b, Margot Hurlbert^c, Elder Sharon Strongarm^d, Elder Ethel Starblanket^d, Elder Denis Mckenzie^e, Elder Veronica Favel^e, Reah Starr^d, Victor Starr^d

^a Department of Humanities, Mount Royal University, Canada

^b Community Disaster Research at the Indigenous Studies, Department of Humanities Mount Royal University, Canada

^c Johnson-Shoyama Graduate School of Public Policy, University of Regina, Canada

^d Star Blanket Cree Nation, Canada

^e Cumberland House Town, Canada

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ABSTRACT

Access to safe drinking water remains a significant challenge for many Indigenous communities in Canada, particularly for remote communities. This stems from historic colonial practices of water governance that have relied on Western worldviews and excluded Indigenous Peoples. Using an Indigenist research framework and a Community-Based Participatory Research design, we, as Indigenous and non-Indigenous collaborative research team wanted to learn from remote Indigenous communities, including Star Blanket Cree First Nation and the Cumberland House Village at the Treaty 4 and 5 territories (known as Saskatchewan) that have not been adequately represented in water governance. Following this, we used storytelling and deep listening to engage seven Elders and knowledge-keepers from the two communities. The findings show Indigenous People have spiritual and historical worldviews and practices surrounding water and its governance. Promoting Indigenous worldviews in water governance is critical to enhancing access to safe drinking water within the two communities. Therefore, reviving and reconnecting Indigenous drinking water governance promotes community healing and water protection. Insights from this paper propose a meaningful bridge between Western and Indigenous perspectives and the capacity to govern water through deep and complex practices and meanings of water governance.

1. Introduction

Despite their invaluable contributions to sustainable water management practices and their deep understanding of the interconnectedness between humans and the environment, the Indigenous worldviews are still largely overlooked. Following this, access to quality drinking water remains a significant challenge for Indigenous communities in Canada (Bakker and Cook, 2011; Bharadwaj and Bradford, 2018). Compared to non-Indigenous populations, evidence shows Indigenous communities are 90 times more likely than non-Indigenous communities to be without running water (Boyd, 2011; Duignan et al., 2022). Especially in Saskatchewan, remote Indigenous communities still live under water advisories (Saskatchewan First Nations Water Association, 2023). This article addresses the challenges of two remote Indigenous communities, the Star Blanket Cree Nation (SBCN) and Cumberland House

Village (CH), in accessing safe drinking water. Our study contributes to the efforts to build significant momentum to shift the inertia of settler colonial water governance systems by highlighting the challenges these two communities face with current water governance regimes.

Studies show several factors account for Indigenous communities' water inequities (Bharadwaj and Bradford, 2018; Boyd, 2011; Datta and Hurlbert, 2020; Duignan et al., 2022). However, the most prominent among these factors has been the marginalization of Indigenous voices and worldviews in water governance decision-making processes (Bharadwaj and Bradford, 2018; Bradford et al., 2017; Goretsky, 2021; Laborde and Jackson, 2022; Mora Johnston et al., 2022). Several studies on water conclude that Indigenous worldviews about water are holistic and differ from mainstream Western worldviews on water (Chiblow, 2020; Datta et al., 2022; Datta and Hurlbert, 2020; Wilson and Inkster, 2018). Wilson and Inkster (2018), for example, observed, "Indigenous

* Correspondence to: Mount Royal University, 307-107 Reindeer Road, Saskatoon, SK S7K 4W8, Canada.

E-mail address: joa970@mail.usask.ca (J.B. Acharibasam).

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peoples often view water as a living entity or a relative, to which they have a sacred responsibility" (p. 516). Laborde and Jackson (2022) further suggest these ontological differences between settler worldviews and Indigenous water worldviews extend beyond perspectives to include differences between realities. As a result, Indigenous water ontologies and realities are centred on strong respect for water and other non-human relatives (Bradford et al., 2017; Goretsky, 2021; Laborde and Jackson, 2022; McGregor, 2012; Wilson and Inkster, 2018). On the other hand, Western settler communities view water as a resource that can be owned, managed, and exploited (Wilson and Inkster, 2018). Based on this, scholars have described the continuous marginalization of Indigenous water epistemologies, where the social and spiritual understandings about water are often marginalized from water governance decision-making as an epistemic injustice that must be challenged (Hurlbert, 2022a; Linton and Budds, 2014; Wilson and Inkster, 2018).

Indigenous communities having jurisdiction over water is important to address access to safe drinking water. According to Dudgeon (2017), understanding Indigenous Peoples' histories and cultures provides a much broader perspective for addressing some of the challenges Indigenous communities face. The point that needs to be made clearer in water governance policy discussions is that before the imposition of current water regimes on Indigenous communities, they had their water governance systems (sacred water rules and laws) grounded in their worldviews (see Craft, 2014). Although these Indigenous water laws were context-specific given that they emerged from the relationship between people and place, they had common features. These water governance systems were sacred, generational thinking, unwritten, passed down from generation to generation orally, and guided by the covenant of reciprocity (see Kimmerer, 2017) and Wahnkohtowin (although this is a Cree First Language term, studies (see; Cajete, 2004; Wildcat and Voth, 2023) show the concept resonates with other First Nations). Wahnkohtowin is the principle of seeing all creation as relatives (Wildcat, 2018). Hence, allowing both humans and non-human relatives to have equal access to safe water reciprocally. The Wahnkohtowin principle of using gifts from Mother Earth, including water, has been described as an honourable harvest (Kimmerer, 2017; Kimmerer and Smith, 2022). These water governance systems were also based on natural spiritual laws (McGregor, 2012). They were gendered with Indigenous women playing leadership roles in water governance (Hanrahan, and Mercer, 2018; Latchmore et al., 2018; O'Bryan and Harriden, 2023). These governance systems were "both given and limited by the Creator and include laws of stewardship and reciprocity with nature that Indigenous people cannot alter or narrow, and cannot be altered or narrowed by other humans, governments or their laws" (Hurlbert and Datta, 2022, p. 39). The lack of recognition for these water laws has led to the current water crises within remote Indigenous communities (Bharadwaj and Bradford, 2018; Bradford et al., 2017; Goretsky, 2021; Wilson and Inkster, 2018). For instance, the lack of recognition for sacred Indigenous water laws in current water governance regimes is highlighted by the Water challenges in the Cumberland House Village, where hydropower dams have impacted access to safe drinking water for both community members and more-than-human relatives. Additionally, water governance decisions have focused on short-term solutions and lack intergenerational thinking.

Given this context, the epistemic disparities in water governance are critically examined in this paper as epistemic resistance (see; Medina, 2013). Medina noted that any form of epistemic injustice, including epistemic marginalization must be resisted by using our epistemic resources to change the normative structures that sustain those systems. Importantly, Wilson and Inkster (2018) conclude, "Working towards meaningful water governance alternatives will necessarily involve prioritizing Indigenous ontologies, epistemologies, and forms of governance" (p.518). Collaborative water governance systems that prioritize Indigenous peoples' voices, water laws, sovereignty, and practices are needed to inform policies around water (Bradford et al., 2017; Goretsky, 2021; McGregor, 2012; Wilson and Inkster, 2018; Hurlbert, 2022a). As

Hurlbert and Datta (2022) observed, the signing of treaties to share the Land and resources with settlers did not mean Indigenous Peoples agreed for their own governance systems to be relegated to the background, dismissed, and subsumed under settler governance structures. What we are arguing for in this paper is not 'to let Indigenous People into the tent of white people' approach to water governance, but rather a system of water governance that respects Indigenous water laws within their territories as equally valid and not to be marginalized or subsumed under current water regimes (see Craft, 2014). Hurlbert (2022a) observes there exists an opportunity within water governance to promote Indigenous People's sovereignty and self-determination.¹ Like health, Irvine et al. (2020) argue for the transfer of water governance to Indigenous communities to allow for greater control over their water priorities and needs. Indigenous People do not want their water epistemologies to be subsumed under settler water governance systems. The new water bill, Bill C-61: First Nations Clean Water Act, seems to finally be moving in this direction of allowing Indigenous People greater autonomy over water but as evidence shows there are still gaps as the bill does not clearly define the nature of Canada's relationship with First Nations (CKOM News Staff, 2024; Stefanovich, 2023).

Self-determination is a commitment that Canada has already made in multiple ways including the recent BC commitment to implement UNDRIP (Bankes, 2021). Without a pluralist approach to water governance, is impossible to achieve Indigenous self-determination. It is not possible to respect Indigenous self-determination unless they have power in water governance and our paper shows how this can be achieved. This understanding is critical to developing collaborative water governance systems in the Star Blanket Cree Nation (SBCN) and Cumberland House (CH).

We aim to promote Indigenous perspectives on drinking water governance and protection within Indigenous communities. The paper starts with the researchers' positionality detailing our commitment to the relationships with the Indigenous communities. Next, it outlines the methodology adopted and how data was collected and analyzed. Further, the results from the study are presented, after which the discussion and conclusion section follow.

2. Positionality

As a collaborative (Indigenous Elders, Settler, and racialized scholars) community-based and anti-racial researchers working with Indigenous, Black, and racialized immigrant communities for the last 15 years in Canada. Our current work is also based on our long-time relationships with Indigenous communities across Saskatchewan and Alberta, exploring and learning from Indigenous worldviews in water governance. We are guided by a relational theoretical research framework (Datta, 2015, 2018). Our relational theoretical framework helped us to understand our relational responsibilities to our research and co-researchers. Most of our research work is community-engaged according to community needs and priorities.

This article emerges from a study that takes a Wahnkohtowin research approach to explore community drinking water resilience to support Indigenous Peoples' right to self-government and self-determination. The aim is to achieve Indigenous water reconciliation. Wahnkohtowin is a Cree First Nation law to respect and honour all relations, including natural systems. According to Wildcat (2018), Wahnkohtowin can be understood from three angles, including being related to human or non-human relatives. Secondly, the scholar observed that Wahnkohtowin is also "a worldview based on the idea that all of existence is animate and

¹ We use the terms Indigenous sovereignty and self-determination as the power of Indigenous People to control their own destiny, including the right to preserve their distinct identity, traditional practices, culture, religion, language, spiritual belief; educational rights; self-determination, and jurisdiction over Land resources including Water management among others (Shrinkha, 2021).

full of Spirit" (p.14). The third meaning of Wahkohtowin is that "there are proper ways to conduct and uphold your relationships with your relatives and other aspects of existence" (p.14). This means that as humans, we are related to the rest of creation, and it is our responsibility to foster a good relationship with the rest (Little Bear, 2000; Wildcat, 2018). Although a Cree Word, Wahkohtowin resonates with other First Nations, especially its kinship or relational principles (Cajete, 2004; Wildcat and Voth, 2023). Given this background, our positionality in this research contributes to fostering this relationship and achieving water reconciliation. As Hurlbert (2022b) concluded, no matter how small the role is, "All Canadians have a role in the process of reconciliation" (p.1).

3. Theoretical framework

We used an Indigenist theoretical framework to guide the research (Datta, 2022; Rix et al., 2019). This theoretical framework creates the space for sharing sacred water stories and healing. As Dei (2013) concluded, "for the colonized and oppressed, Indigenous research can and must be a healing process" (p. 31). Adopting an Indigenist research framework, we learned about the challenges the co-researchers faced with the lack of access to safe drinking water and the gaps in current water governance regimes. This theoretical lens allowed us to centre the current water crises within Indigenous communities under the broader context of Indigenous sovereignty and self-determination. This research framework created the space to advance Indigenous water epistemologies and ontologies within research (Rix et al., 2019). Therefore, Indigenous epistemologies helped us to subvert the continuous domination of water governance by Western knowledge. It also allowed for building trustful relationships with co-researchers by privileging Indigenous voices (Datta, 2022; Saunders et al., 2010). Prioritizing Indigenous voices is key to honouring Indigenous water epistemologies and reconnecting with culture. Importantly, this theoretical framework created the space for healing by sharing water stories.

Following the Indigenist theoretical framework, we used a community-based participatory research approach (CBPR). Crucially, the CBPR approach helped equalize power imbalances within research, build trust between researchers and communities, and foster a sense of ownership over research (Castledan et al., 2008). In line with this, all stages of the study, including the research design, data collection, analysis, and dissemination of knowledge, were community-led. The community guided and directed this research through the Community Knowledge Committee (CKC) and facilitated by the Community Research Assistant (CRA). The CRA led the recruitment of co-researchers and is a co-author of the paper. Overall, the CRA ensured the research followed community protocols and was conducted ethically. Community members and the knowledge they bring to every aspect of the project are valued in this project. As Dawson et al. (2017) observed, "CBPR encompasses collaborative research endeavours that prioritize the needs of the community" (p.6). Indigenous Knowledge and teachings have also informed the research through CKC engagements, data analysis, and Knowledge mobilization processes. The study received ethical clearance from [The University] ethics board and followed community protocols within SBCN and CH.

Our Indigenist and community-based approaches address water governance, quality and quantity, challenges within two remote Indigenous communities in Saskatchewan.

3.1. Star Blanket Cree Nation (SBCN)

The Star Blanket Cree Nation is located on Treaty 4 territory and the Traditional Territory of the Cree, Dene, Nakoda, Lakota, Dakota, Saulteaux, and Homeland of the Métis Nation. The community is in the Qu'Appelle Valley and is part of the File Hill Qu'Appelle Tribal Council. Safe drinking water remains a major challenge for this community as the community is currently under a Boil water advisory. The community has

been under a long-term water advisory since 2007 (Pearce, 2020). As a result, most community members still buy their drinking water from out of town. Although the Canadian government is building a second water treatment plant to provide clean drinking water, community members report that most houses still have old copper pipes. Therefore, the new water treatment plant may not entirely address access to safe drinking water within their community.

3.2. Cumberland House Village

Located on Treaty 5 Territory Cumberland House Village is the oldest community in Western Canada. The community is located on the Saskatchewan River Delta, the second largest inland delta in North America, covering an area of about 10,000 km. The Cumberland House water crises highlight the environmental issues that have been affecting the Saskatchewan River Delta for many years. The impacts of the hydro-power dams on this community are well documented (see; Abu, 2017). Evidence shows these dams have altered the delta's hydrology, including the natural water flow and flood regimes, thereby impacting the communities downstream. Specifically, Abu (2017) stated that since the E. B. Campbell dam began operations in 1963, the people of the community of Cumberland House downstream from the dam have been impacted in several ways including unpredictable water levels, reduced access to harvesting sites, and the destruction of livelihoods. Although the community is not under a long-term water advisory, the community still faces limited access to drinking water for community members and the more-than-human community.

The Cumberland Village has declared a state of emergency in October 2023 due to low, and unsafe, drinking water levels in the local reservoir (Mandes, 2023). The drinking water reservoir which is drawing from the Big Stone River is critically low. In response, the Saskatchewan Government through Saskatchewan Water is recommending the drilling of groundwater to supplement the water in the reservoir to which community members object. The community members observe the groundwater is not safe as they had previously had ground water in the 1960 s which they could not consume. Also, the neighbouring Cree nation, which relies on groundwater, is currently facing water quality challenges. Following this, the community members observe the lack of long-term thinking and Indigenous voices in water governance is the reason why the community is experiencing this water shortage in the first place. According to the Elders, short-term efforts have been made in the past to solve the declining water levels in their reservoir. In 2021, a weir was built in response to the water crisis and 2 years later they are in water crises again. These efforts have been easy-fix short-term solutions. With all short-term solutions, the community members observe the government does not think about the future seventh generations. This reflects the differences between Indigenous ways of thinking and Western worldviews in land and water resources management. Indigenous communities think about seven generations from now and this solution does not journey towards protecting the seventh generations.

3.3. Methods

Following the Indigenist research methodology, we used research methods, including traditional storytelling and deep listening. All these methods are respectful of Indigenous knowledge and practice. Through these methods, we learned from seven Indigenous co-researchers, four Elders, and three community members from Star Blanket Cree Nation (SBCN) and Cumberland House (CH). Partnering with the two remote Indigenous communities, we explored collaborative water governance. Three women, co-researchers, identified as Métis, while the remaining four (three women and one man) identified as Cree First Nation. All are co-authors of the article. A relational selection method was used from our ongoing relationship with community members to get guidelines and recruit co-researchers for this research. The responses represent the views of both groups. Within Indigenous communities, Elders play

significant roles as Knowledge Keepers whose knowledge can contribute to challenging and reshaping current water governance systems.

Individual and collective traditional storytelling methods align with the Indigenist methodology, and the CBPR approach was adopted as a research method by honouring the oral sharing of Indigenous Knowledge and allowing co-researchers to own the research (Datta, 2018). According to the Indigenist scholar, "Traditional storytelling is a significant way of expressing Indigenous knowledge, culture, and oral traditions" (Datta, 2018, p. 36). Therefore, it promotes respect, relationships, holistic understandings, collaboration, reciprocity, spirituality, and humility (Datta, 2018; Kovach, 2009). One-on-one water storytelling sessions were held with seven co-researchers to share their views on collaborative water governance. The storytelling sessions were organized around nine open-ended questions. All the questions were collaboratively designed with the Community Knowledge Keepers and the Community Research Assistant.

We used the term co-researchers to emphasize that research participants played active roles in the research beyond research participants as they hold knowledge, and we, as academic researchers, get to learn (Pope, 2020). The research participants played roles beyond providing informed consent (Green and Mercer, 2001). As a result, the co-researchers were involved in all fundamental aspects of the research process.

3.4. Data analysis

The data analysis process was a collaborative story-learning process engaging our co-researchers in our analysis process. This analysis process aimed to prevent the researcher's voices from dominating those of the co-researchers (Birt et al., 2016). We first adopted a thematic analysis approach to analyze the data. Thematic analysis is "a form of pattern recognition within the data, where emerging themes become the categories for analysis" (Fereday and Muir-Cochrane, 2006, p.82). Braun and Clarke (2006) observed it "is a method for identifying, analyzing, and reporting patterns (themes) within data" (p.6). The research adopted a thematic analysis approach because it provides "a rich and detailed, yet complex account of data" (Braun and Clarke, 2006, p. 5).

The analysis process began with the researchers manually transcribing recorded stories. The transcripts were sent back to the co-researchers to confirm if we could meaningfully capture their (i.e., co-researchers) views and ensure accuracy. The next stage was manual coding and deductively categorizing codes (consisting of words and phrases) into sub-themes. Examples of some of the codes included collaboration, challenges, gaps, water governance, impacts, self-determination, and water worldviews, among others. Since we used individual storytelling, manual thematic analysis was adopted to understand the flow of our learning and organize stories into themes. These codes were also reviewed and approved by the co-researchers. The coding and categorizing of codes into sub-themes were done to reduce the data size for the collaborative analysis process. Thirteen sub-themes emerged from this process, including Water governance, Worldview, drinking water history, Source of pollution, Impacts, Health impacts, Current water situation, History, Future water concern, Challenges, Culture, Caring for water, and Water source. Table 1. Shows the sub-themes that emerged from the analysis process.

The above sub-themes were sent to all seven co-researchers for member checking. After this, the sub-themes were presented to a CKC as a PowerPoint presentation for further analysis. The presentation allowed the co-researchers to participate in the data analysis process. The researchers and CKC further categorized the sub-themes under major themes. The collaborative analysis process found four major themes, including Gaps in Western Water Governance Systems, Meanings of Water from an Indigenous Perspective, Community Water Sources and Current Threats, and Impacts of Unsafe Drinking Water on the Community. For example, the sub-themes of caring for water and culture were categorized under the broader theme of Meanings of Water

Table 1

Themes.

Major themes	Sub-themes
Gaps in Western Water Governance Systems	• Water governance • Current water situation • Future water concern • Challenges
Meanings of Water from an Indigenous Perspective	• Worldview • Water source • Caring for water • Culture
Community Water Sources and Current Threats	• Drinking water history • History • Source of pollution
Impacts of Unsafe Drinking Water on Community	• Impacts • Health impacts

from an Indigenous Perspective. Again, the sub-theme of water sources and sources of pollution were also categorized under Community Water Sources and Current Threats. In line with our co-researchers request for their confidentiality to be maintained, actual names were not used with the quotes in the article. Table 1. Shows the sub and major themes of the research.

4. Results

Overall, the findings further highlight the need for collaborative water governance to improve access to safe drinking water. Currently, the more extensive Western water governance systems need to give recognition to Indigenous water laws and epistemologies. Our co-researchers suggested the need for Indigenous voices and perspectives in water governance, the history of drinking water within communities, the marginalization of Indigenous worldviews, health impacts, current water situation, source of pollution, future water concerns, challenges, and water source. The major themes of Gaps in Western Water Governance Systems, Meanings of Water from an Indigenous Perspective, Community Water Sources and Current Threats, and Impacts of Unsafe Drinking Water on the Community are examined more closely in this section. The themes emerged from the lived experiences of community members who have identified them as barriers to safe drinking water.

4.1. Gaps in western water governance systems

The marginalization of Indigenous communities in Western water governance is a barrier preventing Star Blanket Cree Nation and Cumberland House Village from accessing safe drinking water. Particularly, current water governance systems are not collaborative and participatory enough to allow for community members to have a direct say in water governance decisions. Unlike Indigenous water governance systems that take a bottom-up approach, the co-researchers reported that Western water governance has always taken a top-down approach within their communities. The top-down approach has, therefore, excluded community members from having their voices heard in water governance decision-making processes within the communities. As one co-researcher explained,

When it comes to drinking water governance, from my perspective, drinking water, like the governance of drinking water, is under a government mandate. Like a policy around it, they do the testing of this that the other, and for me, it's like the way that we govern is not by the top determining how things are going to roll out to the community or us as individuals. It's always been upside down. So, we start with community members or individuals, and they give us a mandate. They tell us this is what we see, this is what we would like. And so that's how we govern and it's not just certain individuals in a community that governs, it's all of the community that has a say in the government or in the governance like yes. And so, for me, it's just

like, we've got a group of individuals that don't engage with me. They [government] don't talk to me but are making rules and regulations and doing things. That they don't have the mandate to do, they're just going and doing it for us. And as we know, we've always been patted on the head and treated very paternalistically so that we know what's best for you. And so, we're going to do it for you, and I think in this fashion because of how we've been taught because of our knowledge and upbringing. Things that have been stories that have been imported on us. We look at things very differently (co-researcher 1).

Collaborative and participatory drinking water governance that creates the space for community involvement and bottom-up decision-making rather than top-down directives from government authorities must be implemented. Following this, water governance within the two communities should begin with input from community members based on their needs and perspectives. The community member highlights a desire for more participatory governance processes where communities have a direct say in the decisions that affect them, rather than having decisions imposed upon them by distant authorities. Additionally, they mentioned a sense of frustration with paternalistic attitudes from government officials who believe they know what's best for the two communities without consulting them. By fostering greater transparency, accountability, and inclusivity in water governance processes, it can lead to ensuring access to safe drinking water.

In providing safe drinking water for Indigenous communities, water governance must also address water availability for all creation. Maintaining holistic cultural practices, including traditional food sources, depends on access to safe drinking for all species. Based on this, a second co-researcher stated how the voices of non-humans and different species of animals have been excluded from water governance decision-making within their community. The health of all these species is key to the community's culture and way of life. Traditional activities of hunting, trapping, and fishing are key to their food sovereignty. Based on this, the co-researcher noted,

I look at it through another lens, we know the importance of water. We always hear that water is life. Which and you know, sometimes we take that for granted. I know we have a water drinking system here, you know, that runs through the tap, and it's clean water for us, it's treated water. But out there in our delta and what's coming downstream? Well, who manages that? You know, who manages that for not only us, but you know the actual ones that are unspoken for that don't have a voice, those are the animals. And, you know, we follow a cycle of life. Within our, ways we've been taught, and, you know, we trap, we fish we hunt and it's a sustained life. In order for us to keep on that path of life and teach our young ones, water is a very important priority (co-researcher 6).

This view further highlights the interconnectedness of human communities and the broader ecosystem. To two communities, everything is connected. It is important for water governance systems to not only manage drinking water for human consumption but also consider the health and well-being of the natural environment, particularly the Saskatchewan River Delta which sustains diverse ecosystems. Following this, a holistic approach to water governance that considers the welfare of both humans and non-humans is important to both SBCN and CH. A holistic understanding of water has been lacking in current water regimes.

In addressing the gaps in current water governance systems collaborative water governance is crucial. The co-researchers recognized the need to take the lead in the water governance decision-making process and not to be receivers of policies that come from the top of the hierarchy without meaningful consultation. The top-down approach adopted by current water governance regimes has not and does not build trust within these two communities. Moving forward, Indigenous Peoples' voices must be respected in water decision-making processes. As one co-

researcher observed,

I think that when we set up any table or any sort of discussion, we need to establish Equality. That's one of the things that I found when I went to the water meetings here in my little town. Two Indigenous People were sitting in the room and I understand it's a community consultation but there was not one Indigenous person sitting as a facilitator or as a presenter our Indigenous Knowledge was not brought to the table. It was all around. This is what we need, and this is how we're going to do it. So, it was more like a presentation. There was some discussion, but there again there were two of us in the room that tried to bring the Indigenous perspective to the table and I felt very patronized. It was like I was patted on the head saying—thank you for your comments— but you know there was never any discussion further from what I had said. So, I think absolutely, we need to establish some fair and equitable processes. I think they need to take into consideration the role of Indigenous People in conservation. In being stewards of the Land. In our traditional ways of knowing. They never take that into consideration either (Co-researcher 1).

It is important to ensure equity and inclusivity in water governance decision-making within the two communities. Given their deep connection to land and water, Indigenous People possess valuable traditional knowledge about conservation and stewardship. The lack of Indigenous representation among facilitators and presenters at water meetings reflects a broader issue of marginalization and exclusion that Indigenous communities often face in decision-making forums. When Indigenous voices are not adequately represented or valued, it undermines the principles of equity and inclusivity in water governance processes. To address these issues, there's a need to establish equitable processes that prioritize Indigenous People's participation and incorporate Indigenous worldviews into water governance decision-making. This will involve inviting the community members to the table and ensuring that they have meaningful opportunities to contribute lead discussions, and shape outcomes.

Additionally, the need for collaborative water governance is critical to the communities' sovereignty and self-determination. The community members reported shortcomings in current water regimes, including their paternalistic approach to decision-making, the lack of respect for the voices of all creation, and the lack of representation in water governance leadership. Increased involvement in water governance leadership and decision-making is key if collaborative water governance structures are to be achieved. Importantly, centring Indigenous sovereignty and self-determination in water governance provides a broader context for examining these communities' water crises. Collaborative water governance maintains their knowledge and way of life. For example, access to safe drinking water is key to food sovereignty within Indigenous communities.

4.2. Meanings of water from an indigenous perspective

Indigenous worldviews about water differ from mainstream Western Canadian worldviews. As reported by the co-researchers, water is a sacred gift; it is part of the creation story and the lifeblood of Mother Earth, which gives life to all forms of creation. The community, therefore, has a spiritual connection to water that must be respected. This worldview includes an Indigenous water governance system, water laws, and knowledge guiding water usage within communities. This spiritual connection to water is an essential aspect of the Indigenous water governance system that is not found in current water regimes in the two communities. These were centred on holistic Indigenous Knowledge and practices. Understanding these worldviews is critical to designing a collaborative water governance system. Especially given that residential schools have robbed some of our co-researchers of knowing these stories. Commenting on this, one of the coresearchers stated that,

Well, the whole, there's a creation story in regards to water and our ceremonies come from that where we can sing a water song in ceremonies because that water, we are blessed with it to give us life. And so, from that creation song, it comes from the stars like the Big Dipper and the Little Dipper. Our spiritual connection and belief are from that and what our ways are like, we can't forget where the whole water story and creation story come from. And even though I don't know that story, I know there are people in other First Nation people communities like in Manitoba and Alberta who have those stories and are willing to start sharing with us. And I would like our community to understand that connection because then it would be more meaningful and then we wouldn't use our water in a disrespectful way. We'd be able to conserve in our homes, you know, things like that are important for us to learn about and to keep in our knowledge. You know that we can't disrespect the gift of life which is, you know, part of the water (co-researcher 4).

The co-researcher's view highlights the deep spiritual and cultural significance of water within Indigenous communities, emphasizing the interconnectedness between water, creation stories, and traditional ceremonies. The belief that water is a sacred gift, expressed through creation stories and ceremonies is critical to current water governance systems within the two communities. This belief further underscores the respect that the communities have for water as a source of life. The connection between water and spiritual beliefs is fundamental to Indigenous worldviews and informs cultural practices and relationships with water. By understanding and honoring these connections in water governance, communities can cultivate a deeper appreciation for the importance of water and the responsibilities associated with living well with water. The centring of Indigenous perspectives and knowledge in water governance processes can create more inclusive and sustainable approaches that benefit both communities and the environment.

Reclaiming these stories in water governance is key to collaborative water governance. Importantly, water is culture and a way of life for the communities. In our research, we discovered that the culture of the community is connected to water and the gifts it provides to all lives. These gifts sustain all life and are important for the socio-cultural health of the community. This worldview is key to creating collaborative water governance centered on Indigenous communities' understanding of water. Indigenous water epistemologies can support Indigenous People's sovereignty and self-determination.

Additionally, integrating generational thinking and creating meaningful change to preserve traditional ways of life and protect water resources is important for the two communities. Currently, water governance systems need to address generational thinking. The two communities' water worldviews are deeply rooted in the preservation of their cultural identity and heritage. Given this context, another co-researcher asked,

How can we change that? How can we make a difference? What we experience now, like 20 years down the road our grandchildren are they gonna be able to have that same experience? Living the life of trapping and fishing and hunting, you know, it's a way of life. And if we were to lose that. You know, it's part of our identity too as a people. This is where we were, you know, raised and this is our life. Our way of life, it's a way of life like everybody else has their own ways of life. That is one big component of who we are and where we come from. So, it's a message that we need to share with others. We can't lose it. It's really important (co-researcher 6).

Collaborative water governance systems that promote sustainable resource management, cultural preservation, and Indigenous People's land and water rights have the potential to ensure that future generations have the opportunity to continue living the traditional way of life and maintain their cultural identity and connection to the land and water.

Unfortunately, current water governance often marginalizes

Indigenous worldviews about water. There exist challenges in bridging the gap between Indigenous perspectives on water and the current water governance systems, such as certification for working in water treatment plants. It is, therefore, important to recognize and respect both Indigenous knowledge systems and Western scientific approaches to water management. A co-researcher commenting on the sacred nature of water observed the difficulty in getting the government to understand their worldviews about water. According to co-researcher 5,

Water is sacred and I was told by Elders that our water is a spirit, and it's life. And without water, there would be no life. So, water is powerful. And in our ways, we believe water is the life blood of Mother Earth. So, that's what makes it such a sacred gift and it connects all life. And that's why water is so important to us. But the thing is, it is hard to get somebody in there [government] that believes our ways and also, you know, it's certified, because out here, that's one of our qualifications. If you have to be certified to work in the water plant. So we can all have good drinking water out here (co-researcher 5).

Working towards a more inclusive and equitable approach to water governance that respects Indigenous rights, values, and ways of knowing is crucial to the two communities. The co-researchers recognize the structures in the current water regimes that enhance the domination of Western knowledge in current water regimes. Further, highlights the need for collaborative water governance centred on holistic and spiritual water epistemologies.

4.3. Community water sources and current threats

Another important theme that emerged was the loss of the communities' historical drinking water sources. Within these historical sources are stories highlighting the lived realities of community members in accessing safe drinking water, water governance, the rules surrounding water usage, the community's connection to the Land, and the rest of creation. The co-researchers reported different drinking water sources, including Individual and community wells, sloughs, snow, river, and springs. Through this history, the co-researchers also reported the changes and threats that affected the quality of their drinking water over time. They reported the water was clean previously to drink, even when they got it straight from melted snow, rivers, sloughs, and wells. Water was cleaner than now, where community water runs through taps. The co-researchers also identified old pipes, agricultural runoff pesticides, and fertilizers as different sources of pollution. Particularly, these threats emerged from the different Land uses over time.

The degradation of water quality due to pollution and human activities, such as agricultural practices was reported by the community members. There were concerns about chemicals impacting the environment and water resources. Agricultural runoff, including fertilizers, pesticides, and other contaminants, can significantly impact water quality. These pollutants can enter water sources through surface runoff, leaching into groundwater, or direct discharge, posing risks to human health, ecosystems, and biodiversity. As one co-researcher commented,

For me when I was a child, you could just drink out of the river, with a cup, just drink from the river as you travel. But now you wouldn't, you wouldn't even go there, not with all the chemicals and things. We even think about the farmland in the southern part of the province and all the fertilizers and stuff they put into the ground year after year. That goes into the ground and goes into the water and eventually in the spring it runs off into the river systems (co-researcher 2).

Addressing the root causes of water pollution and implementing measures to safeguard water quality is critical to water governance in the two communities.

Exploring natural spring water sources as an alternative or supplementary water supply can offer several benefits, including spiritual

connection and access to higher water quality. Within the communities' drinking water sources also emerged spiritual connections to water that also needed protection. Spiritual sources of drinking water can sometimes be received through spiritual connection. Spiritual connections of drinking are key to water governance decision-making processes. Commenting on the spiritual sources of water, a co-researcher, for example, noted

what we're missing out on is that there is natural spring water that we need to start to find because that's part of the spiritual connection. To our belief that water gives us life. So, I would like to know where there would be a spring. Because that's naturally filtered. You don't need any kind of technology attached to it. And that's what I would like to find in my community, that natural spring water (co-researcher 4).

Adopting a collaborative and interdisciplinary approach to water governance can create the space for locating and accessing natural spring water sources that provide clean and sustainable water and also contribute to the spiritual and cultural connection to water within the community. Addressing the current water crises within Indigenous communities will require a holistic governance system that recognizes the spiritual sources of drinking water. Collaborative water governance allows for a spiritual understanding of water. Again, a comprehensive approach premised on nation-to-nation relations is needed to address the Land use threats to safe drinking water within the two communities.

4.4. Impacts of unsafe drinking water on community

It was also reported that the lack of recognition for Indigenous water governance systems impacts negatively on the health not only community members but also other non-human relatives. Addressing these health challenges will require a collaborative and holistic approach to protect water resources for the benefit of both current and future generations. The protection of water is crucial to ensuring the health of both community members and the aquatic ecosystems the communities depend. The co-researchers reported current water governance structures are failing to address some of the health threats related to water within their communities. Reported on some of the health threats including pollution they have observed in their water sources, the South Saskatchewan River Delta, one of the co-researchers said

you see all kinds of different things like we've seen fish with some growths and things on them. Different changes and the depleting animals that we have within the delta. Everything is going down. ... my husband was working out on a sturgeon project study, and he's seen great big bogs of sludge, pink kind of things, floating on the river. So, we know our water is not safe and we know it's poorly being looked after by the government. It seems like they don't seem to care after their dams. You know after that they don't seem to care what happens after the dam? But eventually, it's going to kill everything. So, I don't know if I've answered that properly (co-researcher 2).

The observations of fish with growths and other abnormalities, as well as sightings of sludge and pollution in the river, suggest potential water quality issues that can adversely affect ecosystems and the health of community members. These incidents underscore the importance of collaborative water governance for effective monitoring to prevent pollution and mitigate the impacts of human activities on water resources.

Given these challenges, the communities face adverse health impacts due to the lack of access to safe drinking water. The communities have seen a spike in health conditions, including diabetes, cancers, and skin diseases. One co-researcher commented,

Having good drinking water is very important. I want to mention that without it you have an increase in health problems. We've noticed a

big increase in diabetes, we don't know if that's linked with water or not, but we have our suspicions and then the cancers have grown like there are so many different things that have grown, health-wise (co-researcher 2).

The loss of Land-based foods, reduction in hunting/trapping, and low income/poverty leading to reliance on processed foods can cause diabetes. Collaborative water governance system will be crucial in addressing the root causes of health disparities in Indigenous communities. Water governance should empower the two Indigenous communities to reclaim control over their food systems and water including the revitalizing traditional land-based practices to improve health outcomes.

Additionally, exposure to contaminated water can lead to a range of health problems for community members. A second co-researcher who had experienced ill health resulting from the poor-quality drinking water observed

It affected me myself when I was there. I had to go to the hospital a few times with my stomach, I get bacteria or a parasite I think it was called, or something like that, and I had to get put on not antibiotics a few times. And then, my skin had been breaking out and I could each from the water. Yes, I don't know what it was but I had to see a dermatologist for that. It affected me that way (co-researcher 3).

Access to safer drinking water is key to promoting holistic health and wellness within these remote Indigenous communities. The co-researchers reported that the current water regimes have led to negative health outcomes affecting even the food on which the community members depend. Besides, the lack of trust that the government can address the situation is the worry that, eventually, all creation will be impacted by the lack of access to safe drinking water. The lack of access to safe drinking water can also have mental health implications for community members. The lack of water connection can have mental health impacts. Water is critical to most Indigenous ceremonies. Collaborative water governance systems are key to addressing these health impacts and rebuilding trust.

5. Discussion and conclusion

Access to safe drinking water is a critical issue that is key to Indigenous Peoples' sovereignty and self-determination. All the important cultural practices of hunting, fishing trapping and medicine picking that are critical for their sovereignty and self-determination are connected to water (Hurlbert et al., 2024). Access to safe drinking water is an important part of Indigenous Peoples' culture and way of life; it is key to their survival. As a result, collaborative water governance can play an important role in enhancing remote Indigenous communities' access to safe drinking water. The two remote Indigenous communities discussed here highlight the challenges with current water governance systems and the need for collaborative and participatory water governance systems. Our research findings showcased why we need to take responsibility to promote Indigenous water reconciliation and sovereignty. This can be achieved through the recognition of Indigenous People' sacred water rules. There needs to be a reframing of water governance systems and policy around Indigenous water worldviews. The safe protection and management of water can only be achieved when local water governance systems are centred on how the two communities perceive water. To Indigenous Peoples, water is sacred and must be respected (Wilson and Inkster, 2018). Our research indicates that shifting the inertia of settler colonial water governance systems towards collaborative and participatory structures, which prioritize Indigenous worldviews, will likely require a comprehensive approach. This approach must address systemic barriers and foster meaningful engagement, collaboration, and mutual respect between Indigenous and settler communities. We aimed to challenge the current state of water governance by acknowledging the lasting effects of settler colonialism

on two distant Indigenous communities. We developed trustful and meaningful relationships, supporting self-determination, and promoting community-led water governance. We advocate for environmental justice and equality and contribute to the decolonization and reconciliation of water governance.

This study explains why Indigenous community-led water governance can challenge settler-colonial static water governance structures. Specifically, we advocate for collaborative water governance systems that prioritize fairness and inclusiveness in water management within the two distant Indigenous communities. There needs to be a change in how water governance decisions and policies are made. As highlighted by Bradford et al. (2017), "Indigenous People have traditionally had a lack of voice, and little participation or significant representation at higher political points of authority to influence or sanction laws of water protection, regulation and enforcement on traditional territories" (p.269). Addressing what collaborative water governance would look like will involve recognizing sacred Indigenous water rules.

Our study advocates for existing Western water governance frameworks to take Indigenous laws and worldviews seriously, emphasizing the importance of recognizing and respecting the holistic Indigenous water laws. According to Hurlbert (2022), "Acknowledging Indigenous water meanings and rejecting settler views of water that subsume Indigenous water laws within settler-colonial society allows for pluralism" (p.37-38). Central to water reconciliation and the advancement of Indigenous sovereignty is the revitalization of culture and the reclaiming of Indigenous water narratives (Christian and Wong, 2017). Thus, situating water governance within the broader context of Indigenous sovereignty and self-determination offers a comprehensive perspective on collaborative water governance (Hurlbert and Datta, 2022; Hurlbert et al., 2024; Neville and Coulthard, 2019).

The current process of integrating Indigenous water worldviews into existing water regimes (see; Hurlbert et al., 2024; McKibbin, 2023), risks further entrenching Western dominance. Presently, Western worldviews prevail in water governance regimes due to the ongoing process of colonization, which marginalizes Indigenous water ontologies within settler water governance frameworks (McKibbin, 2023). The integration of Indigenous water worldviews into current regimes raises questions about which perspectives will be incorporated and who will control this process.

Given these complexities, collaborative water governance systems that address the challenges of reconciling Indigenous water ontologies with settler Western worldviews are essential for enhancing access to safe drinking water within the two Indigenous communities.

To promote environmental justice and equity in water governance, recognizing Indigenous rights and sovereignty as well as promoting meaningful participation and decision-making by Indigenous communities is critical. As Jackson (2018) observes, advocacy can play a crucial role for Indigenous communities undergoing water struggles. The current paternalistic nature of water governance has been questioned by the two communities demanding a bottom-up approach that is inclusive and community-led. Evidence suggests effective water governance systems can be achieved when a bottom-up approach that builds strong relationships with Indigenous communities is adopted (Irvine et al., 2020). The findings showed that within Indigenous worldviews on water lie cultural norms and values guiding access to water as a gift from Mother Earth. Studies have shown water governance systems become meaningful, good governance when they incorporate these norms (Bradford et al., 2017). A collaborative water governance system grounded in Indigenous worldviews considers water as sacred, takes a bottom-up approach, includes all community voices, including non-humans, addresses spiritual water sources, and considers water as a culture and way of life. Bradford et al. (2017) described these as Indigenous spiritually guided principles of water governance that include all the dimensions of nature. Understanding the spirituality of water is key to Indigenous water governance. Studies show Indigenous knowledge is received from different sources (Dei, 2000,2012). Based on this, Castellano (2000)

concluded that this knowledge could be obtained from the spiritual realm or based on empirical observations of natural phenomena. There are spiritual drinking water sources that need to be considered in current water governance systems within the communities. These spiritual meanings of water will unsettle Western knowledge domination of water management.

Western cultural values see water as a resource and humans as existing separately from water (Bradford et al., 2017; O'Donnell et al., 2023). In Indigenous community-led water governance "A relational approach to water law, therefore, is based on co-constitutive relationships and relatedness between people and place, but also between peoples" (Macpherson, 2022, p. 411). Similarly, our study shows cases within the two communities where water is sacred and part of their creation story. Communities suggested Indigenous water governance is needed for recognition, inclusion and participation in current water governance systems for the health and wellness of communities. Their sociocultural health is key to maintaining their fishing, hunting, and trapping culture, which is strongly connected to water. We learned that the water sources need to be more trusted because the two communities have a limited role in providing safe drinking water. As a result, Indigenous worldviews covering their culture's physical, spiritual, mental, and emotional dimensions are needed in water governance. The point is to recognize Indigenous water governance systems as valid and equal to Western water governance structures.

Given that the two water governance systems share different ontological positions, meaningful engagement can only be achieved by recognizing and respecting these differences; one must not be imposed on the other (Hurlbert and Datta, 2022; Maciel, 2014; Taylor, 1998). The key is to understand "that different knowledge can co-exist, that different knowledges can complement each other, and also that knowledges can be in conflict at the same time" (Dei, 2000, p. 120). For meaningful Indigenous water reconciliation to be achieved, collaborative water governance is crucial. Braided water governance systems may be needed (Hurlbert, 2022a). What collaborative water governance will look like will be dependent on the two communities. In the case of Cumberland House, for example, collaborative water governance can only be achieved by restoring the delta to what it used to be.

This study promotes Indigenous water governance on their drinking water management and protection. Our study challenged the current water governance regimes that need to center Indigenous water epistemologies into collaborative water governance systems. Indigenous community-led water governance can help achieve sovereignty and water reconciliation within Indigenous communities. The ongoing water governance barriers the two communities, SBCN and CH, face in accessing safe drinking water emerge from the continuous need for recognition of sacred Indigenous water laws in current water governance systems. Indigenous communities have a spiritual connection with water, which is key to water protection and management. Within their socio-cultural practices lie norms and values that regulate equitable access to safe water for all creation. Current paternalistic water governance regimes do not incorporate these important governance principles, cultural norms, and values. It is resulting in the current water crises faced by the two communities. Therefore, for water reconciliation to be achieved, we argue for a collaborative water governance system centred on Indigenous worldviews.

Author statement

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CRedit authorship contribution statement

Veronica Favel: Writing – review & editing, Writing – original draft, Supervision, Formal analysis, Data curation, Conceptualization. **Denise**

Mckenzie: Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Data curation, Conceptualization. **Ethel Starblanket:** Writing – review & editing, Writing – original draft, Supervision, Formal analysis, Data curation, Conceptualization. **Sharon Strongarm:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Karen LaRocque:** Conceptualization, Data curation, Methodology, Supervision, Writing – original draft, Writing – review & editing. **Victor Starr:** Writing – review & editing, Supervision, Formal analysis, Data curation, Conceptualization. **Reah Starr:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Data curation, Conceptualization. **Ranjan Datta:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **John Bosco Acharibasam:** Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Margot Hurlbert:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The researchers have no conflict of interest to declare.

Data availability

Data will be made available on request.

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