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Moving towards Effective First Nations' Source Water Protection: Barriers, Opportunities, and a Framework

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Abstract: It is well known that watershed-based source water protection programs are integral to the provision of clean drinking water. However, the involvement of Indigenous communities in these programs is very limited in Canada, which has contributed to the vulnerability of Indigenous source waters to contamination. Through a partnership with an Anishinaabe community, this research aimed to identify challenges and opportunities for communities and practitioners to improve the protection of Indigenous source waters in the province of Ontario. The methodology followed the Indigenous research principles of relationship, respect, relevance, reciprocity, and responsibility. Interviews and a youth focus group were conducted with Indigenous community members and practitioners from industry, academia, non-governmental organizations (NGOs), and government. Analysis was conducted using an iterative process to develop codes and themes in the qualitative data analysis software NVivo. Results indicated that issues with scale, jurisdiction, the concept of source water protection, representation, funding, and capacity impact efforts to protect Indigenous source waters. Hopeful recent developments and upcoming opportunities were identified, and a water protection framework for First Nation communities in Ontario was developed in partnership with an Anishinaabe water protection committee. Recommendations are provided to multiple sectors for moving forward respectfully, and effectively, towards the protection of Indigenous waters.

Keywords: indigenous knowledge; indigenous peoples; source water protection; water security; water governance

1. Introduction

Indigenous water insecurity is a serious issue impacting the health and wellbeing of Indigenous communities around the world [1–5]. In Canada, poor quality of drinking water has severely impacted many Indigenous communities across the country [3,5,6]. As of 15 February 2020, 61 Indigenous communities remained under long-term drinking water advisories despite ongoing efforts by the federal government to eradicate them [7]. While it has been established that watershed-based source water protection (SWP) programs are integral to the provision of safe drinking water [4,6], the involvement of Indigenous populations in watershed-scale SWP programs in Canada and elsewhere is extremely limited [8]. In Ontario, the SWP options for First Nations include: (1) developing an on-reserve (i.e., not watershed-based) SWP plan following guidelines from the federal department of Indigenous Services Canada (ISC) [9], an option for which no federal funding is available; (2) developing an

on-reserve community SWP plan with predominantly in-kind support from external organizations (e.g., Ontario First Nations Technical Services Corporation, an expert technical advisory organization); or (3) having the water intake included in a provincial watershed-based SWP plan administered by local conservation authorities, an option that was only available for a limited time to the 27 of 133 First Nations in Ontario that fall within a designated SWP area [5].

There has been mounting interest across several sectors for involvement of First Nations in SWP in Ontario since the Walkerton tragedy, when seven people died and over 2300 were left severely ill from the contamination of the southern Ontario town's drinking water supply with *Escherichia coli* O157:H7 and *Campylobacter jejuni* [6]. Justice Dennis O'Connor led the Walkerton Inquiry that identified a number of fundamental problems with the management of water supplies in Ontario. This led to the formation of the *Clean Water Act* and the initiation of SWP programming in Ontario. Importantly, the Walkerton Inquiry highlighted that the drinking water available on First Nation reserves was "some of the poorest quality water in the province" [5] (p. 486). Since this incident, many parties have shown increasing interest in improving the protection of First Nations' source waters, from the provincial Government of Ontario to consulting firms, non-governmental organizations (NGOs), academics, and academic institutions. First Nation communities, who have always had an interest in caring for water and to whom water protection is not new [10], have voiced the need for proper consultation and greater First Nation involvement in SWP processes for decades, and have called for SWP processes that recognize Indigenous knowledge and Indigenous water rights [11,12].

Previous studies have discussed a variety of approaches aimed to protect source waters accessed by Indigenous communities in Canada, from the scale of the reserve to watershed-wide SWP procedures [5,8,10,13–36]. Most studies highlight issues with the current SWP options for First Nations in Canada, including jurisdictional issues and the country's highly fragmented water governance system [5,10,14,17–19,21–23,26,27,31–33,35,36], a lack of funding [5,8,18,24,29,31,32], and the need for recognition of Indigenous knowledge and inclusion of Indigenous governments in water governance structures [5,8,10,18,25–27,32,36].

A recent scoping review of the literature on Indigenous SWP in Canada and the United States identified that few studies describe how effective the available SWP options are at protecting the source waters of Indigenous communities, and few identify what strategies and practices are producing the best results [8]. One study by Collins et al. [5] examines the challenges and outcomes of SWP plans developed using different strategies in four First Nation communities located in southern Ontario. Collins et al. highlight the jurisdictional and funding issues First Nations face as they try to engage in SWP and identify that for each case study, it was critical that the SWP planning process gave priority to community involvement and empowerment, was community-driven, and was based on Indigenous knowledge and community priorities [5].

Building on the work by Collins et al., this paper aims to identify opportunities for communities and also practitioners from industry, government, NGOs, and academia to improve the protection of Indigenous source waters in Ontario [5]. While this work was conducted in partnership with an Anishinaabe community and based predominantly on the experiences of communities located in southern Ontario, it is the hope of the authors that the knowledge and insights presented herein may be useful to improve protection of the source waters of Indigenous communities located elsewhere in Canada and beyond. The objectives are to: (1) examine current SWP challenges that Indigenous communities face from the lived experiences of Indigenous community members and practitioners from industry, academia, NGOs, and government who have worked with Indigenous communities in an SWP context; (2) present an SWP framework based on these lived experiences that was developed in partnership with an Anishinaabe water protection committee; and (3) identify recommendations for multiple sectors including industry, government, NGOs, and academia for moving forward respectfully and effectively towards the protection of Indigenous source waters.

2. Materials and Methods

2.1. Research Approach: Indigenous Research Methods

Many authors have reported that research has played a critical role in the marginalization, oppression, and colonization of Indigenous societies worldwide [30,32,37–40]. Indigenous scholars have labeled this as academic colonialism, which is founded on the Eurocentric view that the Western knowledge system is the only correct perspective from which to interpret reality; other worldviews are welcome but have been represented as inferior or illegitimate [37–39]. Narrow perspectives of what counts as knowledge, reality, and values not only inhibit the development of innovative solutions, but also prevent Indigenous people from being able to take control over matters affecting their own lives [37,38,40]. This is especially true where research has validated and perpetuated policies based on inaccurate information about Indigenous realities that negatively affect the lives of Indigenous people [40]. Research has also been criticized for benefitting researchers and having little relevance to the lives of the Indigenous communities being studied [40]. Smith [40], a Maori scholar, recalls that research “told us things already known, suggested things that would not work, and made careers for people who already had jobs” [40] (p. 3). Unfortunately, colonialism in research is not just a historical issue—it is ongoing, and is a major concern for Indigenous communities [30,32,39].

In light of these issues, this research was carried out in a manner that responded to Indigenous scholars’ and community partners’ calls for research methods that have practical applications, empower Indigenous people, and provide tangible results to Indigenous partners [30,32,37,41]. In the contemporary Indigenous context, this meant engaging in the decolonization agenda [37]. Decolonizing the research process does not mean completely rejecting Western knowledge and research paradigms, but instead focuses on centering research around the voices and perspectives of Indigenous people and recognizing the power imbalances that exist between knowledge systems [32,40]. Decolonizing methodologies give Indigenous people space to be co-researchers instead of participants [30,32,42]. In this space, they can produce, share, store, and validate knowledge; determine the credibility of findings; and generate methods of dissemination from their own frames of reference [38]. Therefore, Indigenous research is context-specific. Knowledge can be understood as relational—whole communities are valued as “knowers,” and knowing is achieved through the development of relationships with the living, the nonliving, and the environment [42]. Goals are defined based on local phenomena as opposed to Western theory, and methods are derived from Indigenous knowledge and local experiences [32,38]. It was the goal of the research team that each stage of this research respectfully follows these principles.

This research commenced through a partnership with the Chippewas of Nawash Unceded First Nation (CNUFN) in an effort to develop an SWP plan for the community that included both technical and Indigenous knowledge. A community water protection committee was initiated, and the committee decided to seek out a partnership with a team of water resources engineering researchers from the University of Guelph for technical support (e.g., conducting groundwater contamination studies [34]). A community-based researcher (CBR) was hired, and as the committee began exploring its options for SWP, it became clear that research methods that went beyond the technical studies were needed. The water protection committee needed to gather the knowledge and experiences of community members and outsiders who had specific, practical insights to help them address their SWP concerns. Together, the committee and the research team identified the need to speak to a range of community members with Indigenous and technical water knowledge, from youth to Elders, and to gather information from practitioners with knowledge of SWP processes including other First Nations that had completed SWP plans; First Nation organizations; industry; academia; the provincial government; and watershed conservation authorities. An SWP framework, structured around the teachings of Elder Joanne Keeshig (as discussed below), was then developed based on many conversations that were had around the table at water protection committee meetings and the lessons learned that emerged from the interviews and groundwater research.

Relationship, respect, relevance, reciprocity, and responsibility played important roles in this research. These key pillars have been well established as essential components of Indigenous research methods [30,32,40,43]. In keeping with these values, the research process took on a form that looked quite different from typical Western science methodologies. For example, one of the water protection committee's top priorities was to increase community awareness of water protection issues on-reserve and to increase community engagement in water stewardship. Therefore, the research process included a wide range of community engagement and education events during which knowledge was shared and gathered as part of the research methodology, including Water Walks around the reserve (organized and led by the CBR); summer day camps for children; a teen water night; information booths at community events such as the Fall Fair and Pow Wow; and supporting an annual Water Festival that included sunrise water ceremonies, traditional drummers and singers, mini boat races down the creek, community meals, and information booths run by water-related departments and groups.

This research follows the work of other scholars [32,44] by linking Indigenous and Western research methods through a Two-Eyed Seeing approach, which is "to see from one eye with the strengths of Indigenous ways of knowing, and to see from the other eye the strengths of Western ways of knowing, and to use both of these eyes together" [45] (p. 335). Throughout the multifaceted research process (i.e., technical groundwater studies [34], committee meetings, community engagement, interviews and focus group, creation of a Story Map, etc.), the CBR coordinated and co-conducted research in the community. The water protection committee, CBR, and other community members were engaged in all research stages, including the study designs, data collection and analysis, authorship, and the sharing of results at both academic conferences and events in the community. Researchers committed to securing substantial funding specifically for community engagement activities and for a long-term CBR position throughout the duration of the project (six years and counting as of this writing). Researchers also just simply took the time to have a cup of tea, share a meal, and have a laugh with Elders, committee members, and others in the community.

This research was conducted in accordance with the Ownership, Control, Access and Possession principles (OCAP[®], a registered trademark under the First Nations Information Governance Centre) [46], and received approval from the CNUFN Chief and Council and the University of Guelph Research Ethics Board.

2.2. Community Location

The Chippewas of Nawash Unceded First Nation is an Anishinaabe community located on Georgian Bay in southern Ontario, Canada. As of 2009, CNUFN had an on-reserve population of 816 [47]. The land base of CNUFN is a small peninsula jutting off the eastern shore of the Bruce Peninsula called Neyaashiinigiing, meaning "point of land surrounded on three sides by water" [48]. Neyaashiinigiing spans 6253 ha and is located approximately 20 km northeast of Wiarton, Ontario. Members of CNUFN were relocated to Neyaashiinigiing from what is now Owen Sound in 1854 [48]. The reserve is located adjacent to the provincial source water protection region managed by the Grey Sauble Conservation Authority (Figure 1). The two communities of CNUFN and Saugeen First Nation make up the Saugeen Ojibway Nation (SON), whose traditional territory encompasses the Bruce Peninsula and the water around it, south to the town of Arthur, and west to the shores of Lake Huron (Figure 1). Protecting water in the territory and on the reserve is a high priority for the community both from a spiritual standpoint and to ensure the health of its members [49].

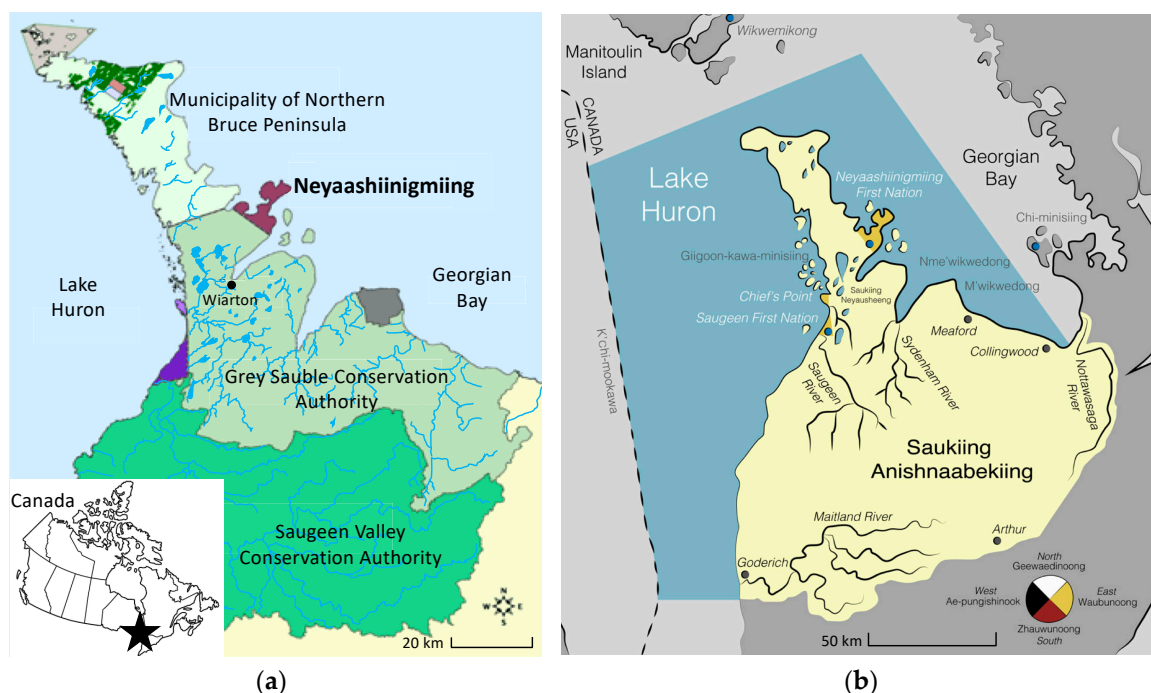


Figure 1. (a) Location of Neyaashiinigmiing in relation to local conservation authorities and to Canada (adapted from [50,51]); (b) the traditional territory of the Saugeen Ojibway Nation (adapted from [49]).

2.3. Western Research Methods: Qualitative Data Collection

Semi-structured interviews were conducted with community members of CNUFN ($n = 14$) and practitioners from other First Nations, NGOs, government, academia, watershed conservation authorities, and industry from across the province ($n = 12$) in 2017, with a total of 1760 min of discussion (Table 1). It should be noted that one practitioner, a First Nation water committee member, was also part of another sector and therefore category values in Table 1 do not add up to 100%. The average interview length was 65 min, and the range was 18 to 115 min. Community members were invited by the CBR to attend a confidential, in-person interview at their workplace, home, or in a private room in a Band building such as the Economic Development Center, depending on the participant's preference. Practitioner interviews were conducted over the phone. A youth focus group was chosen as the preferred method of qualitative data collection for this age group in order to facilitate a comfortable environment for youth (as recommended by the CBR). The focus group was conducted with three youth at a Band building, and was 33 min in length. Interviews and the focus group discussion were audio and/or video recorded with interviewee consent, professionally transcribed, and reviewed by researchers for errors.

The community member interviews and the focus group discussion followed semi-structured guides that consisted of open-ended questions aimed to characterize perceptions of water protection barriers, opportunities, and priorities on the reserve and in the traditional territory of CNUFN. Practitioner interviews followed a similar semi-structured guide aimed to determine the challenges associated with First Nation SWP on and off reserve, what approaches have and have not worked, and their perceptions as to how best to move forward. The guides were designed to create a conversational format [52,53], and were pre-tested for content and structure by the CBR and academics with expertise in water resources engineering and Indigenous research. Community members that were interviewed were purposely selected based on their roles and work experience (e.g., Elder, harvester, water technician), and through the use of the snowball sampling method [54]. Focus group participants were recruited through the existing youth group program in the community. Practitioners were selected through the use of the snowball sampling method based on the criterion that they had worked with a First Nation on an SWP plan or a similar community planning endeavor related to water protection.

Table 1. Demographic and sector information for interviewees.

Demographic Information, Community Interviewees	Interviews (%)	Focus Group (%)
Age	<i>n</i> = 14	<i>n</i> = 3
Youth (0–20)		3 (18)
Adult (21–55)	7 (41)	0 (0)
Elder ¹ (Over 55)	7 (41)	0 (0)
Gender		
Male	8 (47)	0 (0)
Female	6 (35)	3 (18)
Sector, Practitioners	Interviews (%)	
	<i>n</i> = 12	
First Nation water committee member ²	2 (16)	
Academic	3 (25)	
Consultant	3 (25)	
NGO	1 (8)	
Provincial government	2 (16)	
Conservation authority	2 (16)	

¹ Elders were considered community members over the age of 55 in keeping with the age classification designated by CNUFN. ² Categories are not mutually exclusive: one First Nation water committee member was also part of another sector; hence, values do not add up to 100%.

2.4. Analysis

An iterative, multi-step process was used to analyze the interview and focus group data. First, transcripts were reviewed while the audio recording was played as a means of data familiarization [55]. After each transcript review, reflective memos were written and concept maps were created to explore the data and examine relationships within each interview, between interviews, and within the dataset as a whole [56–58]. Keywords from the concept maps were expanded and collapsed into codes that fit the dataset as a whole, and a codebook was developed that defined and summarized each code [57,59]. The transcripts were then coded sentence-by-sentence. Next, the codes were collapsed to develop themes, which were verified for fit with the data by grouping and examining all the coded quotations from the transcripts associated with each theme [57,60]. Themes included issues of scale, jurisdiction, the concept of source water protection, Indigenous representation as stakeholders, funding, capacity, and hopeful developments. The codes and themes were reviewed by the research team for authenticity and accuracy, and reflective of the transcripts [52,61]. QSR International’s qualitative data analysis software NVivo (version 11.4.3, QSR International, Burlington, MA, USA) was used to organize and code transcripts, and to examine coded quotations associated with themes [62].

3. Results

The following text represents the results from community member and practitioner interviews. Several themes emerged relating to the challenges associated with First Nations’ SWP, including issues of jurisdiction, scale, the concept of SWP, the representation of Indigenous people as stakeholders, funding, and capacity. The manner in which these themes interact and overlap with one another is depicted in Figure 2. All of the themes are impacted by the Constitution Act of 1867 which conceded jurisdiction over “Indians and lands reserved for the Indians” to the federal government [63]. The themes, along with recent hopeful developments in the field that participants shared, are outlined in detail below.

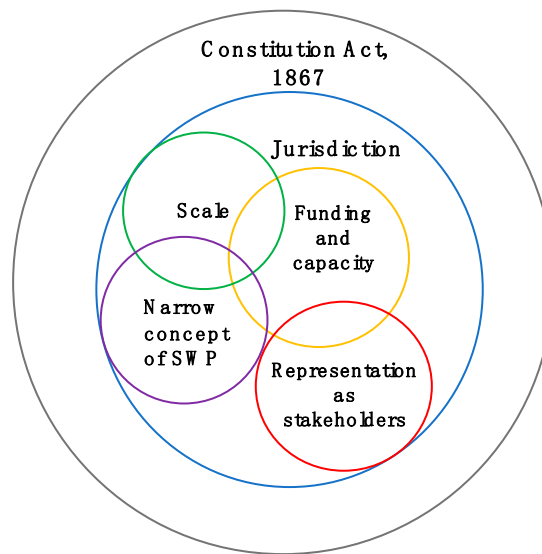


Figure 2. Thematic source water protection challenges faced by Indigenous communities, as identified through interviews and a focus group with Indigenous community members and practitioners from industry, academia, NGOs, and government. Themes that interact with one another overlap. All thematic issues are framed by the 1867 Canadian Constitution Act, which provides the federal government with jurisdiction over lands reserved for Indigenous peoples.

3.1. Challenges with Jurisdiction

The most central and overarching theme identified by community members and practitioners pertains to the jurisdictional issues associated with SWP in Canada, where a highly decentralized and disjointed water governance system has been identified as a major contributor to Indigenous water insecurity by others [6,10,31,32,64,65]. Provincial and territorial governments are generally responsible for water management, and have developed various regulatory systems for SWP and other water management activities [63]. However, provincial SWP regulations do not extend to reserves due to the 1867 Constitution Act, which conceded jurisdiction over “Indians and lands reserved for the Indians” to the federal government [63]. Yet, Indigenous treaty rights cross these jurisdictions [10]. Community members and practitioners identified this complex water management framework as one of the greatest challenges for First Nations wishing to engage in SWP. For First Nations, “because of jurisdictional boundaries, you can’t even get to where you have to get to to make sure you’re protected.”

Dealing with these jurisdictional boundaries when activities that are impacting reserve source waters are off-reserve was identified as an unresolved and daunting challenge by several community members and practitioners. Some First Nations that have put together community plans or have tied into the provincial SWP option have attempted to deal with the jurisdictional problem by assigning any tasks related to off-reserve impacts to the implementation phase of their SWP plans. However, some practitioners expressed concern that this strategy fails to consider the lack of authority First Nations actually have in the multi-jurisdictional water protection arena. As one practitioner stated:

So, how does the First Nations have authority or what authority or jurisdiction do they have to have regulatory instruments or source water protection instruments that were supposed to come out of these implementation plans outside of First Nations jurisdiction? Who’s going to enforce them? Who has the rights to say, “OK, city of Brantford, you’re impacting”? If it’s municipality to municipality, there’s instruments there . . . many of us [said], “Hey, that’s pretty good, the province is going to include First Nations source waters within that”, because of this whole jurisdictional issue, but then, “Now what?” We have these plans, we have these intake areas to identify, we know what the threats are . . . What does that mean for the First Nations?

Even at the community scale, jurisdiction makes SWP difficult to implement in practice for First Nations. Some communities have a mix of Band-owned land and private land holdings that Band members retain under a Certificate of Possession (CP). Community members and practitioners indicated that Band Council does not have jurisdiction over these privately held lands; trying to develop a community-wide plan to regulate activities on-reserve is a source of tension and may be quite difficult when it comes to implementation. These findings are consistent with issues with CP lands reported by others [5].

3.2. Issues of Scale

“Here’s the one-off; this is going to protect source water.” It’s like, “No, it’s not,” because that’s only the one on reserve, and most of the water is under provincial jurisdiction, and they’re polluting up the wazoo.”

A prominent issue identified by community members and practitioners was the challenge of scale. Most SWP frameworks for First Nations in Ontario are designed for the scale of the reserve, and do not address the flow of water or contaminants across political boundaries. Almost all community partners and practitioners expressed concern with this approach, which they believed “makes absolutely no sense for communities.” Indeed, the primary concerns of most community members were off-reserve threats to water quality and/or quantity. Practitioners confirmed that First Nation communities they had worked with were also predominantly concerned with off-reserve threats, and noted that “when we start looking at watershed management, [First Nations reserves] take up such a small part of it that the impacts in a catchment area, a drainage basin . . . are coming from off-reserve developments, off-reserve industries, off-reserve land use activities.” Community members identified off-reserve landfills, agriculture, quarries, road salt, and municipal wastewater and septic system impacts as key concerns.

Interestingly, while protecting water at the scale of the reserve was clearly identified as an issue, the scale of the watershed was also generally considered too small, as many community members and practitioners indicated that First Nations are concerned with the protection of water in their traditional territories, which can span across multiple watersheds. As members of a fishing community surrounded by water, community members were very concerned with impacts to Lake Huron and Georgian Bay (Figure 1), including spills from cargo ships, oil tankers, boaters, factories, and the release of raw sewage. For some community members, the storage of nuclear waste at the Bruce Nuclear Generating Station (located approximately 100 km southwest from Neyaashiinigiing in a different watershed) was the biggest concern. Several community members were well aware of karstic features in the region, or “fingerling lakes that run [underground] . . . just like a tree”, and told stories about being able to “hear the water flowing underneath” the ground at certain locations within their traditional territory. These community members expressed concerns about the rapid transport of contaminants in groundwater across great distances. One Elder expressed that “the nuclear undercurrent of the water source, how it runs from Lake Huron to Georgian Bay is first on my mind; the bigger picture.”

3.3. Issues with the Concept of Source Water Protection

Well, [community] people ask me, . . . “Well, what is source water?” [and I say,] “Well, where you get your drinking water.” And then they kind of say, “Well, that’s just dumb.” They’re not really saying it’s dumb; they frown at you and it’s like “Yeah, this is a government lingo.” . . . So, that whole big interconnected picture is what’s lacking in source water protection from [the] government . . . And how do you find funding or convince scientists or governments, you know, this is how the approach should be?

When asked to describe what the barriers are to effective First Nations SWP, many practitioners pointed to difficulties they had when trying to work with either the federal First Nations on-reserve SWP guide and template or the provincial SWP option that allows First Nations to join a local process led by conservation authorities. Common to both frameworks was the issue that the concept of

SWP—to protect drinking water intake zones and wellhead protection areas only—was considered too limited, and did not make sense from an Indigenous perspective. While practitioners explained that the definition of SWP, “according to the Clean Water Act, is to protect municipal drinking water systems, and nothing else”, practitioners pointed out “that’s not how the Elders and First Nations saw it, because they see it as just protecting water, period.” Collins et al. also reported that communities found the scope of SWP to be problematic [5]. Several practitioners noted that First Nations had trouble working with both governmental plans because the plans did not fit with community perceptions of water security, which included water sovereignty and the “sovereignty of Mother Earth”, ecosystem dynamics, climate change, and the interconnectedness of surface and groundwater systems. Indeed, the concept that “water is connected to everything” was mentioned 27 times by community members.

The narrow approach of the SWP process, described by one provincial SWP authority member as “a horse with blinders on; it’s very specific”, was an issue for First Nations attempting to use the tools of both the federal and provincial frameworks. For example, communities trying to use the risk assessment templates found that the templates did not reflect what they had identified as critical threats to their water sources. One practitioner recalled that “the biggest threat was the lack of connection that people had with water . . . they thought if people understood what water means, and how we depend on it, they would change their behaviour . . . That didn’t fit nicely in any of the boxes. How do you rank that? Is that ‘one’ or ‘two’ or ‘three’?” Communities also found that the one-size-fits-all risk assessment tools did not reflect the local contexts of reserves. Many of the threats to water sources identified in the provincial risk assessment tool, such as agricultural run-off and dense non-aqueous phase liquids (DNAPLs), did not apply on their reserves. In the case of the federal risk assessment template, all reserve land is treated the same—i.e., watershed or sub-watershed divides are not considered. Participants also found that the federal risk assessment tool often ranked certain threats too low from a community wellbeing standpoint. For example, a practitioner shared that one First Nation community they had worked with found the federal risk assessment template ranked non-bacteriological threats located in their intake protection zones (IPZs) fairly low, such as gas station fuel tank leaks. Some practitioners felt that with ranking non-bacteriological threats in the IPZ so low, there was failure to recognize the complex water management situation many First Nations are faced with. As one practitioner noted:

That doesn’t make a lot of logical sense from a bigger look at the issue . . . yeah, you shut off the water plant, and yeah, your water might be impacted, but you’re not making people sick, because you’ve dealt with it. So, and then, oh, what’s the alternative? You know, is everyone going to get bottled water? And how long? And, if you’re in a remote community that could be shut down for weeks while it’s dealt with. And otherwise, you’re going to the lake anyway. So, there’s aspects of it that we didn’t agree with, and when we went through [it] . . . we were like, ‘Oh, man, those scores aren’t that, that doesn’t seem at all right, from how we would prioritize it or rank it, even from a fairly neutral and technical perspective’.

Additionally, practitioners were concerned that both the federal and provincial planning tools assumed all community members received drinking water from a centralized drinking water treatment plant, when in reality many communities rely on a mix of water supplies, including private wells and cisterns, and some communities do not have a centralized treatment plant at all. The issue of mixed water supplies was also highlighted by Collins et al. [5]. Importantly, several community members indicated that some community members (one practitioner estimated “one in ten”) still drink directly from springs on-reserve when they are out on the land. Particularly for First Nations accessing water from private wells and springs, the narrow concept of SWP as a process to protect centralized drinking water intake and protection zones fails to protect human health. Despite these issues, several practitioners found that conducting a risk assessment of some sort was useful, but that the current templates were lacking, and should not be used as the basis for decision-making. As one practitioner said:

Here we are again, trying to jam First Nations into these boxes that are not designed by First Nations, not designed to reflect their reality, so all the most important information that people are sharing, you can't fit in the boxes, right?

Ultimately, as CNUFN stated in an official response when the province originally proposed the now legislated provincial SWP framework, the issue with protecting drinking water sources only lies with the fact that it permits harm to the environment in order to protect human health, which diverges from the Indigenous precautionary principle to “do no harm” and to plan “seven generations ahead” [11]. The official statement pointed out that “it is more consistent with aboriginal environmental knowledge to consider the health of all our relations as well as our own, and once the health of all is achieved so will our own be assured” [11] (p. 2).

3.4. Representation as Stakeholders

... when I say “we” in this particular case, I mean Canadian society, the Crown, citizens, just recognize that First Nations people are not stakeholders. Can we all write that down on a card and put it on our monitors, so that we see it every day? And so, recognize that the rules are different, that we're dealing with a different set of rights; they're constitutional, they're real, they're historical. And even if you don't like it, that's just the way it is.

Several practitioners identified that, for those 27 of 133 First Nations that had the option to participate in SWP planning in Ontario, one of the main barriers to interjurisdictional collaboration is the way First Nations are represented as one of many stakeholders in the Ontario SWP program, with the same rights and considerations as other groups (e.g., farmers). When the provincial SWP framework was originally being developed, First Nations communities and their representatives (e.g., Assembly of First Nations) released reports asking to be recognized as equal partners in the process, stating that their representation as stakeholders was “both erroneous and insulting” because it disregarded their constitutionally recognized Indigenous and Treaty Rights [11] (p. 1). These rights, which are acknowledged in other jurisdictions, including the Northwest Territories, British Columbia, and Yukon, elevate First Nations to the status of equal partners in these regions [11,66]. The challenge with being considered one of many stakeholders is twofold: (1) First Nation voices are drowned out on SWP committees; and (2) some First Nations feared that their constitutional rights would be eroded if they joined the SWP process because their participation might be considered consultation on issues impacting their traditional territories, whether or not their voices were reflected in the decision-making process. For example, two practitioners pointed out that in some cases, the number of First Nations communities located in an SWP area exceeds the maximum number of seats that are available to First Nations communities on an SWP committee (e.g., the Thames River watershed is home to eight First Nations, yet only three seats are available). Yet, not all First Nations have the same priorities, and the representation of a community by a member of another First Nation can be problematic [5].

Additionally, practitioners pointed out that the person representing a First Nation on an SWP committee has sometimes been a non-Indigenous water operator or facilities manager. In these cases, Indigenous perspectives may be entirely lost from the discussion. When Indigenous representatives have sat at the table, some felt they were at a disadvantage due to resource limitations and technical language barriers. As one practitioner put it:

They're sitting there going, 'I don't even know what people are talking about. How can I influence this?' And [First Nations] don't have the same resources as they do. [First Nations] don't have bureaucracy around them and scientists doing all these studies, so they can come to these meetings to maybe counter what they're saying, or maybe add to it, and you're at this huge disadvantage.

Certain practitioners were particularly concerned that conservation authorities were not required to seek out and include Indigenous knowledge in their SWP plans, a sentiment that has been expressed by First Nations since the provincial framework was first proposed [11,12]. One practitioner indicated that

part of the difficulty with including Indigenous knowledge in the plans is that while governments are required to know about Indigenous issues, rights, and treaties, conservation authority staff, scientists, and other practitioners involved in SWP activities are not. Therefore, “even if you share Traditional Knowledge, they don’t know what to do with it . . . they don’t know how to deal with anything Indigenous. Because where are they going to get that training?” The lack of Indigenous awareness training among practitioners has made it difficult for Indigenous knowledge to influence SWP plans in a meaningful manner, which, as one practitioner shared, has made some First Nations “really upset”:

One of the biggest criticisms is that we shared, but it had no influence... Like, for them, it's just data, but it's not data from a First Nation's perspective. But that's what others would think of it as being, 'How do we take this data and stick it into our frameworks and make the same decision we were going to make, anyway?'

3.5. Challenges with Funding

A prominent issue identified by community members and practitioners alike was the lack of funding that is available for First Nations to engage in SWP. Since the initiation of the provincial SWP framework, recommendations that First Nations be engaged in SWP has come from many parties, including Justice Dennis O'Connor, the Province of Ontario, the federal government through Bill S-8, and First Nations themselves [5,6,11,67]. Yet, no federal funding has been provided for First Nations to carry out SWP on reserve lands, let alone to effectively engage with other jurisdictions as partners on a watershed scale [5]. Some community members and practitioners felt that the federal priority to fund drinking water treatment only is an ineffective strategy:

It's not a fix, you know; everyone can have a water treatment plant, but the water is still contaminated, and the water is still polluted. So, that actually doesn't solve the problem . . . It doesn't solve, 'Oh well, we also eat the fish. And they're contaminated. And we get our medicines from the water and they're contaminated'.

Where federal funds have been available, they have been provided in small pockets for activities indirectly related to SWP and recently, to the Ontario First Nations Technical Services Corporation (OFNTSC) to develop a training program for on-reserve SWP planning. However, no federal funds have been provided for communities to carry out the work.

The Ontario provincial government, cognizant of its jurisdictional boundaries when it comes to reserve lands, has been cautious with providing funding to First Nations. Practitioners indicated that when SWP plans were being developed, the province provided small sums to source protection authorities that could then be offered to First Nation representatives to attend SWP meetings, or could be used by the conservation authority to conduct assessment reports of on-reserve threats to source water (an option that was pursued by three First Nations when it was available). The province, despite its jurisdictional limitations, also provided some funding to OFNTSC to develop the on-reserve training program, and offered to provide in-kind support to First Nations undergoing the training via an online informational toolkit that includes access to technical experts [68]. Yet, “toolkits are only as useful as, you know, if someone’s actually able to do it and implement it”, and adequate funding for implementation is nowhere to be seen [5].

Community members and practitioners indicated that for on-reserve plan development, communities have had to piece together funding from various sources:

[Sources have] different purposes for their money . . . nothing called 'source water protection' . . . so it's up to the First Nation to say, 'we can get this from Great Lakes, . . . we can get this from Health Canada, we can get this from the province . . . and pull it together'.

Finding and successfully securing a portfolio of grants requires substantial coordination, time, and effort on the part of First Nations, who are in many cases dealing with limited capacity and

an overwhelming onslaught of issues on-reserve and in their traditional territories that require their attention, from housing emergencies to environmental consultations. To make matters worse, piecemeal funding is still too limited for communities to properly develop SWP plans, let alone engage meaningfully with the provincial process. As one conservation authority member stated, “the community members, they get a stipend to participate, but there really isn’t a lot of funding to support those members to actively participate, and the . . . resources, and taking people’s time, and they’re busy with other priorities, obviously.”

Community members were also worried that they would not be able to sustain important SWP activities in the long term, such as monitoring and implementation, due to a lack of funding—a concern that was echoed by practitioners and is also one of the main findings reported by Collins et al. [5].

3.6. Capacity Issues

Community members and practitioners shared that part of the difficulty with trying to adopt, adapt, or fit into SWP frameworks developed by and/or for non-Indigenous people is that the frameworks do not consider the capacities of First Nation communities, which have been influenced by a colonial history. One community member aptly described this phenomenon:

. . . people say, “Well, you can do it, you have a whole community and you have money devoted to it,” but I feel like the biggest piece is they forget of how close we are from being released to have our own opinions . . . And I think that’s where we get caught up, is that we’ve been told how to think, and how to go about things, and our program mandates, and our program structures . . . we’ve really just begun to grab our own governance, and our own way of life, and our own organization as a community, as opposed to how they’ve already developed that off-reserve, right? And so, there’s a huge gap between those two . . . We’ve only really been given the ability to do that in the last 40 years, 30 years.

SWP frameworks that do not directly address the technical, financial, human resource, and governance capacities of Indigenous communities are problematic for a number of reasons. Such frameworks contribute to colonial oppression by perpetuating one-way communication that can feel like “one more order coming down the chain of something that’s not really taking into account where you’re at.” Most importantly, imposed SWP frameworks that do not consider local capacities and Indigenous realities simply do not work. As one community member described,

It’s not going to work if you don’t value it, or if you don’t understand how to make it work realistically for you . . . And I think that we need to start taking on more of a pushback in saying, “You’re giving us this structure and this framework to help my people, but what my people really need is this . . . You need to let us take it on and develop it into a framework that works for us, not us working for it.”

3.7. Hopeful Developments and Opportunities

Despite the many challenges communities and practitioners face in trying to protect First Nations’ waters, community members and practitioners spoke about several hopeful developments and opportunities that have begun to arise. The Ontario First Nations source water protection training program run by OFNTSC was successfully piloted in 2018 with fifteen Ontario First Nations, four tribal councils, and youth from the program Water First; the program plans to expand to eventually provide training to all First Nations across Ontario. This on-reserve training program aims to provide communities with the tools and support to carry out SWP planning on-reserve. For those communities located within watersheds that fall under the provincial SWP program, the training also aims to provide knowledge and language to engage more readily with the provincial SWP committees and to provide support in maintaining their position in interjurisdictional discussions.

Interjurisdictional support for First Nations’ SWP has been growing. The Province of Ontario has supported the OFNTSC training program—the Ministry of the Environment, Conservation and Parks (MECP) provided some funding to develop the training program, and has created an online

community of a practice toolkit that provides trainees with access to SWP resource materials and an “ask an expert” function [68]. Additionally, practitioners indicated that a Trilateral Steering Committee that was established in 2016 to eliminate drinking water advisories on Ontario reserves has also begun discussions about First Nations’ SWP. The trilateral group consists of representatives from First Nation, provincial, and federal governments, including Chiefs of Ontario; Political Territorial Organizations; OFNTSC; the Province of Ontario; ISC; and Health Canada [69]. Conservation authorities have also shown that they are eager to engage First Nations, and to build new relationships.

Examples of multi-jurisdictional partnerships are emerging that may be able to provide practical insights into how to approach the co-governance of water resources. For example, the Great Lakes Water Quality Board, a bi-national board established under the Great Lakes Water Quality Agreement that advises the International Joint Commission (IJC), was reformulated in 2012 to include a minimum of four Indigenous representatives—two Tribal representatives from the United States, one Métis, and one First Nation representative from Canada. The updated 2012 agreement included a variety of provisions that outline the relationship the IJC planned to establish with Indigenous communities and governments [70], and in response, the new board has “made it our business . . . to try to actually walk the talk, if you like.” For example, the board has established an Indigenous engagement strategy that has changed the way consulting contracts are commissioned. Consulting firms must have the following:

. . . a demonstrable ability to work with and engage Indigenous communities, which all of a sudden, knocks just a truck load of consultants out of the game, because they just don’t have it, or they’ve got to scramble to get it. And it’s got to be real . . . so, instead of big shiny declarations, which are easy to ignore, it’s looking for, for everything that we do, how would this be different, if we were serious?

Another example of transboundary water co-governance that includes Indigenous governments is the Mackenzie River Basin Transboundary Waters Master Agreement, established in 2010 [66].

Indigenous people have been taking a stand for their waters. In 2003, Elder Josephine Mandamin, with a group of Anishinaabe women and supporters, began walking the perimeter of the Great Lakes to raise awareness about water contamination and people’s responsibility for water [71]. Incredibly, the group walked the perimeters of Lake Superior in the spring of 2003, Lake Michigan in 2004, Lake Huron in 2005, Lake Ontario in 2006, and Lake Erie in 2007. These journeys have inspired many communities to conduct their own water walks [10], and Mother Earth Water Walks has now grown into an annual movement across North America each spring [72]. More recently, Sylvia Plain, a member of Aamjiwnaang First Nation, founded the Great Lakes Canoe Journey to bring people living around the Great Lakes together and to raise awareness about Anishinaabe canoe culture [73]. One practitioner described that it is important for communities to be out on the water in these ways because it acts as a reminder that First Nations should be involved in decision-making:

You just go ahead and assert it, right. You just go out on the water . . . because when people are asserting Aboriginal and treaty rights, they’re saying ‘We have jurisdiction off-reserve. We have to be included in decisions’ . . . So, all of that matters because that’s exactly what you’re doing; you’re asserting that jurisdiction and sovereignty over the territories by being on it. If you don’t do it, then people make assumptions about your visibility.

Practitioners also mentioned that Indigenous lawyers and scholars have begun to document Indigenous water laws. An important example of this is the work of Aimée Craft, an Indigenous lawyer who has worked with many Elders to carefully document Anishinaabe water laws because there is a need for laws that better protect water in Canada, and because “the water needs a voice” (Harry Bone in [74]). As one practitioner indicated, the work of Indigenous lawyers and law scholars may prove to be a critical contribution to water protection, particularly as Canada begins to recognize Indigenous law.

This list is by no means exhaustive; other scholars are documenting recent developments related to Indigenous water governance, offering new ways to move forward, and sharing the many ways in which Indigenous people are asserting their inherent rights to water across the country (e.g., [30,32,36]).

3.8. Recommendations for Practitioners

Community members and practitioners provided insights and suggestions for practitioners in government, academia, NGOs, and industry wishing to support First Nations' SWP. The most prominent recommendation that emerged was the need for real relationships based on two-way communication. Community members in particular voiced the need for real collaboration between jurisdictions and highlighted the need to be heard in interjurisdictional discussions, because "this water is everybody's, it's that simple." It was recommended that the province encourage municipalities and provincial entities to build better relationships with First Nations. Many First Nations have developed their own protocols for consultation and engagement, and communities are often happy to share them with practitioners if a request is made. The need for collaboration and meaningful relationships between First Nations and upstream and downstream water actors aligns with findings presented in other studies [75].

One practitioner from industry shared that their biggest "lesson learned" was:

To listen. Most consultants are so aggressive, right? And the one thing I've had to learn after all these years I've been working with [First] Nations, I've spent a lot of time listening. And that's worked out very well for me. I don't go in with my agenda, I listen and try to determine what it is that they want to accomplish . . . [consulting firms] that are not experienced at working with First Nations haven't figured that out. The ones that survive, are the ones that figure it out. That the First Nations do have a say, that they're really good planners, they just need our technical capacity to help them get that plan onto paper . . . give them the right technical advice at the right time.

Several practitioners voiced that technical information needs to be communicated clearly and transparently to community leadership. Essentially, communities require technical advice that comes with relationship. There is also a need for practitioners to recognize community knowledge. Many community members and practitioners mentioned the frustrations First Nations have when dealing with a variety of practitioners that make assumptions about First Nations' understanding of natural systems and what will work best for their communities. As one practitioner shared, "You know what? We already have a lot of this knowledge, and community—they assume community people are ignorant. Like, that's not a good place to start." Community members and practitioners shared that it is important for practitioners to recognize that First Nations:

[First Nations] know where the opportunities and drivers and barriers are in their own community. They'll know it better; they've lived it. They'll know what's on the rise and where there's opportunities, they'll know where the threats are . . . they know their land.

Another component of relationship building that is needed is for practitioners to spend more time with First Nations. Community members shared that relationships are not built overnight, and time investments are needed to build trust. One practitioner shared that their commitment to building real relationships with First Nations has required them to have, "a couple of people on our staff who pretty much just go visit First Nations communities almost non-stop and stay connected and, basically, they're friends." Conservation authorities and others were encouraged to bring meetings to reserves, as opposed to requesting that First Nations to travel to them. Practitioners indicated that particularly for consulting firms, taking a relationship-based approach can be difficult, in part because of the concern that firms may be required to sacrifice profit margins. However, practitioners shared that a different business approach is required if firms are to work successfully with First Nations, and that a long-term, relationship-building approach can be a "win-win" for communities and consultants alike.

Community members and practitioners also shared that there is a need for practitioner training on Indigenous culture, history, rights, and current issues (or "Indigenous Studies 101", as one practitioner put it). A lack of knowledge about the constitutional rights of First Nations has been a hindrance to their involvement in SWP at the watershed scale. Developing a working knowledge of

Indigenous rights and the systemic challenges they face will provide opportunities for practitioners, including conservation authorities; consulting firms; scientists; and others to better engage First Nations in SWP. Practitioners also indicated that hiring First Nation people improves relationships with communities and provides opportunities for better engagement. This includes hiring Indigenous staff members, and also providing training and employment opportunities for community members to become actively engaged in carrying out SWP work for their communities.

3.9. A Framework

The water protection framework presented herein is based on the insights, suggestions, and “lessons learned” from the Nawash Water Protection Committee and community members and practitioners and builds on the work done by others, including OFNTSC. Nawash Elder Joanne Keeshig provided the basis of the framework through her teachings of the Medicine Wheel (Figure 3). The framework follows a cyclical pattern, with smaller cycles embedded within it (e.g., between monitoring, plan development, and implementation). As planning is an ongoing process, the framework is intended to be repeated, with feedback from previous stages informing future ones. The framework is divided into the four directions, and for each direction a list of steps and suggestions gathered from community members and practitioners is presented.

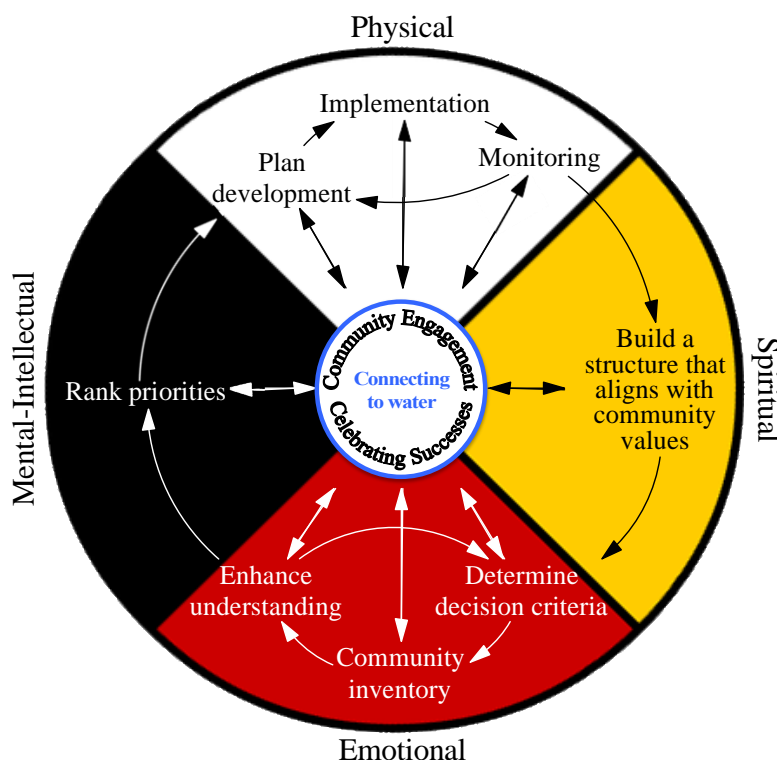


Figure 3. The water protection process and its relation to the Medicine Wheel, based on the teachings of Elder Joanne Keeshig.

3.9.1. Eastern Direction

Anishinaabe Elder Joanne Keeshig shared that the Eastern direction represents the spirit, the season of spring, and the first stage of life. It is the direction of vision, and is a good place to begin the water protection process by envisioning a water protection program that is grounded in the community’s spiritual and cultural values. This visioning stage ensures the water protection program structure will align with community priorities, and will make sense for the local context of the community. Several community members and practitioners emphasized, “it has to be a community-driven approach”, and suggested communities consider historical, spiritual, and cultural relationships with

water, as well as how the water protection plan ties in with economic development. The following steps could be included in this stage:

1. Identify water committee program leader(s) that will lead the program. It is best if program leaders are hired on for their time as opposed to being engaged in a volunteer position.
2. Build a water committee that consists of community members from all walks of life—Elders, youth, Band Council members, and other community members that have a passion for/work with water (e.g., fishermen; water technicians; people working with water in other departments such as Health, Fire, and Lands). Community members and practitioners particularly emphasized the need to involve youth in the program in some way. As one community member shared:

We could be including our youth a lot more, a lot earlier. I think that we don't give them enough credit for understanding the importance of what we're doing, and why we're doing it . . . And I think preparing our youth to be, as best as possible, to be that voice, and to come together . . . I really believe that if we're going to try to fix this in the next generation, we have to include them.

3. Identify the program's vision, goals, and a structure that works with the current assets of the community. For example, community members and practitioners indicated that they did not focus their plans solely on source water protection, but framed them within a broader context of water security or "caring for the water." Some community members and practitioners indicated that it was essential that they include ceremony as part of their program structure. The Nawash Water Committee felt it was important to reach out to community members (e.g., via newsletters and community events) to obtain community feedback on what the vision and goals of the program should be. In terms of program structure, some communities found it better to integrate the water protection program into existing departments instead of developing a whole new department. This can be accomplished by inviting members from interested and relevant departments to sit on the water committee (e.g., departments of Health, Education, Public Works, Fire, and Lands). The existing departments can then carry out water protection activities that align with their mandates and programs.
4. Identify roles and responsibilities. This can include the roles and responsibilities of each department, committee member, and the political leadership. One practitioner shared that they developed a responsibility chart identifying responsibilities at three levels: individual responsibilities (the practitioner shared that, "we even broke it down into 'female' and 'male' because females have different responsibilities"); family responsibilities (e.g., "if I'm the head of the family, it's my responsibility also to educate my family and have these discussions sitting at the table"); and community responsibilities, including educating, hosting community events, and developing collaborative working relationships between programs.
5. Start with what the community already knows. One practitioner shared that often, communities are already doing work that falls under the umbrella of water protection, though it may be labeled differently. For example, community emergency response plans, activities related to better managing waste and fuel tanks, and water-related community engagement activities can be considered water protection work. As the practitioner described:

Once we laid out what's going to be included in source water protection, it turns out, fifty percent of the stuff that was laid out, the community was already doing through other things . . . and we document it as being part of the plan's implementation.

It was suggested that communities identify how they are already achieving water protection goals, mark these tasks as part of the implementation phase of the plan, and celebrate what is already being accomplished through a community event.

3.9.2. Southern Direction

Elder Joanne Keeshig shared that the Southern direction is associated with emotions, the season of summer, and youth. Being associated with the emotional state of being, the focus of this direction is building relationships, linkages, and communication. The cyclical process of conducting a community inventory is situated in the Southern direction, and in this stage, the relationships between water and activities on and off reserve can be explored, including impacts to both water quality and quantity. Communication with the community through education and outreach is critical to this stage, both to collect information and to inform community members about how their actions and the actions of others might affect water quality or quantity. It is also the stage to explore the emotional pulse of the community—what relationships do community members have with water, how have they changed, and what changes would community members like to see to restore these relationships?

The following steps can be included in this stage (however, they may need to be undertaken in a different order and may need to be repeated in a cycle):

1. Identify the main concerns and threats to water. This includes the perspectives of a variety of departments and the community at large. For example, the Education Department may be concerned with the water quality of creeks and shores that children play in, while the Fire Department may be concerned with threats to pressure at hydrants. Some community members and practitioners felt it was important to ask as many community members as possible what they thought the threats to water were (e.g., by setting up booths at community events and surveying community perspectives, visiting Elders and recording their concerns, etc.).
2. Collect technical data on water quality and quantity, the locations of potential contaminant sources, and infrastructure type, age, and maintenance schedules (e.g., dates of septic tank installations and how frequently they are pumped out; the age of landfills and the degree to which they were properly lined when installed). Much of this data collection can be accomplished by speaking to community staff and Elders and by consulting existing resources, such as previously commissioned consultant reports. Identify what work has already been done by the various departments, and amalgamate data. Background information (e.g., geology, soils, community size) can also be found in consultant reports. Other reports can be requested from Indigenous Services Canada (ISC) and Health Canada. However, practitioners provided a word of caution about relying solely on consultant reports. It is important to speak with community members to identify, for example, where they actually source their water. Some people may be collecting water from locations that are not recorded in consultant reports, such as springs and wells that are not officially identified. As one practitioner noted, “where are the drinking water systems? Some of them had been decommissioned years ago, and showing as active, some were new and were not on the list.” If reports do not exist or significant data gaps are identified, they can be flagged as “required data collection” and moved into the implementation phase. Technical data are critical for water protection, yet practitioners shared that in their experiences, resource limitations make it impractical to focus on data collection early on in the planning process. One practitioner mentioned communities should be wary not to “get lost in the weeds:”

Because we know another community . . . And it's a good example of what tends to happen with these processes. And they weren't certain if their well was a GUDI [groundwater under direct influence of surface water] well or not. And they spent all their time trying to figure that out, and never developed a plan, never implemented a plan . . . don't get hung up on that, and then everything goes sideways. Your money or your time has run out, your person has left, and you don't have a plan and you're not actually protecting your source water.

3. Collect data about the area near the reserve, the local watershed(s), and the traditional territory from off-reserve sources, such as conservation authorities (depending on the scope of the program, as decided by the water committee). Again, any important missing data should be identified

and documented as “something to specifically advance as a separate project in implementation, and then you can refine your plan.”

4. Collect traditional and local knowledge about water sources and how they have changed; vulnerable areas on the reserve (e.g., places with thin soil, karst, etc.); the locations of important medicinal plants; and other sites of particular ecological significance that should be protected through the water protection program. This can be accomplished by using maps of the reserve and traditional territory. As one practitioner described it:

We put up big maps where people could write where they do things; where they picnic, where they fish, where they travel. And people found it easier to work with maps, because they could see it, right? So, . . . we just had them do stickies. We had all ages come, right? Kids come; where do you swim, where do you do stuff? So, . . . people would identify concerns and threats. We would also ask them what their solutions were.

5. Amalgamate technical and traditional/local knowledge in written and/or mapping format (e.g., hard-copy map, GIS, interactive online mapping platform, etc.)

3.9.3. Western Direction

Elder Joanne Keeshig shared that the Western direction represents the mental state, the season of fall, and the life stage of adulthood. The foci of this direction are the mental tasks of interpreting data and planning appropriate actions. In this stage, the water committee can use the data collected during the community inventory to “reason things out”—to determine which contaminants pose the most risk to the community, and to set priorities in regards to which risks will be addressed first.

The following steps are included in this stage:

1. As understanding grows within the water committee about the threats to water on the reserve and in the local watershed(s), the committee can begin to set priorities. What is the approach the committee would like to take? A risk assessment, setting priorities based on the precautionary principle to “do no harm” and “plan seven generations ahead”, or some combination thereof? Perhaps the committee has another method they would prefer to use to make decisions about which threats are most important and which will be dealt with first. Practitioners shared that conducting a risk assessment of some sort was a helpful exercise, though some committees then decided to plan for each risk identified, which also aligned with the precautionary principle. One practitioner shared that a risk assessment can be helpful for getting started, but that their committee found it important to identify their own criteria for what they understood to be a priority to maintain “public health” or the “health [of] animals and fish.”
2. If the committee decides to conduct a risk assessment, the risks of each identified threat should be determined. Risk is a measure of both the probability that an issue will occur, and the severity of the impact it would have if it were to occur. However, risk assessment can be a subjective process, and it is important to engage someone with expertise. Practitioners recommended that someone with knowledge of hydrogeological processes be included in the discussion to provide information to the committee (but not to participate in decision-making) such as a consultant or a technical support person (e.g., through the OFNTSC program or a university partnership). If technical data are lacking, the community may wish to err on the side of caution at this early stage and plan for how each risk could be addressed. Special precautions should be considered for communities located in sensitive areas, such as above fractured bedrock with thin soils; in these cases, the precautionary principle should be seriously considered. Practitioners shared that it is important to remember to consider local threats to water as well as regional ones—for one community, the most immediate threat to drinking water was actually dog excrement around wellheads.
3. Prioritize which threats will be dealt with first using information about the risk of each threat, available funding, upcoming opportunities, and community preferences. It is important to

examine the context of the community to understand the full impacts of threats. Will a particular threat cause a drinking water advisory to be put in place, requiring the community to drink bottled water, and if so, for how long? The full impacts of a threat may be different for each community. Identify which organizations should or could be contacted to deal with contaminant threats originating off-reserve. Engage with Chief and Council and Tribal Councils to obtain approvals and request that they engage with certain off-reserve entities.

3.9.4. Northern Direction

The final stage in the water protection process lies in the Northern direction, which represents the physical body, the season of winter, and the life stage of Elder. As this direction is associated with the physical state, the focus of this stage is to carry out the actions proposed in the Western direction. In this stage, the “doing” commences—the water protection plan is finalized and implementation begins. Monitoring the outcomes of the plan (e.g., water quality) keeps the plan on track and in balance. The finalized water protection plan provides the community with a guide to make decisions that are respectful of the lands and waters on the reserve and in the traditional territory (e.g., developing land-use zoning), and support the community’s physical, spiritual, and cultural relationships to water. The plan’s implementation also creates opportunities for community members to engage in water stewardship. The following steps can be included in this stage:

1. Flesh out the priorities developed in the previous stage into a finalized implementation plan including milestones, dates, and outcomes. One practitioner shared that their committee divided this up into three tiers: what was already being done; what was being done but required extra funding; and what required funding in order to begin. It was also suggested that communities identify and flesh out “shovel-ready” projects that will be ready to begin as soon as funding is available. Importantly, community members and practitioners mentioned that the committee has a responsibility to act on the knowledge shared by Elders. Ensuring that the concerns of community members are being addressed in some way is important.
2. Identify external funding opportunities and apply for grants.
3. Engage experts to address data gaps through hydrological, hydrogeological, and/or ecological studies. Communities expressed the importance of engaging expertise in order to ensure ecosystems are properly protected. As one community member noted:

I wouldn't give an appendectomy to a chef, so to speak, so, . . . especially if we're saying it's of high importance, then I think we need to put our money where your mouth is, and actually show that it's of high importance.

4. Divide tasks among participating departments and make internal funding decisions. Certain priorities may align with other goals a department has, making it possible to achieve double dividends by having that department take it on. This may also lessen the financial burden (i.e., if a department already has funding set aside to achieve these goals).
5. Determine long-term strategies for water protection: building partnerships with universities, First Nation organizations, NGOs, etc. and obtain Chief and Council approvals.
6. Monitor the results of the implemented program. This might include monitoring water quality and quantity at certain locations on the reserve or in the traditional territory; or tracking the outcomes identified by the committee such as cleanup activities; upgrading infrastructure (e.g., septic systems); eliminating sources of vulnerability to contamination (e.g., capping abandoned wells); building educational/school programs; and carrying out community outreach activities.
7. Revisit and evaluate the plan based on the monitoring results. Do goals need adjustment? Are new milestones or outcomes required? Does the structure of the program need adjustment? Does the full cycle need to begin again? Provincial watershed SWP plans are reviewed by external experts, such as academics and consultants. It is a good idea for communities to take advantage of partnerships with academics or technical organizations to review their plans at this stage.

3.9.5. Community Engagement and Celebrating Successes

Each stage of the process is connected to its foundational core: community engagement and celebrating successes. Engaging community members, from youth to Elders, was identified by practitioners and community members as the most critical component of their water protection plans. Speaking about a group of communities that have developed water protection plans, one practitioner shared that while they did not all take the same approach, “what was very similar was we all did a community development approach, and community engagement was central to what we were doing; everyone was similar on that. And traditional knowledge, and community knowledge, was an important part of it.” Engaging community members in information and history collection; priority setting; plan development; implementation; and monitoring is integral to the effectiveness and success of the process. Community members and practitioners shared that it is also important to include community education and outreach activities. Examples include conducting water walks or canoe journeys along bodies of water on the reserve or in the traditional territory; hosting water festivals to celebrate the many aspects of water in the community (e.g., inviting everyone from water treatment to the Health Department to set up booths, hosting traditional dancers, water ceremonies, kids activities, feasts, water tasting, etc.); putting on a “Water Treatment Plant Day” to allow community members to tour the plant; hosting day camps and youth groups; facilitating youth–Elder bush walks; and working with the education department to engage children and youth in the schools. In particular, community members and practitioners emphasized the importance of land-based learning, increasing the visibility of SWP activities both on-reserve and in the traditional territory, and strengthening community relationships with water.

Celebrating successes along the way increases community interest and participation, and is a key driver of momentum. However, community members highlighted that it also plays an important role in re-establishing Indigenous identities and supporting the mental health of Indigenous youth. As one community member described:

It's part of suffering the oppression, that we have a very hard time trying to celebrate something, knowing how to bring it together. And, it's part of that history. It's part of that culture. Until we can sort all those things out, it's really a grave [situation for youth].

The importance of celebrating what has already been accomplished and making a point to share each new victory with the community was emphasized by both community members and practitioners alike.

4. Discussion

Several challenges associated with SWP for First Nations in Ontario that were discussed by community members and practitioners echoed the difficulties identified by others. These included jurisdictional issues and the fragmented water governance system in Canada [6,10,31,32,63,65] and a lack of funding both to engage in SWP [8,18,24,29,31,32], and importantly, to be able to implement SWP actions once the planning process is complete [5]. More funding is needed for First Nations to be able to meaningfully engage in SWP planning and implementation. In the United States, federal funding is available for tribes to carry out SWP assessment, planning, and implementation under the Clean Water Act Section 106 Water Pollution Control Program [76]. Yet in Canada, while the federal and provincial governments invested 100,000 CAD each towards the OFNTSC Ontario First Nations SWP training program [68], both the practitioners interviewed and other scholars reported that there is a lack of dedicated federal SWP funding available directly to communities to carry out this important work [5]. As a comparator, the Government of Ontario has spent more than 240 million CAD to carry out SWP planning and implementation activities [77]. It is highly recommended that additional government and other sources of funding be made available for programs like the OFNTSC Ontario First Nations SWP training program and for communities to hire staff and implement SWP activities.

Closely tied to inadequate funding are capacity issues, including technical and also human resource capacity, which can impact a community's ability to conduct water protection planning

(e.g., inability to pay a program lead long-term) and also to carry out important technical implementation activities [5,35,36]. Several elements of the existing SWP options for First Nations, such as the representation of First Nations as stakeholders when they should be addressed on a government to government basis and the goal to protect water in specific zones only, are problematic because they do not respect the cultural perspectives and inherent rights of First Nations [5]. The results of this study confirm that no single SWP approach is working for First Nations in Ontario, and context-specific solutions are required to address local problems [5,30].

The framework presented here aims to address some of the challenges and concerns of community members and practitioners, identified through this research and in the existing literature. The goal of the framework is to provide guidance that includes both Indigenous and scientific approaches for First Nation communities and practitioners alike who are looking for a more thorough process to protect water in Indigenous territories. It is important to note that by presenting the Anishinaabe teachings of the Medicine Wheel here as a structure for the framework, the authors are by no means attempting to generalize across Indigenous cultures, whose diversity across the province, the country, and around the world is rich and profound. It is the authors' hope that the steps, lessons learned, and suggestions presented in this framework will support other communities looking to initiate their own water protection process, and that communities will adapt the structure of the framework to highlight their own local teachings and priorities.

5. Conclusions

This research has clearly demonstrated that First Nations' SWP is a complex issue with many challenges for communities and practitioners alike. Interviews and discussions with community members and practitioners identified that issues with scale, jurisdiction, the concept of source water protection, representation, funding, and capacity all impact First Nations' SWP. However, opportunities for a variety of jurisdictions to improve the protection of First Nations' source waters in Ontario lie at multiple scales, from on-reserve community engagement to the recognition of Indigenous water laws. Relationship building; practitioner training; and interjurisdictional financial support have the potential to greatly improve on-reserve SWP and Indigenous representation in interjurisdictional decision-making arenas.

More examples are needed of functioning water security programs and partnerships that fully engage Indigenous partners. There is also a need for better risk assessment tools that work from Indigenous perspectives, and could be used by Indigenous training programs such as the OFNTSC Ontario First Nations' SWP program. Improved risk assessment tools that are inclusive of Indigenous perspectives would be useful for Indigenous communities in other areas of the world that are looking to put in place SWP or water safety plans (WSP), such as the WSP framework recommended by the World Health Organization (WHO) [78]. It will also be important to consider water protection in the broader context of climate change, as communities, particularly in the north, face changing conditions that impact source waters. Importantly, as community members pointed out, it is time to acknowledge that Indigenous perspectives must be included in water protection policies, laws, and regulations across the province and the country if we are to truly protect this most sacred substance.

"Well, water's sacred. Without it, life ceases."—Nawash Elder

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References

- Bailie, R.S.; Carson, B.E.; McDonald, E.L. Water supply and sanitation in remote Indigenous communities—priorities for health development. *Aust. N. Z. J. Public Health* **2007**, *28*, 409–414. [[CrossRef](#)] [[PubMed](#)]
- McDonald, E.L.; Bailie, R.; Brewster, D.; Morris, P. Are hygiene and public health interventions likely to improve outcomes for Australian Aboriginal children living in remote communities? A systematic review of the literature. *BMC Public Health* **2008**, *8*, 153. [[CrossRef](#)] [[PubMed](#)]
- Harper, S.L.; Edge, V.L.; Schuster-Wallace, C.J.; Berke, O.; McEwen, S.A. Weather, Water Quality and Infectious Gastrointestinal Illness in Two Inuit Communities in Nunatsiavut, Canada: Potential Implications for Climate Change. *EcoHealth* **2011**, *8*, 93–108. [[CrossRef](#)] [[PubMed](#)]
- EPA. *Fiscal Year 2014–2018 EPA Strategic Plan*; US Environmental Protection Agency: Washington, DC, USA, 2014.
- Collins, L.; McGregor, D.; Allen, S.; Murray, C.; Metcalfe, C.D. Source Water Protection Planning for Ontario First Nations Communities: Case Studies Identifying Challenges and Outcomes. *Water* **2017**, *9*, 550. [[CrossRef](#)]
- O'Connor, D.R. *Report of the Walkerton Inquiry: The Events of May 2000 and Related Issues (Part One)*; Ontario Ministry of the Attorney General, Queen's Printer for Ontario: Toronto, ON, Canada, 2002.
- Rand, M.; Sheppard, A.J.; Jamal, S.; Kewayosh, A.; Mashford-Pringle, A. Evaluation of the Aboriginal Relationship and Cultural Competency Courses among a sample of Indigenous Services Canada nurses. *Int. J. Indig. Health* **2019**, *14*, 29–41. [[CrossRef](#)]
- Marshall, R.E.; Levison, J.K.; McBean, E.A.; Brown, E.; Harper, S.L. Source water protection programs and Indigenous communities in Canada and the United States: A scoping review. *J. Hydrol.* **2018**, *562*, 358–370. [[CrossRef](#)]
- Aboriginal Affairs and Northern Development Canada (AANDC). *First Nations On-reserve Source Water Protection Plan: Guide and Template*; AANDC: Ottawa, ON, Canada, 2014.
- McGregor, D. University of Toronto Traditional Knowledge: Considerations for Protecting Water in Ontario. *Int. Indig. Policy J.* **2012**, *3*, 1–21. [[CrossRef](#)]
- McClaren, D. *Comments on Ontario's Source Protection Framework*; Chippewas of Nawash: Neyaashiinigiing, ON, Canada, 2003.
- Assembly of First Nations (AFN). *2012 First Nations Plan: Honouring Our Past, Affirming Our Rights, Seizing our Future*; AFN: Ottawa, ON, Canada, 2012.
- Gray, P.; Hodgkin, E.; Veale, B. Water, water everywhere? Understanding and protecting our nation's most valuable resource. *Environments* **2001**, *29*, 39–65.
- Scharfenaker, M.A. Ontario on fast track to drinking water quality management. *J. Am. Water Work. Assoc.* **2002**, *94*, 14–24. [[CrossRef](#)]
- Shrubsole, D. Reflections on recent developments in watershed management in Ontario and their implications for natural areas management. *Environments* **2004**, *32*, 1–14.
- Lavalley, G. *Aboriginal Traditional Knowledge and Source Water Protection: First Nations' Views on Taking Care of Water*; Environment Canada: Gatineau, QC, Canada, 2006.
- Robins, L. Nation-wide decentralized governance arrangements and capacities for integrated watershed management: Issues and insights from Canada. *Environments* **2007**, *35*, 1–47.
- Hill, C.; Furlong, K.; Bakker, K.; Cohen, A. Harmonization Versus Subsidiarity in Water Governance: A Review of Water Governance and Legislation in the Canadian Provinces and Territories. *Can. Water Resour. J. Rev. Can. Des Ressources. Hydr.* **2008**, *33*, 315–332. [[CrossRef](#)]
- Krantzberg, G. The Great Lake's future at a cross road. *Environments* **2007**, *28*, 301–305. [[CrossRef](#)]
- Mohapatra, S.P.; Mitchell, A. Groundwater Demand Management in the Great Lakes Basin—Directions for New Policies. *Water Resour. Manag.* **2008**, *23*, 457–475. [[CrossRef](#)]

21. Read, J.; Klump, V.; Johengen, T.; Schwab, D.; Paige, K.; Eddy, S.; Anderson, E.J.; Manninen, C. Working in Freshwater: The Great Lakes Observing System Contributions to Regional and National Observations, Data Infrastructure, and Decision Support. *Mar. Technol. Soc. J.* **2010**, *44*, 84–98. [[CrossRef](#)]
22. Patrick, R.J. Uneven access to safe drinking water for First Nations in Canada: Connecting health and place through source water protection. *Heal. Place* **2011**, *17*, 386–389. [[CrossRef](#)] [[PubMed](#)]
23. Plummer, R.; De Grosbois, D.; De Loë, R.; Velaniškis, J. Probing the integration of land use and watershed planning in a shifting governance regime. *Water Resour. Res.* **2011**, *47*, 9502. [[CrossRef](#)]
24. Dan, W.; Nicholas, S.; Kayli, K.; Budhendra, S. Multi-Barrier Protection of Drinking Water Systems in Ontario: A Comparison of First Nation and Non-First Nation Communities. *Int. Indig. Policy J.* **2012**, *3*, 8. [[CrossRef](#)]
25. Jerry, P.; Laura, M.; Nicholas, S. Water and Indigenous Peoples: Canada's Paradox. *Int. Indig. Policy J.* **2012**, *3*, 3. [[CrossRef](#)]
26. Longboat, S. First Nations water security: Security for Mother Earth. *Can. Woman Stud.* **2013**, *30*, 6–13.
27. Armitage, D.; De Loë, R.C.; Morris, M.; Edwards, T.W.D.; Gerlak, A.K.; Hall, R.I.; Huitema, D.; Ison, R.; Livingstone, D.; Macdonald, G.; et al. Science–policy processes for transboundary water governance. *Ambio* **2015**, *44*, 353–366. [[CrossRef](#)] [[PubMed](#)]
28. Simpson, H.; de Loë, R.; Andrey, J. Vernacular knowledge and water management: Towards the integration of expert science and local knowledge in Ontario. *Can. Water Altern.* **2015**, *8*, 352–372.
29. Cook, C. Implementing drinking water security: The limits of source protection. *Wiley Interdiscip. Rev. Water* **2015**, *3*, 5–12. [[CrossRef](#)]
30. Castleden, H.; Hart, C.; Cunsolo, A.; Harper, S.; Martin, D. Reconciliation and Relationality in Water Research and Management in Canada: Implementing Indigenous Ontologies, Epistemologies, and Methodologies. In *Global Issues in Water Policy*; Springer Science and Business Media LLC: Berlin/Heidelberg, Germany, 2016; Volume 17, pp. 69–95.
31. Hanrahan, M.; Jnr, B.D. The Rocky Path to Source Water Protection: A Cross-Case Analysis of Drinking Water Crises in Small Communities in Canada. *Water* **2017**, *9*, 388. [[CrossRef](#)]
32. Arsenault, R.; Diver, S.; McGregor, D.; Witham, A.; Bourassa, C. Shifting the Framework of Canadian Water Governance through Indigenous Research Methods: Acknowledging the Past with an Eye on the Future. *Water* **2018**, *10*, 49. [[CrossRef](#)]
33. Baijius, W.; Patrick, R.J. “We Don't Drink the Water Here”: The Reproduction of Undrinkable Water for First Nations in Canada. *Water* **2019**, *11*, 1079. [[CrossRef](#)]
34. Marshall, R.E.; Levison, J.; McBean, E.A.; Parker, B. Wastewater impacts on groundwater at a fractured sedimentary bedrock site in Ontario, Canada: Implications for First Nations' source-water protection. *Hydrogeol. J.* **2019**, *27*, 2739–2753. [[CrossRef](#)]
35. Patrick, R.J.; Grant, K.; Bharadwaj, L. Reclaiming Indigenous Planning as a Pathway to Local Water Security. *Water* **2019**, *11*, 936. [[CrossRef](#)]
36. Alcantara, C.; Longboat, S.; Vanhooren, S. Improving First Nations water security through governance. *Can. Public Adm.* **2020**, *63*, 155–176. [[CrossRef](#)]
37. Ermine, W.; Sinclair, R.; Jeffery, B. *The ethics of research involving Indigenous Peoples. Report of the Indigenous People's Health Research Centre to the Interagency Advisory Panel on Research Ethics*; IPHRC: Saskatoon, SK, Canada, 2004.
38. Chilisa, B. *Indigenous Research Methodologies*; SAGE Publications: Thousand Oaks, CA, USA, 2012.
39. Louis, R.P. Can You Hear us Now? Voices from the Margin: Using Indigenous Methodologies in Geographic Research. *Geogr. Res.* **2007**, *45*, 130–139. [[CrossRef](#)]
40. Smith, L.T. *Decolonizing Methodologies: Research and Indigenous Peoples*; Zed Books: New York, NY, USA, 1999.
41. Simonds, V.W.; Christopher, S. Adapting Western Research Methods to Indigenous Ways of Knowing. *Am. J. Public Health* **2013**, *103*, 2185–2192. [[CrossRef](#)] [[PubMed](#)]
42. Chilisa, B.; Tsheko, G.N. Mixed Methods in Indigenous Research. *J. Mix. Methods Res.* **2014**, *8*, 222–233. [[CrossRef](#)]
43. Kirkness, V.J.; Barnhardt, R. First Nations and higher education: The four R's-respect, relevance, reciprocity, responsibility. *J. Am. Indian Educ.* **1991**, *30*, 1–15.
44. Peltier, C. An Application of Two-Eyed Seeing: Indigenous Research Methods with Participatory Action Research. *Int. J. Qual. Methods* **2018**, *17*, 1–12. [[CrossRef](#)]

45. Bartlett, C.; Marshall, M.; Marshall, A. Two-Eyed Seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *J. Environ. Stud. Sci.* **2012**, *2*, 331–340. [CrossRef]
46. First Nations Information Governance Centre (FNIGC). The First Nations Principles of OCAP®. 2018. Available online: <https://fnigc.ca/ocapr.html> (accessed on 15 October 2018).
47. Genivar. *Water Feasibility Study. Draft Report*; Genivar Inc.: Owen Sound, ON, Canada, 2011.
48. Chippewas of Nawash Unceded First Nation (CNUFN). 2020. Available online: <https://www.nawash.ca/tag/fishing/> (accessed on 20 October 2020).
49. Saugeen Ojibway Nation (SON). Saugeen Ojibway Nation Environment Office. 2019. Available online: <http://saugeenojibwaynation.ca/> (accessed on 28 June 2020).
50. Saugeen Valley Conservation Authority. 2020. Available online: <https://svca.on.ca> (accessed on 15 July 2020).
51. Rosenberg, M. Blank US Maps. Available online: https://www.thoughtco.com/blank-us-maps-and-other-countries-4070241?utm_source=pinterest&utm_medium=social&utm_campaign=shareurlbuttons_nip (accessed on 22 July 2020).
52. Kvale, S.; Brinkmann, S. *InterViews: Learning the Craft of Qualitative Research Interviewing*; Sage Publications: Thousand Oaks, CA, USA, 2009.
53. Morgan, D.L. *The Focus Group Guidebook*; SAGE Publications: New York, NY, USA, 1998.
54. Patton, M.Q. *Qualitative Research and Evaluation Methods*, 3rd ed.; Sage Publications: Thousand Oaks, CA, USA, 2002.
55. Bourgeault, I.; Dingwall, R.; De Vries, R. *The SAGE Handbook of Qualitative Methods in Health Research*; SAGE Publications: New York, NY, USA, 2010.
56. Birks, M.; Chapman, Y.; Francis, K. Memoing in qualitative research. *J. Res. Nurs.* **2008**, *13*, 68–75. [CrossRef]
57. Decuir-Gunby, J.T.; Marshall, P.L.; McCulloch, A.W. Developing and Using a Codebook for the Analysis of Interview Data: An Example from a Professional Development Research Project. *Field Methods* **2010**, *23*, 136–155. [CrossRef]
58. Wheelon, J.; Faubert, J. Framing Experience: Concept Maps, Mind Maps, and Data Collection in Qualitative Research. *Int. J. Qual. Methods* **2009**, *8*, 68–83. [CrossRef]
59. Fereday, J.; Muir-Cochrane, E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *Int. J. Qual. Methods* **2006**, *5*, 80–92. [CrossRef]
60. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [CrossRef]
61. Creswell, J.W.; Miller, D.L. Determining Validity in Qualitative Inquiry. *Theory Into Pr.* **2000**, *39*, 124–130. [CrossRef]
62. *Nvivo Qualitative Data Analysis Software*; Version 11; QSR International Pty Ltd.: Burlington, MA, USA, 2014.
63. Simeone, T.; Troniak, S. *Bill S-8: The Safe Drinking Water for First Nations Act*; Library of Parliament: Ottawa, ON, Canada, 2012.
64. Phare, M.P. *Restoring the Lifeblood: Water, First Nations and Opportunities for Change*; Walter and Duncan Gordon Foundation: Toronto, ON, Canada, 2011.
65. Bakker, K.; Cook, C. Water Governance in Canada: Innovation and Fragmentation. *Int. J. Water Resour. Dev.* **2011**, *27*, 275–289. [CrossRef]
66. Statutes of Canada. An Act Respecting the Safety of Drinking Water on First Nation Lands. 2013. Available online: <http://laws-lois.justice.gc.ca/eng/acts/S-1.04/FullText.html> (accessed on 20 July 2020).
67. Ministry of the Environment, Conservation and Parks (MECP). Working with First Nations to Improve Drinking Water. 2019. Available online: <https://www.ontario.ca/page/working-first-nations-improve-drinking-water> (accessed on 29 September 2018).
68. Ministry of the Environment, Conservation and Parks (MECP). Working with First Nations to Improve Drinking Water. 2019. Available online: <https://www.ontario.ca/page/working-first-nations-improve-drinking-water#section-4> (accessed on 24 July 2020).
69. Krantzberg, G. Renegotiation of the 1987 Great Lakes Water Quality Agreement: From Confusion to Promise. *Sustainability* **2012**, *4*, 1239–1255. [CrossRef]
70. Morris, M.; Lo, D. Cooperative and adaptive transboundary water governance in Canada’s Mackenzie River Basin: Status and prospects. *Ecol. Soc.* **2016**, *21*, 26. [CrossRef]

71. Mandamin, J. N'guh izhi chigaye, nibi onji: I will do it for the water. In *Anishinaabewin Niizh: Culture Movements, Critical Moments (12-23)*; Corbiere, A.D., McGregor, D., Migwans, C., Eds.; Ojibwe Cultural Foundation: McChigeeng, ON, Canada, 2012.
72. Whyte, P.K.; Cuomo, C. Ethics of Caring in Environmental Ethics: Indigenous and Feminist Philosophies. In *The Oxford Handbook of Environmental Ethics*; Gardiner, S.M., Thompson, A., Eds.; Oxford University Press: Oxford, UK, 2017.
73. Plain, S. Great Lakes Canoe Journey: Mobilizing Indigenous Knowledge in First Nation Communities. In Proceedings of the Indigenous Environmental Justice Speaker Series, Toronto, ON, Canada, 25 January 2017.
74. Craft, A. Anishinaabe Nibi Inaakonigewin Report. University of Manitoba's Centre for Human Rights Research and Public Interest Law Centre. Available online: http://create-h2o.ca/pages/annual_conference_presentations/2014/ANI_Gathering_Report_-_June24.pdf (accessed on 22 June 2020).
75. Garrod, N. Local Water Collaboration to Enhance Community Source Water Protection at Chippewas of the Thames First Nation Ontario. Master's Thesis, University of Guelph, Guelph, ON, Canada, 2020.
76. EPA. Tribal Grants under Section 106 of the Clean Water Act. 2018. Available online: <https://www.epa.gov/water-pollution-control-section-106-grants/tribal-grants-under-section-106-clean-water-act> (accessed on 18 June 2020).
77. Office of the Auditor General of Ontario. Annual Report 2014. 2014. Available online: https://auditor.on.ca/en/content/annualreports/arreports/en14/2014AR_en_web.pdf (accessed on 22 July 2020).
78. World Health Organization. Water Safety Planning. 2020. Available online: https://www.who.int/water_sanitation_health/water-quality/safety-planning/en/ (accessed on 1 September 2020).

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