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Water Insecurity in Ontario First Nations: An Exploratory Study on Past Interventions and the Need for Indigenous Water Governance

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Abstract: In 2018, I began an exploratory study involving fourteen Ontario First Nation participants that examined some First Nation water security challenges and opportunities. In acknowledgment that many of the government assessments, reports, and investments to date have failed, this study aims to determine the causes of the water crisis as well as potential solutions by sharing Indigenous perspectives and recommendations on water governance and security. During the study, Indigenous participants were asked interview questions regarding their water and wastewater systems, their historical and current water security conditions, and if they had recommendations for achieving water security in First Nations. The analysis from these interviews demonstrated that there were ten different themes for water security and insecurity in First Nation communities as well as a set of four recommendations shared by the fourteen participants. The participant recommendations are: (1) that Traditional Knowledge (TK) and Indigenous laws be included in water security initiatives and water governance; (2) that provincial and federal governments work with Indigenous communities on their water security challenges and opportunities; (3) that First Nation leadership develops and implements community water protection plans; (4) that Indigenous communities establish an oversight committee or body for monitoring tourist ventures and extractive development projects such as mining on their territories. This paper will also discuss how an Indigenous research paradigm can be applied during the research process to ensure that the information is captured from the Indigenous perspectives of the participants.

Keywords: Indigenous water governance; First Nations; water crisis; Traditional Knowledge; water policy; Indigenous laws



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1. Introduction

Scattered throughout the province of Ontario, there are 133 First Nation communities [1,2]. While these First Nation communities may differ culturally and linguistically from one end of the province to the other, many of them adhere to the same set of principles when it comes to the land and resources on their traditional territories [3]. At the provincial level, many First Nation communities collaborated on a Water Declaration in 2008, whereby each of the participating First Nations asserted their relationship to water [3]. The Water Declaration of the First Nations in Ontario affirms that water is a sacred gift given to all people from the Creator and we all have a sacred responsibility to respect, conserve, and protect water for present and future generations [3]. For Indigenous peoples, water is also a link to their ancestors who respected, conserved, and protected water so that future generations were also able to enjoy the same access to water quality and water quantity that previous generations had [3–6]. The responsibilities and the teachings that have been passed down orally from generation to generation as well as the teachings from Indigenous Elders and Traditional Knowledge Keepers have resulted in some of the Indigenous Nations creating their own natural laws or Indigenous laws based on their Traditional Ecological Knowledge (TEK) or their Indigenous Knowledge Systems (IKS) [3,5,7].

Another principle strongly adhered to by both Indigenous peoples and Indigenous researchers is “relational accountability” [4]. Indigenous researchers are not only accountable to all their relations, but they are also accountable to their ancestors, youth, Elders, and the next seven generations to come. They are also accountable to the Creator and to the plants and animals that also depend on clean air, water, and land to live [3,5–9]. Additionally, Chilisa (2012) and Smith (2012) state that researchers are accountable to the Indigenous peoples and communities that they conduct their research with [4,10]. Indigenous research should endeavour to improve the living conditions in communities, consider Indigenous cultural and linguistic diversity, balance power relationships, and otherwise ensure that the research is “transformative” [4,10]. Finally, Indigenous research must be flexible and adaptive enough to encompass both western and Indigenous knowledges to ensure that research encapsulates Indigenous perspectives from the Indigenous participants’ frames of reference while also meeting western academic criteria [4,11]. Acknowledging and understanding these principles and protocols will assist researchers with establishing trust, building relationships, incorporating Indigenous worldviews, and providing meaningful results and solutions for the Indigenous peoples and communities that they conduct research with and for [12–14].

Throughout the next few sections, I will discuss how the Indigenous relationship to water has been impacted by government policies, government legislation, extractive development, and water contamination over the past century. I will also discuss how existing literature and research have focused more on the issues and less on meaningful solutions, while Indigenous perspectives and voices have largely been overlooked. The purpose of this research was to determine what water security looks like from First Nation perspectives and share their challenges, insights, and recommendations with those researchers interested in Indigenous water governance and water security. While this research constitutes academic research, specific efforts were made to ensure Indigenous perspectives were included and that they were able to share their contributions from their own point of view [4]. In the results section, I will explain the ten themes that emerged from the data shared by the fourteen participants in this study and discuss their insights, community initiatives, and recommendations on achieving water security in First Nations in Ontario.

2. Water Insecurity in Ontario First Nations

Over the past century, the Indigenous relationship to water has deteriorated significantly as extractive development projects began to divert and contaminate Indigenous community water sources [15–18]. One of the most affected provinces with the highest number of boil water advisories in First Nation communities is Ontario [16]. There are many First Nation communities that have been impacted by water insecurity over the past few decades, but there are three that have received a lot of media attention as well as interest from researchers and scientists due to the severity of their water insecurity. These three communities are Shoal Lake, Grassy Narrows, and Neshkanta First Nation.

Shoal Lake has a long history of water insecurity, which began over a century ago [17,19–21]. In 1919, the Shoal Lake peninsula was cut off from the mainland and became a man-made island to create an aqueduct for the city of Winnipeg [15,16,19,20]. In the decades that followed, the community remained isolated because it was only accessible by boat and it was not connected to the Trans-Canada Highway [16,20,21]. These remote conditions made the building of critical community infrastructure such as water treatment plants and schools next to impossible [19–21]. Construction on Shoal Lake’s essential infrastructure was severely limited until the “Freedom Road” was built and connected the community to the Trans-Canada Highway in 2019 [20,21]. Another community, Grassy Narrows, experienced over half a century of water insecurity when a pulp and paper mill dumped mercury into the community’s watershed in the 1960s [16,22]. In 2016, the community members in Grassy Narrows reported skin rashes caused by bathing in the contaminated water to Human Rights Watch [16]. More recently, the community of

Neshkantaga began posting videos documenting their experiences after an oily substance was found in their treated drinking water supply [23]. By early December 2020, the community had been evacuated for over 40 days, and the daily count continued to grow [23]. The community holds the record for the longest standing boil water advisory, which has lasted over 25 consecutive years [16,23]. In *Make it Safe*, Human Rights Watch made the following statement regarding Shoal Lake and Neshkantaga:

“In communities like Neshkantaga and Shoal Lake First Nations, where advisories have existed for approximately 20 years each, a whole generation of children grew up unable to drink the water from the taps. Individuals from this generation are starting to have their own children, and to despair.” ([16], p. 9)

Unfortunately, water contamination and boil water advisories have not been the only source of water insecurity for First Nations.

The Six Nations of the Grand River Territory and Serpent River First Nation are two Indigenous communities with existing water treatment plants. Six Nations has been struggling with water security for years despite having a fully functioning water treatment plant [16]. The water treatment plant in Six Nations has been operating at maximum capacity for several years with many community members still reliant on individual well systems or water trucks to deliver water to their homes [16]. While facing water insecurity within the community, Six Nations has also struggled to keep water bottling companies like Nestle from over extracting water from the Grand River [16,24]. Serpent River, on the other hand, had received a brand-new water treatment plant in 2015 but were placed on a boil water advisory shortly after it was built [25]. The assessment studies conducted prior to the water treatment system being built failed to account for seasonal changes in the water supply [25]. As a result, trihalomethanes, a by-product that can occur with the improper treatment of water, was detected in their water supply and the community was placed on a water advisory [25]. Indigenous Services Canada had listed the community boil water advisory as “completed” by November 2017, but Serpent River still states that they are impacted by water insecurity on their community website in the years that followed [26,27]. This is a clear example of how First Nations and provincial and federal governments have conflicting views on what water security means. Some First Nation communities with partial access to water treatment systems are not prioritized by provincial and federal governments.

Another community with only partial access to clean drinking water is Batchewana First Nation located near Sault Ste. Marie, Ontario [16]. Part of Batchewana is connected to a municipal water system, but the community cannot increase the number of homes it connects to this system because of an existing water use agreement [16]. According to Human Rights Watch, the community had reached the maximum number of homes that could be connected to this system by 2015 [16]. The remaining homes in the community are reliant on individual well water systems, which Indigenous and Northern Affairs Canada does not fund [16]. This leaves the costs of repairing these systems up to the First Nations reliant on these water systems and many community members or community bands cannot afford these costs [16]. By 2016, many individual well systems in First Nations had fallen into disrepair as a result [16].

Merell Ann Phare, Deborah McGregor, and Human Rights Watch have critically assessed why government interventions, legislation, and investments have largely failed over the past decade. In 2009, Phare determined that there were two key flaws in government initiatives and investments. The first flaw was that there was a lack of legislation protecting drinking water in First Nation communities. The second flaw was that only 67% of the funding invested by the government into drinking water in First Nations was received by the communities [1]. The remaining 33% of the government funding and investments went to government staff and the other administrative requirements for implementing safe drinking in communities [1]. Phare stated that this information had been obtained from reports by the Assembly of First Nations [1]. By 2014, McGregor had also compiled a list of government assessments, reports, investments, and legislation in her article the

Ethic of Responsibility [8]. McGregor found that Indian and Northern Affairs Canada had discovered some alarming statistics with their 2003 National Assessment of Water and Wastewater Systems [8]. Out of the 740 water systems that the government had assessed, 29% posed potentially high risks to water quality, 46% were medium risks, and less than a quarter of the water systems posed low or no risks to the water quality in First Nation communities [8].

Three years later, Indian and Northern Affairs Canada announced an Action Plan for Drinking Water in First Nation Communities [8]. This action plan called for the establishment of an expert panel that was to advise on a regulatory framework for securing safe drinking in First Nation communities [8]. The expert panel presented three options for a regulatory framework in their final report: (1) creating new regulations, which were supported by existing legislation; (2) the establishment of federal drinking water quality standards for First Nation communities; (3) enabling First Nations to include their own laws in new regulations [8]. Phare, McGregor, and Human Rights Watch indicated that these recommendations were also lacking because they did not mention the need for sufficient funding and resources, which are required to implement these options [1,8,16]. In 2005, the Assembly of First Nations conducted a study, which found that First Nations were receiving less than half of what municipalities were receiving for their capital infrastructure [1]. The same study found that many First Nation communities could not keep up with the operations and maintenance required for their water systems, especially communities in northern, rural, and remote areas where the associated costs were much higher [1]. Despite millions of dollars in investments from 2003 to 2008, critical water security challenges remained in First Nation communities [1,8,16].

In 2010, the federal government initiated a legislative process to regulate drinking water in First Nations [8]. Federal engagement and consultation with First Nations were limited, and in 2013, the Safe Drinking Water for First Nations Act (SDWFNA) was enacted [8,12,16,19]. The federal government was met with heavy criticisms from First Nations, as the legislation did not reflect their core concerns and, thus, failed to address Indigenous water security. While the Act succeeded in establishing regulatory components for safe drinking water in First Nations, it also absolved the federal government of all responsibility for providing safe drinking water in communities and placed this burden on First Nation Chiefs instead [19,28]. The legislation also failed to mention where the necessary funding and resources required to establish and maintain safe drinking water in First Nations would come from. The issues found within the legislation were indicative of the government failure to adequately engage and consult with First Nations prior to the legislation being established [19,28,29].

In *Make It Safe*, Human Rights Watch discussed a 2011 report by Indian and Northern Affairs Canada, which found that between 20 and 25% of water and wastewater systems in First Nations were operating at capacity or beyond [16]. The Indian and Northern Affairs Canada report also stated that only 69% of First Nation households had access to piped water, while the remaining 31% relied on individual wells, trucked water, or had no water service at all [16]. By 2015, assessments conducted on First Nation water needs found that there was insufficient funding to address the infrastructure needs in communities and that First Nations had difficulties operating their systems without adequate funding and resources [16]. As the government only provided a maximum of 80% of the funding required to operate and maintain water and wastewater systems on reserve, First Nations were left paying for the remaining 20% needed to cover their water and wastewater needs [16]. There was also a 2% cap on increased funding for their water and wastewater systems, which meant that inflation and population growth had not been factored into the funding allocations [16]. This significantly impacted population growth and housing needs in First Nation communities [16]. Human Rights Watch claimed that CAD First Nation communities required 4.7 billion dollars to bring their water and wastewater infrastructure up to Canadian standards [16].

By the year 2016, linkages between water insecurity and the health, education, social, and justice issues within Indigenous communities began being identified. It was determined that water insecurity made the Indigenous peoples affected by it more vulnerable than the rest of the Canadian population that had access to clean drinking water [30–32]. Furthermore, there were direct links to water insecurity found within the Missing and Murdered Indigenous Women and Girls (MMIWG) Inquiry conducted by the Ontario Ministry of the Solicitor General [31]. Water insecurity was also linked to the untimely deaths of seven Indigenous youth who had died under mysterious circumstances in the Thunder Bay area in Ontario [30,32]. Following the Inquiry into the deaths of the seven youth, it was determined that their mental and social health was impacted by the water insecurity in their First Nation communities [30,32]. The conclusions from both inquiries found that First Nation communities required sustainable funding and resources to meet their water security needs [30–32].

Currently, the Assembly of First Nations has been working with the 634 First Nations in Canada on repealing the SDWFNA [28,29]. Given the complexities and the current COVID-19 pandemic, it is unclear how far they have progressed with this initiative. When the liberal government was elected in 2015, they pledged to end all long-term drinking water advisories in First Nation communities by 2021 [27]. However, Indigenous Services Canada (ISC) recently announced that this initiative would be put on hold because the COVID-19 pandemic had caused too many delays with the water system projects [33]. Nishnawbe Aski Nation released a statement in early December 2020 claiming that the ISC delay would impact fifteen First Nations with long and short-term drinking water advisories in their region alone [33].

In *Navigating Indigenous Water Rights and Regulatory Politics in Settler Colonial States*, Wilson et al. state that the pandemic should be a reason to expedite the delivery of water security to First Nations, not an excuse to impede progress [20]. When an E. coli outbreak emerged in the town of Walkerton in 2000, their water issues were resolved within six months with a full inquiry launched into the events leading up to the contaminated water supply [19,34]. It is clear from the ongoing water security challenges in several First Nation communities that these timelines do not apply to Indigenous communities [18,19].

3. The Process of Situating Self

Within Indigenous cultures, it is important to explain who you are and where you come from so that others have an idea of how your culture and perspectives may shape discussions and collaboration [1,4]. Within western knowledge systems and the academic community, it is equally important to assert how your background and perspectives may influence your research and outcomes [4]. To situate myself in my research, I am an *Anishinabek Kwe* from *Mnidoo Mnsing* (Manitoulin Island). I have several years of experience working with an Indigenous organization, and I have also worked on numerous Indigenous initiatives at both the regional and national levels throughout the past few years. This work experience and the resulting knowledge provided me with a basic understanding of the best practices and the best processes to follow when working with Indigenous peoples and, more specifically, First Nations. It was also through my work experiences that I learned about the First Nation water crisis in Canada.

4. Exploring the Challenges and Opportunities in Ontario First Nations

There is more to water insecurity in First Nations than the current governments' focus on drinking water advisories. Chilisa refers to research and initiatives that do not meet the needs of the people it is purported to assist as "dominant research paradigms" ([4], p. 35). Dominant research paradigms tend to focus on "deficit-driven and damage-centered research . . . which chronicle only the pain and hopelessness of the colonized" ([4], p. 160). Chilisa adds that the only way to counter dominant research paradigms is to create research that resists "methodological imperialism" ([4], p. 160). Since the literature concluded that the First Nation water crisis extends beyond boil water advisories, I wanted to ensure

that the participants in this study had opportunities to discuss their perspectives based on their experiences and observed challenges. Additionally, researchers such as Chilisa and Murdocca found that existing research conducted by academics, organizations, and governments tended to focus on the “pain and suffering” from the research subjects as well as the “deficits” incurred [4,18]. Rather than adding to the distress that affected communities are already facing by focusing on the negative impacts, research should also target the opportunities which are available to communities as well as highlighting Indigenous ideas, recommendations, and voices [4,18].

Throughout this study, I will discuss how an in depth understanding of Indigenous perspectives, priorities, and values is required for making meaningful recommendations and potential solutions [7,9,35–37]. Luby et al. (2018) discussed this in an article about knowledge sharing frameworks and conducting research with Indigenous communities in the Grand Council Treaty #3 region of northwestern Ontario:

“Treaty #3 demands that non-Indigenous researchers collaborate with Anishinaabe communities. Collaboration, however, makes it easier to envisage overlapping interests. Non-Indigenous researchers immersed in Anishinaabe systems-thinking are more likely to identify connections between personal projects and community goals” ([38], p. 213)

They conclude that understanding the Anishinaabe perspectives will help researchers align themselves with community goals and priorities [38]. This process will also help ensure that communities benefit from the research as well as the researcher [7,9,12,19,36–38].

When I began this study, I wanted to ensure that I implemented existing Indigenous research methodologies, as

“Indigenous researchers have . . . highlighted the significance of using Indigenous research methodologies to ensure that Indigenous communities have the opportunity to adhere to their fundamental practices and protocols while participating in research and other initiatives, as well as conducting ethical research with Indigenous communities and recognizing the distinctive Indigenous ways of knowing”.
([37], p. 123)

While reviewing different methodologies that could be applied to Indigenous research studies, I found that several Indigenous researchers agreed on four main concepts, which Indigenous research must take into consideration. These concepts are:

- (1) Posterity;
- (2) Relational accountability;
- (3) Reciprocity;
- (4) Creating “transformative” research.

From the First Nations in Canada to Indigenous Nations in Africa and New Zealand, Indigenous researchers stress the importance of considering the needs of present and future generations and living sustainably so that these generations can enjoy the same access to air, water, and land quality as past generations [4,7,10]. Relational accountability refers to the understanding that Indigenous peoples are accountable to their Indigenous participants, to the communities they work with, and present and future generations [4,7,10]. Relational accountability also means that Indigenous researchers are responsible for ensuring that Indigenous communities benefit wherever and whenever possible as well as being responsible for providing meaningful results [4,7,10]. Reciprocity is the recognition that western knowledge and Indigenous Knowledge Systems can be interwoven in Indigenous studies and that in many cases, they can complement and enhance one another [4,7,10,38]. Reciprocal relationships are especially important to Indigenous peoples given the history of research in communities, which has led to mistrust as well as the acknowledgement made by Luby et al. that the “Anishinabeg have a right to be actively involved in the process of knowledge creation as educators and as advisors” ([38], p. 207). Finally, Indigenous

researchers from across the globe have determined that research conducted with, for, and on Indigenous peoples must be adaptable, flexible, and “transformative” so that it can be tailored to the specific needs of communities [4,7,10].

Borrows adds that Indigenous research should not be categorized into one main area of study [7]. Indigenous Traditional Knowledge (TK) and Traditional Ecological Knowledge (TEK) transcend geography, law, health, politics, sociology, and Indigenous studies and simultaneously encompasses all these areas of study [7]. Therefore, researchers should take multiple areas of study into consideration when working with Indigenous peoples on research affecting their lands and resources [7,19].

5. An Exploratory Water Study on Ontario First Nations

From the spring of 2018 until the fall of the same year, I conducted an exploratory study of water security in Ontario First Nations. Within this timeframe, I contacted the regional Political Territorial Offices (PTOs) in the four regions in the province known as the Anishinabek Nation (that services 39 First Nation communities), the Association of Iroquois and Allied Indians (that services seven First Nation communities), Grand Council Treaty #3 (that services 29 First Nation communities), and the Nishnawbe Aski Nation (that services 49 First Nation communities). I also contacted individuals from the Independent First Nations (IFN) and the unaffiliated First Nations. Initiating contact with First Nation communities using this process has been used and documented by Indigenous organizations and researchers as a best practice [39,40]. After initiating contact with each PTO region, I used the snowball sampling technique to find participants for the study.

Although I attempted to include a diverse range of participants from each PTO region, it was difficult to obtain participation from some regions and easier to obtain participation in others. While the actual sample size was small, some respondents represented regional offices that serviced 39 First Nation communities in one region and 49 First Nation communities in another region. Collectively, these two participants worked for 88 First Nation communities in the province of Ontario. However, while this study provides guidance for future research initiatives, it is exploratory, and much more research is required to address Indigenous water security challenges in Canada.

By reviewing and assessing how Indigenous participants were selected for conferences and meetings throughout the province, I understood that environmental studies should include Indigenous Elders and Knowledge Keepers, youth, Leadership (First Nation Chiefs and Councillors), and Indigenous community technicians [39,40]. Targeting these sub-groups of Indigenous peoples allows for the inclusion of Elders and Knowledge Keepers who understand the history of the community and the cultural significance of the land and water, the youth who are the voices for present and future generations, the Indigenous Leaders who know and understand all the issues and opportunities within communities, and the technicians who work on the environmental issues impacting communities daily [39,40]. When undertaking research with and within Indigenous communities, it is critical to involve the youth in Indigenous communities, as the

“Anishinaabe understanding [is] that their youth [have] a right to learn and ideally become cultural liaisons . . . [This] is an important teaching needed to resist both previous and current attempts at silencing Indigenous cultures.” ([38], p. 212)

Including Indigenous youth, particularly in western research, is a good way to build trust with Indigenous communities and reassure them that there are no attempts to “assimilate” their Traditional Knowledge or Traditional Ecological Knowledge [38]. With the information that the participants provided, it was my goal to determine what their past and ongoing challenges were, share information with them, and prepare a report that they could use for their present or future advocacy efforts to achieve water security in their communities [19]. Finally, I compiled a list of four recommendations based on the information that they shared that will be discussed at the end of this section. An illustration

showing the locations of each First Nation community that the participants were from in Ontario can be found below in Figure 1.



Figure 1. Illustration of the participants' First Nation communities in Ontario.

The participants were asked the following questions: (1) What types of water systems are being used in your community? (2) What are some of the challenges for water security in your community? (3) Do you have any recommendations or feedback on initiatives that can be done to improve access to water in your community? The first two questions were intended to highlight the different types of water systems that exist in First Nation communities to gain a better understanding of water security and insecurity in different communities across the province. The third question enabled the participants to discuss potential community-led solutions toward achieving water security as well as providing the participants with the opportunity to share their own ideas on water security initiatives. Based on their responses, ten themes emerged:

- (1) Concerns over well water contamination was discussed by five participants.
- (2) Concerns over the disappearance of aquatic species and lowering water levels was discussed by three participants.
- (3) A lack of community planning and accountability measures was discussed by three participants.
- (4) Water contamination from summer tourists, industry, and extractive development within or adjacent to the community was discussed by three participants.
- (5) Community growth inhibitors such as water treatment plants operating at maximum capacity and a reliance on water trucks was discussed by five participants.
- (6) A lack of community capacity, training, and resources to achieve and maintain water security was discussed by four participants.
- (7) The ongoing effects of historical water contamination on communities was discussed by four participants.

- (8) The cultural significance of water to First Nations was discussed by five participants.
- (9) Limited options for community water treatment systems were discussed by all of the participants.
- (10) Outdated water systems were discussed by two participants, but these participants worked for the Nishnawbe Aski Nation and the Anishinabek Nation regional offices that service 88 First Nations in Ontario collectively.

These findings were significant because they confirmed that the conclusions made by Phare, McGregor, and Human Rights Watch from 2009 until 2016 were not only accurate, but ongoing. Out of fourteen participants residing in fourteen different First Nation communities, there were many that were concerned about their well water systems and the fact that First Nation communities were not receiving any funding or resources to maintain them [19]. One of the participants stated:

“We can’t drink the water from our wells and we only use them to wash. If we use them for cooking, then we boil it first. With the condition of the wells and the condition of the water plant, we also didn’t have funding to get our operators trained and educated. Now the wells are still an issue, but we had a new water treatment system built in 2014.” ([19], p. 89)

Five of the participants discussed theme 1, and two of the participants from Batchewana First Nation and Six Nations indicated that the source water for their well systems was so contaminated that it was not fit for bathing or laundry. The costs for maintaining well water systems either falls on the individual band members or it is another expense to the already over stretched community budgets [19]. Three different communities also noted the disappearance of certain species of fish from their water ways as well as lowering water levels [19]. One of the participants stated:

“[T]he community had to deal with Parks Canada after the islands were flooded to create the Trent Severn waterway. After the flooding, the traditional waterways were severely altered. There used to be species in the waterway such as American eel and salmon coming up from Lake Ontario. That species doesn’t exist there anymore.” ([19], p. 75)

The participant from Munsee Delaware discussed how the community had shifted from a fishing community to a water scarce community. Three participants from the Anishinabek Nation region were also concerned with the lack of accountability measures protecting source and ground water in their communities [19]. One of the participants discussed a beach closure due to the proximity of the local dump and a community graveyard, and another participant discussed their concerns over a lack of sewage disposal at seasonal camping grounds [19]. It was determined that a lack of accountability measures and concerns over water quality and quantity were prevalent in many of the participants’ communities [19].

Another key finding was that many of the participants from southern Ontario all the way up to the remote northern Ontario First Nations were reliant on water trucks [19]. Many of the communities reliant on water trucks had water treatment plants that were operating at or beyond capacity [19]. One of the participants discussed how this impacted community growth:

“The access to water for some [communities] is trucking from water treatment plants to homes and some communities, such as Zhiibaahaasing First Nation, are always on BWAs. Near Manitoulin, another issue is that systems are at full capacity, so if a community wants to grow, they can’t because they don’t have enough pressure in their system to provide for their [new] homes. The infrastructure system is at the max. Another issue, in Dokis First Nation for example, is that they’re having a hard time finding another ground water source and they are at the max. They would need a new water treatment plant if they wanted to grow.” ([19], p. 77)

This knowledge was concerning for the participants that had discussed theme 6, as the options for implementing water treatment systems in First Nation communities were extremely limited [19]. Resources, capacity, and training to achieve or maintain water security in First Nation communities was another big issue for many participants [19]. One of the participants stated that “our [water] operators haven’t been given the right equipment and there’s been exposure. We lost two operators and there was nothing confirmed, but there was talk that they died from exposure” ([19], p. 81). The participants that were water technicians stated that First Nation communities would still be in a shortfall for the operations and maintenance of their water systems after receiving funding from Indigenous and Northern Affairs Canada [19].

The ongoing effects of historical water contamination was another theme that emerged from the participants’ data. This was especially true for communities located next to mining sites [19]. The two participants from Serpent River First Nation and Batchewana First Nation discussed uranium being detected in their community water supplies [19]. *E. coli* was another source water contaminant that was found in Hiawatha and Batchewana First Nations [19]. One of the participants discussed the dumping of contaminants into the community’s water supply:

“When there was a settlement upstream from us, they dumped all kinds of hazardous stuff in the water. You can put a magnet in the lake and metal shavings will stick to it. Rice lake is the most fished lake, but it is full of mercury, PCBs, etc. . . . but that’s one water source that we can’t use or it’s very expensive to treat. Our groundwater has high nitrates and that’s because of the agricultural cattle farm on the one side and chickens on the other—big industrial ones.” ([19], p. 81)

The ongoing water contamination in First Nation communities also impacted the Indigenous cultural relationship to water that became theme 8. Several of the participants discussed how the respect, protection, and conservation of water were linked to the cultural significance of water in First Nation communities [19]. This was another significant finding as no questions on the cultural significance of water were posed to the participants during the interviews [19].

Theme 9 was intricately connected with theme 6 as water treatment plants impeded community growth and, in several cases, only provided communities with partial water access. The participants from Hiawatha First Nation and Couchiching First Nation explained that the government favoured water treatment plants over other types of water treatment systems and that communities had little choice in this regard [19]. The participant from Couchiching stated:

“Getting a [water treatment] plant is relatively easy, but maintaining it is harder and semi trained people can stress equipment and raise attrition rates . . . The costs for those services are extremely high.” ([19], p. 87)

The last theme that emerged was also significant, as it involved two PTO regions within Ontario. Two participants from the Anishinabek Nation and the Nishnawbe Aski Nation discussed the impacts of outdated water systems on First Nation communities, which became theme 10 [19]. One of the outdated water systems discussed was sand filtration systems that were still being used in some First Nation communities:

“There are sand filtration systems and a few [communities] are using the UV water treatment systems now which are more complex than the ones they are used to using. Most plants were built in the 90s. When the infrastructure was built, it was in the early 90s and the sand filtration system was used in many communities. In a couple of communities, that was the issue there. They would build those systems and they couldn’t treat the source. We’re finding with some of the original water treatment systems that they are unable to maintain those systems because the parts are outdated or not manufactured anymore.” ([19], pp. 67–68)

Both participants stated that communities with outdated water systems struggled to provide clean drinking water to their members because they could no longer buy the parts required for maintenance, and many of the older systems were faulty to being with [19].

Below is Table 1, which explains the different themes that emerged from each region.

Table 1. Themes by region.

Region	Themes
Anishinabek Nation	<p>Theme 1: concerns over well water contamination</p> <p>Theme 2: concerns over the disappearance of aquatic species and lowering water levels</p> <p>Theme 3: a lack of community planning and accountability measures</p> <p>Theme 4: water contamination from summer tourists, industry, and extractive development within the community or located nearby the community</p> <p>Theme 5: water trucks, water treatment plant capacity, and other inhibitors of community growth</p> <p>Theme 6: a lack of community capacity, training, and resources to achieve or maintain water security</p> <p>Theme 7: ongoing effects of historical water contamination on communities</p> <p>Theme 8: the cultural significance of water to First Nations</p> <p>Theme 10: outdated water systems</p>
Association of Iroquois and Allied Indians	<p>Theme 1: concerns over well water contamination</p> <p>Theme 2: concerns over the disappearance of aquatic species and lowering water levels</p> <p>Theme 5: water trucks, water treatment plants, and other inhibitors of community growth</p> <p>Theme 6: lack of community capacity, training, and resources to achieve or maintain water security</p> <p>Theme 7: ongoing effects of historical water contamination on communities</p>
Grand Council Treaty #3	<p>Theme 4: water contamination from summer tourists, industry, and extractive development within the community or located nearby the community</p> <p>Theme 7: ongoing effects from historical water contamination impacting communities</p> <p>Theme 8: the cultural significance of water to First Nations</p> <p>Theme 9: water treatment plants are not the only solutions to water insecurity</p>
Independent First Nation	<p>Theme 1: concerns over well water contamination</p> <p>Theme 5: water trucks, water treatment plant capacity, and other inhibitors of community growth</p> <p>Theme 8: the cultural significance of water to First Nations</p>
Nishnawbe Aski Nation	<p>Theme 1: concerns over well water contamination</p> <p>Theme 5: water trucks, water treatment plant capacity, and other inhibitors of community growth</p> <p>Theme 6: a lack of community capacity, training, and resources to achieve or maintain water security</p> <p>Theme 10: outdated water systems</p>

Some of the participants discussed initiatives that their communities had either established or were a part of [19]. They discussed the connections among water ceremonies, water walks, and traditional Indigenous water governance structures [19]. One of the participants discussed a collaborative well water project that the community was trying to initiate [19]. This was a challenge for the community because both levels of government tended to favour water treatment plants as the primary source of water treatment in First Nation communities [19]. Another community initiative discussed by a participant was a water assessment study that would determine the community's water needs and the associated costs [19]. This study demonstrated that the community was operating with inadequate funding for their community needs [19].

Finally, the last question that the participants were asked was what they would recommend for achieving water security in First Nations. One of the recommendations made by the participants was to have First Nation communities return to the traditional Indigenous governance structures such as the clan system [19]. Several participants discussed enabling First Nations to create their own water laws and regulations, which was linked to this recommendation. Another participant suggested the inclusion of Indigenous women as community advisors, which this person believed might improve solutions and outcomes

for First Nation communities [19]. Another participant suggested improved access to both levels of government so that First Nations had more opportunities to voice their concerns and request environmental monitoring on neighbouring industries when required [19]. This participant also suggested that communities establish “Watch Groups” to monitor industries within and adjacent to communities and to follow up with communities on their environmental concerns [19]. Establishing community Watch Groups would also increase community capacity by enabling members to monitor their own water supplies and could potentially provide them with employment if the community found funding for these positions [19]. It was also noted that the environmental monitoring taking place for First Nation water supplies was typically funded and administered by employees from extractive development agencies and industries [19].

An investigative study on funding, resources, and budgets for community infrastructure needs was also suggested [19]. The participant that suggested this also noted that communities would often shortfall themselves on estimates for their infrastructure needs that would result in deficits [19]. This could potentially be rectified by determining what their actual total budget needs are before funding agreements are generated [19]. This conflicted with the recommendation from another participant. One participant recommended shifting the focus from capital costs and water treatment to a focus on the training and retention required by communities to maintain their water systems [19]. From the literature, however, it became clear that First Nation communities need both. One of the other participants suggested applying pressure to both levels of government to rectify the water security challenges in communities and ensure that governments continue to make safe drinking in First Nations a priority [19].

The participant from Sandy Lake First Nation discussed a significant opportunity for communities. They stated that Indigenous youth in First Nation communities could be trained and hired to work on the operations and maintenance of community water systems [19]. The participant suggested that this would greatly assist remote, rural, and isolated communities because requesting water technicians to fly in to communities for repairs was a challenge [19]. Implementing this recommendation would also assist communities with the wait times in urgent situations [19]. This participant also noted frequent emergency issues due to pipes bursting in the wintertime in their remote northern Ontario community [19].

With all the contributions made by the participants, there were four recommendations which were discussed frequently by all of them. These combined recommendations were:

- (1) That all the initiatives for achieving water security in First Nations incorporate Indigenous Traditional Knowledge (TK) wherever and whenever possible.
- (2) That both levels of government work with First Nations on resolving their water insecurity challenges.
- (3) That community leaders develop and implement community plans to protect the land and water from environmental contamination and degradation.
- (4) That First Nations collaborate on the establishment of an environmental watchdog group or committee to assist with community capacity when it comes to monitoring extractive industries and other development projects.

Most of the participants suggested that these recommendations be implemented to ensure that Indigenous priorities, values, protocols, and laws are incorporated into water security initiatives [19]. They also suggested that communities need to do more to protect their sacred waters from internal and external threats [19].

6. Conclusions

The first two conclusions that can be drawn from both the literature and the participant contributions is that many communities with current access to clean drinking water are barely able to keep up with the operation and maintenance of their water systems and that many First Nation communities are concerned about contamination from industries, development projects, and tourists either inside or adjacent to their communities. In both

the reviewed literature and the discussions by the participants, there is a growing concern about water treatment plants operating at capacity and how the community reliance on water trucks impedes community growth. While a fraction of First Nation communities have benefited from the Indigenous Services Canada commitment to end all long-term boil water advisories by 2021, there are many more with short-term boil water advisories and other water insecurity challenges that have fallen through the cracks. In addition, some of these formerly prioritized communities that were still waiting to have their water systems repaired by ISC have now been told there will be a delay because of the COVID-19 pandemic. How much longer will communities like Neshkantaga have to wait before they have access to clean water?

From the literature and the participant contributions, we can also conclude that water insecurity in First Nations is an overly complex issue with no simple answers. However, some Indigenous organizations, such as the Assembly of First Nations, are committed to mitigating the impacts of the First Nation water crisis as well as assisting communities with repealing the SDWFNA. While the federal government has delayed the process of ending long-term drinking water advisories in First Nation communities, it is a relief to know that there are some initiatives that are still underway. After the research has been completed, there are two outstanding questions that I am left with based on the literature and the participant contributions: What can be done for communities struggling to maintain their well water systems on reserve? Additionally, what can be done to provide adequate resources for the operations and maintenance of existing infrastructure in First Nation communities?

Discussed throughout this study was the necessity of including Indigenous priorities, values, protocols, and laws into all efforts to achieve water security in First Nation communities. The voices of Indigenous Elders and youth are just as vital as the voices of community leaders and technicians and researchers need to ensure that they are using a balanced approach with Indigenous research initiatives. Research has already demonstrated that Traditional Knowledge and laws can easily be integrated into Canadian laws and regulations and that adding Traditional Knowledge to environmental laws and regulations would strengthen and enhance these laws.

Finally, it was concluded by the reviewed literature that water insecurity in First Nations across Canada has persisted despite millions of dollars in investments. However, despite these investments, the government still has an obligation to continue their efforts to provide and secure safe drinking water in First Nation communities. It was also concluded that both levels of government need to include First Nations in water governance and water security initiatives as well as enabling First Nations to propose and collaborate on their own water security opportunities. This process needs to occur at the local, regional, and national levels. Despite being an exploratory study, this paper adds the Indigenous experiences, insights, and perspectives that are missing from many reports and studies conducted on their behalf. Only by including Indigenous peoples in decision-making processes affecting their lands and territories can we expect to provide them with meaningful solutions to their issues and challenges, especially when it comes to water security.

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References

- Phare, M.A. *Denying the Source: The Crisis of First Nations Water Rights*; Rocky Mountain Books: Victoria, BC, Canada, 2009.
- Chiefs of Ontario. *About the Chiefs of Ontario*; Chiefs of Ontario: Toronto, ON, Canada, 2020. Available online: <http://chiefs-of-ontario.org/about/> (accessed on 26 July 2020).
- Chiefs of Ontario. *Water Declaration of the First Nations in Ontario*; Chiefs of Ontario: Toronto, ON, Canada, 2008. Available online: <http://www.onwa.ca/upload/documents/coo-water-declaration.pdf> (accessed on 30 July 2020).
- Chilisa, B. *Indigenous Research Methodologies*; SAGE Publications: Thousand Oaks, CA, USA, 2012.
- Craft, A. *Anishinaabe Nibi Inaakonigewin Report: Reflecting the Water Laws Research Gathering Conducted with Anishinaabe Elders*; The University of Manitoba, the Manitoba Centre for Human Rights Research and the Public Interest Law Centre: Roseau River, MB, Canada, 2013.
- McGregor, D. Indigenous Women, Water Justice and Zaagidowin (Love). *Can. Woman Stud.* **2015**, *30*, 71–78.
- Borrows, J. *Living between Water and Rocks: First Nations, Environmental Planning and Democracy*; The University of Toronto: Toronto, ON, Canada, 1997; Volume 47, pp. 417–468.
- McGregor, D. Traditional Knowledge and Water Governance: The ethic of responsibility. *Altern. Int. J. Indig. Peoples* **2014**, *10*, 493–507. [CrossRef]
- Patrick, R.J.; Grant, K.; Bharadwaj, L. Reclaiming Indigenous Planning as a Pathway to Local Water Security. *Water* **2019**, *11*, 936. [CrossRef]
- Smith, L. *Decolonizing Methodologies: Research and Indigenous Peoples*; Zed Books: London, UK, 2012.
- Marshall, A. *Etuptmunk/Two-Eyed Seeing*; Public Presentation for Environmental Science Program; Saint Mary's University: Halifax, NS, Canada, 2012.
- 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. Available online: <https://www.mdpi.com/2073-4441/10/1/49> (accessed on 1 November 2020). [CrossRef]
- Tobias, T.N. *Living Proof: The Essential Data-Collection Guide for Indigenous Use-and-Occupancy Map Surveys*; Union of British Columbia Chiefs: Vancouver, BC, Canada, 2009; pp. 126–131.
- Ontario First Nations Environmental Assessment Technical Working Group. *Environmental Assessment Toolkit*; Chiefs of Ontario: Toronto, ON, Canada, 2016; pp. 50–77.
- Barlow, M. *Boiling Point: Government Neglect, Corporate Abuse, and Canada's Water Crisis*; ECW Press: Toronto, ON, Canada, 2016.
- Klasing, A. Make It Safe: Canada's Obligation to End the First Nation's Water Crisis. Human Rights Watch. 2016. Available online: https://www.hrw.org/sites/default/files/report_pdf/canada0616web.pdf (accessed on 3 November 2020).
- Notzke, C. *Aboriginal Peoples and Natural Resources in Canada*; Centre for Aboriginal Management Education and Training (CAMET) and Captus Press Inc.: Concord, ON, Canada, 1994; pp. 1–31.
- Murdocca, C. "There is Something in That Water": Race, Nationalism, and Legal Violence. *Law Soc. Inq.* **2010**, *35*, 369–402. [CrossRef]
- Arsenault, R. *Mitigating the Impacts of the First Nation Water Crisis in Ontario Using Indigenous Approaches*; Laurentian University: Sudbury, ON, Canada, 2020.
- Wilson, N.; Montoya, T.; Arsenault, R.; Curley, A. Governing Water Insecurity: Navigating Indigenous Water Rights and Regulatory Politics in Settler Colonial States. *Water* **2021**, publication pending peer review.
- Troian, M. Waiting for a Century: Shoal Lake 40 Celebrates Freedom Road. APTN. *National News*. 4 June 2019. Available online: <https://aptnnews.ca/2019/06/04/waiting-for-a-century-shoal-lake-40-celebrates-freedom-road/> (accessed on 30 June 2019).
- Science Matters. *Grassy Narrows' Fight for Clean Water Is a Struggle for Environmental Justice*. The David Suzuki Foundation, 2016. Available online: <http://www.davidsuzuki.org/blogs/science-matters/2016/06/grassy-narrows-fight-for-clean-water-is-a-struggle-for-environmental-justice/> (accessed on 30 July 2019).
- Neshkantaga First Nation. *9439 Days of Boil Water Advisory: 47 Days Since Evacuation*; Neshkantaga First Nation Community Website. 2020. Available online: <http://neskantaga.com/> (accessed on 3 December 2020).
- Perry, M. OFL Statement on Protecting Water in Six Nations Territories. Published Statement by the Ontario Federation of Labour. 2018. Available online: <http://ofl.ca/ofl-statement-on-protecting-water-in-six-nations-territories/> (accessed on 30 July 2019).
- McClearn, M. *Unsafe to Drink*; Globe and Mail: Toronto, ON, Canada, 2017. Available online: <https://www.theglobeandmail.com/news/water-treatment-plants-fail-on-reserves-across-canada-globe-reviewfinds/article34094364/> (accessed on 5 May 2018).
- Serpent River First Nation. Water Treatment Plant. Serpent River First Nation Website. 2020. Available online: <http://serpentriverfn.com/meetup/water-treatment-plant/> (accessed on 30 November 2020).
- Indigenous Services Canada. *Ending Long-Term Drinking Water Advisories*; Government of Canada: Ottawa, ON, Canada, 2020. Available online: <https://www.sac-isc.gc.ca/eng/1506514143353/1533317130660> (accessed on 30 November 2020).

28. Assembly of First Nations. Resolution No. 26/2017: Safe Drinking Water for First Nations Act. Assembly of First Nations Annual General Assembly. 2017. Available online: https://www.afn.ca/wp-content/uploads/2017/08/2017-AFN-AGA-Resolutions_EN.pdf (accessed on 30 June 2019).
29. Assembly of First Nations. Resolution No. 26/2018: Support for a First Nations Preliminary Concepts. Assembly of First Nations Annual General Assembly. 2018. Available online: https://www.afn.ca/wp-content/uploads/2018/08/2018_Resolutions_ENG.pdf (accessed on 15 July 2019).
30. Talaga, T. *Seven Fallen Feathers: Racism, Death, and Hard Truths in a Northern City*; House of Anansi Press Inc.: Toronto, ON, Canada, 2017.
31. National Inquiry into Missing and Murdered Indigenous Women and Girls. Reclaiming Power and Place: The Final Report of the National Inquiry into Missing and Murdered Indigenous Women and Girls. The National Inquired into Missing and Murdered Indigenous Women and Girls. 2019. Available online: https://www.mmiwg-ffada.ca/wp-content/uploads/2019/06/Final_Report_Vol_1a-1.pdf (accessed on 30 July 2020).
32. Ontario Ministry of the Solicitor General. Verdict of the Coroners' Jury. Office of the Chief Coroner, 2016. Available online: <https://www.mcscs.jus.gov.on.ca/english/Deathinvestigations/Inquests/Verdictsandrecommendations/OCCVerdictsSevenFirstNationsYouths.html#LivingConditions> (accessed on 30 July 2020).
33. Nishnawbi Aski Nation. More Action Needed as Federal Government Walks Back Commitment to Eliminate Drinking Water Advisories. Nishnawbi Aski Nation Statement Issued on 2 December, 2020. Available online: <https://www.nan.ca/news/more-action-needed-as-federal-government-walks-back-commitment-to-eliminate-drinking-water-advisories/> (accessed on 3 December 2020).
34. Hipel, K.W.; Zhao, N.Z.; Kilgour, D.M. Risk Analysis of the Walkerton Drinking Water Crisis. *Can. Water Resour. J.* **2003**, *28*, 395–419. [CrossRef]
35. Anderson, K. Aboriginal Women, Water and Health: Reflections from Eleven First Nations, Inuit, and Metis Grandmothers. Atlantic Centre for Excellence for Women's Health and Prairie Women's Health Centre for Excellence, 2010. Available online: <http://www.onwa.ca/upload/documents/womenandwater.pdf> (accessed on 15 July 2018).
36. Longboat, S. First Nations Water Security: Security for Mother Earth. *Can. Woman Stud.* **2016**, *30*, 6–13.
37. Arsenault, R.; Bourassa, C.; Diver, S.; McGregor, D.; Witham, A. *Including Indigenous Knowledge Systems in Environmental Assessments: Restructuring the Process*; Global Environmental Politics Special Issue Forum Piece; MIT Press: Cambridge, MA, USA, 2019. Available online: https://www.mitpressjournals.org/doi/pdfplus/10.1162/glep_a_00519 (accessed on 1 November 2020).
38. Luby, B.; Arsenault, R.; Burke, J.; Graham, M.; Valenti, T. Treaty #3: A Tool for Empowering Diverse Scholars to Engage in Indigenous Research. In *Indigenous Research: Theories, Practices, and Relationships*; McGregor, D., Restoule, J.P., Johnston, R., Eds.; Canadian Scholars Press: Toronto, ON, Canada, 2018; pp. 200–218.
39. McGregor, D. Taking Care of Each Other: Taking Care of Mother Earth. In *Summary and Highlights Report on "Reconnecting with Mother Earth" Elders and Youth Gathering on Climate Change November 4–5, 2017*; Chiefs of Ontario: Toronto, ON, Canada, 2017.
40. Chiefs of Ontario. *Chiefs of Ontario: Annual Report 2015–2016*; Chiefs of Ontario: Toronto, ON, Canada, 2016.