Analysis of challenges and opportunities to meaningful Indigenous engagement in sustainable water and wastewater management

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Abstract

Access to safe drinking water and adequate sanitation continue to be significant issues affecting Indigenous populations worldwide. The full participation of Indigenous peoples within water and wastewater policy and decision-making has been hindered by many factors, including capacity, inadequate resources and, overall, a lack of respect or formal recognition of Indigenous rights. This study investigates limitations to engagement around water and wastewater management and policy. Findings from this study show that in order to improve engagement with Indigenous people on water and wastewater management policy, systemic issues need to be addressed, in addition to gaining a greater understanding of the specific socio-economic conditions, and technical and financial capacity gaps, and the recognition of inherent Indigenous rights is necessary. It is concluded that long-term sustainability of water and wastewater management necessitates Indigenous engagement from the start, as well as increased autonomy over the management of their systems, including financing. The findings from this paper can be used by policy-makers and decision-makers to address the urgent issue of access to safe drinking water and sanitation, by improving the level of engagement with community members, and challenging the status-quo of top-down approaches through community-driven processes.

Keywords: Drinking water; Engagement; Indigenous rights; Indigenous water; Water policy; Water rights

Introduction

The role of Indigenous people in the management and decision-making process surrounding their lands continues to shift, as citizens and governments begin to recognize the importance of Indigenous rights and interests. Indigenous peoples' engagement in environmental management is increasing globally as a result of recognition of their rights and interests, including through the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). On May 9, 2016, Canada joined nations worldwide in recognizing the rights declaration and the rights of Indigenous people (Government of Canada, 2016). In Canada, in excess of 150 boil water advisories exist at any time, across the country.

The Canadian Government has recently committed to renewing relationships with Indigenous people, and committed to improving health and well-being, and the reduction of boil water advisories.

Australia is a country with many similarities to North America vis-à-vis its Indigenous population and demographics. In 2011, the Australian Government launched the National Water Initiative, which had a clear focus on including Indigenous knowledge and participation in water management and decision-making (National Water Commission (NWC), 2011). A similar shift occurred in the United States, with the establishment of the Navajo Nation Environmental Protection Agency and Safe Drinking Water Act. The Navajo Nation is the largest tribe in North America, and is located in north-eastern Arizona and extends into western New Mexico and southern Utah. The Navajo Nation is the only tribe in the US that has achieved 'primacy' in that it has obtained delegated authority under the Safe Drinking Water Act. The entire process to obtain 'primacy' took eight years with the central issues being staff capacity, and the separation of regulatory authority from bodies being regulated. This is one of the first examples whereby federal responsibilities have been devolved to an Indigenous community, and points to a growing shift towards increased Indigenous autonomy and self-governance.

Despite these advances, limitations and challenges to full participation of Indigenous people on issues of environmental management continue to exist. In particular, water and wastewater management continue to be significant issues affecting Indigenous populations worldwide.

Collaborative and Indigenous approaches to water and wastewater management

Collaborative approaches to increasing Indigenous involvement can be loosely defined as 'involvement of non-state actors in decision-making for water management; this frequently (but not always) implies the delegation of decision-making to lower scales of governance such as the watershed, municipality, or region' (Nowlan & Bakker, 2007). The term collaboration is often seen alongside words such as 'co-management' and 'partnerships' (von der Porten & de Loe, 2013a). Rationales for collaborative governance include: bringing together diverse groups of stakeholders to work towards consensus and to resolve conflicts; drawing on local knowledge to inform decision-making; attempting to address and solve issues related to diverse and unequal interests (Nowlan & Bakker, 2007; von der Porten & de Loe, 2013a).

It has been suggested that the creation of separate Indigenous advisory groups, from which a few individuals can also be chosen to serve within a larger water advisory committee as 'stakeholders', is seen as an example of a collaborative approach to Indigenous engagement (Jackson *et al.*, 2012). However, viewing Indigenous participants as merely stakeholders can be seen as a hindrance to full participation, as the assumption is that each party is an equal contributor or 'stakeholder' throughout the process. It is argued that this assumption undermines the Indigenous right to self-determination (von der Porten & de Loe, 2013b). This right to self-determination has been internationally recognized by the United Nations (UN), and includes the right to freely pursue economic, social and cultural development and the right to traditionally occupied lands, territories and resources, among many (United Nations General Assembly (UNGA), 2007). Mauro & Hardison (2000) similarly argue that:

'Indigenous peoples should not be treated as clients or mere stakeholders in the process, but should be invited to participate in all levels of decision making and management, finding representation on steering committees, planning boards, advisory bodies, and similar organizations.'

In contrast to collaborative governance models, Indigenous governance models tend to resist the notion of stakeholder representation in favor of presenting Indigenous peoples as the rightful leaders and decision-makers. Indigenous governance views the rightful decision-making role stemming from the inherent right to self-determination. In general, discussions of Indigenous governance tend to be centered around 'the reassertion of Indigenous control or jurisdiction of pre-contact lands and rights, and the reinvigoration of Indigenous ways of doing and governing, Indigenous languages, knowledge, culture and spirituality' (von der Porten & de Loe, 2013a). It has been argued that the autonomy of Indigenous communities over their resources and lands should be respected, and the rights of Indigenous people as decision-makers should be recognized (Spak, 2005). Similarly, it can be argued that the use of traditional knowledge can be further fostered, if decision-makers themselves include Indigenous representation (Berkes *et al.*, 2007).

Shift away from status-quo approach

Almost all of the participants (88%) made reference to either the 'status-quo' or the 'current approach' to meaningful engagement with Indigenous communities as needing to either be re-evaluated or changed in their entirety. It was noted the current system is a limitation to engagement (see above), but in particular, participants highlighted a need to shift away from the current approach, which has been shown to be ineffective in reducing boil water advisories, or improving access to safe drinking water and adequate wastewater treatment.

In the Canadian context, there is precedent for more inclusive approaches to environmental management. The Northwest Territories (NWT), like the rest of Canada, is home to an abundant source of water, including the Mackenzie River, the largest river in Canada. Approximately 41,000 people live in 33 communities, of which 50% of the population is Indigenous (NWT Bureau of Statistics, 2006). Jurisdiction over water is shared between the Government of Canada (Government), NWT and Indigenous governments. Through land claim agreements, the Government of Canada has a constitutionally-based responsibility to ensure that the water in the NWT remains 'substantially unaltered as to the quality, quantity and rate of flow' (Miltenberger, 2010). With the development of the Alberta oil sands, and threats due to climate change and other anthropogenic sources, the Government undertook a collaborative process involving several stakeholders that led to the development of the NWT Water Stewardship Strategy. This strategy was developed in partnership with Indigenous governments and organizations, and as such the concept of traditional knowledge is a 'guiding principle of the Strategy' (Miltenberger, 2010).

Historically, the NWT has endeavored to be more proactive than other provincial and territorial governments at engagement with Indigenous communities. An earlier example is the Mackenzie Valley resource management act that seeks to incorporate traditional knowledge into environmental decision-making. As such, any resource development application that is sent to the Mackenzie Valley Land and Water Board is subsequently forwarded to the relevant Aboriginal groups for review during a specified 'pre-screening' time period, typically of 30–45 days (Mackenzie Valley Environmental Impact Review Board (MVEIRB), 2003). Once completed, further consultations with technical experts, and public hearings, if necessary, are carried out before a final decision is rendered. In this example, Indigenous groups are able to participate at different points, including the development of terms of reference, technical sessions, public hearings, etc. (Ellis, 2005). This process is said to consider traditional knowledge in three ways: Indigenous groups make recommendations in the

pre-screening process justified through traditional knowledge; half of the members of the board are Indigenous, and these representatives review projects with a traditional knowledge lens; and lastly, Indigenous groups are able to make both statements and presentations at technical sessions and hearings (Ellis, 2005). Theoretically, it is assumed that the contributions stemming from Indigenous group concerns, based on traditional knowledge, are given equal credit to other concerns and contributions.

Recently, the NWT has moved towards even higher levels of public participation (as per the International Association of Public Participation (IAPP), 2007), into 'collaboration' and 'empowerment'. Through the co-drafting of legislation and a more collaborative public process, Indigenous communities in the NWT are more actively engaged in the decision-making process. The most recent example, the drafting of the NWT *Wildlife Act*, included the recognition and accommodation of Indigenous rights, use of co-management boards, and, extensive collaboration between all levels of Government (Donihee, 2008). The example of the NWT can serve as a useful framework for a nation-wide approach to collaborative water and wastewater management approaches that enhance engagement and improve Indigenous decision-making control.

Challenges to Indigenous engagement and strategies for improvement

Many elements, including the government structure, and complacency by the majority of policy-makers and decision-makers alike, hinder full and meaningful participation of Indigenous peoples in decision-making. It has been shown that:

'Indigenous peoples' participation in self-government negotiations is marginalized through a dominant non-Indigenous style of discourse, power imbalances favouring governments, and state policies that do not address ongoing injustices that structure the foundation of the relationship between Indigenous peoples and the state' (Irlbacher-Fox, 2009).

A recent study identified the key principles of a framework for Indigenous environmental decision-making, including: understanding the relationship that Indigenous peoples have with their respective territories; acknowledging Indigenous peoples' responsibility for protecting their territories; balancing the divide between western and Indigenous ways of knowing; recognizing and protecting Indigenous rights; acknowledging and learning from Indigenous law and Indigenous governance systems; respecting the autonomy of Indigenous peoples to make decisions about their territories; moving towards increased democratization of environmental decision-making; creating space for Indigenous communities to participate fully in decision-making; and, supporting Indigenous communities to uphold unique cultural protocols for participation (Wilkes, 2011). Similarly, Booth and Skelton derived key recommendations for improving Indigenous engagement including: taking community concerns seriously; fixing relationships between communities and government; engaging in mutual education; fixing procedural issues; and, respecting Treaty and Aboriginal rights.

Jackson *et al*. (2012) highlighted several key principles for good practice in water planning, including: incorporating Indigenous knowledge; Indigenous involvement at all levels of the planning process; and, increasing capacity within communities. In addition, the authors argue that technical assessments such as water resource planning need to take into account sociological factors and that Indigenous water requirements should be made a priority in any water plan development. These principles serve as

examples of areas for opportunity to increase Indigenous engagement around water and wastewater policy.

The participation of Indigenous peoples thus far, has been typically included in policy on a project-by-project or case-by-case basis. It has been argued that in order for Indigenous people and traditional knowledge to be part of decision-making, Indigenous people must be present at the initial stages of decision-making, including involvement at the strategic planning level, leading to a greater sense of empowerment and control (Houde, 2007).

It can be argued that the majority of Indigenous engagement to date has been tokenistic in nature. According to Arnstein's ladder of citizen participation, citizen participation is presented as eight rungs on a ladder of citizen participation where consultation is viewed as a degree of tokenism, as it is argued that consultation provides no real assurance that concerns or ideas will be taken into account (Arnstein, 1969). Arnstein's ladder for citizen participation is presented in Figure 1. Similarly, according to the International Association of Public Participation (IAPP), consultation represents a 'low level of public impact' as shown in Figure 2 (IAPP, 2007).

There has been a shift away from strictly speaking of consultation, towards focusing on building relationships and meaningfully engaging with Indigenous people on issues of environmental management. The importance of relationship building has been highlighted in several studies (Booth & Skelton, 2011; Hill *et al.*, 2012). However, decision-makers and policy-makers are still determining ways in which to build relationships and engage with communities and a lack of information exists related to how to move away from strictly consultation-type approaches.

This paper seeks to expand the discussion by analyzing existing limitations to increased Indigenous engagement on water and wastewater management and policy. If policy-makers wish to meaningfully engage with Indigenous communities around water and wastewater management, then an understanding of the current challenges that exist is needed. In addition, this paper seeks to present opportunities for increasing engagement with Indigenous communities, towards increased decision-making control and self-determination surrounding water and wastewater management. The perspectives of both Indigenous
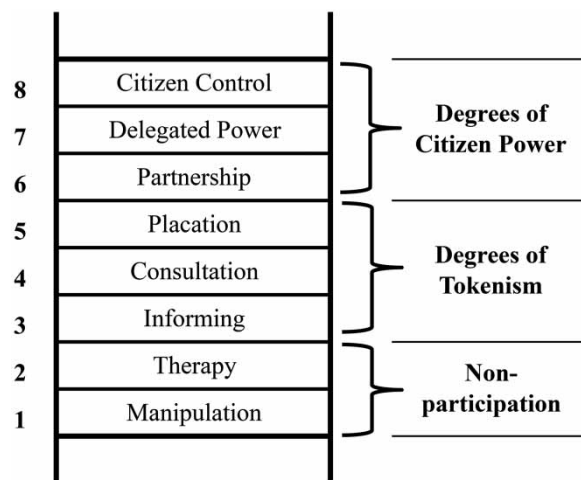

Fig. 1. Arnstein's Ladder of Citizen Participation (adapted from Arnstein, 1969).

Fig. 2. Level of public impact (International Association of Public Participation, 2007).

and non-Indigenous participants were recorded in order to more clearly articulate the limitations and challenges to engagement.

Methodology

The study was conducted with Indigenous representatives from the Provinces of Ontario and Saskatchewan, Canada, in addition to non-Indigenous representatives from across Canada. Non-Indigenous participants included representatives from the public and private sector engaged in water and wastewater management, design and policy. Indigenous representation consisted exclusively of First Nations leaders and community members involved in water and wastewater management including operational, training and administrative roles. Indigenous participants represented communities with varied demographics and geographic locations including more rural communities, small and large communities, and varied economic conditions.

Communities in Saskatchewan and Ontario were selected based on participation in a larger research project, in addition to recommendations and relationships established with the research team. Participants were identified and selected through a 'snowball' sampling technique (Atkinson & Flint, 2001), in addition to purposeful sampling. A total of 17 participants were included as part of this study. Data collection and analysis followed principles of grounded theory methodology (Glaser, 1994; Charmaz, 2003; Creswell, 2003) including: semi-structured interviews; transcripts of verbal interviews; open-ended coding and validation through participant feedback; and, axial and selective coding. Participant responses were reviewed several times prior to selecting themes. A particular theme was identified based on frequency of response. A theme was identified when the particular coding was observed at least 20 times by a minimum of one-third of participants, similar to previous approaches (e.g. Escott *et al*., 2015). After each interview, responses were analyzed to determine new trends or themes. At the end of analysis, transcripts and responses were re-read to ensure coding was accurate. In addition, coding was also separated within Indigenous and non-Indigenous responses in order to provide a basis for comparison between the two groups.

Participants were asked a series of open-ended questions to enable in-depth responses. Open-ended interview questions can offer greater anonymity to participants and often elicit more honest responses (Erickson & Kaplan, 2000). Principles of Indigenous research methodology were incorporated using the principles of ownership, control, access and possession, through which research can enable ways for Indigenous people to make decisions about the nature and process of research and data (First Nations Centre, 2007). Open-ended dialogue with participants provided the opportunity for deeper insight into a specific issue or challenge. The

establishment of both confidentiality and trust are critical to obtaining uninhibited opinion and personal experience.

Results and discussion

Participants were asked to discuss the role of Indigenous communities in the management of water and wastewater, and the level of engagement of Indigenous community members and technical representatives. All participants were asked to identify what level of engagement they currently perceived regarding Indigenous participation around water and wastewater management vis-à-vis the IAPP categories presented in Figure 2. Participants were then asked open-ended questions on the quality of engagement, limitations to further engagement, and opportunities going forward to increase Indigenous involvement in decision-making on water and wastewater management.

Perceptions of engagement

Participants were given the category name and description provided in Table 1 and asked to assign the perceived level of engagement.

Participant response rates are shown in Figure 3. Overall, 70% of participants indicated they felt Indigenous engagement was restricted to the lower levels of public participation (levels of 'Inform' and 'Consult'). The remainder of participants indicated they felt the level of engagement was slightly higher, at the 'Involve' level.

These results indicate that overall the perceived level of Indigenous engagement is quite low. However, the results describe an interesting trend when they are separated into Indigenous and non-Indigenous response rates (Figure 4). All of the responses received for the higher level of perceived engagement (i.e. 'Involve') were provided by non-Indigenous practitioners. None of the Indigenous participants identified with the 'Involve' level of engagement. In fact, the results indicated that non-Indigenous participants ranked the perceived level of Indigenous engagement as higher than Indigenous participants. This specific result could point to a systemic issue whereby non-Indigenous practitioners (i.e. those typically involved in the policy and decision-making around water and wastewater management) may perceive their level of engagement with Indigenous communities as being more thorough than what is perceived at the community level.

Table 1. International Association for Public Participation Levels of Public Impact (IAPP, 2007).

| THEME	DESCRIPTION
INFORM	Provided balanced and objective information to assist community's understanding of the problem, alternatives, opportunities and/or solutions
CONSULT	Obtained community feedback on analysis, alternatives and/or decisions
INVOLVE	Worked directly with the community throughout the process to ensure community concerns and aspirations are consistently understood and considered
COLLABORATE	Partnered with community in each aspect of the decision-making, including development of alternatives and identification of the preferred solution
EMPOWER	Placed final decision-making in the hands of the community
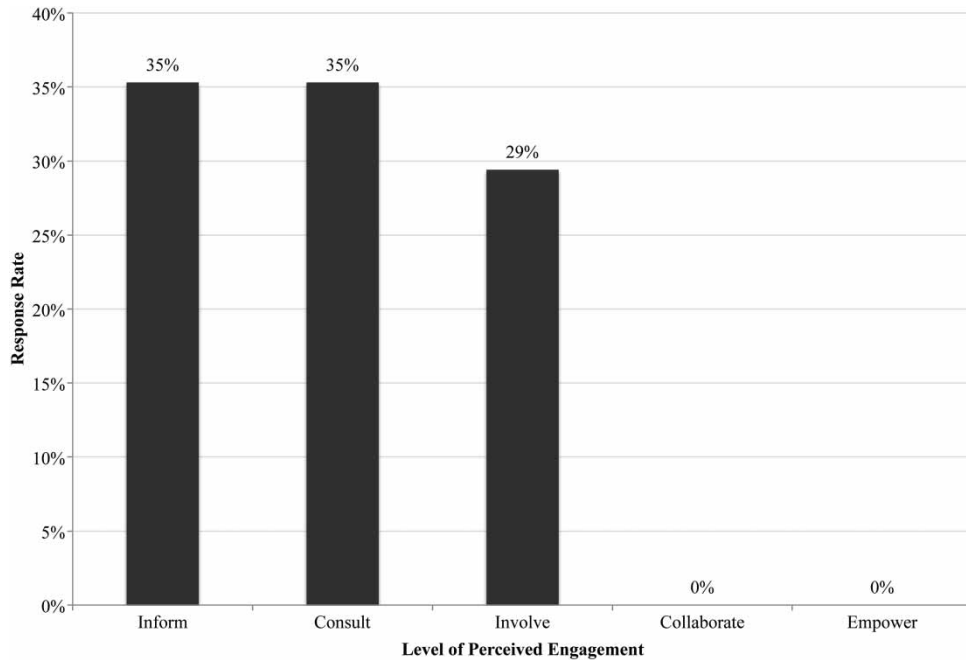
Fig. 3. Overall level of perceived engagement.

Participants indicated that they felt the majority of engagement was restricted to providing information through public consultation sessions or meetings:

'The majority of engagement seems to be restricted to providing information at public meetings or through reports and providing an analysis of possible options. However, very little time is spent involving community members in understanding the key issues or identifying the right solutions.'

'Public consultations are restricted to one-time sessions, with very little effort or time put in to engage communities in a more meaningful way.'

It was observed that feedback was typically obtained on problems and options for solutions, but that this feedback was viewed as a symbolic part of the process, as a 'box-ticking' exercise in the Indigenous consultation process:

'An attempt is made to include Indigenous community opinions and feedback, but how that feedback is included, remains a mystery.'

'It's hard to tell at what level the feedback that is given is incorporated into the decision-making process. But beyond that, simply being given the opportunity to provide feedback isn't sufficient.'

Ten participants (59%) made specific reference to feeling that engagement felt like a 'box-ticking exercise'. Participants noted engagement as being a requirement, and not a priority. Responses point
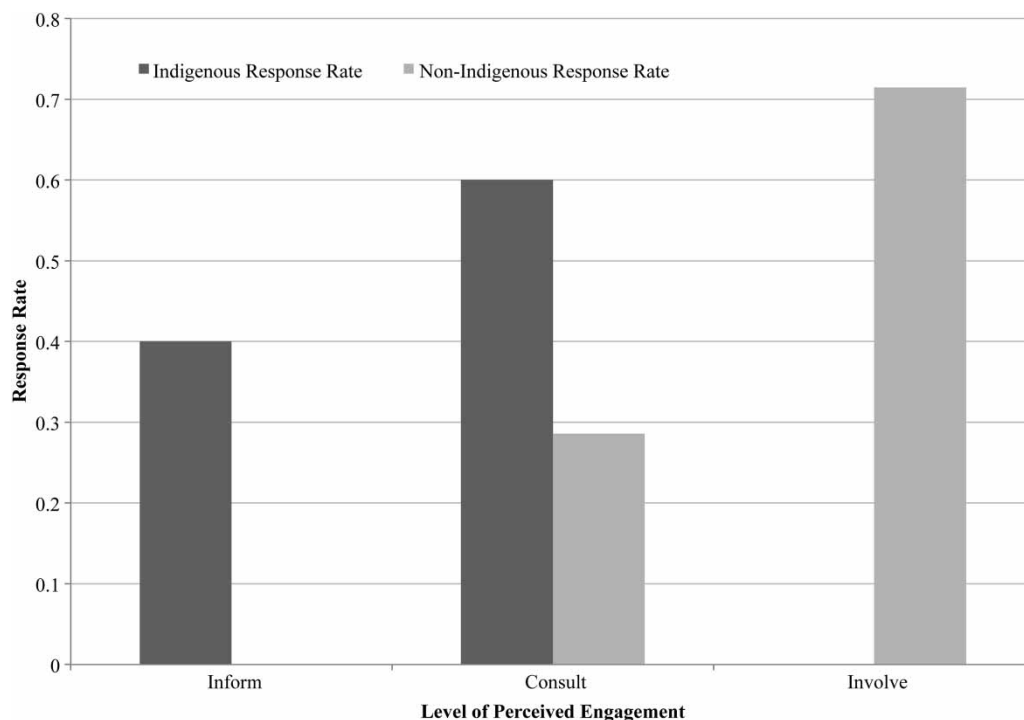
Fig. 4. Perceived level of engagement by category.

to an overall sentiment that engagement with Indigenous communities on water and wastewater are limited and seen as a procedural requirement:

'Overall, inclusion of our community in water and wastewater management decisions feels obligatory, but not welcomed. There is a strong feeling that communities are consulted as part of a process, not because there is a desire to do so at a deeper level.'

'It can be difficult in the time constraints imposed, or given urgency of providing safe drinking water or adequate sanitation, to ensure meaningful engagement occurs.'

Despite an overwhelming number of responses related to a lack of meaningful engagement with communities, four participants (24%) made reference to a changing culture and shift:

'Things seem to be changing, there seems to be a stronger desire to at least try to engage on a deeper level. I have noticed that more time is spent trying to talk and build relationships.'

'Typical constraints to meaningful engagement seem to be beginning to shift, allowing for deeper and greater opportunity to engage with communities.'

The majority of Indigenous engagement in water management has been argued as being largely symbolic in nature (Hunt *et al*., 2009). The results obtained indicate that the perceived level of engagement

at the community-level is at the lower level of public participation, based on the IAPP levels of participation, and is viewed as a box-ticking exercise.

Challenges to engagement

Participants were asked to discuss what they felt were challenges to Indigenous engagement on water and wastewater. Analysis of responses pointed to four key thematic categories that limit engagement of Indigenous communities and representatives in the decision-making: social and economic conditions at the community level; capacity; urgency of issues; and, structural or systemic issues. These are each described in detail below.

Socio-economic conditions. The socio-economic conditions of Indigenous communities across Canada, and across the world vary greatly. In the Canadian context, Indigenous communities exhibit lower levels of education, employment and income, and health (Adelson, 2005; Assembly of First Nations (AFN), 2008).

Participants noted lack of access to education and lack of higher education, as well as difficulty in finding employment and limited economic opportunities as limitations to enhanced engagement around water and wastewater:

> *'We see the benefit of educating our youth about water and wastewater management. Promoting education and encouraging involvement in solving our community's problems can help our community be more independent.'*

> *'We can see the difference in the community's well-being when education and employment opportunities exist.'*

It has been argued that financial limitations that reduce a community's ability to engage can be alleviated by access to education and employment (Escott *et al*., 2015). Improving access to educational programs, including operator-training programs can increase the level of Indigenous engagement around water and wastewater management. Improving socio-economic conditions within Indigenous communities can enhance not only the opportunity to engage, but the degree and level of participation in decision-making.

Capacity.   Participants noted a lack of capacity (e.g. human resources, financial) as a factor which limits enhanced engagement. References were made with respect to capacity limitations on both sides of the issue. Specifically, a lack of capacity within government and the private sector to adequately understand unique Indigenous issues, including historical context:

> *'People come to communities for one hour, one day, and have no idea where the community has come from, this history, our background, what has shaped who we are and how we act. To think that anyone could provide solutions or work within our community without this deep understanding, is short-sighted.'*

> *'I don't like to hear comments about communities not having adequate capacity to design, operate and manage water and wastewater treatment. Communities have the capacity, but maybe not the*

resources. People who come into the community are the ones who don't have the capacity to under-
stand our problems, and can't possibly provide suitable solutions.'

Every participant in the group identified a lack of financial capacity or adequate resources as a limiting factor to engagement. It was noted that proper engagement necessitates financial resources in several regards:

• Significant resources are needed to educate, train and/or hire community members, operators and consultants to design, operate and manage water and wastewater treatment plants.
• Infrastructure development requires substantial resources, without the advantage of economies of scale.
• Resources are needed within the public and private sector to adequately manage the large number of water and wastewater treatment projects.

Participants noted that even when financial capacity is increased, there are still significant gaps that exist:

'Despite changes to financial programs, or slight increases in funding, and even if funding is signifi-
cantly increased, the costs associated with major infrastructure projects will still surpass what is
made available to communities.'

'On top of everything, [communities] have to stretch dollars very thin in order to cover the varied
needs of our community. [Communities] are always playing catch-up.'

Several participants noted that the development of capacity was critical in the process of increasing decision-making power within communities, and progressing towards self-determination:

'Communities want to have more control over their water and wastewater, and eventually over all of the
services within the community, but to get to this point communities need to increase training, education,
employment, and know-how … develop the capacity now so that communities are in control later.'

Development of capacity both within communities and within public and private sector practitioners (who interact with Indigenous communities) was seen as an important tool for improving engagement and enhancing decision-making capacity.

Urgency of issues.   There was specific discussion around a need to expedite projects, especially in the case of water treatment plant upgrades. It was noted that the urgency of situations (i.e. boil water advisories) can often mean that projects progress at a much faster pace, leaving fewer opportunities for meaningful engagement:

'Our community has been on a boil-water advisory for years, projects come up, money becomes avail-
able, and we need to act fast – consultants try to engage with us, operators wish there was more
opportunity to be part of the process – but the primary concern is getting safe water to the community.'

'We know the way things should be done, and the way we want things to be done – but we are constantly
operating under urgent public health situations, and our community's health is what really matters.'

Participants noted that the urgency to provide adequate safe drinking water to residents superseded the need to encourage more meaningful engagement. This observation was noted by Indigenous and non-Indigenous participants alike.

Structural and systemic issues. An important distinction related to the theme of capacity was comments related to systemic issues limiting the ability for enhanced capacity development. Participants noted that tight timelines limit the ability to engage more deeply. This particular issue was distinct from the issue of urgency (noted above) because participants noted that lack of engagement in this instance, was an inherent part of the process/structure:

> *'The structure of funding programs or government processes doesn't allow for meaningful engagement with communities.'*

> *'Timelines are such that decisions are made quickly, with only as much engagement as needed to push a project through.'*

> *'The existing systems encourage a status-quo of engagement where there is outreach to communities, limited opportunity for involvement, and limited opportunity to influence decisions.'*

It was also noted by several participants that lack of ability to control funds meant limited involvement or engagement in the decision-making process:

> *'In our case, we had very little control over the way the money was used. In the end the community was happy because we got a new water treatment plant – but some community members were left wondering whether this was the best use of the funds, were the prices competitive or did we get the best value?'*

> *'In can be difficult at times because funding programs are so prescriptive – the requirements are such that it leaves little room for change … flexibility is limited. There are also a large number of requirements to secure funding, and this can mean that communities have to turn to external consultants in order to get the right approvals in place.'*

Opportunities for increasing decision-making control

Participants were asked to discuss how engagement with communities around water and wastewater management could be improved, and how this could benefit Indigenous communities. Participants noted the importance of addressing the limitations to engagement that were highlighted previously. In addition, in analyzing responses related to areas of opportunity, two new themes emerged, and are discussed in detail below.

Respect and awareness. Participants noted that increased respect for Indigenous ways of knowing and doing, including deeper understanding from non-Indigenous practitioners on Indigenous culture and history, would go a long way to creating a space to allow for meaningful engagement:

'Whether it exists or not, there is a belief that [non-Indigenous practitioners] aren't invested in these problems, because they have nothing to lose. If people on the outside treated these issues the way they would if it was affecting their families – I think we'd see a real change.'

'There needs to be more effort made by non-Indigenous practitioners to improve their understanding of the real issues, and to want to gain the trust and respect of communities. But more importantly, there needs to be a significant cultural shift, towards increased respect, and a desire to set things right.'

Every participant referenced a need to better understand community-specific issues. Several participants further noted that increased awareness was needed on the significant cultural and historical differences from community to community, and one participant said it was important not to 'paint every community with the same brush.' In order to meaningfully engage with Indigenous communities, there needs to be a basis of respect and understanding, from which meaningful engagement can emerge. This is echoed in the UNDRIP (UN, 2008).

Conclusions

The full participation of Indigenous peoples within decision-making has been limited by many factors, including capacity, lack of formal protocols and procedures, inadequate resources and, overall, a lack of respect or recognition of Indigenous rights. This study sought to investigate and analyze limitations to engagement around water and wastewater management, and elucidate opportunities for improved and more meaningful engagement with Indigenous communities.

Through semi-structured interviews with Indigenous and non-Indigenous participants, several key limitations to engagement were observed. In order to ensure more meaningful participation, these limitations need to be addressed.

In order to move beyond tokenistic or symbolic participation of Indigenous communities in water and wastewater management, the following important considerations need to be addressed.

• Existing socio-economic conditions within Indigenous communities (which vary community by community) limit the ability to engage and participate meaningfully. Frameworks or strategies for improving engagement need to address the social and economic 'gaps' that exist, in order to facilitate increased participation.
• Issues of capacity relate not only to the financial and technical capacity required to effectively design, operate and manage water and wastewater projects, but extend to lack of capacity within non-Indigenous practitioners to fully comprehend community-specific issues. Increasing capacity is often seen as a one-sided problem (i.e. communities not having sufficient 'capacity'), but in order to effectively engage with communities, external consultants and public/private sector practitioners need to address internal capacity issues that limit their ability to create a space for more meaningful participation by Indigenous communities. In addition, it was observed that increasing financial capacity also necessitates providing more autonomy to communities around the use of these funds.
• Given the urgency of needing to provide safe drinking water to communities, efforts to engage often fall short. Engagement strategies need to carefully balance the urgency of issues, with the need for

comprehensive engagement. Including Indigenous participation at the outset of any project or policy development ensures continued engagement throughout. Long-term sustainability of water and waste-water management necessitates Indigenous engagement from the start.

- Structural and systemic issues need to be addressed in the short-term to address issues of engagement. Existing processes limit the meaningful participation of Indigenous communities. A shift away from the 'status quo' is needed, and would signify a larger cultural shift in the way in which water and wastewater management in Indigenous communities is approached.
- At the most basic level, improved respect for Indigenous rights and interests should form the basis of any engagement strategy.

In order to improve participation in the decision-making processes around water and wastewater management, Indigenous community members need to be actively involved in every aspect of decision-making in order to progress towards enhanced self-governance and autonomy.

Acknowledgements

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