

Preliminary Empirical Findings – Adoption of Water Sharing Arrangements



Social Sciences and Humanities
Research Council of Canada

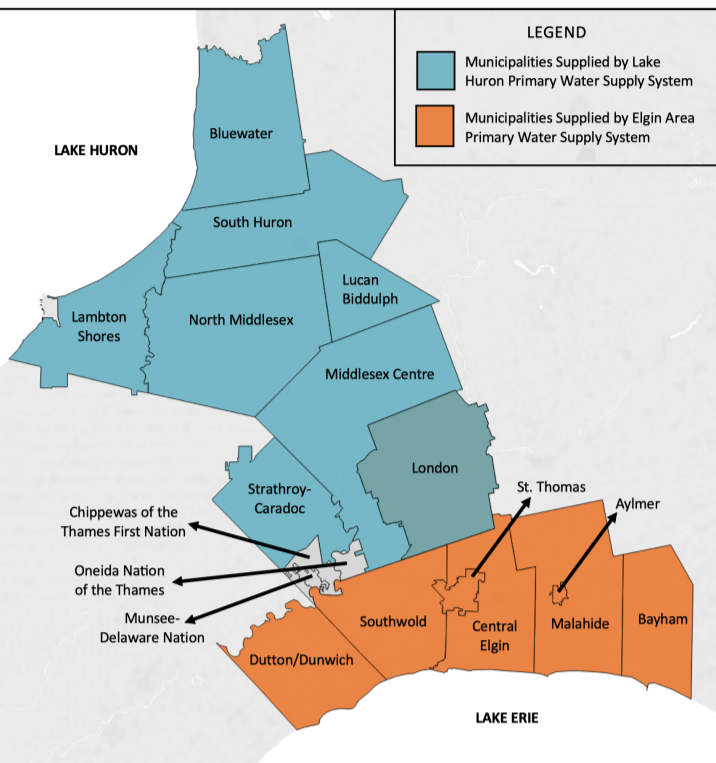
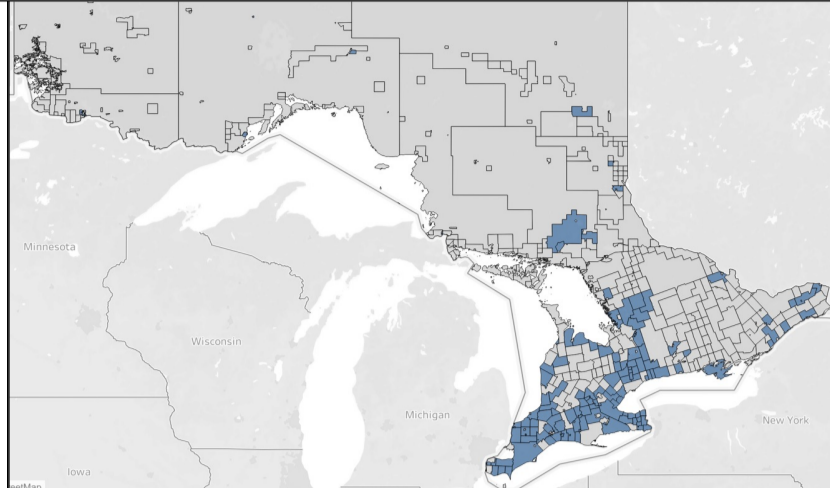
Conseil de recherches en
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Key Empirical Research Question: are First Nations less likely to be engaged in water sharing arrangements (WSAs) than Ontario municipalities, after controlling for important considerations?

Our empirical dataset is comprised of 710 water systems in Ontario: 565 municipal water systems, and 145 First Nations water systems. Of those 710 water systems, 202 were engaging in water sharing with at least one neighbour during our study period of 2009-2010.

Some communities have more than one water system servicing their population. After aggregating to the community level, we found that 134 (approximately 32%) of communities in our data set were participating in water sharing during our study period. The map to the right highlights communities participating in these arrangements. Only 12 of these communities are First Nation communities.



The map to the left provides a specific example of water sharing taking place through two large distribution networks around the City of London, Ontario. This unique case example helps to motivate our research question.

Several municipalities in this area are serviced by two large regional water distribution networks: the Lake Huron Primary Water Supply System (LHPWSS) and the Elgin Area Primary Water Supply system (EAPWSS).

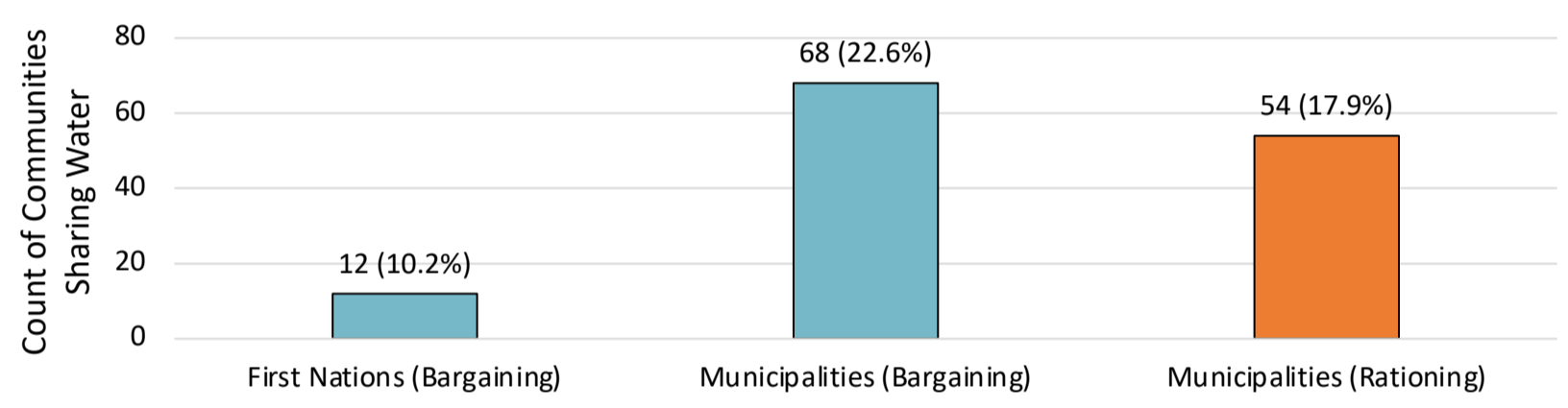
Situated at the centre of these two regional supply networks are three First Nations: Chippewas of the Thames First Nation, Oneida Nation of the Thames, and Munsee-Delaware Nation. Despite being situated within the service areas of these regional supply networks, these First Nations were not engaged in water sharing through these networks during the study period (and are currently not engaged in water sharing through these networks).

Water Sharing Arrangements (WSAs) in Ontario

In Ontario, municipalities are local governing units created by the Province, with rights and duties defined by provincial legislation: namely, the [Municipal Act \(2001\)](#). The *Municipal Act* defines municipal responsibilities with respect to community services like drinking water provision. Some municipalities in Ontario are placed within WSAs per force of law - we refer to these arrangements as *rationing* arrangements. Other municipalities have to negotiate in order to enter into WSAs - we refer to these arrangements as *bargaining* arrangements.

The figure below provides a summary of the number (and proportion) of First Nations and municipalities in our data set participating in WSAs during our study period.

First Nations and Ontario Municipalities Engaging in Water Sharing (2009-10)



Transaction Costs:

Importantly, First Nations have a relationship with the federal government, and are not subject to Provincial legislation when it comes to the provision of services in their communities. For this reason, First Nations must always bargain to enter into a WSA. This process of bargaining comes with many costs, which are commonly referred to as *transaction costs*. We expect the transaction costs of bargaining to engage in WSAs to be higher for First Nations communities than for municipalities, for two key reasons:

- Trust and social capital:** while there is great diversity among First Nations across Ontario, all First Nations differ from neighbouring settler communities in important ways - with respect to nationhood, culture, systems of governance, and the experience of historic and contemporary colonial violence. These factors can impact the process of relationship building between First Nations and their neighbours. In contrast, there is much greater homogeneity among municipalities, which serve only as local governing units created by the province, with rights and duties defined through a similar provincial legislative process. This homogeneity among municipalities may make relationship building between municipal governments less costly.
- Governing institutions:** the [Municipal Act \(2001\)](#) grants Ontario municipalities the rights of "natural persons" within their spheres of jurisdiction, including water services. In contrast, First Nations must operate within the constraints of the [Indian Act \(1985\)](#), and the federal oversight and many restrictions it imposes on community decisions making.

To best assess our research question, we include a number of key community characteristics in our analysis. Summary statistics for these community characteristics are provided in the table to the right.

Variable	Mean	Std. Dev.	Min	Max
Population (2006 Census)	23,214.32	148,454.80	72	2,503,281
Population Density in Persons per Square Kilometer (2006 Census)	154.77	363.92	0.3	3,972.40
10 Year Average Temperature Range (Degrees Celsius)	41.53	4.66	33.88	50.99
10 Year Average Annual Precipitation (mm)	925.77	127.76	596.45	1,328.01
Nearest Neighbouring Community with a Water System (m)	10,222.66	12,694.77	132	68,280

Key Finding:

We find that across several different model specifications, First Nations are consistently less likely to be engaged in a water sharing arrangement compared to municipalities.¹ One explanation of these results is that First Nations do in fact have relatively high transaction costs of bargaining for WSAs compared to municipalities.

Another important observation is that WSAs are much less likely to emerge in northern Ontario, where 82% of First Nations communities are located. Additionally, in our examination of municipal water services across the province we identified 54 municipalities (approximately 18%) that were placed within rationing WSAs by the province. We attribute these rationing WSAs to a provincial institutional innovation designed to significantly reduced transactions costs associated with shared water provision among municipalities.

¹The magnitude of this result is sensitive to model specification, and may be influenced by continued research. However, the sign has remained consistent across all models estimated.

Limitations and Importance of Qualitative Research:

There are numerous critical complexities surrounding the issue of WSAs that we can only provide context to with these findings, and we cannot fully address. As outlined above, there are key institutional differences between how municipalities and First Nations are governed, producing different constraints and costs of transacting with neighbouring communities. Additionally, existing social capital and relationship building between First Nations and neighbouring municipalities can vary significantly from place to place, impacting the perceived benefits and desirability of collaborative relationships. The qualitative case study component of this research plays an essential role in shedding light on these crucial situational factors that cannot be captured by this broader empirical analysis.

Implications:

We find evidence that First Nations are less likely to engage in WSAs compared to municipalities. As discussed above, transaction costs – e.g., the costs of gathering information, negotiating, etc. – may be a barrier to WSAs. There are many ways that these transaction costs could be reduced. Most simply, facilitating increased interactions between communities may reduce information costs associated with pursuing opportunities. More focused policy innovations might seek to reduce the burden of bargaining for WSAs that First Nations face, while respecting their autonomy over community water provision. For example, a policy innovation that requires municipalities to provide water to First Nations if requested could result in a shift in municipal planning decisions that would take into account First Nations access rights to potable water from shared water sources. While we are not in a position to evaluate a legal change such as this, we recognize there are a spectrum of ways to reduce transaction costs that are worthy of consideration.

Importantly, transaction costs are not the only costs associated with WSAs that are deserving of more careful exploration. There is a need for more localized analysis of the short and long term financial costs to First Nations associated with WSAs, compared to alternative water provision options. These costs will vary by community. Therefore, more focused research might focus on the relative costs associated with WSAs for First Nations in close proximity to municipalities.