



SUSTAINABLE DEVELOPMENT

BRIEFING NOTE

Canadian Water Sustainability Index

Highlights

- The Canadian Water Sustainability Index (CWSI) is a composite water index, developed by the Policy Research Initiative to evaluate the well-being of Canadian communities with respect to fresh water.
- The CWSI was successfully field tested in six communities across the country. Participating communities provided suggestions and feedback that will greatly contribute to index improvement and refinement.
- Communities expressed an interest in the CWSI and would support further development of the index. They identified a number of policy applications for the CWSI, particularly for planning, marketing, communications, and education.

Background

The Policy Research Initiative recently completed a project to develop and test a composite water index for evaluating the well-being of Canadian communities with respect to fresh water. This index, known as the Canadian Water Sustainability Index (CWSI), integrates a range of water-related data and information into a series of indicators. Together, the indicators provide a holistic profile of a community's key water issues, allowing for intra-community and inter-community comparison and analysis.

The development of the CWSI was informed by an expert workshop,¹ a data study,² bilateral consultations and a literature review. The resulting framework and evaluation methodology was field tested in six communities throughout Canada in Spring 2006. The framework shown in Table 1 consists of a nested structure of fifteen indicators in five broad policy-based categories or components.

To evaluate a community, scores are calculated for each indicator. Scores range from 0 to 100, where the higher the score, the closer the community is to having the ideal conditions for that given indicator. The scores are based on a standardized evaluation methodology with the indicators measured against a benchmark or target.³ This differs from some other composite index models that determine scores based on relative rankings of administrative units assessed.

Once indicator scores are calculated, the five component scores are determined by taking the average of the three indicators in that respective category. The final CWSI score is the average of the five component scores. The higher a community's CWSI score, the better positioned it is to enjoy and maintain the ecological, socio-economic, and health benefits associated with fresh water.

Table 1: The Canadian Water Sustainability Index Framework

Component	Indicator	Description
Resource	<i>Availability</i>	The amount of renewable fresh water available per person.
	<i>Supply</i>	The vulnerability of the supply caused by seasonal variations and/or depleting ground water resources.
	<i>Demand</i>	The level of demand for water use based on water license allocations.
Ecosystem Health	<i>Stress</i>	The amount of water removed from the ecosystem.
	<i>Quality</i>	The Water Quality Index score for the protection of aquatic life.
	<i>Fish</i>	Population trends for economically and culturally significant fish species.
Infrastructure	<i>Demand</i>	How long before the capacity of water and waste water services will be exceeded due to population growth.
	<i>Condition</i>	The physical condition of water mains and sewers as reflected by system losses.
	<i>Treatment</i>	The level of waste water treatment.
Human Health	<i>Access</i>	The amount of potable water accessible per person.
	<i>Reliability</i>	The number of service disruption days per person.
	<i>Impact</i>	The number of waterborne illness incidences.
Capacity	<i>Financial</i>	The financial capacity of the community to manage water resources and respond to local challenges.
	<i>Education</i>	The human capacity of the community to manage water resources and address local water issues.
	<i>Training</i>	The level of training that water and waste water operators have received.

Field Testing the CWSI

The Centre for Indigenous Environmental Resources (CIER) was hired to conduct a field test of the CWSI in order to assess its applicability and usefulness in a range of Canadian communities. Six separate case studies were conducted as part of this field test.⁴ The six communities listed below spanned five provinces and each had a population of less than 5,000 people. The communities, which include three First Nations, also represent a range of circumstances in terms of key economic activities, such as agriculture, energy, or tourism, and perceived water challenges.

- District of Chetwynd, British Columbia
- Town of Three Hills, Alberta

- Tsuu T'ina First Nation, Alberta
- Pelican Lake First Nation, Saskatchewan
- Rural Municipality of Gimli, Manitoba
- Moose Cree Nation, Ontario

These case studies and the community workshop that followed⁵ were very successful in gauging the usefulness and feasibility of the index, in particular the fifteen indicators. Overall, the communities expressed interest in the CWSI and in seeing the tool developed further and implemented. There is, however, a need to refine certain elements of the index. The field testing process and results identified challenges related to data acquisition, availability and scale and the relevancy of certain indicators. In response to these challenges, the consultants and, in particular, the communities provided valuable feedback and suggestions to improve the CWSI.⁶

Communities indicated that they would be willing to commit the time and personnel to provide the data necessary to populate the index and that the opportunity to have CWSI results for their communities would, in fact, provide an incentive for completing voluntary surveys. Having the results tabulated by a government agency rather than by the community would make the findings more credible among community members.

Using the CWSI

In general, communities were very receptive to the CWSI and identified a number of uses and applications for the index. First, communities observed that their CWSI results could be used to inform planning decisions and activities, specifically those related to water and waste water infrastructure, including exploring water storage options and training operators. Indicators related to issues of supply and demand could help inform land-use planning, particularly zoning for water-intensive industries. Results could also be useful in approaching governments for funding and identifying areas for research. Federal departments have indicated that they could foresee using such a tool to inform funding decisions.

It was also suggested that the CWSI could be used as a communications tool to verify or discredit existing speculation in the community on a number of water issues, particularly quality and quantity. Results can also be used to market the community's potential to prospective developers and industries, especially water-intensive industries.

Finally, the CWSI could be used to educate residents on the state of water well-being in their communities and how they compare to other communities across the country. Communities also observed that the index could be extremely useful if applied by communities in the same region or relying on the same water source. Communities could compare their scores, simultaneously acquiring a general understanding of the state of their area and their collective ability to address water sustainability on a regional level.

Conclusion

The CWSI project yielded valuable information on the feasibility of developing a composite water index and identified the potential for broad application of such a tool. It is hoped that the suggestions and findings emerging from this project can be used to further develop and implement the CWSI so governments at all levels can use the tool to inform decision-making and improve our understanding of water issues in our communities.

Notes

- ¹ A two day workshop, held in November 2005 to discuss the development of the CWSI, was attended by leading water policy and indicator experts.
- ² Tri-Star Environmental Consulting. 2006. *Canadian Water Sustainability Index (CWSI) Data Study* (PRI Working Paper Series #013). Available at <www.policyresearch.gc.ca>.
- ³ The CWSI evaluation methodology is outlined in the *Canadian Water Sustainability Index (CWSI): Project Report* (2007). Available at <www.policyresearch.gc.ca>.
- ⁴ Case study results can be found in *The Canadian Water Sustainability Index (CWSI) Case Study Report* (PRI Working Paper Series #028) by the Centre for Indigenous Environmental Resources and Anne Morin. Available at <www.policyresearch.gc.ca>.
- ⁵ A one day workshop was held in August 2006 to obtain feedback and input on the CWSI case studies. The workshop was attended by representatives from four of the six participating communities and selected government officials.
- ⁶ For more information, please refer to the *Canadian Water Sustainability Index (CWSI): Project Report* (2007). Available at <www.policyresearch.gc.ca>.