

Water Pricing Policy in Canada

Introduction

Economic instruments such as pricing have generally played a small role in water resources management in Canada, particularly with respect to the industrial and agricultural sectors. Overall, current water charges are about one-quarter of European rates, and three-quarters of American rates (Environment Canada 2006). Water in Canada is generally over-consumed and underpriced, and the pricing arrangements that are in place have been called rudimentary (Pearse 2002). But Canada is not entirely alone. In many developed countries, water rates are generally low. The rates in two-thirds of OECD nations are not high enough to cover basic utility operation and maintenance costs (Katz 2010).

Over the last three decades, however, there has been a growing emphasis on the use of pricing and market-based mechanisms to allocate public goods such as water. Water charges are beginning to rise around the world and most likely will continue to rise. As one author noted, “The sharply increasing water prices that we empirically observe today in a few selected and water-deficient regions are likely to be predictive of trends that will develop in many other parts of the world tomorrow” (Maxwell 2010).

General Policy in Canada

Canada is not facing water deficiency on a large scale. So why is it necessary to consider raising charges for water? One reason is that current rates are not sufficient to cover all utility expenses. In 2007, aggregate revenues from water agencies covered only 70% of total expenditures (Renzetti 2009). Water is heavily subsidized in Canada and subsidies are particularly large in the municipal and agricultural sectors. By providing subsidized water at low cost to the end user, some argue that “benevolent governments” have contributed to a general

WATER IN MONTREAL

The City of Montreal is facing serious challenges in terms of its water and wastewater infrastructure, which is in a state of disrepair due to neglect of the system and an inability to finance repairs (Minardi 2010a). Almost 40% of Montreal’s water is lost each year due to leaky infrastructure and the City has decided that the problem must be addressed. However, the cost of repairs is estimated to be \$4 billion over the next two decades.

In Montreal, water infrastructure is publicly owned and operated. Citizens are charged a flat rate for water use that comes out of property taxes rather than through direct billing. Water is heavily subsidized through municipal and provincial taxes as well as federal grants. Is maintaining the status quo—continuing to use taxpayer dollars to foot the bill—the solution to Montreal’s water problems?

The largest water users in Montreal—industry, business and institutions—use more water but pay less than residential water users. Residential usage accounts for only 38% of total water usage but 45% of water revenue comes from residential charges. Industries, businesses and institutions account for total usage of 62% but pay for only 55% of total water usage. In short, the residential sector is partially subsidizing other water users (Minardi 2010b).

In order to address infrastructure deficiencies and the cross-subsidization of water use, the City has decided to introduce new initiatives. For example, a new water fund has been created to finance infrastructure repairs. Part of the revenue generated for the fund is coming from a new tax that has been added onto property taxes. Water tariffs for industries, businesses and institutions have also increased (Minardi 2010b).



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societal attitude of mindless over-consumption (Maxwell 2010). In addition, failing to charge water users appropriately has led to insufficient funding of water and wastewater infrastructure, which, in some regions and cities of the country, is in a serious state of disrepair. Water experts have criticized provincial governments that do not charge fees for water permits, arguing that fees are applied to the extraction of other natural resources, such as lumber and oil (Renzetti and Dupont 1999).

The majority of water used in Canada occurs in the municipal, industrial and agricultural sectors. Much of the water in the latter two sectors is self-supplied—water utilities are not involved in the delivery or treatment of that water. In this case, water is essentially free of charge and the only expense involved is the cost of obtaining a water license from the provincial government. However, there are environmental and social costs associated with large-scale water use.

A Changing Policy Environment

Some provinces are moving toward better and more comprehensive water pricing policies. The Ontario and Quebec governments, for example, have introduced new pricing schemes. Under the *Ontario Sustainable Water and Sewage Systems Act*, the provincial government has directed that all water and sewerage agencies charge users the full cost of water. In addition, new pricing policies have recently been put in place for water abstractions by certain manufacturing sectors. In British Columbia, water abstractors are expected to pay an annual rental fee for the use of water. In Manitoba, the provincial *Water Strategy* embraces the principles of cost recovery and industrial water users are charged for abstractions by volume.

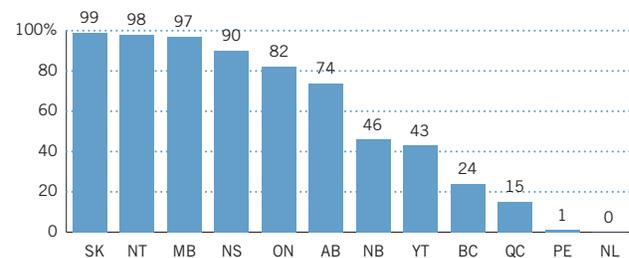
The majority of pricing regime changes are recent and it is too early to discern whether they will be effective or not. It has been argued that in the jurisdictions where charges have been implemented, the primary goal seems to be raising revenue in a politically acceptable way rather than changing water use patterns or behaviours (Policy Research Initiative 2005). Despite such criticism, it appears that governments are at least becoming more interested in using pricing as a tool to promote water conservation. Although the charges that have been

introduced may be considered small and insignificant by some observers, they are important if only because they demonstrate at least a measure of political and public appetite for change.

Municipal Water Pricing

Municipalities across Canada serve a wide range of residential, commercial, industrial and institutional water users. While municipal water rates vary across the country, water rates are generally low. In 2004, the average monthly charge across Canada for water supply was \$23.00. The average monthly charge for sewer service was \$20.00 (Katz 2010). Most municipal water agencies have failed to employ water pricing as a policy instrument and often do not have the adequate monitoring and cost accounting means to do so (Renzetti 2005). For example, the percentage of the population that is metered for water use varies widely across Canada. Over 90% of the population in Saskatchewan, Manitoba, the Northwest Territories and Nova Scotia have metered service, but less than a quarter of the populations of British Columbia, Quebec, Prince Edward Island and Newfoundland have water meters (Figure 1).

FIGURE 1: Percentage of the Population With Water Meters 1999



Source: Canada West Foundation.

Most municipal water utilities in Canada bill customers directly for the use of water services, but the way that customers are charged can vary (Figure 2). Municipal rate structures range from the simple flat rate system (where the same price is charged to all users regardless of how much water is used) to more complex systems such as the inclining block rate (higher rates are charged as the amount of water used increases).

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FIGURE 2: Pricing Rates and Systems

System	Rate Mechanism	Description	Advantages	Disadvantages
Flat Rate Systems	Flat Rate or Fixed Rate	A specified rate is charged, usually per month, regardless of the amount of water used.	Flat rates systems can appear to be socially equitable as everyone pays the same rate. It is administratively simple and no metering is required.	It fails to encourage water conservation. Water usage rates can run 70% to 80% higher than under volumetric rates.
	Constant Unit or Uniform Rate	A specified rate is charged for each unit of water used. Those who use more water will pay more, but the rate does not change depending on the amount of water used.	This too can also appear to be socially equitable. Water users are also charged based on what they consume. This is more of a user pay approach.	Metering is required for this system to be put in place. Rate structure does not reward those who use less water or encourage heavy water users to conserve.
Volumetric Systems	Declining or Decreasing Block Rate	The rate charged decreases as more volumes of water are used. The rates are divided into specific volumes or blocks.	Provides low cost water for economic applications requiring heavy water use.	Not socially equitable as those who use little water pay for their water at higher rates. No incentive to conserve water as the lowest cost water is the last unit of water used.
	Inclining or Increasing Block Rate	The rate charged increases as more volumes of water are used. Can be implemented by establishing categories such as basic use, normal use, heavy use or excessive use.	Can be socially equitable if special lifeline rates, credits or rebates are provided. Another option is to provide a base amount of water for free or at low cost. Because charges are higher for use beyond a minimum amount, the system creates an incentive to conserve water. Addresses the problem of "free-riders."	The system can create revenue volatility for water suppliers and utilities. It can also create some equity difficulties. For example, the same pricing scheme applying to a family of two as to a family of six.
	Complex Pricing	The rate charged is based on a combination or all of the above.	Dependent on the combination.	Dependent on the combination.

Source: Derived by Canada West Foundation from Katz 2010; McFarlane and Nilsen 2003; Hildebrand 2009; and Johansson 2000.

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Agricultural Water Pricing

The largest use of water in the agricultural sector is for irrigation. While some irrigators obtain their own water through self-supplied systems, the great majority of Canadian irrigators are provided with water from an irrigation district. Irrigation districts function in a manner similar to municipalities, providing water infrastructure and delivery to farmers in the district. In Canada, flat water rates are the most common rate structure in irrigated agriculture, with fees usually based on the land area being irrigated rather than the volume of water used. Metering in the agricultural sector is uncommon.

When it comes to flat rates, there are several ways that they can be implemented.

Area pricing: A charge for water based on the area being irrigated. Area pricing is the most common method of irrigation pricing around the world, including Canada. There are variants, however. For example, area prices can vary based on crop type, how much water a crop requires and the type of irrigation method being used.

Output pricing: A water charge per unit of agricultural output produced.

Input pricing: A water charge through taxes on agricultural inputs, such as a per unit charge for each kilogram of fertilizer purchased.

Betterment levy pricing: Charges that capture the implicit value of water through fees charged per unit area based on increases in land values. In other words, the more land a farmer has, the more the farmer will be charged for water.

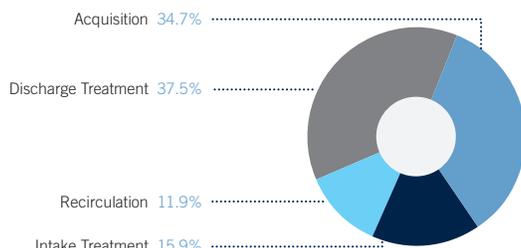
The goals of implementing water charges for agriculture are to recover costs of water supply and to incent the reduction of excessive water use and pollution. This can prove to be difficult. Irrigation water demand is fairly inelastic because the amount of water required by particular crops does not change. Past irrigation pricing reform has not led to significant reductions in water usage. Demand for water in agriculture is complex and varies between farmers based on water availability and its quality, land quality, crop type, irrigation technology used, climate and seasonal weather patterns (Policy Research Initiative 2005).

Changing water rates in agriculture is difficult, expensive and may result in negative consequences. One way that problems in agriculture can be addressed (e.g., inefficient irrigation technology) is through cross-sectoral pricing. In order to assist irrigation districts and irrigators with improving the technology used without providing subsidies from the general tax base, some suggest that taxpayers could subsidize efficient irrigation technologies through taxes on residential water use (Policy Research Initiative 2005). Despite the challenges, some irrigation districts are experimenting with different systems, such as the South East Kelowna Irrigation District. This district has incrementally introduced a metering program since 1994. Simply due to the installation of meters, water use was reduced by 10% from 1994-2000. The second phase of the project involves allotting a certain amount of water for each farm based on average needs and using inclining block rates for excess water used (Policy Research Initiative 2005).

Industrial Water Pricing

The great majority of water intake in industry—up to 95%—is self-supplied (Dachraoui and Harchaoui 2004). After obtaining a water license or permit from the provincial government, each company is responsible for using its own infrastructure to transport the water it withdraws from surface or groundwater sources. Self-supplied water is obtained directly from the water source, whether it is a lake, river or aquifer. Self-supplied water is essentially free. In most cases, the only expense a company will pay is for a license or permit. Currently, taxing industrial water use is not common in Canada and only British Columbia, Saskatchewan and Nova Scotia charge royalties on water abstractions (Policy Research Initiative 2005; Dachraoui and Harchaoui 2004). The remaining 5% of industry obtains water from municipal water utilities. In this case, companies are charged for water use and delivery based on the rate system in place. This usually involves connection fees and per cubic meter charges for water intake.

FIGURE 3: Water Costs in Manufacturing by Component 2007



Source: Derived by Canada West Foundation from the *Industrial Water Use Survey, 2007*. Statistics Canada.

There are several challenges related to water charges for industry. First, there is an information deficit. Canada does not have a complete water inventory. In particular, detailed knowledge of the total amount of groundwater available, as well as localized water usage data, is rudimentary (McFarlane and Nilsen 2003). Water management is difficult when the total amount of water to be managed is unknown. Compared to information on municipal water pricing, there is little information on pricing in the industrial sector, how it is currently done, how it could be done and how effective it might be. The role of water use in industry is understudied and industry does not typically make public detailed knowledge of their cost structure (Policy Research Initiative 2005).

Second, fostering political will is essential in bringing about change. Although all provinces have the authority to establish fees for water abstraction, not all provinces have fees in place. Implementing any kind of price change may be viewed as unpalatable by industry. Steven Renzetti, a Canadian water expert, suggests that water charges can be made to seem more appealing to industry by charging fees for non-compliance with existing regulations rather than water intake and by redirecting revenues raised from such fees to investments into water treatment equipment (Renzetti 2005). However, as water policy issues become more significant, it appears that firms are paying attention to how water is used, if only for the sake of their public image as socially responsible businesses.

Third, how should self-supplied industry be charged? Pricing industrial water use can be carried out through several means. Prices can be established or altered through direct water fees, taxes or royalties. Some argue that setting a tax on self-supplied

QUESTIONS IN NEED OF ANSWERS

What costs of water should a price include? Water charges can recoup some or all of the costs associated with water supply and delivery. Full-supply cost pricing is when costs are partially subsidized. Full-cost pricing or full-cost recovery is when all the costs of water provision are recouped including environmental and social costs that result from the use and consumption of water.

Should there be separate charges for water supply and wastewater?

Water supply charges can be separate from wastewater charges. However, integrated water pricing calls for utilities or service providers to combine water prices, sewerage prices, additional charges for extra-strength effluents and direct industrial abstraction charges" (Rogers 2002).

What characteristics should water charges have?

Water charges should be perceived as fair by water users, should be equitable across all customer classes, must generate sufficient revenue to cover basic operation and maintenance expenses (if utilities are distributed water) and must be transparent and easy to understand. Additionally, prices should strive to find the middle ground between ensuring equity and efficiency.

Should prices vary by season? Demand for water is generally higher during summer months and at certain peak points in a day (in the morning and evening). How should a pricing system account for these fluctuations? Some argue that prices should be higher during heavy periods of use (Pearse 2002). For example, in Waterloo, Ontario, summer water rates are higher to reflect increased demand.

Should groundwater and surface water be priced differently?

Groundwater and surface water should be treated as an integrated resource. They are interlinked. Pricing should focus on both. If only surface water is priced, it could lead to the overexploitation of groundwater. Currently, they are treated separately in law. The argument to maintain this status quo is that groundwater is harder to monitor and measure and that the replenishment of groundwater can be so time-consuming that it should be treated as a non-renewable resource (Policy Research Initiative 2005).

What should be done with revenue collected from water pricing?

Revenue raised from water charges can be directed several ways. It can be put back into the general tax base, it can be earmarked for water specific initiatives or it can be returned to water users through subsidies and programs.

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water has the potential to be ineffective. Each industry and company uses water in a different way and values water in a different way. However, it is not realistic to attempt to tailor water charges or taxes by company. It can be difficult to pin down specific amounts of water used at specific locations. To that end, some have argued that industry should be charged for the right to use water—usufructuary rights—rather than for the water itself (Gibbins and Zehnder 2010).

Fourth, what should the fees include? Should companies be charged for wastewater through effluent taxes? Will fees vary by location, time and source of water? Should ground and surface water be treated the same? There are a number of questions to answer.

Valuing water use in industry is difficult and finding an appropriate price is challenging. Water use throughout industry is not homogeneous. Use and consumption patterns vary by industrial sub-sector and the value placed on water also varies. Finding an effective price point will require further groundwork. Prices that are too low will be ineffective while prices that are too high will be politically hard-to-sell and may affect productivity. While economists are optimistic in suggesting that industry is more responsive to price changes than agriculture or even domestic use, there have been relatively few studies carried out to measure the impact of pricing on competitiveness (Policy Research Initiative 2005). However, it appears that industrial water use may be more sensitive to price changes than agriculture or domestic use and that financial and economic instruments, such as pricing, may have the potential to affect industrial demand for water use (Renzetti 2005).

New Policy Initiatives

Policymakers and water experts have recognized that Canada must improve its water—particularly groundwater—inventory. In a 2010 report published by the National Round Table on the Environment and Economy, panel members urged that a better understanding of water use, management and governance in Canada is essential. Improvements in technology are allowing for increasingly accurate measurements of water. For example, it is now possible to measure the amount of water consumed on a specific piece of land—thereby improving management and unsolved water claims. The University of Idaho has recently implemented a mapping system that relies on satellite data.

When it comes to pricing, it should be noted that implementing water permit and abstraction fees may lead to improved water monitoring. Charges are often based on volume used and companies would be required to monitor how much water they are using and discharging and from what sources. While water pricing in Canada has a long way to go, there are signs that the country is on the right track. For example, a number of new monitoring initiatives are underway:

- In Manitoba, a museum will be creating the first Canadian virtual simulator that will allow users to manipulate real-life variables that impact long-term sustainable development of the Lake Winnipeg Basin.
- The Mid-Vancouver Island Habitat Enhancement Society has been granted funds by the Royal Bank of Canada Blue Water Project to protect the Englishman River watershed and its rich ecosystem by funding an assessment of the interaction of ground and surface water.
- The Forum for Leadership on Water (FLOW) is spearheading a new initiative where leaders and experts will be working with the Assembly of First Nations in developing a First Nations Water Commission.
- The Great Lakes Commission is working on the Value of Great Lakes Water project, which will result in a pilot program with different price structures for Great Lakes water.
- In August 2010, the Council of the Federation endorsed a *Water Charter*, which recognizes that Canada can improve its water management by working in partnership and leveraging the successes of the management of water conservation and water quality protection in our individual jurisdictions (Council of the Federation 2010). Although the *Water Charter* is a broad document that does not outline specific policy objectives, its significance lies in the identification of common goals and objectives of water management across Canada. The premiers have directed their respective ministers to use the *Water Charter* as a guide in their work.
- In 2008, the premiers of British Columbia, Alberta, Manitoba, Saskatchewan, Nunavut, the Yukon and the Northwest Territories created the *Western Water Stewardship Council*. The Council will work together in monitoring water supply and watershed planning and governance.

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Conclusion

Water is clearly important to Canada's continued economic development and supplementing current policy and practice with financial and economic instruments such as water pricing can help moderate current consumptive patterns. However, if prices are put in place, they must be delicately balanced between being high enough to encourage conservation and low enough so that economic investment is not driven away.

For more information and to access the Canada West Foundation's water policy research visit: www.cwf.ca

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