MUNICIPAL WATER USE IN ONTARIO

PRACTICES AND PRICES

In 1990, Environment Canada established a database containing information on water rates and prices from over 1 600 Canadian municipalities with populations over 1 000. From this database, water and sewer rate information for Ontario was extracted. A similar survey was conducted in 1986, parts of which have been included for comparisons.

Forty million people, including six million in Ontario, use and reuse the freshwater of the Great Lakes and St. Lawrence River Basin. With populations of this magnitude, even such an abundant resource is put under tremendous pressure. Wasting water is costly in terms of providing proper treatment facilities, consuming energy, chemicals and other related resources, and through general environmental degradation. Such waste is one aspect of modern society's overconsumptive, "throw away" ideology.

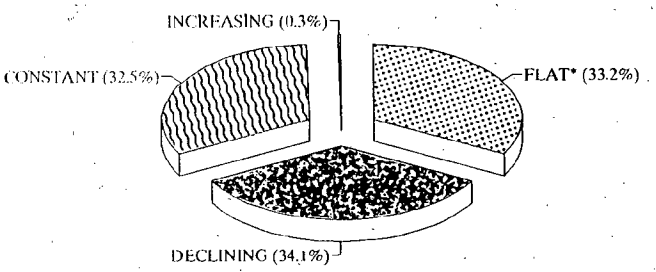
Water management in Ontario has traditionally meant increasing supplies rather than questioning uses of water and managing quantities demanded. Sustainable water use may be encouraged through changes to three influencing factors:

water rate types;
water efficient lifestyles and fixtures; and,
water prices.

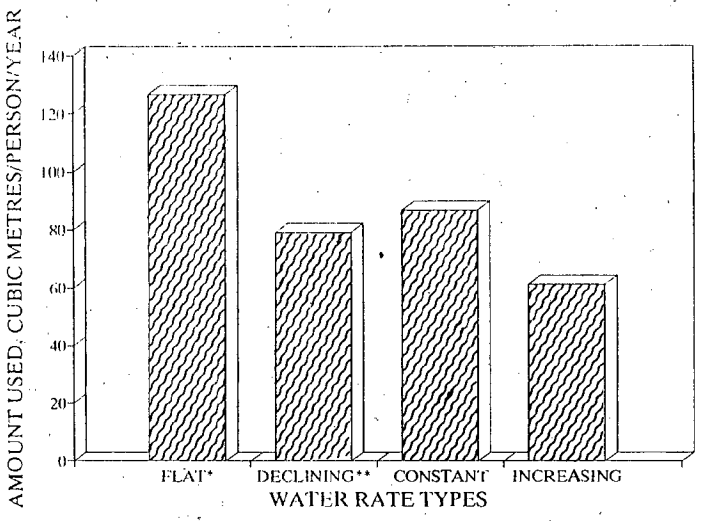
MAJORITY OF USERS PAY RATES THAT DO NOT PROMOTE CONSERVATION

By observing the actual population served by various types of water rate schedules, we find that 67% of the sample have rate structures that either discourage (flat rate) or do not actively promote (declining block rate) water conservation. About 33% of the population are charged a flat rate and 34% are charged declining block rates, both of which discourage water conservation. Wise use is more likely under the constant unit rate (32.5%) and is encouraged by the increasing block rate (0.5%). The increasing block rate is the most effective but least used system.

RESIDENTIAL WATER USERS
BY RATE TYPE, ONTARIO 1989



PER CAPITA RESIDENTIAL WATER USE
BY RATE TYPE, ONTARIO 1989



LARGEST QUANTITIES USED UNDER FLAT RATE SYSTEM

The quantity of water used per person varies significantly across the rate types. Under the flat rate system there is no extra cost to the consumer when greater quantities of water are used, therefore no incentive to conserve exists. Per person water use under flat rates is, on average, twice that of use under increasing block rate systems. The rate type implemented appears to be a significant factor in determining the volume used per person.

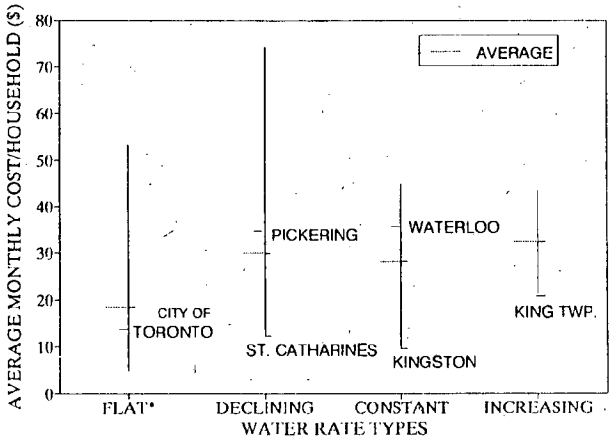
* Flat rates include some declining block rates and constant rates, since a few municipalities implement a combination of rate types.

** Greater quantities would be used, theoretically, under the declining block rate than a under constant unit schedule. However, other factors may be involved. For example, the first block of a declining block rate system may be more costly in comparison to the price per unit under constant rates, thus encouraging conservation.

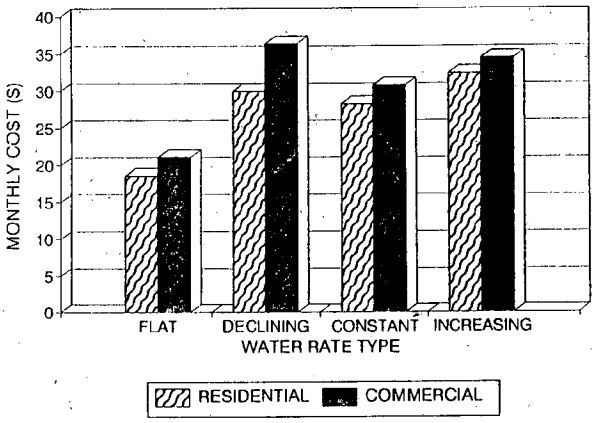
WATER PRICES VARY GREATLY WITHIN ONTARIO, 1989

Differences in prices are evident among the various rate types used in Ontario. The price of water under flat and declining rate types varies to a much greater extent than under constant and increasing block systems. Prices are set municipally, and are influenced by a number of different and sometimes conflicting criteria, including cost recovery, competitiveness, perceived local acceptability and low cost.

RANGE OF RESIDENTIAL WATER COSTS
FOR 35 CUBIC METRES/MONTH/HOUSEHOLD



RESIDENTIAL AND COMMERCIAL WATER COSTS
FOR 35 CUBIC METRES/MONTH



Commercial water prices follow the same cost patterns across the rates types as the residential, except that commercial rates tend to be somewhat higher for the same volume of water. The quantity of 35 cubic metres per month was used as it represents the use by an average Canadian family household.

RATE TYPE DEFINITIONS

Flat Rate

Under the flat rate system, a fixed charge is levied regardless of volume used. The price for each additional unit of water used is zero.

The large majority of rate structures incorporate a minimum or flat rate charge into each customer's bill. That is, a certain price is charged outright regardless of volume used. In Ontario, about 96% of all municipal water users pay a minimum charge which varies greatly between municipalities.

Constant Rate

Under the constant rate system, the user pays a fixed amount per unit of water consumed. Each additional unit costs the same amount.

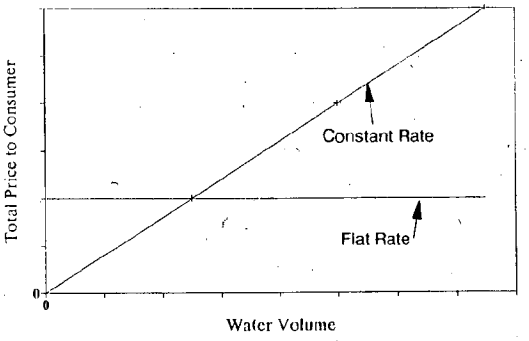
Declining Block Rate

Declining block rate schedules allow a successively lower price for each additional "block" of water used. In other words, the greater the volume of water consumed the lower the price per unit.

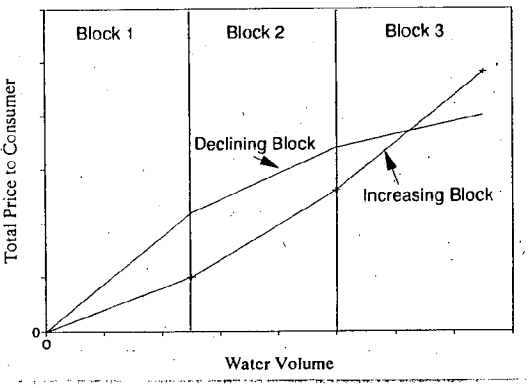
Increasing Block Rate

The increasing block rate works in essentially the same way as the declining block rate, except that the price of water in successive blocks increases rather than declines. Under this rate schedule, the increasing marginal cost structure rewards low volume users and makes it increasingly expensive for users who demand larger amounts. The cost of expanding facilities to accommodate large volume users can thereby be recovered from those same users.

FLAT AND CONSTANT RATE SYSTEMS



BLOCK RATE SYSTEMS



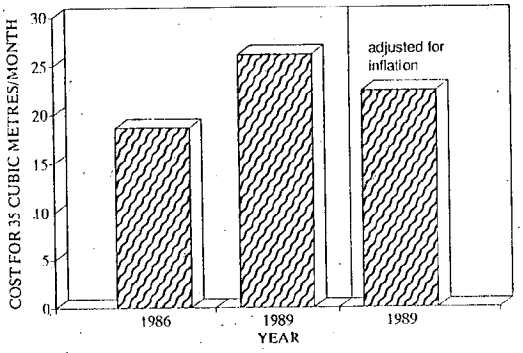
WATER USE TRENDS AND PRICING

In 1989, total municipal water use in Ontario (includes residential, commercial/institutional and some industrial) was about 10% higher than that used in 1986. After adjusting for population growth, the increase was still about 8%. Such an increase in average, or per capita use may be the result of a) higher consumption by all water users or b) demand for water being comparatively greater by the marginal water users (new water users since 1986). This increase is consistent with the rest of Canada, where water withdrawal increased by over 50% between 1972 and 1981 while population increased by only 5%.

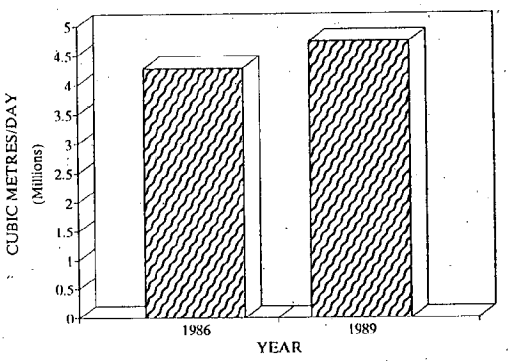
Also in 1989, the price of 35 cubic metres/month to the average household was 29% higher than in 1986. When adjusted for inflation, the price is 16.6% higher (included in the price to water users is a sewer surcharge which is added to cover the cost of treating wastewater). On average, an extra 44% of the cost of water supply is charged to customers for this service in Ontario.) The effect of the '86 to '89 price increase on demand appears to have been overshadowed by other influencing factors such as water intensive lifestyles (swimming pools, jacuzzis, garbage disposal units, dishwashers and automatic lawn sprinklers). As well, a hotter summer in 1989 may have increased water use for irrigation.

Prices charged to users for water and wastewater services have traditionally reflected only the costs of pumping; filtering and treating; maintaining pipes and other systems infrastructure; and more recently sewage treatment costs. Environmental degradation costs from the discharge of wastewater (economic impacts of pollution) have never been included. The capital costs of constructing and upgrading water and sewage treatment facilities have typically been paid for through lot levies, general property taxes, transfers from other levels of government and increased debt.

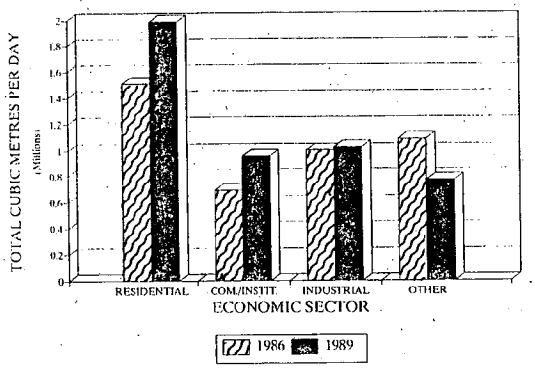
AVERAGE PRICE TO HOUSEHOLD
FOR 35 CUBIC METRES/MONTH, ONTARIO



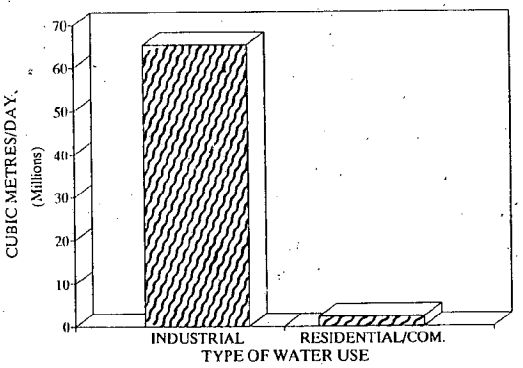
TOTAL DAILY MUNICIPAL WATER USE
ONTARIO



MUNICIPAL WATER USE BY SECTOR
ONTARIO



DIRECT INTAKE BY INDUSTRY
VS MUNICIPAL WATER USES, ONTARIO 1986



INDUSTRIAL VERSUS MUNICIPAL WATER USE

WATER AS A FREE GOOD

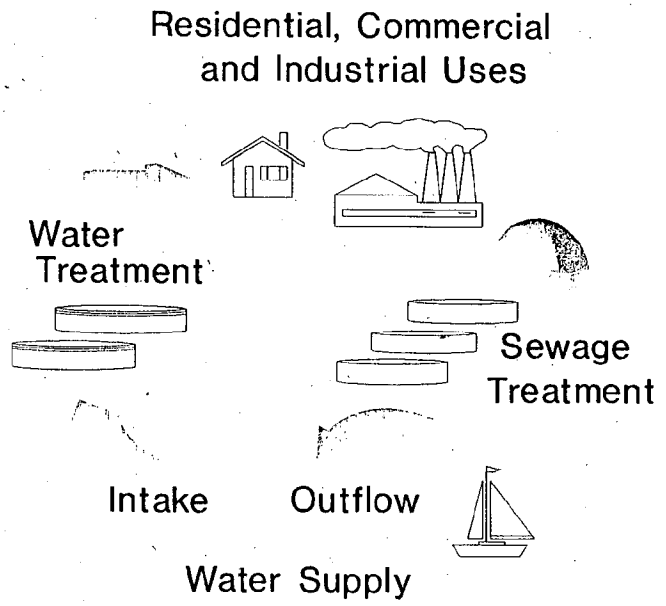
Industry withdraws its greatest amount of water through direct intake, that is, by pumping water directly from lakes, rivers and groundwater supplies to plants. In comparison, residential and commercial users connected to municipal water systems use only a fraction of total withdrawals (industries connected to municipal lines are not included on graph). Industrial water use statistics show that water withdrawal rates for Canadian industry are relatively high compared to other nations, and at the same time, water recirculation rates are low. These wasteful industrial practices are a result of the lack of a price for direct water supply. Water essentially becomes a free good for anyone in Ontario who chooses to pump it directly for their use. Since water is considered free, dilution becomes a less expensive way of treating pollution in Ontario to meet effluent concentration standards. The concentrations of contaminants are reduced by the excessive use of water, but the pollution load is not minimized.

THE WATER CYCLE

Although water pours out of taps and disappears down drains, it is a mistake to think of the trip as one-way. Water isn't just used, it is reused in a continual cycle through the environment; - a sobering thought to consider when flushing the toilet and then drinking a glass of water.

The less water used, the less degraded this natural resource becomes. When water use is examined using an ecosystemic approach, its interconnections with the natural and human environment becomes clearer. The strain on the environment in general intensifies with increased demand for water. This extra strain is not rational at a point when wasteful and damaging habits urgently need to be reversed. Greater water use has costly implications in terms of greater requirements for technical equipment and expanding treatment facilities; energy requirements for treating, transporting and heating water; chemical additives; and other related infrastructure and treatment processes. For example, the cost of energy used to pump water is the fastest rising expenditure in most water system budgets. In the average household, about 20% of the energy cost goes for heating water.

A benefit of water conservation is the reduction in water pollution through reduced quantities used. In one study, computer simulations of water flow reductions, modelled for a conventionally operated sewage treatment plant, have indicated that significant reductions in mass loads of some pollutants to the environment can be achieved from reducing the flow of water in the system. For a 40% reduction in water flow, total loadings of biochemical oxygen demand (BOD) and suspended solids (SS) were found to decline by as much as 59% and 68%, respectively. Water quantity reductions attack pollution at its source by reducing the amount of water becoming contaminated.



For information on wise use of water around the home contact:

Water Conservation and Project Evaluation Section
Water Planning and Management Branch
Inland Waters Directorate,
Environment Canada,
Ottawa, Ontario,
K1A 0H3

Ask for the following booklets:

-What We Can Do For Our Environment
-Water: No Time To Waste
-A Consumer's Guide To Water Conservation
-A Primer on Water

Think Recycling!

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Environment Canada Environnement Canada

Canada

TABLE 2. Current Status of Canadian Remedial Action Plans

Location	Stage 1	Stage 2	Stage 3
Thunder Bay	X		
Nipigon Bay	X		
Jackfish Bay	X		
Peninsula Harbour	X		
Spanish River	X		
Severn Sound	IJC		
Collingwood Harbour	incomplete	X	
Wheatley Harbour	X		
Metro Toronto	incomplete	X	
Port Hope	IJC		
Bay of Quinte	IJC		
Hamilton Harbour	complete	X	
St. Mary's River	X		
St. Clair River	X		
Detroit River	X		
Niagara River	X		
St. Lawrence	X		

Needs update

Legend

"X": means that work is being undertaken in the particular Stage.

"IJC": means that the Stage Report has been submitted to the IJC

"Incomplete": indicates that the IJC has reviewed the Stage Report but found that it did not fulfil all the criteria (see section 3.3. for the IJC Review Criteria)

"Complete": means a satisfactory review by the IJC

DOE disagrees w. terminology