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Selling ourselves short: A discussion of water-markets in Alberta

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ABSTRACT

The issue of water management has become one of increasing importance. Any new policy regarding resource management must balance the needs of the environment, the municipalities, and industry. In an effort to reconcile these needs, this report reviews the best practices of water policy. Specifically, the reason for undertaking this report is to research policy options available to the Alberta government to provide a framework for improving the Water for Life strategy. One generalization that can be made across the spectrum of privatization models is that whenever a resource is labelled a commodity, the objective to sell it for a profit invariably undermines the aquatic ecology at the source. The report identifies a common practice in which industrial entities pay for water on a sliding scale, (if they are made to pay anything at all), with bulk water purchases becoming cheaper as more water is consumed. By applying a conservation-orientated system to industrial users, the minimum amount of water available would have heavy fees assigned when exceeding the allotment. An industrial system with the conservation-orientated approach could also add extra incentive to recycle water used for industrial purposes. A policy of conservation-orientated charging applied to municipalities and industry offers the practical aspects of water leases and conservation enforcement. Research finds that private ownership of water offers more detrimental than beneficial outcomes for the people of Alberta.

> *We face an unassailable fact: we are running out of freshwater . . . In the last century we humans have so vastly expanded our use of water to meet the needs of industry, agriculture, and a burgeoning population that now, after thousands of years in which water has been plentiful and free, its scarcity threatens the supply of food, human health and global ecosystems. (Leslie as cited in Feldman, 2007, p. 6)*

Water is understandably necessary to sustain life, but should it ever constitute a commodity to sustain an economy?

The issue of water privatization or water-markets has been raised before. A number of countries have already adopted various forms of water-markets—with mixed success. One generalization that can be made across the spectrum of privatization models is that whenever a resource is labelled a commodity, the objective to sell it for a profit invariably undermines the aquatic ecology of the source: "No sector in the world has become more conscious of the worth of water than the private sector, which sees a profit to be made from scarcity" (Barlow & Clarke, 2002, p. 73). Moreover, there is a persistent thought process tied with 'water-as-commodity' that consumers, even the poor, choose where they spend their money; in time we can expect to hear that people without water services just made bad choices (Barlow, 2012, p. 6).

Alberta is in the process of reviewing its historical water allocation system, and one of the options being proposed is a market-based allocation system. The water allocation system currently in use has been in place for more than 100 years and limitations to this system have arisen (Government of Alberta, 2009, p. 9). Theoretically, market-based allocation ensures that the increasingly scarce resource (i.e., water) will be put to its highest and best use.

The question that has yet to be adequately answered is whether the economic value of a resource has any bearing on its value to society. Industry has the ability to pay for water; does this mean that industrial growth is more important than providing clean water to municipalities?

Water is arguably too valuable to have a price. And yet, by not assigning a monetary value to water, extensive and uncontrolled consumption is encouraged within our society. This unsustainable practice and behaviour needs to change. This paper is grounded in the premise that complete private ownership of a universal human necessity is unsound. The inherent costs and benefits of water-markets will be explored in this paper, and will provide a policy framework for updating Alberta's water allocation system.

Literature Review

Prior to developing policy recommendations a review of the existing literature was conducted, as well as a close examination of the 'Water for life: Action plan' published by the Province of Alberta. International case studies were reviewed to determine best and worst practices in the areas of ecosystem conservation, sustainability, allocation of resources, financial implications, and business models. The literature review was the major instrument used in developing the policy guidelines. These literary sources were selected using two criteria:

1) by relevance to the subject of private ownership of water; and

2) by the credibility of the author.

A number of the sources, both academic papers and books, were authored by Maude Barlow. Her authority on the subject matter is undisputed, having received eleven honorary doctorates, a Citation of Lifetime Achievement at the 2008 Canadian Environment Awards, the 2009 Earth Day Canada Outstanding Environmental Achievement Award, the 2009 Planet in Focus Eco Hero Award, and the 2011 EarthCare Award, as well as serving as Senior Advisor on Water to the 63rd President of the United Nations General Assembly (Barlow, 2012, p. 1). Additionally, reports from independent, public policy research institutes such as the Parkland Institute and Pembina Institute were reviewed, as well as a selection of works detailing the economic operations of water-markets.

In a report released by the Council of Canadians, Rahman, Barlow, and Meera (2011) indicate that Alberta is at risk from virtual water markets since the province has just two per cent of Canada's water supply, yet accounts for two-thirds of the country's water usage, towards irrigation, much of it for export through virtual water markets (p. 5). In this report, the concept of virtual water is explained as "the amount of water consumed in the production process of a good or service" (J.A Allan, 1993, as cited in Rahman, et al., 2011, p. 9). Building on this definition, the virtual water content (VWC) of products ranges greatly: a cup of tea (i.e., 250 ml) contains about 35 litres in VWC, a cup of coffee (i.e., 125 ml) is 140 litres, and a hamburger (i.e., 150 g) is 2,400 litres (Hoekstra & Chapagain, 2008, as cited in Rahman, et al., 2011, p. 10). The same principle applies to agriculture. The United States is able to offset their water requirements by importing high VWC products while exporting low VWC goods, causing an imbalance in trade and a net virtual water loss for Canada (p. 31). Agriculture exports a significant amount of water through virtual trade, although more ecologically damaging is the tar

sands extraction in Northern Alberta. Water is used in the tar sands to extract bitumen from the sand. Bitumen has been deemed the worlds' most water-intensive hydrocarbon—consuming a net average of three barrels of water to produce each barrel of oil (Dyer, Moorhouse, Laufenberg, Powell, 2008, & Nikiforuk, 2008, as cited in Rahman, et al., 2011, p. 21). The water consumed by this industry is taken out of the natural cycle and is destroyed—polluted beyond use.

Presently, "the tar sands mines account for more than 76 per cent of the water allocations from the Athabasca River" (Rahman, Barlow &. Meera, 2011, p. 25). This is a significant drain on the Athabasca River. More detrimental is the reality that the water consumed is not able to be reclaimed: "Every year, the energy sector—all of it corporate and much of it foreign controlled—uses (and destroys) 1.1 billion cubic metres of freshwater in the production of oil from the tar sands . . . Alberta does not charge any money for access to this water" (Rahman, Barlow & Karunananthan, 2011, as cited in Barlow, 2012, p. 9). The practice of allowing free access to raw (untreated) water is a measure put in place to promote industrial growth, but it is a short-sighted policy that needs to end. Especially since new water-intensive methods of extraction such as hydraulic fracturing (also known as 'fracking' or hydro-fracking) are becoming more common. Hydraulic fracturing uses a solution made with water, sand, and chemicals which is injected at high pressure to fracture existing geological formations and force the oil or gas up the well (Rahman, et al., 2011, p. 26).

A large contributing factor to the lack of conservation efforts is related to how our society allocates value. Unless there is a monetary value attached to something society seems to believe that it has minimal to no value. The Polis Project published a report, Worth Every Penny, A Primer on Conservation-Orientated Water Pricing, that suggests Canadians pay remarkably little for their water, noting that water consumption is remarkably high, and conservation-orientated charging could curb excess use. The report continues, explaining that under the current system with flat volumetric charging, you pay for the water you use—the more you use the more you pay. Implementing changes to the pricing may reduce consumption. Under conservation-orientated block charging the price is very low for basic water needs and then charges incrementally more per unit of water used (i.e Tier 1, 2, 3, etc). A visual representation of this incremental increase is shown in Figure 1. Simply put, the basic water you use is cheap; when you start to use more, you pay more per unit. The queston posed by the authors of the report is why should prolific users pay the same amount as those who do their best to conserve (Polis Project as cited in Barlow, 2012, p. 7)?

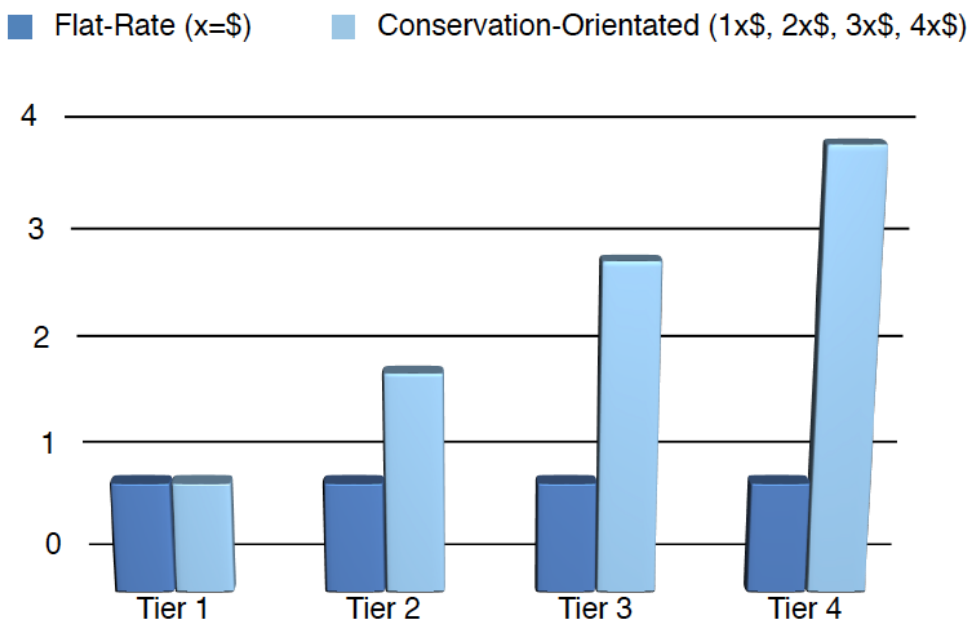

Table 1. Comparing conservation-orientated block charging with a flate rate.

The concept of conservation-orientated charging is considered one of the most logical best-practices described in the literature.The strength of conservation-orientated policy is that it could also be adapted to industry. Industrial entities commonly pay for water on a sliding scale, (if they are made to pay anything at all) with bulk water purchases becoming cheaper as more water is consumed. Applying a conservation-orientated system to industrial users would assign heavy fees to those who exceed a set water allotment.

An industrial system resembling the conservation-orientated approach could also add an extra incentive to recycle water used for industrial purposes. According to Barlow (2012), water-reliant natural resource industries such as agriculture, manufacturing, mining, oil and gas, pulp and paper, and electricity generation account for 90% of our consumed water (p. 8).

As such, this is where the policy of water conservation needs to be focused. Especially since most provinces charge nothing or very little for 'raw water' extraction. Quebec and Alberta do not charge at all for commercial water takings. Instead, a one-time license to the user is granted; provincial policy has been orientated to using water supplies to promote industry and growth, not to promote conservation (Barlow, 2012, p. 8). Yet, the motivation and advocacy for water privatization and user-fees for water

originates from industry itself. The key point is that corporations prefer to pay for a resource than to be responsible to the community. As commented on by Barlow (2012), the call for market-orientated water pricing comes most adamantly from the sectors that use large volumes of water, or are in the private water business . . . bottled water companies, the big private water utilities, the energy and mining industry, agribusiness, etc., have landed on water pricing as the solution and alternative to environmental laws, conservation regulations, and progressive taxation, to which they are opposed (p. 11).

The problems associated with corporate ownership of water are both systemic and intrinsic. As noted by Thompson and Newman (2009), "The private-interest, for-profit oil and gas industry creates significant social, environmental and political harm, much of which is a result of its profit-maximization mandate . . . when corporations fail to maximize profits, their directors can be sued" (p. 8, 15). Since share value is estimated to be a reflection of the net present value of the future profit stream; in the long run, maximizing share value comes down to maximizing profits (Investopedia as cited in Thompson & Newman, 2009, p. 13). Furthermore, profits can be maximized by minimizing costs. Reducing internal costs can mean making operations more efficient; however, it also implies 'externalizing' costs so that somebody else pays them (Thompson & Newman, 2009, p. 14). These costs are then all too commonly paid for, (although unaccounted for), through environmental degradation that directly affects the residents living in the now environmentally damaged area.

As previously stated, Alberta's water allocation system has been in place for over 100 years. The current system grandfathers in (i.e protects) the first user with a water license, allowing that licence holder to extract as much as he or she chooses. This is a standard practice, but by no means the best-practice or most sustainable practice. As noted by Janmaat (2011), "Property rights around water generally apply to the right to use an annual flow volume rather than simple ownership of the water. Prior appropriation, or 'first in time, first in right,' water rights are the most common form in western North America" (p. 145). Given that there is no official oversight on how the water is extracted, there are numerous cases where water rights almost exhaust or even exceed the capacity of the water sources they are issued on (Postel as cited in Janmaat, 2011, p. 147).

If the "first in time, first in right" system is converted to a market model, the most senior license holders stand to gain a significant profit for a water license they received for minimum effort or payment: "The greatest gain in profit accrues to the most-senior water license holder, as this water user sells water to one or both of the other users [in

line], as well as to the regulator . . . [which is] water purchased for conservation" (Janmaat, 2011, p. 153). In terms of conservation, there is a concern that many water markets have relatively few sellers that could provide conservation water (p. 158). Out of necessity, purchases of water for the environment are increasing where water-markets are in effect; short-term water leases provide a means to adjust conservation purchases in response to environmental conditions; however, this still leaves open the question of where the money must come from (p. 147). Generally, the regulator must purchase water back to safeguard the environment, and so, in effect, the tax payers are paying to keep water in the stream, in addition to paying for their own water consumption. Finally, and most poignantly, "where 'first in time, first in right' water rights prevail, the environment is typically last in time" (p. 158).

The other aspect to be aware of when discussing water-markets is the types of private enterprise that are available and in use internationally. Some of these models have proved to be problematic (i.e. full privatization) while others are able to function within the public sector, the following is an overview of these models. Under full privatization a private company purchases water assets and runs the operation as a business on a permanent basis. This is rare. However, with the concession contract, the private company assumes the commercial risks (i.e., manages the utility and maintains infrastructure); the company supposedly takes the commercial risks while the municipality retains ownership of the assets. A joint venture exists when the private company works with the public sector to provide water services. Garrick and Aylward (2012) were valuable in outlining the requirements of a water-market based system: "In the context of market-based environmental water allocation, policy enactment costs include enabling reforms of water rights institutions to define, transfer, and manage water rights in a cap-and-trade system that allows transactions for environmental flow restoration purposes" (p. 540).

The oil extraction projects in Northern Alberta were mentioned repeatedly throughout the Canadian literature on the subject of water quality and private use:

> Perhaps the fastest-growing source of water loss and contamination in the country is coming from the mining operations in the tar sands of Northern Alberta." Schindler continues, "the tar sands are made up of sand and bitumen, a tar-like mix of petroleum and hydrocarbons that requires intensive processing to become finished petroleum. To produce the current million barrels of oil a day from the tar sands . . . enough water is withdrawn from the Athabasca River to sustain a city of two million people a year, (Schindler as cited in Barlow, 2007, p. 182).

The population of Edmonton, Alberta, as of April, 2012, was 817,498 (Edmonton Census, 2012); Calgary, Alberta, had a population of 1,120,225 (Calgary Census, 2012). Evidently, this observation of the population of Alberta's two major cities (approximatly two million people) and annual water consumption of the tar sands operations was made earlier, as cited in Barlow (2007): "The British science journal Nature notes that western cities such as Edmonton, Calgary, and Saskatoon are at risk of losing the rivers upon which they are built in the next generation or two" (p. 179).

The most immediate water quality issues are being experianced by the aboriginal communitues in Northen Alberta. In 2012, Marle Roberts, the Alberta President of the Canadian Union of Public Employees (CUPE), called on the government to take action regarding the fact that over two-thirds of Alberta's First Nations communities have boil water advisories:

> As the union for most municipal water workers in Alberta, we understand the importance of safe drinking water, and we're appalled at the situation" (CUPE). The federal government has since announced increased funding for these communities. A 2013 press release from Aboriginal Affairs and Northern Development Canada stated, "our Government is committed to addressing water and wastewater issues on reserve (sic) to ensure that First Nations communities have access to safe drinking water, (AANDC, 2013).

Increased funding for infrastructure is applaudable, but it is more important to protect the water sources from over exploitation and contamination in the first place.

The water management guidelines for Canada as outlined below by Barlow (2012) provide excellent guidelines for gauging the best policies for Alberta:

> A larger, more sustainable plan for water governance in Canada must be based on the rule of law and needs to include strict pollution controls, conservation, long-term watershed protection and restoration, stringent regulations about water takings to curb the free-for-all now happening in Canada, restrictions on access where necessary, strict adherence to an improved Fisheries Act, bottled water bans, education, and investment in water and wastewater infrastructure. (p. 11)

This literature review has provided a strong foundation from which to develop an improved water policy framework for Alberta. The addition of this new study will reconcile the issue of creating an economic incentive without exploiting water resources or losing control of the resource to private for-profit operations.

Discussion

The notion that water will be ever abundant has passed, and now society needs to begin making some difficult and complex decisions on where its values lie. The Water for Life strategy was first adopted in Alberta in 2004 and the government renewed the strategy for another 10 years starting in 2009. The document appears to be wellintended, although some of the wording is troubling.

In discussing the "renewed" Water for Life strategy, the Government of Alberta (2009) indicated "five years later, Albertans continue to care about the health of the aquatic environment, as well as issues concerning water quality and quantity" (p. 3). That Albertans are still concerned about their water resources seems self-evident—there is no reason why this would change. Furthermore, "Water is an essential resource that must be protected to ensure future growth and prosperity in Alberta" (Government of Alberta, 2009, p. 3). The overriding concern for growth and prosperity suggests precedence over the more legitimate concerns of providing safe drinking water for municipalities and preserving the aquatic ecosystems.

The Alberta Water Council recommended having the renewed strategy centralized around two key themes:

1) safeguarding our water sources, and

2) accelerating our actions (Government of Alberta, 2009, p. 5).

Some of the actions required to achieve these goals include addressing ecosystem degradation, determining best-practices, clarifying roles and responsibilities, enhancing data collection, and building shared commitments (p. 5). The report acknowledges that Alberta's growth has created challenges for municipalities to provide safe drinking water and environmentally acceptable wastewater (p. 9). And yet the wording then appears to equivocate: under the heading of "Healthy aquatic ecosystems," the stated goal is that "Albertans are assured that aquatic ecosystems are maintained and protected" (Government of Alberta, 2009, p. 12).

Why is the goal not simply stated as "aquatic ecosystems are maintained and protected?" Such unclear wording creates confusion as to the government's intent and actions regarding aquatic ecosystems. Are Alberta's aquatic ecosystems really being "maintained and protected?"

The Water for Life strategy is not very ambitious. One of the key actions is to "set

water conservation objectives on all basins by 2015" (Government of Alberta, 2009, p. 13). The plan, in other words, is to have a plan by 2015.

Another key action is to actually map out and model Alberta's groundwater resources by 2015—interestingly, this task wasn't completed decades ago. Under another heading,"Reliable, quality water supplies for a sustainable economy," has the goal listed as "Albertans will be assured that water is managed effectively to support sustainable economic development" (Government of Alberta, 2009, p. 14). Once again, this goal could have been simplified to state "water will be sustainably managed." But instead it is qualified in two ways:

1) Albertans are only to be "assured" that the water is being sustainably managed, and

2) even then, the focus is for the long-term sustainability of the economy, not the environment.

These policies need to be rewritten to remove the ambiguity and give explicit direction on what actions are to be taken to promote conservation and true sustainability.

There is misconception surrounding fresh water availability and renewal in Alberta. As taken from the Water for Life strategy, "our fluctuating water supply is challenging the way we allocate and use this renewable, but increasingly scarce, resource" (Government of Alberta, 2009, p. 20). Fresh water is not a renewable resource in the typical sense. The fresh water cycle functions within a closed system, and as such has a declining available water budget. Rain is the same water that had previously evaporated. Glacier melts will feed the provincial rivers and lakes, but these are finite (and dwindling) fresh water sources. In 2003, a Statistics Canada study, Human Activity and the Environment, warned that the country's major glaciers, which hold 50% more water than the Great Lakes are melting quickly; approximately 1,300 glaciers have lost between 25% to 75% of their mass since 1950 (as cited in Barlow, 2007, p. 179). The fresh water we do have is being polluted through industry and careless actions. As reported by Barlow and Clarke (2002), even though Canada is a wealthy country, over one trillion litres of untreated sewage are still dumped into waterways every year (p. 31). The practice of dumping raw sewage into public waterways is more than an oversight: this is neglect on behalf of the Canadian people.

The research process also uncovered a startling comment by Bakker (2007), stating "Canada is one of the few industrialized countries in the world not to have legally enforced water quality standards . . . The only serious federal law regarding water protection is the Fisheries Act, which prohibits dumping of materials in waterways that would harm aquatic life. But this act is routinely broken" (as cited in Barlow, 2007, pp. 184-85). Alberta and Canada, every place on Earth, needs strong government oversight to protect water resources.

This study's research methodology consisted of an extensive literary and historical review. The insights gained from this review will be discussed herein as they relate to Alberta's specific situation. The objective is to identify policies and practices that will be sustainable for Alberta's native ecology and communities. Sustainability has been criticized as a "highly idealized objective," yet it provides important guiding principles, primarily by "setting priorities, providing a crucible to determine if decisions are likely to resolve conflicts by embracing solutions to several problems at once (or to exacerbate them by promoting one objective at the expense of all others" (Ostrom, 1990, and President's Council on Sustainable Development, 1996, as cited in Feldman, 2007, p. 91).

A market-based system of water allocation places profit ahead of protection. Conservation may be an argument for implementing water-markets; however, it alone is an insufficient reason for implementation considering the numerous case studies available like those reviewed earlier. One of the aims of the final key actions listed in the last pages of the Government of Alberta's Water for Life strategy (2009) is to "Implement a market-based ecosystem services incentive program" by 2015 (p. 21). The phrasing is as ambiguous as ever, although it reads as though market-based water services are coming to Alberta by 2015.

Results

The results of the research indicate that private ownership of water is a poor policy choice for Alberta.

A special feature of Fortune magazine (May 2000) predicted the following: "Water promises to be to the 21st century what oil was to the 20th century: the precious commodity that determines the wealth of nations" (as cited in Barlow & Clarke, 2002, p. 104). With water quickly becoming such a valuable resource and regrettably a commodity as well, Alberta needs to implement meaningful policy changes to protect its water.

Any assumptions that private ownership will automatically place water to its 'highest and best' use are dangerously flawed. Those with the ability to pay, like companies operating in the oil sands or corporations seeking a new source for bottled water, will always be able to outbid the individual households and farms that desperately need water but may be unable to afford it. Additionally, the argument that private enterprise will safeguard the ecosystem is equally flawed. Corporations have an unforgiving mandate to maximize share value; this can only be achieved by maximizing profit. Maximizing profits and externalizing costs does not bode well for aquatic ecology.

Conclusions and Recommendations

Private ownership of a basic human necessity is carelessly short sighted. Short-sighted from the perspective of our sustainable development. Short-sighted in providing safe drinking water for our municipalities. And short-sighted in safeguarding our ecosystem from over-exploitation.

After deliberating on the information available on the operation of water markets, the best policy framework for Alberta's allocation system would include annual water lease licenses that would require strict government oversight, a progressive per-unit-rate based on conservation-orientated charging (for both municipal and industrial users), and by operating under a concessional-contract the financial burden to the municipality would be reduced while maintaining public ownership of the water.

Stressing the necessity to enforce conservation-orientated charging for industrial users is important. The industrial users have traditionally consumed the bulk of our water resources and enjoyed limited accountability and lower utility rates. These practices must stop.

As noted in the Water for Life Strategy, additional research is needed on the quantity of ground water contained in Alberta's aquifers. Before the Province can begin to allocate anything, the policy makers need to know how much fresh water is actually available. As Alberta's Provincial strategy indicates, we need water for life—let's not sell ourselves short.

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