Policy Research Initiative | Projet de recherche sur les politiques

Sustainable Development
Briefing Note

Exporting Canada's Water I: Outside of NAFTA

Highlights

- Exporting Canadian water outside of NAFTA is only economical as a luxury product.
- Water exports would not necessarily harm the environment, but would have little economic benefit to Canada.
- Water exports for humanitarian emergencies would not turn water into a commodity, but Canada is not the closest and cheapest source of water for most other countries.

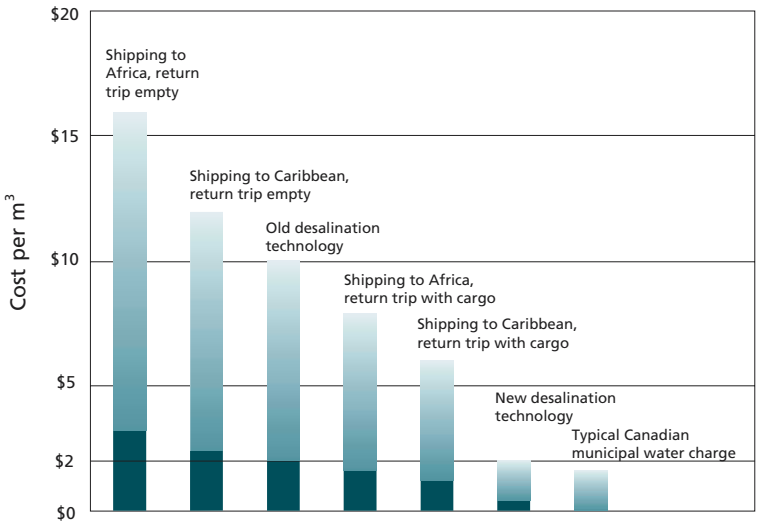
Background

Schemes have been proposed in recent years to move bulk water from Canada to thirsty nations around the world using tankers, large water bags towed behind ships, or hauling icebergs from the western North Atlantic. None of these schemes, conceived of as commercial for-profit ventures, has actually been implemented.

Canadians strongly oppose diverting our rivers south to the United States. This opposition has extended to any form of bulk export of water. The opposition to other forms of bulk export – in tankers, for example – is linked to fear that if allowed, it would brand water as a commodity under NAFTA or World Trade Organization (WTO) rules, with the result that Canada could not stop American interests from taking all our water.

This Note examines the economics of overseas bulk water (as opposed to bottled water) exports from Canada to non-NAFTA countries. A companion note (*Exporting Canada's Water II: To the United States or Mexico*) examines the more complex issues surrounding bulk water export to the United States and potentially Mexico.

Cost of water supply



Shipping water overseas is more expensive than local desalination. Canadian water rates are given for comparison only; this charge is mainly for treatment and distribution, is normally subsidized, and does not include a charge for the water itself.

Canada

Physical economics of bulk water exports

For overseas destinations, tankers, towed bags, and towed icebergs are the only technologically feasible choices at this time. Towing icebergs from Canadian waters would not be reasonable, as icebergs are abundant in international waters closer to any potential overseas destination.

Water in containers

To move bulk water from Canada to other continents would require container transport. Proposals to date include tankers (particularly old single-hull oil tankers) and "Spragg bags" or other similar approaches in which one or more large plastic bags are filled with water and floated behind a ship for ocean-going transport.

Export in water tankers would require port facilities for the ships and loading the water, and for unloading and treating the water at the receiving end. Most proposals, such as the abortive one to export water from Newfoundland's Gisbourne Lake, involve ships capable of holding about 275,000 m^3 of water. The tanker would either have to make the return trip empty, have removable containers, or else return with a liquid cargo that would not contaminate the water on the next trip out; this would seriously limit the economic potential of the return trip.

Large tankers are expensive to operate. The cost per m^3 of water payload per day of transport has a broad range of $0.12 – $0.60 per m^3 per day[1], depending on current oil tanker market conditions, fuel prices, and the size of tanker involved. With a tanker typically able to cover about 400 km in a day of sailing, the cost is therefore highly dependant on distance. If a cargo could be found to pay for the return trip, the shipping cost would still be in the range of $1.50 to $8.00 per m^3 to the nearest African port, or $1.25 - $6.00 per m^3 to the Caribbean. The cost would be double if there was no suitable return-trip cargo.

The concept of towed water-bag technologies may reduce the operating costs per m^3, but the technology has not yet been proven for long-distance open-ocean transport. Water is shipped in towed bags to serve islands in the eastern Mediterranean, and this may be done in the near future to serve some islands in the Caribbean. It has also been proposed, but not implemented, for California. In all cases, the total sea-distance is small, typically on the order of 100 km. In the case of California, the proposal would use water from Oregon or Washington, not from Canada.

Delivering water by freighter or bag to a port may require treating the water on arrival and moving it uphill and inland to reach consumers. Treatment costs will vary by method used and by factors such as purity of the source water, pre-treatment before shipping, duration and conditions of transport (during which bacteria may have multiplied), and the end use to which the water is applied. Delivering the water to consumers will mean significant infrastructure costs for piping, but relatively minor operating costs for pumping.

Despite these difficulties, several countries receive a portion of their freshwater through marine transport. For example, Cyprus and Israel both receive water from Turkey, and Bermuda ships water from the United States. In all cases, the transport distances and the populations served are fairly small; in all cases, desalination plants are being considered or are already under construction.

The alternatives

Countries with chronic water shortages have several options other than bulk water imports. These include (but are not limited to) conservation programs, wastewater recycling, and desalination.

1 Canadian dollars for 2004 are used throughout this Note, unless otherwise indicated.

Wastewater recycling can be expensive, but conservation programs are often seen as a nearly no-cost way of reducing the need for additional water. While this may be true in water-rich countries like Canada, it may not hold for water-poor countries, such as Israel, where water use is already constrained and therefore conservation may already be a way of life.

Desalination is a particularly good comparison for bulk import, as it would deliver water to a coastal location, as would shipping. The cost of desalination is currently about $2.00 - $10.00 per m^3, but is declining rapidly. New plants that are in design or construction are expected to produce desalinated water for as little as $.50 per m^3. This is less than the cost of shipping from Canada to Africa, and has the advantages of producing water that is already treated, of being under local control, and of contributing to – rather than costing – the local economy.

Desalination is energy intensive; its costs fluctuate with the world oil market, as does the cost of shipping. However, while shipping is a fairly mature technology, which cannot be expected to become noticeably cheaper with time, desalination is a young technology in which large cost savings can be expected from future technological developments. It is therefore likely that desalination will become still more cost effective than shipping water overseas for the foreseeable future.

Economic benefits and environmental impacts of allowing bulk water export

Economic benefits

In Canada, an exporting province would have the right to charge a royalty or other fee for the sale of its water. From the analysis above, it is clear the fee would have to be small if it were not to be prohibitive for export as anything other than a pre-bottled luxury product. The direct benefit of bulk export is therefore likely to be small.

Similarly, the number of jobs created would be small, and largely confined to the vessels conducting the shipping, with a small number of jobs in the filling and servicing of these vessels.

Environmental impacts

The amount of water that can be removed by a tanker is small relative to the amount of water available – a large tanker load would be about one day's flow of a small river. For example, the all-time minimum flow recorded for Manitoba's Burntwood River is over 200,000 m^3 per day, and Quebec's Rivière aux Outardes has a minimum daily flow of over 900,000 m^3 per day. A large river, such as the Niagara, has a minimum flow greater than 350,000,000 m^3 per day, and, even on a bad day, could fill more than 700 of the largest super-tankers. Therefore, provided the source is selected with moderate care, the taking of the water by itself need not pose any environmental threat.

Nevertheless, shipping water would not be without environmental risks. Ships could run aground, spill fuel, import invasive species in bilge water, and so on. Port facilities would also be needed. These risks are however related to shipping in general, not shipping water in particular. Unlike oil or most other cargoes, a spill of freshwater, even in a sensitive near-shore environment, would have no lasting environmental consequences.

Humanitarian emergencies

In a humanitarian emergency, Canada could export bulk water as a temporary measure. Since it would not be sold, it would not involve WTO or NAFTA rules, and would therefore not risk turning water into a commodity.

However, it is doubtful there will ever be a need for this. There are relatively water-rich countries closer than Canada to any given water-poor country; it will likely always be less expensive to ship emergency water supplies from one of these other countries than from Canada.

Conclusion

Commercial export of bulk water from Canada to non-NAFTA countries is not likely to be economical in the foreseeable future. Canada would not be the source of preference for most dry regions of the world, because closer and therefore less expensive sources are generally available. Such export need not in any event have a significant environmental impact. There is no real reason to prohibit the non-profit export of water in tankers for humanitarian aid, and the Minister of Foreign Affairs currently can permit it. It would not make water a commodity under NAFTA, and need not have a significant environmental impact. It would not likely be a long-term solution, and would be best viewed as a stopgap measure until local desalination or other plants could be built in the receiving country. It is also likely that other, closer, and therefore less expensive, sources would be found.

Further Reading

Newfoundland and Labrador, Government of. 2001. *Export of Bulk Water from Newfoundland and Labrador.* A report of the Ministerial Committee Examining the Export of Bulk Water. October.

Pearse, P.H., F. Bertrand, and J.W. MacLaren. 1985. *Currents of Change. Final Report. Inquiry on Federal Water Policy.* Ottawa: Environment Canada, ISBN 0-662-14189-X.