

The Soft Path for Water

A Social Approach to the Physical Problem of Achieving Sustainable Water Management

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Need for a New Paradigm of Water Management

For 2,500 years, perhaps longer, water management has meant constructing dams, digging and drilling wells, and extending canals and pipelines to cities and large irrigation systems. This approach has been spectacularly successful at providing humans in rich nations with vast amounts of clean water wherever and whenever wanted. As well, water was made available to farms, factories, and generating stations so they could supply food, industrial goods, and electricity in huge amounts to people around the globe – generally with enough water left over for gardens, parks, and swimming pools.

Despite past success, the long “day” in which the search for new supply could dominate water planning is now coming to an end. Although many Canadians still believe that our freshwater resources are limitless, the reality is that only a small proportion of our water is truly renewable and located

where most of us live. Direct costs to develop additional freshwater are doubling (per cubic metre) every 10 to 15 years (Serageldin, 1995). These costs increase significantly when the environmental impacts of both increasing infrastructure development and high water use are included.

Water management challenges in Canada, as in much of the world, are rapidly increasing. Climate change, population growth, increasing pollution, and rampant development are some of the many stressors to our freshwater resources. Within the past few years, nearly a third of Canadian communities have faced threats to the security of quantity or quality of their water supply (Environment Canada, 2004).

The Potential of a New Approach

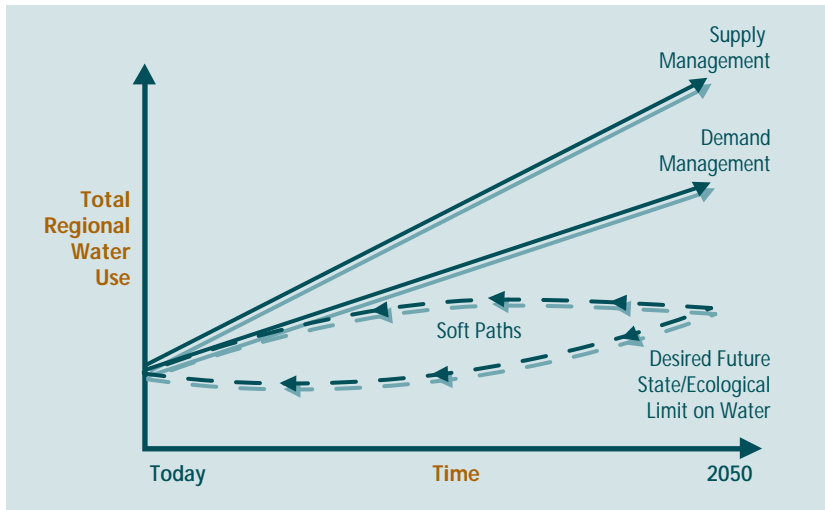
The key to a fresh approach for water management lies in shifting the focus from expanding the supply to moderating the demand. But water conservation does not just happen; it will not

FIGURE 1
Spectrum of Water Management Approaches

Policy	Dominant Discipline	Range of Policy Choices	Fundamental Questions	Planning Process	Outcome
Supply Management	Engineering	Policies based on presumed need for new infrastructure.	How can we meet projected water needs given current trends in water use and population growth?	Planners extrapolate from current consumption patterns to determine future “requirements” and then locate and develop new sources of supplying to meet this projected demand.	Construction of dams, pipelines, canals, wells, desalination systems, and interbasin transfers, where necessary.
Demand Management	Economics	Policies based on short-term cost-benefit calculations.	How can we reduce needs for water to conserve the resource, save money and reduce environmental impacts?	Planners incorporate efficiency and information programs together with improved pricing patterns to maximize use of existing infrastructure. Increasing capacity is only one option among others in a least-cost approach.	Efficiency gains through technical fixes and consumer education.
Soft Path	Social sciences with recognition of bio-physical limits.	Policies based on stakeholder consultation and political review.	How can we deliver services currently provided by water in ways that recognize the need for economic, social and ecological sustainability?	Planners model a sustainable future state for water use with attention to long-term economic and social prosperity. They then “backcast” to devise a feasible and desirable path to reach that state. Ecological sustainability is fundamental to all economic, political and socio-cultural choices.	Options to reduce use through innovation, conservation, water reallocation and changing patterns of use and re-use. More water is left <i>In situ</i> .

Source: Brandes and Brooks (2005: 5).

FIGURE 2
Planning for the Future with a Soft Path Approach



Source: Brandes and Brooks (2005: 13).

Core Principles of Soft Path Analysis

Treat water as a service rather than an end in itself – Beyond a very few services, there is no absolute requirement for water, or at least water beyond that which comes from rain. Rather, water is an input that can be delivered as an alternative to other ways of achieving the same result: air-based cooling, rain-fed agriculture, waterless sanitation.

Make ecological sustainability a fundamental criterion – Soft paths recognize ecosystems as legitimate users of freshwater and as the foundation of our economy. Environmental constraints are built in from the start to limit the amount of water withdrawn from natural sources and to establish conditions on the quality of water returned to nature.

Match the quality of water delivered to that needed by the end use – For both economic and physical reasons, it is almost as important to conserve the quality of water as to conserve its quantity. Soft path policies are designed from the start to match the quality of water supplied to the quality required by cascading water systems, ensuring that wastewater from one use becomes input for another use – from a washing machine to a garden, or from a cooling system to other industrial uses.

Plan from the future back to the present – Traditional planning starts from the present and projects forward to the future. Soft path planning does just the reverse through a technique called “backcasting.” First, it defines a sustainable and desirable future state for society, at least as water sources and uses are concerned. It then works backward to identify policies and programs that will connect the future to the present.

take root in the absence of leadership and action by all levels of government. A new paradigm of water management is situated in the approach called demand management (in obvious contrast to supply management), and it extends from simple technical fixes (e.g., low-flow shower heads) and economic incentives (e.g., volume-based prices) to a more long-term and fundamentally holistic approach dubbed the water soft path.

When viewed on a spectrum, all three water management approaches – supply management, demand management, and the soft path – represent incremental steps toward sustainability. However, far from being a simple progression, some key characteristics distinguish them, as shown in Figure 1. The most significant difference is the view of the limits of water available for human use and of the nature of the choices that should determine how we manage water. Figure 2 offers an idealized sketch of the different paths that will result from following each of the three approaches.

Water demand management seeks primarily water efficiency, and often focuses on the implementation of cost-effective ways to achieve the same service with less water. Demand management options have been known for years, but with water prices kept artificially low, little incentive existed for widespread adoption. Recent research at the University of Victoria demonstrates the potential of demand management and discusses action opportunities for government to implement a comprehensive, integrated, long-term approach (Brandes and Ferguson, 2004; Brandes et al., 2005).

Though demand management has always been part of how water systems operate, it is typically treated as a secondary or temporary measure needed until additional supplies are secured. Changing our water management paradigm requires that demand management become the primary focus. With rampant growth and the uncertainty of climate change, reducing the demand for water is our best “source” of “new” water in Canada. A recent California study showed that total urban (residential, commercial, institutional, and much industrial) water use in California could be cut by 30 percent using off-the-shelf technologies. Those savings are available at lower cost and in less time than any new supply project, and they would eliminate the need for California to build any new supply project for at least several decades (Gleick et al., 2003).

The Soft Path

The first steps toward a more sustainable water future are found with conventional demand management, which harnesses the full potential of existing technologies and economic incentives to achieve water efficiency. However, because they begin from an anthropocentric rather than an ecosystem perspective, efficiency-oriented measures alone are not sufficient to achieve sustainable water management. Indeed, we likely already withdraw so much water that we impair the ability of nature to provide ecological services (Postel and Thompson, 2005). Water soft paths accept the importance of greater water efficiency, but go further by searching for those changes in water use habits and water management institutions that will promote long-term ecological and social sustainability (Brooks, 2005a, b).

Efficiency Versus Conservation

In the simplest terms, efficiency is a means and conservation an end. However, a more useful distinction focuses on the nature of the decision. In most cases, the search for more efficiency in using water reflects what any consumer, whether farmer or industrialist or homeowner would mean by water productivity – water as just one more factor of production – and the criterion is short-term cost effectiveness. Conservation in contrast reflects decisions that are taken for reasons other than narrow cost effectiveness, perhaps because of a longer time frame or because of a desire to protect the environment. The simple task of watering lawns can illustrate the difference. Efficiency dictates that one looks at the cost of water and, in response to rising rates, starts using low-flow sprinklers. Unfortunately, with ever more lawns to water, sprinklers become just a better way to keep doing something we should no longer be doing in the first place. In contrast, conservation suggests planting greenery that does not require watering at all. First costs would likely be higher, but the conservation approach effects a permanent, sustainable, not just an interim, solution to the problem.

The soft path approach changes the conception of “water.” Instead of being viewed as an end product, water becomes the means to accomplish specific tasks, such as sanitation or agricultural production. Conventional demand management asks the question “how”: How can we get more from each drop of water? Water soft paths also ask the question “why”: Why should we use water to do this at all?

- Why, for example, do we use water to carry away our waste? Demand management would urge low-flow toilets, but soft paths promote waterless or composting systems – perhaps not for homes (because of the need for regular maintenance), but certainly for larger buildings. On-site methods of waste treatment and reuse are also available, with possible total freshwater savings of 80 to 90 percent.

- Why do we use half the potable water that is piped to a house in the summer for watering lawns and gardens and sidewalks? Demand management would urge more efficient sprinklers with automatic shut-offs. Soft paths go further by recycling water from bathtubs and washing machines or, better yet, planting drought-resistant greenery that requires little or no watering once it is established.

By focusing on why, the soft path greatly increases the number of possible solutions. The approach is broadly applicable, not just to houses and gardens, but also to large buildings, factories, and farms, indeed, across sectors and to entire cities. The textbox on previous page presents the core principles underlying water soft path analysis.

Water soft paths adopt the same service-based approach when dealing with

water quality. Delivery of good quality water is vital for drinking and washing; however, few other uses require high-quality water. We can generally achieve the same result with lower-quality water, which is more abundant and lower cost.

Under a water soft path regime, the role of management shifts from building and maintaining water supply infrastructure to providing water services, such as new forms of sanitation, drought-resistant landscapes, urban redesign for conservation, water reuse and recycling, and new methods for rain-fed agriculture.

Conclusions

Many nations are already shifting from a supply to a demand focus in their management of freshwater. To avoid a water crisis of our own making, Canada must do the same. The focus must be on designing and implementing strategies today that can reduce or even eliminate the need for supply-side developments for the foreseeable future. Embracing the soft path allows communities to obtain the many advantages of greater water efficiency and, in addition, move toward long-term ecological and social prosperity.

The water soft path is both a concept and a method. Many people accept it as an ideal – the freshwater approach to moving toward sustainability. However, only a few recognize that

Water Soft Path Analysis in Canada

Recently, Friends of the Earth Canada and The POLIS Project on Ecological Governance at the University of Victoria released a brief guide to water soft paths that describes both concept and method, including a detailed step-by-step plan. (*The Soft Path for Water in a Nutshell*, by Oliver M. Brandes and David B. Brooks was jointly published in 2005 by the POLIS Project on Ecological Governance, University of Victoria, and Friends of the Earth Canada.)

This publication is part of a larger experiment that seeks to apply a comprehensive water soft path analysis led by Friends of the Earth Canada for three economically and ecologically different regions of Canada, each at a different scale: the watersheds making up the Annapolis Valley in Nova Scotia, the full Province of Ontario, and selected urban areas in British Columbia. The core research team consists of senior staff from Friends of the Earth Canada, Acadia University, the University of Waterloo, and the University of Victoria's POLIS Project on Ecological Governance.

Beyond analyzing the potential for water soft paths, this study will suggest policies for moving the regions toward sustainable water management. Initial results of the water soft path study for Canada are expected by the end of 2006.

Further details about the project can be found at <www.foecanada.org> or <www.waterdsm.org>.

methods exist to transform the soft path from “eco-dreaming” to practical opportunities and policies. True, these methods must be refined, but past studies have demonstrated that a method originally developed for analyzing alternative energy strategies (Lovins, 1977; Brooks et al., 2004) can be adapted to freshwater.

Currently, a study is underway to explore just what water soft path

policies would look like in Canada (See text box above). Far from being just an academic exercise, this study is intended to demonstrate that the goal of sustainable development for freshwater is within our grasp. Sometimes “*where there's a way, there's a will.*”

Full references are available in the online version of this issue. It can be accessed by visiting the PRI web site at <www.policyresearch.gc.ca>.

Maps and Water Issues

Developing a Community of Practice

Workshop
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Water issues are diverse and can vary from manure applied upstream of municipal water intakes to institutional arrangements for water governance. What they have in common is that they cut across watersheds, jurisdictions, and water users' interests. They are truly horizontal and integrative. Maps can communicate the findings of the science community to non-scientists, both the policy community and the general public. Presenting water issues on maps can easily convey the magnitude and the complexity of the issues. Maps can show the stakeholders that they are stakeholders, show the issues affecting your home watershed, and show who is implicated by specific issues in a particular watershed.

A workshop, organized by the PRI in co-operation with the GeoConnections Secretariat (Natural Resources Canada), explored the challenges to be addressed when mapping water issues. Held January 20, 2006, this event brought together more than 50 participants, half from federal departments and half from non-governmental organizations and provincial governments. The workshop aimed at improving partnerships toward complementary efforts in spatially referenced water information development, sharing, access, and decision-support tools.

The intensity of the networking at the time of the workshop was the best illustration of the existing willingness to co-operate and join already existing efforts and partnerships in producing water-related maps and sharing water-related information. All participants agreed that a broader and organized community of practice on mapping water issues will be of great value in terms of saving resources, duplication of efforts, and producing better products. A question was raised, however,

regarding the need for a common vision of what to do and where to go. A community needs something to motivate the interest of its members and needs to build something together to be a community.

The discussion on what is needed to build together as a community on mapping water issues included different potential outcomes; however, the common understanding about the path forward sought an interface where most people would be served. The interface would have an enabling culture and everybody would be able to contribute. This brought several issues to the fore: content standards, which have to evolve with the development of the community; structures to accommodate different streams – data, policy, knowledge; how to compel funding and how to link it to management; broadening the reference to include coastal water, as well as the initial focus on inland water; the question of who will be interpreting the data, and more importantly, who will ensure that data are not misinterpreted. The nature of the discussion implied that the key is a well-defined scope to what the community wants to accomplish.

All participants acknowledged the importance of identifying who will be using the information, and therefore identifying users' needs. The workshop reinforced the critical requirement to include users in the community of practice.

In response to the emerging need for leadership coming from a group that can provide enabling capacity, RésEau, a federal government demonstration initiative with a focus on water information, volunteered to lead the broader community of practice on mapping water issues. A discussion paper is to be prepared to present a vision and mandate.

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