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HORIZONS

POLICY RESEARCH INITIATIVE

Sustainable Development

Where Next?

While the term sustainable development was not defined until more than a century later, recognition of the concept by the Government of Canada dates to Confederation. In 1871, Prime Minister Sir J.A. Macdonald remarked that

> [t]he sight of immense masses of timber passing my windows every morning constantly suggests to my mind the absolute necessity there is for looking into the future of this great trade. We are recklessly destroying the timber of Canada, and there is scarcely a possibility of replacing it.

Recent major milestones in Canada's sustainable development (SD) journey include the 1987 Montréal Protocol on ozone-damaging chemicals, the 1992 Earth Summit, and Canada's 2002 ratification of the Kyoto Protocol on climate change. These developments reflect increasing attention being paid to SD issues, and increased recognition of the interactions between the environment, the economy, and social development. The February 2, 2004 Speech from the Throne included a lengthy section on SD – a clear demonstration that sustainability is of central importance to the Government of Canada.

The Policy Research Initiative's Sustainable Development project was launched in 2001, focusing on corporate social responsibility, environment and trade, and governance. This issue of *Horizons* marks a major turning point in the PRI's SD

SUSTAINABLE DEVELOPMENT

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PRI Horizons Team

The Policy Research Initiative (PRI) produces *Horizons* as a liaison publication for the federal government policy research community. The primary objective of the PRI is to deepen, collect, and integrate research on crosscutting issues that are highly relevant to the Government of Canada's medium-term policy agenda. *Horizons* highlights the work of policy researchers from across federal departments, and from external experts, on issues that relate closely to PRI horizontal research projects and activities. For more information on the Initiative or to consult previous issues of *Horizons,* please visit <www.policyresearch.gc.ca>.

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project, with the first wave of activities coming to an end, and a new phase beginning. The first feature article, by project lead Ian Campbell, signals that the PRI's own SD journey will take the path of studying socio-economic and governance aspects of freshwater management.

A summary of the findings of the report, *Advancing Sustainable Development in Canada,* recently published by the PRI, sets the stage for the remainder of the issue. In this report, the International Institute for Sustainable Development identifies seven priority areas for SD policy research. A variety of articles, briefs and reports follow, introducing selected aspects of these and other SD issues. The topics covered here are far from comprehensive, and some major themes are not included. Some of these other themes have been covered in previous issues of *Horizons* and the fall 2002 issue of *Isuma*. These include corporate social responsibility, international engagement, health and development, ocean resources, and climate change.

An eco-region or landscape approach is critical to many aspects of SD, and is one of the seven priority areas identified in *Advancing Sustainable Development*. Kelvin Hirsch (Natural Resources Canada), Ruth Waldick (Environment Canada), and Ken Farr (Natural Resources Canada) contribute on different aspects of landscape sustainability. Examining optimal policy mixes for managing water demand will be a key focus of the PRI work on freshwater management. Fatma Maged (Environment Canada) discusses voluntary measures for environmental protection.

Lest it be thought that SD in Canada is only about the environment, several articles deal with social aspects of SD. Urban transportation consultant Richard Zavergiu shares some thought-provoking observations on how environmental sustainability can help Canadian cities compete with their American counterparts. Pearl Eliadis (PRI) and Donald Lemaire (Justice Canada) discuss normative approaches to policy, in particular as they apply to the field of social policy.

As regards data development in the area of SD, David McGuinty (National Round Table on the Environment and the Economy) presents the NRTEE's new integrative indicators, and Robert Smith (Statistics Canada) highlights data gaps related to water management in Canada.

Research briefs, book reviews, and conference reports related to social capital, early child development, and evidence-based policy in education round out the issue. The next issue of *Horizons,* due out in the spring, will be primarily dedicated to the North American Linkages project.

Jean-Pierre Voyer
Executive Director
Policy Research Initiative

Toward Integrated Freshwater Policies for Canada's Future

Ian Campbell
Policy Research Initiative

Following the North Battleford and Walkerton tragedies, there has been growing concern over the quality of water for human consumption. Pollution-driven declines in beluga and other aquatic species, and the human health concerns related to high levels of mercury in both freshwater and marine fish, have increased awareness of the need to protect water quality in the broader environment, as well as ensuring its safety for direct human consumption. Safe water has become a salient policy issue for Canada.

At the same time, water supply is increasingly problematic in many regions. For example, there was a grassroots campaign to prevent OMYA Canada Inc. from withdrawing large amounts of water from the Tay River near Perth, Ontario, because area residents feared the withdrawals would damage the river's ecology, and perhaps reduce the availability of water for the town of Perth. Global climate change is likely to make supply problems in southern Ontario and other parts of Canada worse; already, drought has become a regular feature of western Canada.

Additionally, ecosystem stability is threatened by invasive species, by diversion projects, and by overconsumption. Our scientific understanding of water, the chemicals that are in it, and the ecosystem services it provides, must be better linked to our policy-making. Water supply and use to support economic development and recreation, or to support natural ecological and ecosystem functions, is also becoming a policy issue in Canada.

Wanted: An Integrated Freshwater Policy Package

Canada benefits from an abundance of resources: 7 percent of the world's renewable freshwater; 25 percent of global wetlands; and the world's longest marine coastline. Much of this, however, is removed from the major population centres. Increasingly, Canadians are aware of water as a resource to be managed and conserved, rather than to be taken for granted.

Canada has traditionally regulated pollution to ensure water quality. However, Canada is not making much use of efficient and effective signals and incentives for freshwater management. Treated water use is often subsidized or not even priced at all, there are few or no incentives for water conservation, and effluent water treatment is managed primarily through direct regulation.

Direct regulation provides an incentive to limit harmful activities only to the extent that penalties for noncompliance are perceived as likely and severe. Regulation does not readily encourage "beyond compliance" behaviours, and may not sufficiently encourage innovation.

Ensuring safe water is more than just treating drinking water. It is also managing the water source to reduce the presence of harmful bacteria and toxins in the intake water supply (source-to-tap protection). It is ensuring intake water is free of post-consumer drugs and endocrine-disrupting chemicals that may come from other urban areas upstream of the intakes. And, it is ensuring the quality of the water leaving urban areas is safe for downstream consumers, recreationalists,

Ian Campbell,
Senior Project Director,
is the project lead for the PRI's
Sustainable Development project.

and wildlife (tap-to-environment protection). At the same time, we need to ensure ecosystem stability through controls on invasive species, through prudence in diversion projects, and by minimizing consumption. In essence, we need to move from a paradigm of managing the water in the pipes, to one of managing the water in the entire watershed. To do this, we need an integrated, complete suite of policies for source-to-tap-to-environment water quality and supply management.

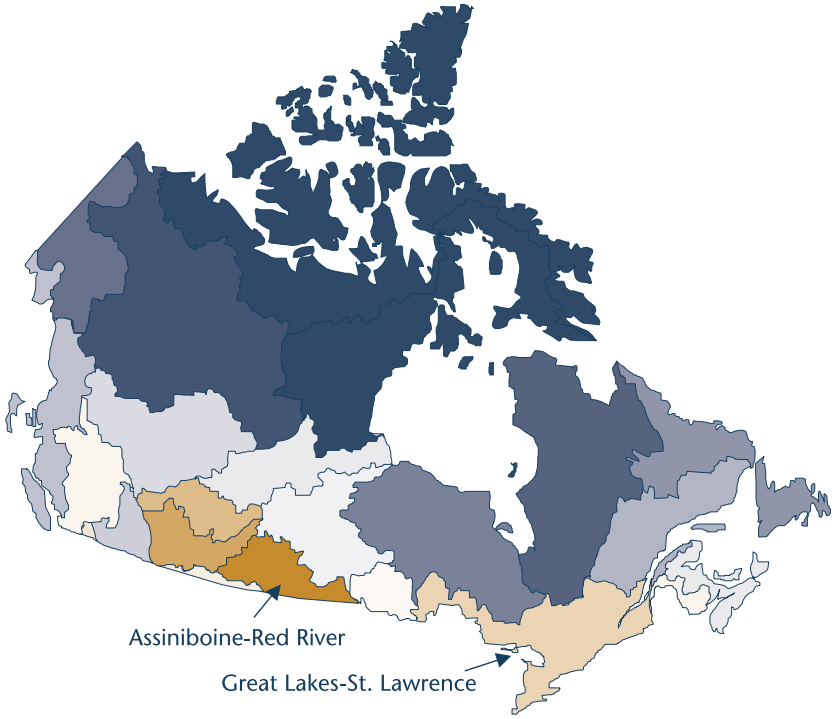
Water Supply and Water Use in Canada

While Canadians use 131 m^3 of water per person per year, industrial and other economic withdrawals of water bring the total withdrawn each year to about 1,500 m^3 per Canadian – a total of 44,873 million m^3 in 1996. While much of this is returned to the lakes and rivers it was taken from, its use inevitably modifies it – often chemically and biologically, as well as physically. (More than half is used for electricity generation, which returns the water used largely unaltered except for filtration and heating.) Although Canada has an estimated annual precipitation of 5,451 km^3, more than 3.5 billion times our annual per capita withdrawal, much of that is not where or when it is needed. Indeed, in the Assiniboine-Red basin, home to more than 1.25 million Canadians, annual streamflow is only about 1,200 m^3 per person, and is highly variable from season to season and year to year.

Such limited water supplies lead to competition for use. In Alberta, the oil and gas industry is encountering increasing difficulty in accessing sufficient water for its operations – and is increasingly competing for water against agriculture and other users. At the same time as these demands are increasing, the glaciers of the Rocky Mountains, sources of much of the water that flows through Alberta, are receding.

Many Canadians may have difficulty believing we could one day be short of water. However, there is strong evidence that, 6,000 years ago (a time often used as indicating the possible future under global warming, as it was warmer than present by about the same amount that is predicted for 50 to 100 years from now) the groundwater table in much of Alberta was as much as 15 metres lower than at present.

FIGURE 1
Annual Stream Flow per Capita in Canadian River Basins



The amber shaded areas on the prairies indicate lower flows per capita. The Assiniboine Red River basin has annual stream flow per capita that is less than the national average annual per capita water withdrawal. Although the Great Lakes-St Lawrence basin has large quantities of surface water, much of it is stored ("fossil") water rather than annually renewed; the high population density in this region makes for a relatively low per capita renewable water resource. Although most of the water that is withdrawn is returned to the system, it is usually returned downstream of where it was removed, and with chemical, biological, and physical changes. The untapped stream flow is often relied on to dilute these modifications to a non-harmful level. It can be expected that at smaller spatial scales of data aggregation, many sub-basins have less per capita stream flow than the average national per capita withdrawal. Data from Statistics Canada, 2003, Human Activity and the Environment Annual Statistics 2003, 16-201-XPB.

While there is scant evidence for regional groundwater decline in Canada, the Ogallala aquifer, which underlies much of the American Great Plains, has experienced declines ranging from 3 to 30 metres. In Canada, there have been local declines, such as at Estevan in Saskatchewan, where the water table was locally lowered by more than 45 m - and by nearly 20 m as much as 20 km away - by a field of pumps extracting water for electricity generation. Pumping was halted in 1994. While the pumping was originally thought to be well within the sustainable yield of the aquifer, further study now shows that recharge is occurring at a rate of only 1 mm to 3 mm per year, suggesting the local water table will take thousands of years to fully recover. Relying on groundwater without adequate knowledge of the resource and its recharge rate has been likened to writing large cheques on a bank account without knowing either the balance or the deposit schedule.

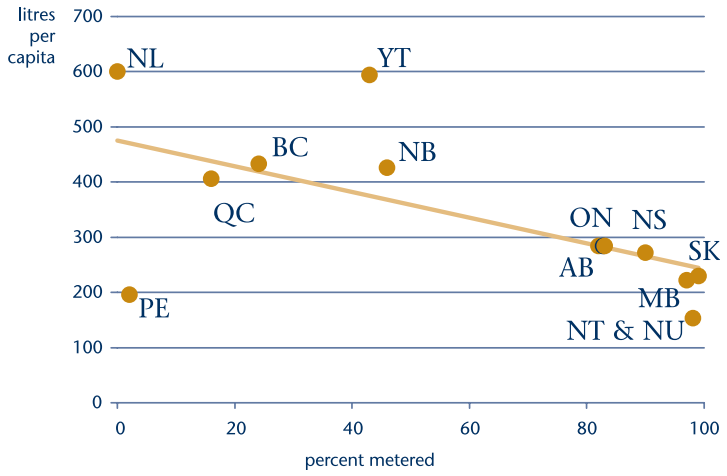
Meanwhile, in Alberta, the federal and provincial governments have partnered to help farmers access new so-called sustainable and permanent sources of water for their farms - new dugouts and wells for irrigation. It could be that many of these works will be no more than temporary solutions, as groundwater levels decline from the combination of global warming and non-sustainable pumping for irrigation.

Impacts of Water Use

Most human uses of water affect it in some way. Some, like generating electricity in a gas-fired generating plant, do little more to the water than filter it and heat it before returning it to the environment. Other uses have greater impacts, such as many industrial processes or domestic water uses, which alter the water's chemistry and biology, often adding high concentrations of bacteria, viruses, or toxic chemicals. When we return used water to the environment with little or no treatment, we rely on the dilution of this used water by the untapped river flow. To be effective at diluting our impacts, the untapped flow must be greater than the tapped flow by a variable amount, depending on the degree and nature of the modification of the tapped flow. Some pollutants in the tapped flow may require dilution by 100 times more untapped flow to be safe for the environment and downstream communities.

FIGURE 2

Per Capita Water Use by Percent Metered Population (1998)



Per capita water use in Canadian provinces and territories may be heavily influenced by the use of water meters. The sample regression line suggests a 233 litres per person per day reduction in water use - a 50% reduction - when the water supply is metered.

Adjusted r2 = 0.31. Data from Statistics Canada, 2003, Human Activity and the Environment Annual Statistics 2003, 16-201-XPB.

For example, the nitrate concentration in City of Calgary municipal wastewater effluent averages about 17 mg/l. (The Health Canada guideline for drinking water is 45 mg/l.) Dilution in the Bow River (assuming the river water is nitrate-free before the addition of Calgary effluent) reduces that to about 0.0019 mg/l (calculated from data at <Pollutionwatch.org> and <Calgary.ca>, both accessed December 9, 2003). Peak concentrations from the Calgary plant may exceed the 45 mg/l guideline, but dilution in the river will amply mitigate the impacts.

Nationally, over 22 million Canadians live in river basins where the annual per capita stream flow is less than 10 times the national annual per

capita withdrawal. This means that in those basins people may use 10 percent or more of the stream flow in some way. Even with most of the used water returned to the river, any impacts this may have on the water quality are poorly diluted with unused water.

Over 20 million Canadians live in watersheds that cross the Canada-US border (over 17 million of them in the Great Lakes–St Lawrence watershed), and are therefore affected by American policies, or else affect American water quality.

Conservation may be part of the solution to the problems of environmental impact, increasing water shortages, and the increasing cost of treating water for human consumption. Canada's per capita water consumption is the second highest in the world. Evidence suggests this could be significantly reduced through relatively simple measures, such as public education and water metering. There are also no-cost measures that could be taken: for example, a 1996 amendment to Ontario's plumbing code requires that all toilets installed in new construction in Ontario be low-flush (6 litre). This alone may reduce water use in a typical apartment building by as much as 40 percent. Many other examples of no-cost conservation measures can be found.

Conservation alone, however, is unlikely to be a complete long-term solution, as the source water for many of our cities is increasingly polluted by upstream activities. A watershed management approach may have the best long-term payoff.

Shifting to a watershed management paradigm will not be easy. It will involve considering not only competition between different uses of water, but also competition between different uses for watersheds. An example is the ongoing debate over development of the Oak Ridges moraine, north of Toronto. The moraine is the source of drinking water for over 250,000 people; it is also a prime target for development. However, development, implying significant increases in impervious surface area and in chemical contamination, would threaten the quality and perhaps even quantity of the water supply.

Inter-Jurisdictional Issues

Watersheds and water issues also cross international boundaries. Over 20 million Canadians live in watersheds that cross the Canada-US border (over 17 million of them in the Great Lakes–St Lawrence watershed), and are therefore affected by American policies, or else affect American water quality. The International Joint Commission is one well-developed and valuable mechanism for coordinating policies between Canada and the United States. Other mechanisms include provisions under the North American Free Trade Agreement, supported by its environmental commission, which attempt to ensure that the Agreement's policies are consistent with environmental protection and conservation as well as strengthening the development and enforcement of environmental laws and regulations. Canada has also signed various bilateral and multinational agreements that stipulate specific obligations. However, policies affecting freshwater in the two countries are not harmonized, and a recent EKOS opinion poll suggests there is overwhelming public support in both Canada and the United States for increased harmonization of environmental regulation, with safe freshwater seen as the top priority in Canada.

Internationally, Canada has committed to cooperating with other countries to reduce by half the number of people without reliable, safe freshwater by 2015 (World Summit on Sustainable Development and United Nations Millennium Development Goal). Canada will need to refocus international activities to ensure that Canadian expertise is used as effectively as possible in this effort. Done correctly, this could benefit both Canada and the countries most in need of assistance.

At home, Canada has a patchwork of authorities and responsibilities inherited from days when water was taken for granted, and other resources, such as timber and minerals, were the main concern. Even within the federal government, the Commissioner for the Environment and Sustainable Development (CESD) has indicated there is no coordinated approach to freshwater. In its annual reports, the CESD repeatedly decries unsatisfactory integration of policy goals, slow progress

of departments in attaining their sustainable development objectives, a lack of basic information to support and evaluate policies, and the lack of leadership in providing departments with the tools they need to advance on a sustainable path. One encouraging sign is the recent appointment of the Minister for Water in Manitoba. If this is the start of a trend, it may lead to much greater coordination of water policies across Canada.

Where Next?

The PRI is working with federal government departments and other partners to lay the groundwork for a project tentatively titled Federal Leadership for Integrated Freshwater Policies. A priority scanning exercise has resulted in proposed work on signals and incentives for freshwater management in both urban and eco-region contexts. This project aims to answer pressing policy research questions such as:

- How can we ensure safe and affordable drinking water?
- Is full pricing for municipal water desirable and effective?
- How can we minimize urban Canada's impact on the aquatic environment?
- What can the Government of Canada accomplish (both directly and indirectly through supply-chain pressure and by capacity development) by greening its own operations?
- How can we manage at the watershed level?
- How can we harmonize water-related policies within jurisdictions, between jurisdictions within Canada, and between Canada and the United States?
- How can we choose between competing uses for water?
- How can Canadian expertise be brought to bear on international water management issues?
- How can we ensure an efficient and effective science-policy interface for freshwater management?

The freshwater project at PRI is in a developmental stage, with ongoing bilateral and multilateral interdepartmental consultations to identify priority research gaps. We will form working groups around the key questions coming out of these consultations. These working groups will include representatives from interested federal departments and, where appropriate, representatives of provincial, territorial, and municipal governments. Non-governmental organizations may also be invited to participate in relevant discussions. With the PRI providing coordination as well as policy research expertise, and the other participants providing sectoral expertise and perspectives, we hope to develop well-rounded policy research taking all key perspectives into consideration. Together with other ongoing processes, we are confident we can contribute to more coherent, consistent, coordinated and effective water policies for Canada.

Threatened Water

The successful alleviation of threats to the availability of freshwater in Canada will require the establishment of policies and practices developed in collaboration by all levels of government, academia, and industry. *Threats to Water Availability in Canada* is intended to stimulate groups to action and to provide the foundation on which these policies and practices are built.

The report's production was overseen by Environment Canada's National Water Research Institute (NWRI) and the Meteorological Service of Canada. Authored by experts from governmental, academic, and private sectors, it is one of the most rigorous, far-reaching examinations of the threats to water availability in Canada. Each chapter focuses on a priority threat to water availability, including dams, reservoirs, droughts, floods, residential/urban development, industrial/manufacturing demands, mining, and climate variability and change.

These assessments will serve as an important reference to water-science decision-makers, resource managers, and the research community.

A companion report, *Threats to Sources of Drinking Water and Aquatic Ecosystem Health in Canada*, details the state of science on key water quality issues. It was released by the NWRI in 2002, and can be accessed at <http://www.nwri.ca/threats/intro-e.html> (accessed March 3, 2004).

***Threats to Water Availability in Canada* is slated for release in March 2004. A downloadable version will be available at <www.nwri.ca/threats2full/intro-e.html>.**

Key Issues for Sustainable Development in Canada

Editor's Note

The Policy Research Initiative recently published a report written by the International Institute for Sustainable Development, *Advancing Sustainable Development in Canada: Policy Issues and Research Needs*.[1] The priority research issues identified in the report are summarized by PRI staff in the following article.

The recent World Summit on Sustainable Development, held in Johannesburg in September 2002, reminded us that issues such as poverty, consumption patterns among wealthy nations, demographic trends, climate change, and access to clean freshwater are universal concerns that play a major role in the quality of people's lives.

Progress has been slow in many areas, and Canada has made a commitment to do its part and follow up on the Plan of Implementation of the World Summit on Sustainable Development. One of the challenges facing the federal government is to identify and clarify sustainable development issues of particular importance to Canada, and to acquire the knowledge needed to develop effective public policies.

With this in mind, the Policy Research Initiative (PRI) joined with federal departments and the International Institute for Sustainable Development (IISD) to develop a process for identifying these key issues. Seven issues and the corresponding research needs were pinpointed. Climate change was deliberately withdrawn from the discussion so as not to focus on previously identified strategic priorities or on existing or parallel research activities. The key issues are presented here in no particular order.

Urban Redesign

The urban infrastructure is the physical manifestation of our cultural and social values and, as such, it reveals the underlying problems with the current urban form. Designed at a time when efficiency was the top concern for city planners, the urban form is no longer suited to current realities. In recent decades, population growth and rural-urban migration have increased urban sprawl, resulting in more numerous and rapidly growing cities, which have become vibrant centres of culture and commerce. There is a flip side, however. Higher levels of consumption create mountains of waste; population growth and the inequitable distribution of wealth also lead to more slums and homelessness; and the addiction to the automobile encourages urban sprawl to the detriment of downtown areas and neighbouring farmland.

In a report published in 1999, the National Round Table on the Environment and the Economy (NRTEE) stated that maintaining the status quo would hurt Canada's competitiveness. Some cities are seeing losses of five to eight percent of their gross regional product. These losses are directly related to environmental degradation, its harmful effects on health and the inadequacy of urban infrastructures.

The urban issue is exacerbated by the fact that 79 percent of Canadians live in urban areas, and studies predict that this rate could exceed 90 percent in the coming decades. Sustainable urban development has therefore become a multi-faceted and critical problem that now relates to energy consumption, transportation and land use planning,

community building, and environmental and social justice issues, as well as good environmental management. Two Canadian reports prepared for the United Nations make similar observations and touch on the additional issues of a lack of affordable housing, the breaking up of farmland, and aging infrastructures that perform poorly in terms of energy efficiency and the environment.

It is agreed that local governments have great influence over economic innovation and social cohesion in Canada, and that the various levels of government must work closely together and citizens must be involved from the outset if we are to find answers to the problem of urban sustainability.

As part of the process, stakeholders would benefit from a greater understanding of how cities implement sustainable development objectives (which relate to broader quality-of-life objectives), the key factors for making a successful transition to sustainable urban development, and the combination of government and economic tools that will advance sustainable urban development.

Freshwater Management

Water scarcity and declining water quality are at a critical point in many areas around the world. In a recent report, UNESCO states that the availability of drinking water varies widely around the world. In addition to demographic pressures, the increase in per capita water consumption and pollution problems affect the amount of freshwater available and are propelling us toward a world water crisis.

Canada has nearly 10 percent of the world's freshwater, but accounts for less than one percent of the world's population and has the second highest per capita consumption of freshwater. A number of factors make water a serious issue for Canada.

- Many Canadian basins are affected by pollution from industrial and municipal runoff, and airborne pollutants have a harmful effect on people and ecosystems.

> *Some cities are seeing losses of five to eight percent of their gross regional product, directly related to environmental degradation, its harmful effects on health and the inadequacy of urban infrastructures.*

- Water supplies are threatened by inefficient use and unnecessary overconsumption.
- Globalization has already increased the demand for agricultural exports, resulting in increased pressure on our domestic freshwater resources.

Other events, such as the Walkerton tragedy and the drought that is ravaging Western Canada, reinforce the importance of sound freshwater management and initiatives focusing on water quality and availability. Water is critical not only to society and the environment but to the economy as well: water-related activities contribute $7.5 billion to $23 billion annually to the Canadian economy.

In Canada, efforts are underway to promote integrated water resource management (IWRM) across the country. A report by the Canadian Water Resources Association concludes that although some progress has been made, the concept has not been widely implemented in Canada and has become a challenge in the face of significant reductions in government spending in many jurisdictions, federal and provincial. In addition, the government issues non-tradable permits without analyzing the relative costs and benefits, and permit holders face no external price. Consequently, water use has not been made cost effective.

The use of economic or market-based instruments as a policy option for managing freshwater use has also not been widely explored.

There are still some key areas for research. How do we ensure the effective implementation of integrated freshwater management? How do we leave enough water in ecosystems to ensure that ecological services can continue? What is the real cost of water? What is the best mix of rights, incentives, and administrative structures for improving the management of freshwater ecosystems?

Eco-Region Sustainability

Biological communities and habitats rarely respect political borders. As a result, to make better decisions on sustainable development, we must study the problems and consider solutions based on how they interact on the land and over time.

Canadians' quality of life depends on the health and wealth of ecosystems. In Canada, several large eco-regions are experiencing habitat degradation and loss. This degradation results in the loss of eco-services and related jobs.

Some regions of the country are at a high risk (urban, agricultural, and some forest landscapes) and all habitats are at risk from global issues, such as climate change, the long-range transport of atmospheric pollutants, and the invasion of exotic species. More than 400 species in Canada are listed as endangered.

People in some parts of the country face the loss of their livelihoods, as witnessed by the collapse of the Atlantic cod fishery, which resulted in the loss of 40,000 jobs. This example also shows how the scarcity of ecological resources often leads to or aggravates conflicts. The situation involving Aboriginal communities and logging companies has also been a source of tension in recent years.

Canada has taken several proactive steps to regulate, plan, and manage the environment using an ecosystem-based approach and has signed the UN convention on biological diversity. However, on the whole, this type of approach has not become widespread in Canada.

Taking an ecosystem-based approach to public policy decisions is fairly recent, and future research could explore the following areas: proper valuation of eco-services and the creation of conflict mediation bodies, the best examples of eco-regions being used as the basis for decision-making, new tools for managing at the eco-region level, mechanisms for coordinating activities between various levels of government, and a framework for policy, legal, and management arrangements for Aboriginal peoples.

Signals and Incentives

There are two main categories of signals used in daily decision-making: monetary (marked-based incentives and disincentives) and non-monetary, such as information. The problem is that monetary signals are rarely linked directly to environmental signals. Market signals can be improved by ensuring that they reflect external effects on the environment.

Canada has started to fall behind in formulating and providing these signals and incentives. Several European countries and some US states are implementing policies that promote the inclusion of externalities (market signals) and provide information on the status of sustainable development (non-monetary signals). In Europe more so than in Canada, price increases and other policies have helped to build a more efficient economy. The future challenge lies in finding ways to calculate the cost of externalities and develop tools that increase prices reasonably and in a way that is socially and economically acceptable.

A recent study on ecological fiscal reform conducted by the National Round Table on the Environment and the Economy highlights the issues behind the use of fiscal measures and economic instruments. According to the study, Canada has made limited use of economic instruments and could increase their use but, before selecting a combination of instruments, it must identify the objectives to be achieved and the instrument's role.

Future research could focus on developing a framework for combining monetary and non-monetary instruments, creating appropriate indicators for Canada at various spatial levels, evaluating economic instruments and their applicability in relation to biodiversity and habitat conservation, and determining how to better communicate the concepts and framework to the public.

Current WTO negotiations concerning the opening of markets in the service sector indicate strong pressure to privatize health and education systems.

Impacts of Globalization on Canada

The growing integration of Canada's economy within the global economic structure and the number and increasing influence of trade agreements create special tensions with regard to sustainable development. The links between globalizing trends and sustainable development can be grouped into three categories:

- impacts on government's ability to regulate in the interest of its public policies concerning a clean environment, public health and safety, etc.;
- impacts of increased economic activity on income levels, income distribution, and employment rates nationally and at other levels; and

- impacts of the increased flow of goods and services on the environment.

The first type of impact is definitely the least studied and the most socially significant, as illustrated by the lawsuits launched by private parties under NAFTA's provisions concerning investor protection. Current WTO negotiations concerning the opening of markets in the service sector indicate strong pressure to privatize health and education systems.

The problem is aggravated by the presence of a powerful neighbour who enters into more and more bilateral trade agreements at the risk of marginalizing the WTO and other processes and multi-lateral agreements to which Canada is firmly committed. Organizations and multi-lateral agreements are the best avenue for Canada to define socially acceptable rules for investment, trade, and environmental protection.

Further studies must explore the possible regulatory impacts of the liberalization of services trade and investment as well as the potential impact of regionalism on sustainable development.

Unsustainable Lifestyles

In a world of limited resources, Canadians have tremendous wealth. Many feel that Canadian per capita consumption levels are unsustainable and inequitable. Despite 30 years of environmental policy development, people still do not seem to make the link between long-term environmental damage and individual lifestyles and to act appropriately. A recent study by the OECD stated that environmental impacts from household activities have worsened over the past three decades and are likely to intensify over the next 20 years, particularly in the areas of energy, transportation and waste.

High consumption rates can be linked directly or indirectly to a significant number of "danger signs" in our ecosystems, such as greenhouse gas emissions, massive deforestation, pollution, and damage to biodiversity. In addition, Canada has one of the largest ecological footprints, estimated at 7.7 ha per capita; only the United States and Australia have higher ratios.

Consumer habits are deeply rooted in individual perceptions about status and identity. They are influenced by contextual social forces such as the media and advertising, and are subject to powerful structural features of the economy, the environment, and policy.

Health care has shown that we must combine and use intervention tools together; in addition to information, there must be access to new technologies (offer choices and tools, such as nicotine patches) as well as regulatory support (such as anti-tobacco laws).

In a 1993 Canadian study, Ida Berger indicated a definite correlation between strongly held attitudes toward the environment and corresponding behaviour as long as citizens personally experience environmental degradation or as long as reports of environmental problems are in the news. Berger also noted that environmental attitudes are not stable. Hobson states that presenting sustainable development in the context of social justice leads to greater social transformation than attempting to reduce individual consumerism.

Recent work by the IISD on Canadians' attitudes to this issue shows that, although some recognize the need for environmental protection as part of a moral obligation or value system, the majority (even opponents to the Kyoto Protocol) were motivated by the prospect of innovation – being on the leading edge of a new way of working that would benefit the planet and provide new opportunities for economic growth. Research also shows that citizens are less inclined to take action unless they see government, and business in particular, setting a good example.

Certain research needs emerge: strengthen evidence-based research on the effectiveness of social instruments in the environmental and sustainable development fields; investigate how sustainable development policy instruments can be combined more effectively; carry out research on what motivates Canadians to change their behaviour; investigate communications and engagement approaches that stimulate collective responses.

International Engagement: Poverty and Sustainable Development

Reducing poverty is a key principle of sustainable development and takes a prominent place in the Millennium Development Goals and the Plan of Implementation of the World Summit on Sustainable Development, both of which have UN approval. Despite 50 years of work by development agencies, nearly half of the world's

population – three billion people – still live below the poverty line of two dollars a day.

There are many reasons for this failure, including the confusion between means and ends, and policies motivated by political and ideological interests. In addition, the paradigm of rapid economic growth has not alleviated poverty.

Canada participates actively in the work of the United Nations, helping to maintain peace and security around the world and at home.

While Canada increased its official development assistance in 2003, a gap remains between results and objectives, and between international commitments and the capacity to implement them under current domestic policies. Given their current commitments, Canada and the donor community will not achieve their objectives to reduce poverty.

Little research has been conducted to date on the links between poverty and the environment at the local level, the ability of programs to help developing nations participate effectively in the multi-lateral aid system, how international trade and investment can contribute optimally to sustainable development, and the efforts of donor countries to ensure coherent policies and coordinated efforts.

Conclusion

Despite its abundance of natural resources, Canada faces major challenges in terms of sustainable development. A great deal of work must be done to tackle the key issues described previously. However, there are also broader questions to be examined.

- If many of these key issues were addressed in the action plans stemming from Stockholm, Brundtland and Rio, why have Canada and the international community made so little progress?
- Why is the integration of environmental and economic signals still a challenge?
- Is it possible to provide developing countries with enough ecological and political space to achieve sustainable development while enhancing the standard of living in these countries and in Canada, and to do so without threatening critical global systems?

A solid research program can shed light on these questions and is a necessary foundation for public policy development.

Note

1 International Institute for Sustainable Development. 2003. *Advancing Sustainable Development In Canada*. Ottawa: Policy Research Initiative. The report can be viewed at <www.policyresearch.gc.ca>.

Recent Developments in Strategic Environmental Assessment

Strategic environmental assessment is an evolving policy tool that establishes a systematic and comprehensive process for evaluating the environmental effects of a policy, plan, or program, and its alternatives. Ensuring thorough environmental analysis in advance of making policy decisions is an important means of supporting sustainable development.

An updated version of the federal government's environmental assessment directive, the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals,* came into force on January 1, 2004. The directive now provides for a more balanced assessment of both negative and positive impacts during assessments. There is also a new requirement that, on completion of detailed strategic environmental assessments, public statements of environmental impacts be made. This requirement is intended to assure stakeholders and the public that environmental factors were considered when program design decisions were made.

For more information on strategic environmental assessment and the directive, visit the Canadian Environmental Assessment Agency's Web site at <www.ceaa-acee.gc.ca>, or contact the Agency by phone at 819.997.1000.

Voluntary Approaches in Environmental Policy

Fatma Maged
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This article evolved from an ongoing policy instruments research project within Environment Canada's Policy Research Directorate. The project's aim is to build research capacity in policy instrument choice and evaluation and, ultimately, develop a systematic framework for evaluating the environmental impact of policy instrument implementation.

Since the 1990s, experiments with voluntary approaches have proliferated in most member countries of the Organization for Economic Cooperation and Development (OECD) and, in particular, in Canada and the United States. Interest in voluntary approaches is not new. Beginning with the first wave of environmental regulation in the late 1960s, an emphasis has always been placed on voluntarism, education, and information. Many reasons account for the recent increased interest in voluntary approaches, including awareness of the limitations of regulation and the need to fill the vacuum left by the regulatory state (Dietz et al., 2002, Introduction).

From an environmental policy perspective, increased reliance on voluntary approaches raises a number of research issues. It is crucial to ascertain how well voluntary approaches work compared to the available alternatives, how efficient and effective they are, whether they can serve as substitutes for other policy instruments, and the circumstances in which they can be used in combination with other instruments.

This article provides a synopsis of current research on voluntary approaches. The goal is to advance understanding and appreciation of the role and function of voluntary approaches in environmental policy. After positioning voluntary approaches within the spectrum of alternative policy instruments, the article provides a synthesis of research findings in three areas: understanding of voluntarism, systematic evaluation issues, and ways to improve performance.

Voluntary Approaches in the Policy Instruments Continuum

Wilbanks and Stern (Dietz et al., 2002, Chapter 21) contend that the central policy question about voluntary approaches is

> [w]hether environmental objectives can be achieved more effectively or more cost-effectively, if direct regulation is reduced in favor of policy instruments that enhance the power of market pressure, investor influence, public concern, reputation and the like to press firms toward better environmental performance.

They argue that the proper distinction is not between voluntary and coerced compliance, but between direct regulation and other instruments that may be perceived as less coercive.

Figure 1 illustrates an instrument typology offered by Vedung (Bemelmans-Videc et al., 1998, Chapter 1), and links it to experimentation with alternative approaches to regulation. Among the plethora of policy instrument typologies, this is the most frequently used, and is most relevant to the issues addressed in this article. In this typology, public policy instruments are defined as "the set of techniques by which governmental authorities wield their power in

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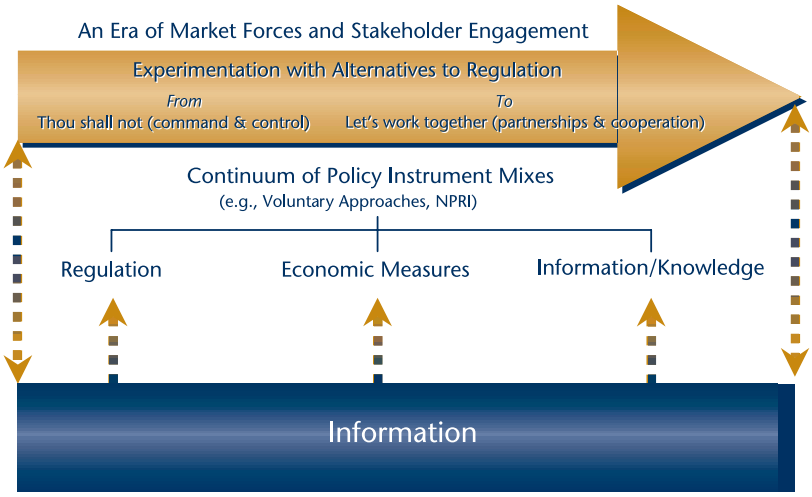
FIGURE 1
Voluntary Approaches and Alternatives to Regulation



attempting to ensure support and effect social change." Based on the degree of authoritative force (coercion) involved in the governance, Vedung categorizes them into regulation, economic measures, and information. He contends that all other policy instruments and/or packages advanced in the literature can be reduced to and/or composed of these fundamental three (Bemelmans-Videc et al., 1998, Chapter 1, p. 21).

Regulation is often described as command and control as it typically specifies standards (for levels of emissions and sometimes for technologies) with which the regulated must comply (the command) or be penalized (the control) (Gunningham and Sinclair, 2002, Introduction).

Economic instruments, according to Vedung, involve either handing out or taking away material resources. They make certain actions cheaper or more expensive in terms of money, time, effort, and other valuables. However, they leave the subject entity free to choose whether or not to take an action. Economic instruments are often put forward as a way to meet the need for flexibility, and to harness market forces. Tradable permits and pollution taxes are examples of such instruments.

Information as a policy instrument is used as a catch-all term for education and communication campaigns (e.g., social marketing). Information-based instruments rely on more implicit sources of behavioural control, so the resulting behaviour, as noted by Dietz et al. (2002, Chapter 20), is likely to be perceived as voluntarism. There is also growing awareness that markets can be made more efficient by making available to the public the environmental information collected by governments in fulfilling their long-standing regulatory mandates, for example, through dissemination of a pollutant-release inventory (*National Pollutant Release Inventory* in Canada). Empirical evidence, though not conclusive, indicates that provision of information indirectly affects markets by generating pressures – investor influence, public concern, reputation and the like - that influence corporate behaviour toward better environmental performance.

Information, because it is a necessary condition for the functioning of all other instruments, is a policy instrument in its own right, a meta-policy instrument, and a cumulative knowledge base. As a meta-policy instrument, in Vedung's view, it is used to inform on other policy instruments, revealing their existence, meaning, and availability. As a cumulative knowledge base, it informs instrument experimentation, design, choice, and packaging. The learning that results from experimentation enhances the cumulative knowledge base. To improve the design and implementation of a policy approach, it is crucial to incorporate experimentation, evaluation research, and monitoring procedures that feed back into the knowledge base (as depicted by the arrows). This point links to the evaluation section below.

The point of departure in choosing Vedung's typology, as noted by Bemelmans-Videc et al. (1998, Introduction), is that the government is first and foremost a democratically legitimized power factor, which acts on its power and is held accountable for the way that power is wielded. They argue that Vedung's construct "links to a nation's dominant ideological position with regard to the degree of intervention in the societal processes." So, in moving from the "thou shalt not" prescriptive approach toward "let's work together" approaches (Figure 1), Vedung's construct acknowledges the evolving role of contemporary governments, although it stresses that governments

retain final authority. Regarding this movement as experimental, governments may still choose to dictate the rules at any point. This aspect is central to the ensuing discussion of ways to improve voluntary approaches (Bemelmans-Videc et al., Chapter 11, Conclusions, p. 250).

Moving further toward "let's work together," voluntary approaches are introduced in many shapes and forms. These include self-regulation, voluntary codes, environmental charters, co-regulation, covenants and negotiated environmental agreements. The OECD distinguishes three types of voluntary approaches: negotiated environmental agreements between industry and public authorities, public voluntary programs developed by public authorities, in which individual firms are invited to participate, and unilateral commitments made by polluters, without public authority participation (OECD, 2003). In Vedung's policy instrument construct, voluntary approaches are not considered as policy instruments in their own right (Bemelmans-Videc et al., 1998, Chapter 1).

Figure 1 depicts voluntary approaches as a policy instrument mix, tending to embody one or more of the three fundamental categories. As demonstrated by Vedung, "[p]ursued in calm and civilized forms, negotiations are cases of governing through persuasion. The public authority confines itself to informing, arguing and persuading." At a certain point, however, the state may choose to enunciate a threat to impose regulation or assess a fine in case of non-compliance. This, then, would constitute a new approach, a combination of regulatory threat and/or economic measure (Bemelmans-Videc et al., Chapter 1, p. 37).

Understanding Voluntarism: Public Use of Private Interest, or Private Use of Public Interest?

Dietz et al. (2002, Chapter 20) argue that increased interest in voluntary approaches has run well ahead of a basic understanding of their attributes. Participation motivations are not fully understood, and are inevitably subject to question. To some, publicly supported voluntary approaches seem to be public use of private interest (e.g., reputation benefits or a social licence to operate) in the interests of the environment. To others, voluntary approaches tend to curtail the role of governments and place considerable faith in self-regulation by the business community. As such, they may be perceived as private use of public interest (e.g., in the form of regulatory capture and free riding).[1]

Information is a policy instrument in its own right.

Although conclusive evidence does not favour either view, Dietz et al. (2002, Chapter 20) demonstrate that the interplay between altruism and self-interest is central to the analysis of motivations to participate in voluntary approaches. In examining the example of the free-rider model, they indicate that although a case can be made for it that is logically compelling, decades of research have shown that this is not always a realistic predictor of human behaviour. Although research is in the early stages, the following key motivators have been identified by Dietz et al.

- *Voluntary participation is not wholly voluntary.* Randall (Dietz et al.,2002, Chapter 19) argues that firms, acting rationally, will anticipate government actions. For example, they may participate to avoid regulations that are perceived as more onerous. Participation may also be induced by regulatory and other environmental policy tools. For example, one outcome of the US Toxic Release Inventory (a regulatory program requiring only the disclosure of information) is voluntary action by firms to reduce their listed pollutants.
- *Networks matter.* Major corporations do not typically make decisions in isolation from one another. Trade or industry associations may be especially important links in these networks.
- *Individuals matter.* Personal values, beliefs, and norms of senior corporate executives bear on decisions.
- *Protecting the environment may protect the bottom line.* Environmental impacts generated by a production process may be the result of poor design and represent wasted resources. Insights from industrial ecological analysis may be a major motivation to participate in a VA.
- *Organizational structure matters.* The assumption that an organization can be seen as purely a unitary rational profit-maximizing entity has been proven dubious. For example, in some modern corporations, executives may have considerable independence from shareholders, which gives them the freedom to pursue goals they consider desirable without strict adherence to profit-maximization models.

Systematic Evaluation Issues: Assessing the Merits of Voluntary Approaches

In general, systematic environmental program and policy evaluation is in its infancy. For voluntary approaches, systematic evaluation is particularly challenging. Although an increasing amount of research is becoming available, progress has been slow, and research findings are questionable. Dietz et al. (2002, p. 320) contend that "in developing and assessing the merits of voluntary approaches, in the future, it would be wise to think carefully about methodological and conceptual issues of evaluation."

In the realm of methodology, Harrison (Dietz et al., 2002, Chapter 6) asserts that systematic evaluation of any program demands a fundamental understanding of what is being evaluated, delineation of the criteria used in the evaluation, specification of the benchmark to be used as a standard of measurement (e.g., a reference year, a business-as-usual baseline, or an alternative policy), establishing clear expectations, and implementing procedures for monitoring and verifying environmental performance and public reporting.

In terms of evaluation criteria, Bemelmans-Videc et al. (1998, Introduction) demonstrate that normative theory of "good governance" stipulates various criteria for instrument choice and evaluation. These often-competing criteria are not restricted to effectiveness and efficiency, but include legality, legitimacy, and democracy. In general, assessments that focus only on effectiveness and efficiency overlook governments' need to mediate between these conflicting criteria.

Empirically, in the absence of experimental design, evaluators typically confront what are termed quasi-experiments involving non-equivalent groups. The challenge is to separate the effects of the treatment (i.e., voluntary program) from differences resulting from the lack of comparability between the treated and untreated groups. Developing a business-as-usual case in the absence of a VA (untreated group) scenario requires knowledge of what motivates business behaviour (Dietz et al. 2002, Chapter 20).

With regard to credibility, self-selection may cause biases in the assessment of environmental effectiveness, and in testing for whether regulatory capture and free riding have taken place. (Self-selection occurs when participating firms are limited to those predisposed to comply voluntarily.)

Some of these characteristics challenge the conclusions of a recent assessment of the merits and shortcomings of voluntary approaches by the OECD (2003). The OECD examined two key potential shortcomings of voluntary approaches: regulatory capture and free riding. It concluded that VA impacts on the environment are questionable, and many claimed effects cannot be attributed unequivocally to them. These conclusions are considered too general for the heterogeneous set of voluntary approaches examined, and the failure to disentangle the effects of voluntary approaches from other instruments is a manifestation of evaluation challenges. In particular, the study ignores self-selection as an issue. As well, the report focuses only on the trade-off between efficiency and effectiveness, and questions government political will, while paying no heed to public authorities' motivations for initiating voluntary approaches, and in assessing the merits of voluntary approaches against other good governance criteria and their interaction with public motivations. For example, from a democratic perspective, recent American and Australian research findings (Dietz and Stern, 2002; Gunningham and Sinclair, 2002) indicate that voluntary approaches may potentially allow increased efficiency and democracy by the decentralization of decision-making to those who are in the best position to evaluate what works for them. Voluntary approaches may also hold the promise for changing organizational culture, behaviour, and capabilities, which are crucial for achieving sustained environmental improvements.

From an industry perspective, voluntary approaches can do better than command-and-control regulations, because they are based on a comprehensive consideration of technical trends; they allow those with best knowledge to propose and execute measures that are effective and cost efficient; and they provide a flexible framework for innovation (BIAC, 2003).

Ways to Improve Performance

Gunningham and Sinclair (2002) classify, as two discrete questions, the broader lessons learned about the design and appropriateness of voluntary approaches as a policy mechanism. First, what are the internal characteristics most likely to make voluntary approaches effective? Second, how do we combine voluntary approaches with other policy instruments or link them to external pressures to increase their effectiveness?

Internal Design Characteristics

To maximize the opportunity for voluntary approaches to succeed, the OECD, as well as researchers, identify a number of features of importance for their design. First, concrete environmental targets should be clearly defined and realistically attainable. Second, ensure accountability and transparency through self-reporting, performance measures, and implementation timetables, to facilitate evaluation. Third, independent monitoring and verification is crucial for credibility and provide ongoing incentives for enterprises to deliver on their accountability.

External Pressure

Role of Government

Randall (Dietz et al., 2002, Chapter 19) argues for a strong government presence, at minimum, maintaining a capacity for meaningful monitoring, a credible threat of regulation should self-policing fail, and a regulatory and legal liability system to penalize blatant polluters and repeat offenders. Because it would be naively incautious to rely entirely on good will, green consumerism, and social pressures to achieve consistent environmental performance, he recommends that voluntary approaches supplement, not supplant, the regulatory framework, particularly when this is costly for polluting firms, consumers, and public agencies. This recommendation is consistent with the OECD (2003, p. 12) conclusion that the "performance of many voluntary approaches would be improved if there were a real threat of other instruments being used."

Third-Parties as Surrogate Regulators, Monitors or Police

There are many ways to involve third parties in voluntary approaches, directly and indirectly. Most of these approaches capitalize on the key motivations identified above and use a broader instrument mix to harness the third-party interest. The most obvious third parties with an interest in playing a role include consumers, trade unions, industry associations, investors, financial institutions and non-governmental organizations.

Conclusions

As Dietz et al. (2002, Chapter 20) state, "environmental policies are social experiments…. Our knowledge is imperfect, things change, and the only wise way to proceed is one that is reflexive, allowing for trial analysis and revisions." In this context, rather than viewing voluntary approaches as substitutes for other instruments, they should be seen as opportunities to learn, and as promising additions to the policy and regulatory frameworks. Although they are not a panacea and their benefits are less than certain, it makes good sense, under any circumstances, to encourage good environmental citizenship. After all, industries, firms, public agencies, and individuals are part of the problem. Why not include all as part of the solution? Environment Canada's new approach to environmental protection, which is founded on serious environmental regulations to protect human and ecosystem health, emphasizes voluntarism and encourages good citizenship.[2]

References

Bemelmans-Videc, Marie-Louise, Ray C. Rist, and Evert Vedung, eds. 1998. *Carrots, Sticks & Sermons: Policy Instruments and Their Evaluation*. New Brunswick (USA) and London (UK): Transaction Publishers.

BIAC (Business and Industry Advisory Committee to the OECD). 2003. *Voluntary Approaches in Environmental Policy in OECD Countries*. Comments presented to the OECD, February.

Dietz, Thomas, and Paul Stern, eds. 2002. *New Tools for Environmental Protection: Education, Information and Voluntary Measures*. Washington: National Academy Press.

Gunningham, Neil, and Darren Sinclair. 2002. *Leaders & Laggards: Next-Generation Environmental Regulation*. UK: Greenleaf Publishing Limited.

OECD (Organization of Economic and Development). 2003. *Voluntary Approaches for Environmental Policy: Effectiveness, Efficiency and Usage in Policy Mixes*.

Notes

1 *Regulatory capture* describes a situation where a convergeance of interests leads to the regulator becoming in some degree a protector of the industry being regulated, as in the case of stringent environmental regulations which create barriers to market entry, and thus protect large existing firms from new competitors. *Free riding* describes a situation where an individual or company derives benefit from a program or regulation without actually complying with its requirements, as in the case of a non-participating company benefitting from an industry-led cooperative public relations effort.

2 Environment Canada, despite OECD hesitancy is moving ahead in the use of voluntarism. Its *Policy Framework for Environmental Performance Agreements*, approved by the Minister in June 2001, highlights the principles and design criteria that reflect the key elements stressed as important to successful voluntary approaches. This policy framework has been useful in strengthening the use of voluntarism in toxics management and, more recently, in moving forward on the climate change front.

Forest Fires and Sustainable Forest Management in Canada

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Natural Resources Canada

During the summer of 2003, Canadians were captivated by vivid images and stories about forest fires, especially those in British Columbia and Alberta. Portrayed as an unmanageable menace that only produces loss and suffering, fire is, in fact, essential to maintaining the health, structure, and diversity of most of Canada's forest ecosystems. Given the dichotomous nature of these two realities, policy-makers as well as land and resource managers face a daunting challenge as they seek to find ways to balance effectively the potential benefits and detriments of fire in an attempt to ensure the ecological, economic, and social sustainability of our forests, the forest industry, and forest-based communities.

Canada's Forests

Canada has 418 million hectares of forest, which constitutes 10 percent of the total forested area in the world. These forests are vital to the cultural, social, and economic well-being of Canadians. For example, exports of forest products are the single largest contributor to Canada's balance of trade ($32.6 billion per year); the employment of 361,000 Canadians is directly tied to the forest sector; and there are over 300 forest-dependent communities in all regions of the country. Millions of Canadians also use forests for recreational activities, such as hiking, bird watching, canoeing, fishing, and hunting, spending over $11 billion annually on trip-oriented, nature-based activities. From an international perspective, we have been entrusted with a vast resource whose stewardship is critical to achieving global sustainability. Canadian forests not only contain thousands of different plant, animal, and insect species, but they also store a sizeable portion of the world's terrestrial carbon.

Forest Fires in Canada

Most of the forests in Canada have evolved harmoniously with fire since vegetation began colonizing land after the glacial retreat at the end of the last ice age, some 10,000 to 15,000 years ago. Many species are adapted to or dependent on fire, which serves numerous functions in forest ecosystems including influencing species composition and age structure, regulating forest insects and diseases, affecting nutrient cycling and energy fluxes, and maintaining the productivity, diversity, and stability of different habitats. Currently, there are about 8,500 forest fires reported each year in Canada (Figure 1). About 60 percent are caused by humans, but in some regions the number of lightning fires greatly exceeds those caused by people. The mean annual area burned is 2.5 million hectares, but this varies significantly from year to year (e.g., 0.3 million hectares in 1978 to 7.5 million hectares in 1989) and spatially across the country (Figure 2). Under a changing climate, forest fire activity is also expected to increase in many parts of Canada, especially the continental interior, due to longer fire seasons, increased ignitions, and more severe fire danger conditions resulting primarily from an increase in the frequency and severity of drought.

Operational forest fire management activities, such as fire suppression, prevention, and prescribed burning, are the responsibility of provincial and territorial governments, and Parks Canada. Collectively, these agencies expend between $400 million and $800 million annually, making fire

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management one of the most expensive aspects of forest management in Canada. The federal government plays an important role in fire management, in that it has maintained an internationally recognized research program in this area since the mid-1920s. The results of this research, in combination with the efforts of a formal federal and provincial/territorial forest fire committee created in 1947, have assisted Canada in becoming a world leader in forest fire management.

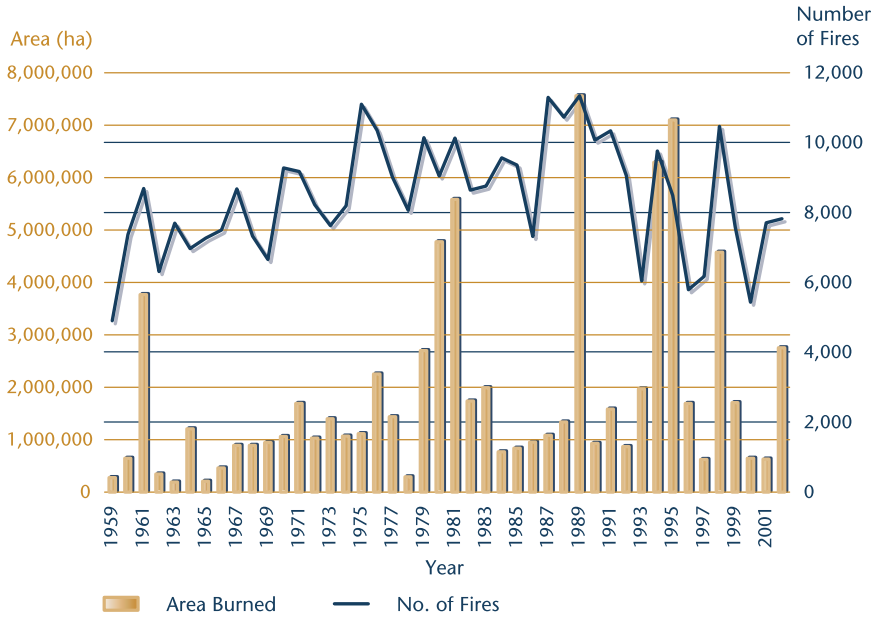
Fire Management in the Sustained Yield Era

Forest fire management is defined as the activities concerned with the protection of people, property, and forest areas from wildfire, and the use of prescribed burning for the attainment of forest management and other land-use objectives, all conducted in a manner that considers environmental, social, and economic criteria. It is, therefore, not an end in itself but, instead, provides mechanisms by which desired resource management goals can be achieved.

In the late 19th and early 20th centuries, the focus of Canadian forest policy and practices on resource extraction, combined with European-based perceptions of fire, resulted in forest fires being seen as "the enemy." Fire was considered a major threat to public safety having destroyed numerous communities across Canada (e.g., Miramichi, NB in 1825; Lac St. Jean, QC in 1870; Vancouver, BC in 1886; Fernie, BC in 1908; Matheson, ON in 1926; Haileybury, ON in 1922). It was also seen as wastefully consuming readily accessible timber. Consequently, early foresters and the general public sought the total elimination of fire.

FIGURE 1

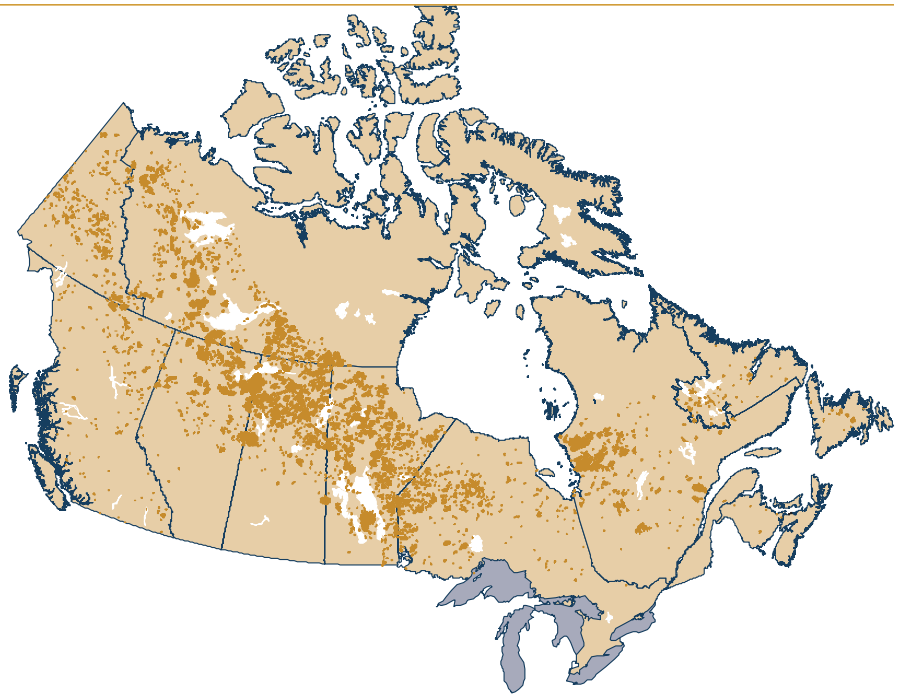
Number of Fires and Areas Burned in Canada 1959-2002



Source: Stocks et al. (2003).

FIGURE 2

Map of the Large Forest Fires in Canada (>200 ha) 1980-1994



Source: Amiro et al. (2001).

In the mid-20th century, under a philosophy of sustained yield, forest management practices in Canada concentrated primarily on efficiently maximizing fibre production at the stand level (i.e., on a small area usually less than a few hundred hectares). This goal, along with the lingering fear of fire, caused fire management to remain focused almost exclusively on wildfire prevention and suppression to minimize the area burned and, ultimately, the loss of life, property, and natural resources. To this day, large, uncontrolled, unplanned wildfire is considered undesirable from various Canadian viewpoints. Within both the forest industry and forest-dependent communities, the extensive allocation of available timber resources has heightened concerns about the economic and social impact of wildfire. Increasing threats to urban development in or near flammable forest areas, the potential impact of smoke on public health and the economy, and the effect of wildfire emissions on the global carbon cycle are all cited as reasons to minimize the number and size of wildfires.

The desire to control wildfire and the belief that this is possible is founded primarily in an attitude of human mastery of nature. It has also been fuelled by unprecedented technological developments in transportation (e.g., airplanes and helicopters), equipment (e.g., gasoline-powered pumps and aerial helitorches), communications, and now satellite and computer technology, all of which contribute to faster and stronger initial attacks and sustained forest fire suppression activities. In fact, in the last few decades the effectiveness of fire suppression programs has risen to the point where 97 percent of all fires in Canada are contained at a very small size (less than 200 hectares). However, a small percentage continue to escape initial attack, and these fires, which are extremely difficult to control, account for almost all the area burned and a majority of the fire management expenditures in Canada. Further, fire suppression is subject to the law of diminishing marginal returns. According to the literature, and based on recent experiences with large fires in Canada and other developed nations, suppression appears to be reaching its limit of economic and physical effectiveness. Those who work closely with fire now realize it is neither economically possible nor ecologically desirable to eliminate fire from our forest ecosystems.

Embarking on a New Era for Forest Fire Management

Over the last 10 to 20 years, there has been a growing recognition of the need for an integrated, systems-based approach to forest management at the stand and landscape levels. This recognition has been a catalyst for a philosophical shift from single or multiple resource sustained-yield management toward a more holistic, ecosystem-based approach. In Canada, this is referred to as sustainable forest management, which has been formally defined as management to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social, and cultural opportunities for the benefit of present and future generations.

In forests where fire has historically played a significant role, the transition toward sustainable forest management has tremendously increased the complexity of forest fire management. It is no longer acceptable for policies and practices to focus on the exclusion of fire. As such, greater consideration is being given to the short- and long-term socio-economic and environmental risks associated with both the presence and absence of fire. The rate of advancement toward this new paradigm is, however, hampered by past perceptions and attitudes toward fire, as well as by individual and institutional inertia associated with the status quo. Many steps need to be taken by both the private and public sectors to overcome these challenges, but three steps appear essential.

First, resource management professionals and the public, especially those who live and work in or near forested areas, must acknowledge and respect the inherent flammability of forests, and the vital role of fire in the long-term sustainability of these ecosystems, and the products and services they provide. Recognition must also be given to the fact that because suppression has its limits, the challenges posed by wildfire cannot be overcome by an increase in firefighting capacity or funding. Although it is certainly important to be able to react appropriately in emergency situations, proactive measures are needed to alleviate the root causes of such problems before they occur. For example, cross-training of structural and wildland firefighters will improve their ability to respond to wildland–urban interface fire incidents, such as those that occurred in Kelowna, BC, but it would be even more preferable if the frequency and severity of such incidents could be minimized through proper implementation of FireSmart guidelines (see the accompanying

sidebar for details) for land-use planning, home construction, and area maintenance.

Second, the spatial and temporal uncertainty associated with forest fires and other natural disturbances needs to be incorporated into strategic and operational forest and fire management planning. Planning in the forest sector, which has historically been based on deterministic models, will now need to consider the stochastic nature of fire. This can be readily accomplished by adopting a risk management approach to sustainable forest management. In dealing with fire, such a process would include attaining a comprehensive understanding of the historic fire regime(s) of a management area, a quantitative assessment of the current and projected fire environment (i.e., fire behaviour potential, ignition potential, suppression capability, and values-at-risk), and an evaluation of short- and long-term strategies to minimize vulnerability and risk to achieve desired management objectives. Numerous techniques and discipline-specific models are available to assist analysts and decision-makers. However, further interdisciplinary research and modelling, as well as an effective knowledge exchange are required to make significant advances.

Third, policies governing resource management must be revised to foster the development and application of innovative, results-based forest management practices founded on the best available science and traditional knowledge. Policy-makers will have to give resource managers the mandate and support to take reasonable risks in the present to minimize other risks in the future. This could include increased use of prescribed fire to enhance ecological integrity and manage forest fuels as is occurring in our national parks, or converting highly flammable coniferous forests to less flammable deciduous species at strategically located areas on the landscape. Coincident with greater freedom and flexibility, land managers must also assume more responsibility for ensuring public deliberations and support for their activities, increase monitoring of possible impacts of their actions, and ultimately be accountable for the eventual outcomes of their practices.

Moving Forward

Fire has been and is likely to become an even more significant disturbance in Canada's forest ecosystems. This means the sustainable management of these forests will depend on the ability to balance the social, economic, and ecological impacts of fire. Although philosophically attractive and desirable, this goal may not be pragmatically attainable due to the difficulty of reconciling all the trade-offs associated with the positive and negative aspects of fire. Nevertheless, it is a worthy objective and, therefore, the responsibility of government, industry, non-governmental organizations, and the public to encourage and foster the open and informed evaluation and debate of the future directions of forest fire management policies and practices in Canada.

Further suggested readings related to this article can be found in the version that is posted on the PRI website at <www.policyresearch.gc.ca>.

FireSmart: Protecting Your Community from Wildfire

FireSmart is both a concept and a product. Initially, a FireSmart manual was developed to encourage community-based initiatives to reduce the risk from wildfire in the wildland-urban interface. Produced by Partners in Protection (an association of federal, provincial, and municipal government agencies and non-government organizations), it provides knowledge, tools, and examples of how to increase public safety, decrease the potential for structure loss, and reduce public and private expenditures for evacuations and fire suppression. Through a Web site <www.partnersinprotection.ab.ca> and the distribution of over 10,000 copies of the manual, many individuals and communities across Canada and internationally have undertaken FireSmart activities.

FireSmart thinking is now expanding to include forest landscapes. Research and operational trials are underway to identify how forest management practices (e.g., harvest scheduling, cutting and road designs, regeneration, and stand tending) can be used in a proactive and planned manner to reduce the area burned by unwanted wildfires and also the risk associated with the use of prescribed fire. The eventual goal is to have FireSmart homes, within FireSmart communities, within FireSmart landscapes to help people and fire-dominated ecosystems harmoniously co-exist.

The Comparative Advantages of Urban Canada

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Magplane Technology Inc.

In the global knowledge-based economy, the environmental sustainability, economic viability, and social capital of cities will affect the ability of Canada to attract international investment. Around the world, cities that previously paid only minimal attention to environmental and quality of life concerns now recognize that these issues affect corporate decisions about where to locate or expand industry. These same site location determinants also influence the ability of cities to attract important knowledge workers. As a result of the growing importance of vibrant urban economies to national economies, federal governments are assuming a more central role in assisting cities to become more competitive.

Because our neighbour to the south wields the largest and most influential economy in the world, Canada must compete with a formidable rival. How do Canadian cities match up? Are they better or worse? And perhaps more important, will Canadian cities be able to cope better than US cities as urban economies evolve from an industrial base to a knowledge base?

Unfortunately, no one in Canada has the answers. For the last several decades, almost all the research initiatives in this field have emulated the very same research preoccupations as in the United States: auto congestion, urban sprawl, decaying central cities, smart growth strategies, and new urbanism to name a few.

However, there is evidence to suggest that Canadian cities will fare better in the coming decades, providing Canadian governments are able to identify and strengthen comparative advantages. In this article, selected data relating to the environmental sustainability of urban transportation networks, economic viability, and social capital are presented to support this claim.

Environmental Sustainability – Transportation Greenhouse Gas Emissions

According to Kenworthy and Laube, in their 1999 *International Sourcebook of Automobile Dependence in Cities,* Canadian cities emit much less greenhouse gas for passenger transportation than do American cities. On average, the annual urban Canadian CO_2 emission per capita is 2,764 kg, about 41 percent less than in urban America where 4,683 kg of CO_2 per capita are emitted into the atmosphere. Canadian urban transportation emission rates are far closer to European rates, where the average European city emits 1,887 kg of CO_2 per capita for passenger transportation.

Why Are Canadian Cities Less Auto Dependent?

There are several major reasons for lower auto dependency in providing intra-urban transportation in Canada.

At the metropolitan level, the Canadian city is more densely populated with residents and workplaces, enabling public transit systems to offer effective alternatives to the automobile. Annual 2001 passenger boarding statistics from the Canadian Urban Transit Association and the American

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TABLE 1:

Urban Transportation CO_2 Emissions per Capita

	Automobiles		Public Transportation		Total Transportation	
	CO_2 tonnes	Per capita (kg)	CO_2 tonnes	Per capita (kg)	CO_2 tonnes	Per capita (kg)
US Average		4,609		73		4,683
Metro New York	66,480,480	3,611	3,078,676	167	69,559,156	3,779
Sacramento	7,449,120	5,497	29,074	27	7,478,194	5,524
Houston	17,856,000	5,157	124,286	36	17,980,286	5,193
Canadian Average		2,675		89		2,764
Calgary	2,364,984	3,328	46,321	65	2,411,305	3,393
Edmonton	1,901,376	3,093	48,235	78	1,949,611	3,172
Montréal	7,259,688	2,327	282,704	91	7,542,392	2,418
Ottawa	2,100,096	2,313	99,749	110	2,199,845	2,423
Metro Toronto	5,211,288	2,290	328,546	144	5,539,834	2,434
Vancouver	4,030,776	2,612	93,306	60	4,124,082	2,673
Winnipeg	1,773,504	2,763	45,722	71	1,819,226	2,834

Source: Kenworthy and Laube (1999). US cities: Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Phoenix, Portland, Sacramento, San Diego, San Francisco, Washington.

Public Transportation Association show that, on average, every Canadian urban resident uses public transit 2.7 times more than the average US urban resident. And, as important, when Canadians rely on the automobile to travel within the metropolitan region, trip distances are about one third shorter than in the US city. In Toronto, the average trip distance travelled in the automobile is less than half the distance travelled in an average American city.

The conventional wisdom is that building freeways increases auto dependence. Very curious and disturbing to this conventional wisdom is the stark comparison between Vancouver and Toronto. Why is it that Vancouver, which eschewed building a freeway network, has half the population density and consequently records 45 percent more auto kilometres travelled per capita than does Metro Toronto?

If comparisons between Boston and Toronto are a consistent indication, then prior to the 1960s, public transit use was greater in the United States. In 1960, in Metro Boston, 25.6 percent of commuters used public transit while 62.2 percent drove. By 1990, public transit in Metro Boston was down to 14.7 percent while motoring grew to 77.8 percent. Similar, but less drastic declines in public transit and increases in automobile use were recorded in New York City. During the same period in Metro Toronto, the percentage of automobile commuters actually declined from 70.3 to 64.6 percent while transit commuters increased from 22.9 to 30.1 percent. This gain in public transit was achieved through major capital transit funding for a number of projects: the Toronto Subway system in the early 1950s and subsequent extensions, the creation of a massive GO Transit rail commuter network in the 1960s, '70s, and '80s, and upgrades in local bus transit networks. Other Canadian cities have also built subways (Montréal), light rapid transit (Calgary, Edmonton), and automated transit (Vancouver Skytrain).

The 1950 to 1980 period marked a major turning point for Canadian and American cities. While Canadian cities invested in new urban highways, the provinces and municipalities also invested heavily in public transit systems. In the United States, most of the investment in urban transportation was in freeways. On a per capita basis, American cities built four times the amount of freeway lanes than did Canadian cities.

Freeway construction was not the only factor in the exploding US metropolis. There are important differences in the national character and in governance that have restrained the physical expanse of Canadian cities.

TABLE 2:

Metropolitan Population Density

	Population per Hectare	Jobs per Hectare
US Average	14.2	8.1
Canadian Average	28.5	14.4
Calgary	20.8	12.1
Edmonton	29.9	15.8
Montréal	33.8	14.8
Ottawa	31.3	15.8
Metro Toronto	41.5	23.2
Vancouver	20.8	10.5
Winnipeg	21.3	8.8

Source: Kenworthy and Laube (1999). US cities: Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Phoenix, Portland, Sacramento, San Diego, San Francisco, Washington.

Aggressive US vs Cautious Canadian Federal Roles in Urban Transportation

In the United States, the federal government invested aggressively in the freeway network both within and between metropolitan regions. In contrast, the Canadian federal government in the 1950s and '60s largely restricted its role to building the Trans-Canada Highway, the St Lawrence Seaway, marine ports, and a national airport and air navigation system. Within Canadian metropolitan regions, the federal role was very restricted and cautious.

In Canada, any improvement in public transit comes directly from the financial contributions of the cities and provinces. The Vancouver, Calgary, and Edmonton public transit systems were almost entirely paid for by the cities and the provinces of British Columbia and Alberta. Similar investments in Toronto and Montréal were funded without contributions from the federal government.

The cautious nature of the federal government with regard to freeway development may have contributed to an urban transportation system in Canada that is less automobile dependent and less environmentally destructive than in many US cities. It remains to be seen if the continued absence of the federal government from urban transportation funding will endanger the ability of public transit to be responsive to the needs of commuters in the knowledge-based economy. This is being debated, leaving open the possibility that Canada will no longer be the only nation in the OECD where the federal government does not assume a role in urban mass transit.

Urban Fragmentation vs Urban Consolidation

Canadians are more accepting and trusting of regional and larger local governments. In the United States, there is a strong tradition of local autonomous governments, reflecting the need to structure these bodies to the particular needs of small homogeneous communities. This increases the resistance to municipal integration and reorganization for the sake of the public good.

In 1978, there were 79,913 governments in the United States, one government for every 2,801 Americans. In the same year, there were 4,740 governments in Canada, one government for every 4,954 Canadians. Since then, Canada has seen an aggressive decline in the number of local governments, particularly in Ontario, and last year in Quebec. In the United States, the trend has been toward even more local governments.

Such increased local autonomy has resulted in a far more dispersed and fragmented US metropolitan region. Local planning boards are easily persuaded by not in my backyard residents who oppose housing development, thus setting very low density standards. As housing demand is forced to look further beyond the metropolitan range, more rural land is converted into housing use. For example, in St. Mary's County in Maryland, new residential developments are required to sit on six-acre lots.

It appears that strong effective Canadian regional governments have been successful in regulating land use controls that likely have restrained urban growth in Canada.

Autonomous US Local School Boards vs Provincial Education Control

In Canada, strong provincial standards that apply throughout the metropolitan region tend to equalize the quality of education for primary and secondary students in public schools. While there may be small differences between school boards within metro-

politan regions, rarely is the gap large enough to affect residential location choices. The educational system in the United States is very different. While some state standards do apply, school boards enjoy much greater autonomy than they do in Canada.

In Boston, the local school board's expenditures averaged US$6,783 per primary and secondary student in 2001. Next door, in Cambridge MA, expenditures amounted to US$11,679 per student. By comparison, the average student expenditure in the Toronto School District was C$6,902 while in the York Regional School District the average student expenditure was virtually identical, at C$6,877 for 2001-2002.

This large discrepancy in school funding in the United States, affecting student-teacher ratios and teacher salaries, remains a powerful deterrent to professional middle class families considering moving into the central city, which is often where the poorest school boards are found.

And it also seems that race and education remain a powerful urbanizing force in US cities. According to a recent study, racial segregation is accelerating rather than declining. Inner city, African-American and Hispanic populated schools are becoming "less-equal" compared to their counterparts in suburban, middle-class communities.

The Harvard Civil Rights Project recently released a study examining the growing trend toward racial re-segregation in America's schools. *Brown at 50* concludes that, while America is celebrating a victory over segregation, schools across the country are becoming increasingly segregated. According to the Harvard University researchers, the reversal began in 1991 when the Supreme Court authorized a return to more autonomous neighbourhood schools, a system that is inherently conditioned to produce striking differences in the quality of education (Washington Post, 2004).

Mortgage Interest Payments and Income Taxes

In the United States, federal and state governments subsidize home ownership financing costs by allowing tax deductions for mortgage interest payments. This subsidy might be a major factor contributing to the ever-expanding US city. During the 1990s, land consumption in Virginia grew nearly three times faster than population growth, and in Maryland land consumption grew two times faster. This unfortunate trend expanded the metropolitan region of Washington DC. While its population grew 15 percent, the average number of kilometres travelled increased by 27 percent as commuters have to travel further to get to work.

Canadians do not enjoy this tax break, which may reduce willingness to hold large mortgages, promoting lower-cost and higher-density housing, and thus limiting development beyond established urban boundaries. We need to

TABLE 3:

Urban Vehicle Ownership and Use

	Total Vehicles per 1,000	Total Private Vehicle km per Capita	% of Workers Using Transit	% of Workers Using Autos	% of Workers Using Foot or Bicycle
US Average	751	12,336	9.0	86.3	4.6
Canadian Average	598	7,761	19.7	74.1	6.2
Calgary	700	9,201	16.5	78.2	5.3
Edmonton	579	8,397	11.0	83.0	6.0
Montréal	455	NA	21.3	72.6	6.1
Ottawa	562	6,534	27.0	66.0	7.0
Metro Toronto	706	6,051	30.1	64.6	5.3
Vancouver	694	8,750	12.4	81.9	5.7
Winnipeg	493	7,635	19.9	72.1	8.0

Source: Kenworthy and Laube (1999). US cities: Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Phoenix, Portland, Sacramento, San Diego, San Francisco, Washington.

TABLE 4:

US Rental Housing Affordability and Required Median Incomes (30% housing income) US$

2001	San Francisco $	Boston $	Washington $	San Diego $	Chicago $	Dallas $
Two-bedroom fair market rent	1,362	942	840	805	762	749
Income needed to afford fair market rent	54,480	37,680	33,600	32,200	30,480	29,960
Median incomes						
Retail clerks	19,323	17,930	17,285	17,139	17,971	17,243
Janitors	20,800	20,987	15,787	16,536	18,824	14,810
Nurses	39,603	39,541	33,280	31,990	31,990	38,938
Bio-technicians	36,546	36,109	32,219	32,781	35,526	32,011
Teachers	38,293	38,584	32,781	38,584	36,733	34,861

Source: John F. Kennedy School, Joint Centre for Housing Studies.

have a better understanding of how our taxation policies affect Canadian housing consumption.

Social Capital

Are there societal reasons Canadian cities are more compact than American cities? Cities reflect the values of a society. Canadian cities are different from US cities, because Canada is a different country. We consider ourselves to be a more compassionate, collective, and considerate society, and these values likely influence the spatial organization of our cities.

We need a better understanding of the environmental benefits of a more socially integrated urban society. For example, to what extent do Canadians feel more secure in Canadian cities, because of investments in social programs, which in turn facilitate the creation of more compact urban communities? In the United States, urban residents have a need to separate economic classes. This expands the city, further lengthening automobile trips. In the 1960s, were there any Canadian neighbourhoods that resembled Watts, Compton, South Washington, North Philadelphia, Roxbury, the Bronx, or inner Detroit? Conversely, Cabbagetown in Toronto was gentrified, and inner-city neighbourhoods in other Canadian cities remained very stable.

Hippodamos was a fifth century urban planner in Ancient Greece. His contribution to urban planning was the realization that cities are composed of different socio-economic classes that require a high degree of co-dependency to make a city function efficiently. Hippodamos understood that the design of the city ought to facilitate pedestrian travel between distant quarters of privilege and quarters of the working class. His perfected "grid-iron street system" permitted workers to provide necessary services without living in the same neighborhood as their paymasters. He advocated that cities integrate the lives of "all residents." To design a city that isolates and ignores a contributing segment of society detracts from the quality of life of other dependent classes.

The genius of Hippodamos was the realization that the spatial integration of the city's socio-economic classes served an economic purpose. In the knowledge-based economy, we have to be certain that Canadian cities will integrate all citizens and leave no sub-class isolated.

Economic Viability

In today's knowledge-based economy, economic development is far more dependent on the availability of a highly trained workforce and competitive costs than on proximity to input material supply or markets. The former US Secretary of Labor, Robert Reich, argued that, "[l]abour shortages rarely means that workers cannot be found at any price. A more accurate meaning is that desired workers cannot be found at the price that employers and customers wish to pay" (Reich, 1991). The cost of operating a business will

remain the single most important location criterion for knowledge-based economy companies.

Silicon Valley and Boston have become the most expensive places in the United States to operate a business in terms of wages and land costs. According to John Boyd, a site location consultant for knowledge-based economy companies, venture capitalists are persuading companies in Silicon Valley and Boston to consider relocating to other cities to reduce operating costs (Montreal Gazette, 2002).

Canadian cities are very well positioned to compete for knowledge-based economy investment. John Boyd studied 48 cities in Canada and the United States and determined that Montréal has the lowest operating costs. It costs an average of US$7.95 million annually for an average biotechnology company to operate in Montréal vs US$12.1 million in San Jose, CA, the most expensive US location. Other Canadian cities are equally affordable, with the most expensive city in Canada, Vancouver, having an estimated annual operating cost of US$8.6 million.

We need a better understanding of why Canadian cities have lower operating costs than US cities. To what extent do housing costs and the transportation infrastructure contribute to a more competitive Canadian metropolis? What is the linkage between economic viability and social capital?

The Growing Housing Affordability Crisis in US Cities

The North American city is undergoing a major transformation from an industrial economy to a knowledge-based economy. In the United States, competition for housing between old economy and new economy workers is elevating the cost of owning and renting a home in the city beyond the affordability of many workers, especially janitors, retail clerks, nurses, and teachers, to name a few. In the industrial era, the middle class was well accommodated by American cities. Today, there is mounting evidence that the middle class is being squeezed out of US cities because of changing land economics.

TABLE 5:

Canadian Rental Housing Affordability and Required Median Incomes (30% housing income) C$

Metropolitan Region 2002	Weighted Average Rent Two-Bedroom Apartment $	Minimum Wage Required (30% Housing) $	Lowest Category School Teachers Salary (3 yrs experience) $	Difference $
Halifax	704	28,160	43,195	15,035
Saint John	492	19,680	39,394	19,714
Québec City	550	22,000	41,001	19,001
Montréal	552	22,080	41,001	18,921
Ottawa	930	37,200	39,842	2,642
Toronto	1,047	41,880	38,727	- 3,153
London	705	28,200	35,726	7,526
Winnipeg	622	24,880	42,513	17,633
Regina	581	23,240	42,301	19,061
Calgary	804	32,160	46,273	14,113
Edmonton	709	28,360	46,273	17,913
Vancouver	954	38,160	45,076	6,916

Sources: Canada Mortgage and Housing Corporation and Canadian Federation of Teachers.

In the old industrial centre of San Francisco, one out of every three companies does not employ even a single resident of the city. City officials have resorted to providing public housing for newly recruited teachers in San Francisco. Scores of police, firefighters, postal workers, and other essential urban workers have organized car and van pools to transport workers over 80 km into the Bay Area, as affordable housing recedes further. Some Bay Area workers even commute 150 km from Sacramento, because of exorbitant housing costs. The consequences of escalating housing costs for rising greenhouse gas emissions are evident.

While Metro Toronto is an exception to the rule, Canadian cities still offer affordable housing for a large range of workers, helping to constrain urban development pressures within existing borders.

We must continue to plan and build cities that will provide enough affordable housing for both new and old economy workers if we want to preserve the social capital of our cities. When the industrial economy replaced the agrarian economy, changes in urban land economics forced operating farms to vacate the city. The industrial city left no room for agriculture. As the urban economy changes, Canada must make certain companies and workers from the industrial economy still have a place in the cities, or they too will soon be leaving. We have only to examine the difficulties that old economy workers are experiencing in the United States to gauge the negative impact to Canadian cities of a similar occurrence. The lessons from Hippodamos still apply to cities in the knowledge-based economy.

This growing housing crisis is rapidly becoming the most pressing problem for urban America, even greater than transportation congestion (a contributing cause of escalating land values), greenhouse gas emissions, and crime. And this difficulty is going to compromise the economic sustainability of the American city in the knowledge-based economy. Canada has been spared this phenomenon. Or, is it only a brief respite?

Telecommunications, Transportation, and the Spatial Implications of the Knowledge-Based Economy

There is another area of research that needs attention. We need to understand the spatial implications of the growing division of labour in the knowledge-based economy. In particular, we need to understand the interplay between telecommunications and transportation to increase the availability of specialized labour for knowledge employers. One very interesting development in Canada is testing the limits of urban commuting patterns.

> In a knowledge-based economy of developed countries such as Canada, a city's competitiveness is determined primarily by its ability to attract and retain highly skilled people and fixed capital investments. Competitiveness is also determined to a lesser extent by a city's environmental and social performance (Conference Board of Canada, nd).

The Greater Halifax Partnership and Enterprise Greater Moncton, together with 12 other regional economic corridor stakeholders, have created the Halifax-Moncton Growth Corridor. This new urban corridor has as its major objective the fusion of adjacent urban labour markets in Halifax and Moncton and points in between into a single urban labour market that will allow any employer access to an enlarged urban agglomeration of specialized labour (Halifax-Moncton Growth Corridor, nd).

For the metropolis, the workplace is centrally located, because the transportation infrastructure is well equipped to provide essential daily commuting. For the Halifax-Moncton Growth Corridor, it is anticipated that knowledge employers will pursue a decentralized workplace to bridge the substantial physical distance separating the metropolitan regions. If labour decentralization is the option favoured by employers, then the organization of labour will be determined by metropolitan labour residence rather than departmental function. For example, it would permit all Halifax residents to report to work in Halifax and the same for Moncton residents, regardless of whether their supervisor, colleague, or subordinate are physically located in another city, 240 km away.

The actual distance by which decentralized workplaces can be separated yet function effectively will be determined by the speed, cost, convenience, and reliability attributes of both the telecommunications and transportation networks. Telecommunications would minimize the need for physical commuting while transportation advancements would maximize the opportunity for physical commuting. While it is hoped that labour decentralization is the preferred alternative, it is also possible that most knowledge employers will still insist on labour centralization whether in Halifax or Moncton. If this is the case, then the investment capital needed to provide essential daily commuting between Halifax and Moncton will be very substantial, perhaps beyond the ability of the region to invest.

The formation of the Halifax-Moncton Growth Corridor represents significant challenges for the federal government. It will affect federal government labour policies, transportation infrastructure, telecommunications infrastructure, and national competitiveness.

The Halifax-Moncton Growth Corridor is a major innovation for Canada, and if successful, it can be replicated across the country to increase labour productivity, and attract more international investment. At Confederation, the city was only a few kilometres wide. In the post-war era, the metropolis expanded to a radius of about 50 km, but most remained within the boundaries of one province (with the exception of Ottawa-Gatineau). But, in the knowledge-based economy, where the future super-urban economy will span provincial boundaries, the federal government may play a more critical role. The sooner we understand the spatial implications of the knowledge-based economy, the better prepared the federal government will be.

Tomorrow's Challenges

The federal government needs to develop an urban research program to identify and promote the comparative advantages of Canadian cities. The steps taken in the next few decades will leave a lasting impact that will determine how Canadian cities will compete in the 21st century global economy. The challenges we face are significant, but fortunately, the foundations of our cities are in very good shape. We need to take stock so our cities will remain environmentally sustainable, economically viable, and socially integrated. We need to know what we are doing right and do more of it. We need to better understand the linkages between environmental sustainability, economic viability, and social capital. The cities that flourish in the knowledge-based economy will be those best able to balance these conflicting objectives.

References

Boston Finances. nd. *Massachusetts Department of Education* <http://profiles.doe.mass.edu/home.asp?mode=o&so=-&ot=5&o=164&view=fin>. Accessed January 8, 2004.

Conference Board of Canada. nd. *Cities, Competitiveness, and Environmental Quality.*

Goldberg, Michael, and John Mercer, eds. 1986. *The Myth of the North American City.*

Halifax-Moncton Growth Corridor. nd. <http://www.shiftportal.com/corridor/homepage/index.cfm?CFID=7011365&CFTOKEN=25535545>. Accessed January 20, 2004.

Kenworthy, Jeffrey, and Felix Laube. 1999. *An International Sourcebook of Automobile Dependence in Cities, 1960-1990.*

Montreal Gazette. 2002. "Why Montreal? We're Cheaper than Other Cities." December 31.

Mumford, Lewis. 1961. *The City in History.* New York: Harcourt, Brace and World, Inc.

Ontario, Ministry of Education. nd. "School Board Profiles." <http://esip.edu.gov.on.ca/english/default.asp>. Accessed January 8, 2004.

Reich, Robert B. 1991. *The Work of Nations: Preparing ourselves for 21st century capitalism.* New York: Alfred A. Knopf Inc.

Smith, Matt. 2003. *Industrial Nightmare.* March. <http://www.sfweekly.com/issues/2003-03-05/smith.html/1/index.html>. Accessed January 8, 2004.

Soberman, Richard. 2001. *Public Transportation in Canadian Municipalities.*

Washington Post. 2003. "Density Limits Only Add to Sprawl: Large Lots Eat Up Area Countryside." March 9.

Washington Post. 2004. "U.S. School Segregation Now at '69 Level." January 18.

Zavergiu, Richard. 2003. "Celebrating the Canadian City." *The New Canadian.* May/June.

Normative Approaches to Policy

Integrating Legal Policy Perspectives

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Editor's Note

P. Eliadis wrote the article on normative approaches to policy. D. Lemaire provided a commentary on the subject using the article by Ms. Eliadis as a starting point.

Getting policy right starts with the "rules of the game of society" (North, 1990). The rules of the game include not only laws, but also the broader set of norms – emerging practices, principles, and values – that, taken together, are the foundation for how societies order themselves.

Most disciplines, from economics to medicine, have norms. Equity and "do no harm" are two well-established examples. Law, however, is uniquely concerned with the ongoing process of sorting and ordering norms from all disciplines to resolve conflicts, making social priorities, and systematically assessing the validity and enforceability of norms for society at large.[1] This ongoing, dynamic process generates a dialogue between how society wishes to structure itself on the one hand and the legal system, which is used to articulate that vision, on the other.

While there is a great deal of discussion and debate about norms in social policy development generally, it is rare to see legal policy perspectives explicitly driving or even feeding into horizontal policy development at the federal level, especially at the early stages.

There are probably several reasons for this. First, law is usually viewed as an "end-of-pipe" exercise, designed to manage conflict or assess the lawfulness of policy proposals once the basic directions are set. Clearly, the normative content of law has end-of-pipe consequences if a government gets it wrong. These can range from public disapproval to litigation or criticism from international forums. However, to integrate norms that take the perspective of law as a systematic driver of public policy is a different matter.

The second reason is the view that we have already "set" the major norms for Canada as a country. Many of them underpin the welfare state, for example, and were in place in the 1960s, '70s, and early '80s, before the entrenchment of the *Canadian Charter of Rights and Freedoms*. Social policy debate at that time focused on norms such as point-in-time equality of income, access to education and health care, and included human rights, albeit in a supporting role. Another spate of debate about the normative underpinnings of Canadian society took place around the time of the development of the Charter, but these did not fundamentally alter Canada's social policy structures.

We in Canada assume a stable normative foundation (at least with regards to those stronger norms that make up our legal structures), and policy research is now clad primarily in the empirical language of equity, equality of outcomes and efficiencies, with an emphasis on statistical measurements of trends, such as low income or demographic patterns. This trend has also had the effect of creating a perception of law as a policy "output" or lever of change after social policy is set (and as one of a variety of

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instruments intended to change behaviours), rather than as a major policy driver. The current tendency to clothe policy in empirical, statistical measurements is in large measure a function of a "policy by numbers" approach that dominates federal policy-making and that sees

> all social action [as] hypostatized as a market. That is, the market is not just an economic market, and the wealth that one seeks to maximize can be non-monetary…. [T]he correction of market failures is the sole legitimate ground to regulate human conduct. Of course, aside from regulating to ensure that a market can function according to the presumed postulates, the rest is inefficient….
>
> A contrasting ethic is one that sees regulation as the symbolic construction of social solidarity through institutions recognizing and legitimating the identities by which people come to express who they are (Macdonald, 2004).

This article is largely concerned with the "contrasting ethic" of norms and their relationship with law, and with how legal policy functions as a policy driver. The thesis is that there have been several normative shifts with legal policy implications over the last two decades that belie the assumption of a stable normative framework.

Sources of Legal Policy in Canada

When we think of norms, a vast range of values, principles, and rules come to mind, some of which are more powerful than others. "Strong" framework norms, such as constitutional law, the common law, and civil codes are obvious sources, as is the evolving body of case law, and the emerging principles, practices, and benchmarks that arise from business dealings, uniform codes, or voluntary standards. Norms are also shaped by international law, such as treaties and covenants, as well as "soft" law, such as declarations, resolutions, and standards of international and regional bodies (Toope, 2001).

Assessing when and how values and principles are transformed into norms and then become part of a legal framework is the business of policy-makers as well as lawyers.

When norms begin to express an emerging consensus, most Western societies will seek to articulate that consensus through a variety of instruments that have varying degrees of legal effect and that reflect, in turn, the construction of "social solidarity" referred to earlier. Assessing when and how values and principles are transformed into norms and then become part of a legal framework is the business of policy-makers as well as lawyers.

In Canada, the normative components of social policy were built on foundations constructed in the post-World War II period, with critical points of evolution in the 1960s and '70s, and again during the post-Charter period. Basic powers are divided between the federal and provincial governments according to the Constitution Act, 1867. Powers such as employment insurance, for example, are specifically given to the federal government, whereas others are allocated to the provinces.[2] Since the division of powers is not exhaustive, governments use fiscal arrangements to ensure the smooth operation of cooperative federalism and to facilitate the equitable transfer of funds to achieve social purposes across a large and diverse country.[3]

Section 36 of the *Constitution Act*[4] is a relatively recent addition to the normative framework of our constitution, but it reflects a long-standing debate about the underpinnings of cooperative federalism, social transfers, and control of public policy. Section 36(1) provides that all federal and provincial levels are committed to:

- promoting equal opportunities for the well-being of Canadians;
- furthering economic development to reduce disparity in opportunities; and
- providing essential public services of reasonable quality to all Canadians.

Although section 36 does not confer new authority or rights on governments, it does articulate norms for all levels of government.

Since the 1982 constitutional amendments, there have been several major developments with important implications for policy-making. Two of them are discussed here. The first is the shift in the relationship between the legislature and the judiciary, with

implications for how policy-making is conducted. The second is the growing importance of international law as a driver of domestic policy. Both of these have changed the normative framework within which we operate and develop policy, especially in the last decade.

The Legislature and the Judiciary

Prior to the Charter, the courts gave legislators a wide berth of deference within their areas of jurisdictional competence. So long as a government did not try to legislate beyond its powers, the courts would not generally interfere with governments' prerogative to set social policy. This is not surprising, since the basic structures of Canada's social policy were set before human rights legislation, the Charter, or international human rights instruments.

After 1982, legislatures were subordinated to the rights and guarantees set out in the Charter. Policy-makers now had to work within the parameters imposed by the Charter, and courts were increasingly scrutinizing programs and policies in a way that would have been impossible before 1982 (or 1985, in the case of equality rights). The interaction between the legislature and the judiciary has created a balance of power that has shifted over the years, and that has had its own normative implications from a legal policy perspective.

As a practical matter, even after the Charter, the balance between the judicial and the legislative arms of government imposed a continuation, albeit modified, of judicial deference, namely that public policy is the fruit of an "enlightened" exercise of discretion rather than the result of obligations on the part of government.[5]

Over the last decade, the berth of deference has narrowed markedly where policy is shown to infringe equality rights as a result of exclusion "from membership and participation in Canadian society," a test that has emerged from several appellate courts, including the Supreme Court of Canada.[6] Courts will be especially careful where there is a demonstrated impact on equality rights of persons who are vulnerable, at risk, or part of a historically disadvantaged group. This is not, as some media commentators would argue, about "judicial activism," but rather about a planned sharing of constitutional responsibility between the three arms of government in parliamentary democracies, creating a check on the will of the majority to impose their wish in a manner that may contravene the basic norms that underpin our society.

When courts find that there has been exclusion from membership and participation in Canadian society, they are much more likely to require the government to create or modify social programs to address the "rights gap," even though this has historically been seen as the prerogative of the legislative arm. In short, the rights and guarantees provided by the Charter establish standards against which changes to social policies can be anticipated. This has happened in the area of health care for persons who are hearing-impaired (*Eldridge v. British Columbia*), and for social assistance programs created for new categories of older beneficiaries (*Gwinner v. Alberta*).

The twin forces of globalization and the post-9/11 environment have made complete separation of domestic and international policy spheres not only artificial, but also potentially dangerous.

Most recently - and unusually - a court granted a mandatory injunction, forcing a government to extend a social program to an autistic child who had been denied service on the ground of age. In doing so, the court relied on the equality rights in Section 15 of the Charter, as well as the international *Convention on the Rights of the Child,* which has not yet been formally incorporated into Canadian law.

As such, the benchmarks against which the courts are assessing government actions are increasingly normative, qualitative, and value-driven. The case law shows that courts are much more likely to intervene and "reset" social policy where it can be shown that equality rights have been infringed and where the policy operates to exclude persons from services or programs that have a real impact on equality (equality rights under section 15 of the Charter rather than equality of opportunity in section 36). From a social policy perspective, the areas where the courts seem likely to reset policy tend to coincide with basic social and economic rights – the right to education and to health, for exam-

ple – especially for historically vulnerable groups, including younger and older persons.

Legal Policy and International Instruments

Given Canada's leadership on the international stage, it might be assumed that our international commitments are systematically reflected in domestic policy. In fact, this is not always the case. Federal public policy tends to divide itself between domestic and international spheres, with the result that major normative developments on the international stage in areas such as human rights, poverty alleviation, or even sustainable development have traditionally had little influence on domestic approaches or have been seen as "big ideas" that have little momentum internally in terms of policy.

This schism is in large part the result of an anomaly in Canada whereby the process of ratifying and signing treaties and covenants – the major expression of the international law - is an executive power that does not automatically generate a formal requirement for debate before Parliament. Leaving aside democratic deficit, the result is that such obligations at the international level do not tend to generate effects in domestic (national) law, because legislation is generally needed to give full force and effect to the provisions of a treaty or covenant.[7] Many key international instruments, such as the *International Covenant on Economic, Social and Cultural Rights* (ICESCR) and the *Convention on the Rights of the Child,* have not yet been transformed into Canadian law.

Canada generally takes the position that this gap is not important, because legislation is not always required to fulfill an international commitment. The argument is that Canada's many social programs and policies can fill the gap. Indeed, the Canadian government frequently takes this position when it appears before international committees that oversee country compliance with international covenants. But adherence to international standards as a matter of government-wide policy-making is not, in fact, government policy.

In its guidelines to the federal public service, the Privy Council Office directs policy-makers to ensure "conformity" with international obligations in the law-making process, but as regards other instruments (say, guidelines, partnerships, programs, standards, etc.), policy-makers are simply encouraged to consider the "effects" of international obligations (PCO, 2001).

Indications are that this position is not sustainable. The twin forces of globalization and the post-9/11 environment have made complete separation of domestic and international policy spheres not only artificial, but also potentially dangerous. As well, the courts are starting to give norms from international instruments legal effect, even where the instrument is not transformed into Canadian law. The courts are increasingly holding governments accountable to the standards to which they have obligated themselves. This is most likely to occur when Canada's laws fall short of a standard contained in an international instrument and when the "gap" becomes the subject of litigation.

In the 1999 *Baker* decision, the Supreme Court of Canada dealt with a case of a mother who was to be deported from Canada. She sought to restrain the government from deporting her on the ground that her child, a Canadian citizen, had the right to live in Canada accompanied by a parent. There is no such right in Canadian law, but the *Convention on the Rights of the Child* supports such an interpretation. The Supreme Court of Canada held that "non-transformed" international principles (contained in international instruments that have not been enacted into Canadian law) can be used as a source of values, and that they must be taken into consideration by decision makers, even when the government takes a different view (*Baker v. Canada*).

A second area of influence from the international sphere is framework policy, such as sustainable development, which does not have the force of a covenant or treaty, but changes the way in which governments manage policy development.

Increasingly, sustainable development is viewed as a useful concept and a source of basic principles that have emerged at both the international and the domestic levels over the last two decades. These principles have been identified, refined and, in some instances, given legal force through case law and international instruments from the Brundtland Report, through the Rio Conference to the recent World Summit on Sustainable

Development. While some of them may not be new, their integration in a single policy framework that has international recognition brings a unique and forward-looking perspective for social policy. They include the overarching principle of integration and interrelationships in relation to human rights and social, economic, and environmental objectives, as well as equity and poverty eradication, precaution (in relation to human health as well as natural resources and ecosystems), sustainable use and "polluter pays," public participation and access to information and justice (ILA, 2002; CISDL, 2002).

Applied to the social field, sustainable development offers two insights of particular relevance that have begun to change the way we think about social policy: "First, is the importance of moving beyond a *curative* role for social policy, towards a greater focus on *prevention* and on the incentive structures of agents. Second, [is] the need to move away from the typical one problem/one instrument approach in the formulation of social interventions, towards greater *ex-ante* integration of social goals into other areas of policy making" (OECD, 2003).

The sustainability of institutions and social protection programs in Canada also depends on good governance as part of a forward-looking and adaptive system of social policy planning. Examples of how sustainable development approaches might support new directions include the introduction of new instruments such as "sustainability assessments" to ensure that social policy proposals are forward looking and "joined up" – reflecting the principle of integration as well as collaboration from all relevant government actors and civil society.

Conclusion

Canadian policy-makers can improve their effectiveness by taking a normative approach that sees the Charter, the courts and, increasingly, international law and related international developments as policy drivers with a critical impact on how policy is formed.

In particular, the changed relationship between courts and legislatures shows that developments in equality rights have been drivers of policy in certain areas, and that if policy does not integrate these developments, the courts will, in some circumstances, intervene to "reset" social policy. Social areas, such as health and education, tend to be especially vulnerable to challenge since they touch on basic issues, such as education and health.

A second set of developments comes from international law, which is increasingly a driver of policy, at two levels. The first is that the courts are more likely to use international law contained in signed and ratified instruments – even if it is not yet transformed into Canadian law – to inform their decisions. Second, international policy issues, such as sustainable development, have an increasing impact on how governments should manage the horizontal policy development process, including the recognition of principles that are developing legal force.

Normative approaches to policy provide us with a mirror on ourselves – about how our own country behaves, how other countries perceive us, and how others are likely to behave and interact.[8] In short, normative approaches provide a critical piece of the policy puzzle by identifying "the rules of the game" today, and the analysis of what the next set of rules is likely to be.

Commentary on "Normative Approaches to Policy Development"

Donald Lemaire, Justice Canada

The issues that Ms. Eliadis raises in her article invite us to think about the relationship between the law and government social policies and actions. These issues have been the focus of intense public debate in recent years. A great deal has been written on them since the *Canadian Charter of Rights and Freedoms* came into effect, and expressions such as government by judiciary, judicial activism, the rights society, and minority dictatorship have heated up the debate.

The repatriation of the Constitution in 1982 changed the rules of the game and established a system of constitutional sovereignty in Canada. This rule change is causing a corresponding shift in the way institutions in our system of government interact. The judicial, legislative, and executive arms are involved in a complex institutional dialogue in which each must exercise its jurisdictional autonomy according to new rules that challenge what this very process means.

Parliament's hegemony has not been completely eliminated. It still has the power to reaffirm its supremacy by putting a notwithstanding clause in the Constitution.

The courts had to adapt to this new reality very quickly. The judiciary's role in protecting minorities increased with the adoption of the Charter. By

definition, protecting minorities can sometimes mean not agreeing with majority opinion. As a result, the democratic deficit is associated with a perception of unrestrained judicial activism. Obviously, it is too simplistic to pin the democratic deficit on the role of the judiciary.

Constitutional sovereignty did not just give the judiciary a more pervasive role in the field of governance. The legislative and executive arms had to review their roles as well. Government action, whether executive or legislative, must take into account the normative framework that is part of our society's meta-legal structure.

The debate over judicial activism and the democratic deficit overshadows the role of other stakeholders in developing public policy. Perhaps the question we should be asking is whether public policy development is not also suffering a democratic deficit.

That is the opinion of Janet L. Hiebert of Queen's University, who suggests creating a parliamentary Charter committee. She puts forward the following case:

> By identifying serious Charter concerns and facilitating a more rigorous and conscious evaluation of legislation, greater pressure will be placed on government to explain, justify and, where warranted, amend or even withdraw legislation. This more systematic and rigorous scrutiny would provide a more transparent and accountable record of political debate, a desirable democratic objective in itself. However, judges would also benefit from a more full and transparent public record of debate that focuses directly on Charter issues, the considerations that have influenced legislative decisions, and the policy arguments about justification (IRPP, 1999: 36).

Aside from creating a parliamentary committee to handle these issues, as Ms. Hiebert suggests, the analytical process that underlies government policy development must be better defined.

Public policy development currently takes place within a normative framework composed expressly of agreements, legislation, and constitutional law. This framework is dynamic. It continues to evolve both nationally and internationally.

We must set out a clear rationale why public policy should respect this normative framework; in other words, link legal analysis and public policy development. Claiming that there is always a normative dimension to public policy development is no longer enough. It must be done expressly and according to principles identified in a meta-legal instrument such as the Charter, the Constitution, and other relevant documents.

For example, in my opinion, it is no longer possible to justify actions with regard to a specific group or the enforcement of certain obligations without raising the issue of exclusion. We must analyze government actions to see if the target population is defined broadly enough. The courts expect legislators to have conducted this analysis.

The difficulty arises when legislators try to justify the normative basis for their policies after the fact.

References

Case Law and Legislation

Baker v. Canada (Minister of Citizenship and Immigration), [1999] 2 S.C.R. 817, [1999] S.C.J. No. 39.

Canadian Charter of Rights and Freedoms, Part I of the *Constitution Act 1982* (U.K.), 1982, c. 11.

Constitution Act, 1867 (U.K.), 30 and 31 Victoria, c. 3, reprinted in R.S.C. 1985, App. II, No. 5.

Eldridge v. British Columbia (Attorney General), [1997] 3 S.C.R. 624.

Gwinner v. Alberta (Human Resources and Employment), (2002), 217. D.L.R. (4th) 341, 2002 ABQB 685 (C.A.).

Symes v. Canada, [1993], 4 S.C.R. 695.

Vancouver Society of Immigrant and Visible Minority Women v. M.N.R., [1999] 1 S.C.R. 10.

Authors and Reports

Canada, Department of Finance. nd. "A Brief History of the Canada Health and Social Transfer." <www.fin.gc.ca/FEDPROV/hise.html>. Accessed January 7, 2004.

Canada, Privy Council Office. 2001. "Choosing the Right Tools to Accomplish Policy Objectives." Chapter 1.1 in *Guide to Making Federal Acts and Regulations,* second edition. <http://www.pco-bcp.gc.ca/default.asp?page=publications&Language=E&doc=legislation/lmgcatalog_e.htm>. Accessed January 22, 2004.

Canada, Senate of, Standing Senate Committee on Human Rights. 2001. "Promises to Keep: Implementing Canada's Human Rights Obligations," December 2001. <http://www.parl.gc.ca/37/1/parlbus/commbus/senate/com-e/huma-e/rep-e/rep02dec01-e.htm>. Accessed January 22, 2004.

CISDL (Centre for International Sustainable Development Law). 2002. *Weaving the Rules for Our Common Future.* <http://www.cisdl.org/wtr/>. Accessed January 22, 2004.

Finnemore, M., and S.J. Toope. 2001. "Alternatives to 'Legalization': Richer Views of Law and Politics." *International Organization* 5(3).

Hogg, P. 1999. *Constitutional Law of Canada,* Toronto: Carswell.

ILA (International Law Association), ILA Committee on the Legal Aspects of Sustainable Development. 2002. *New Delhi Declaration on the Principles of International Sustainable Development Law.*

IRPP (Institute for Research on Public Policy).1999. *Choices* 5, no. 3 (June).

Macdonald, R. 2004 (forthcoming). "The Swiss Army Knife Of Governance." In *From Instrument Choice to Governance,* ed. Eliadis, Hill, and Howlett. Montréal and Kingston: McGill-Queen's University Press.

North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance.* Cambridge: Cambridge University Press.

OECD, General Secretariat. 2003. *Sustainable Development – Building Sustainable Societies: The Role of Social Protection.* Discussion Paper Doc. No. SG/SD(2003b)3.

Posner, Richard A. 2001. *Frontiers of Legal Theory.* Cambridge, MA: Harvard University Press.

Toope, S. 2001. "Inside and Out: The Stories of Domestic and International Law." *University of New Brunswick Law Journal* 50(11).

Notes

1 Richard A. Posner (2001) goes further and posits that norms are fundamental to law in a way that is not the case for more quantitative and descriptive disciplines.

2 The power over unemployment insurance, for example, was added to the federal jurisdiction in 1940. Authority for matters not otherwise prescribed lies with the federal government, whereas matters of a local and private nature are under provincial jurisdiction.

3 The creation of shared cost programs has been a prominent feature of co-operative federalism. Since the 1960s, major programs included the 1966 *Canada Assistance Plan* (R.S.C. 1985, c. C-1) and the 1977 *Established Programs Financing Plan,* covering income support, social services, health care, and education. These were replaced in 1996 by the Canada Health and Social Transfer (CHST) fund pursuant to the *Budget Implementation Act,* 1995, S.C. c. 17. There have since been several changes to the CHST fund, supplemented by additional programs and funds, such as the Equalization Fund, as part of the overall structure of major transfer programs. See generally, Hogg (1999). See also Department of Finance (nd). The federal government announced on February 5, 2003 new funding for health care that would include a Health Reform Fund.

4 *Constitution Act,* 1982, being Schedule B to the *Canada Act 1982* (U.K.), 1982, c.11.

5 *Symes v. Canada,* [1993], 4 S.C.R. 695, citing with approval Decary J.A., at 785.

6 See for example, *Vancouver Society of Immigrant and Visible Minority Women v. M.N.R.,* [1999] 1 S.C.R. 10. A detailed discussion of this case law is contained in the forthcoming research paper in the Poverty and Exclusion project of the Policy Research Initiative.

7 With respect to international human rights obligations, see the discussion in, for example, Senate (2001) and authorities cited.

8 On the role of law and the interrelationships with international relations and political science, see Finnemore and Toope (2001).

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February 2004

Exploring the Promise of Asset-Based Social Policies Synthesis Report

The report provides a synthesis of the key issues discussed at a conference held in December 2003. The participants at the conference learned from existing research, policy, and practice in the area of asset-building and low-income savings, and had a chance to assess critically the appropriateness, merit, and applicability of an asset–based approach to social policy in Canada.

January 2004

Genomics, Health and Society: Emerging Issues for Public Policy

Edited by Bartha Maria Knoppers and Charles Scriver, this new volume tackles critical issues that will need to be addressed for us to reap the potentially tremendous health and economic benefits that genomics promises, while managing the associated risks. Fourteen papers deal with a range of topics, including genetic medicine and privacy, issues of intellectual property, and implications for the developing world.

Evolving Urban Forest Concepts and Policies in Canada

Ken Farr
Natural Resources Canada

Nearly 80 percent of Canadians live in urban areas that comprise just 0.2 percent of Canada's total land mass. Though rarely considered a forested ecosystem, Canada's urban landscape is estimated to be 19 percent forest covered. As a forest resource, it contrasts markedly with Canada's natural forests, which are largely remote, largely unpopulated, spatially extensive, and publicly owned. In comparison, the urban forest is densely populated, spatially concentrated, and, for the most part (85 to 90 percent), privately owned.

Forest regulations in the urban forests of Canada, like those covering traditional forests, evolved in response to increased demands for effective, local, resource management. In the urban context, legislation respecting trees and forests had simple beginnings, concerned chiefly with the placement and care of individual trees along individual city streets. Keeping step with the complex issues and interactions created by dense human populations, urban forest regulation has expanded to encompass issues of insect and disease control and quarantine, wildfire protection and exclusion, pesticide use, priority use of parks and, increasingly, regulatory control of trees on private land. The emergence of integrated, ecosystem-based approaches to sustainable management in urban forests as well as natural ones, suggests that municipal-level forest policies will continue to increase in scope and complexity.

Evaluated as a simple landscape amenity, the monetary value of Canada's urban forest is impressive. Vancouver's 114,500 street trees have an assessed value, using standards of the International Society of Arboriculture, of over $500 million. The 103,000 boulevard trees and 142,000 park trees of Edmonton have an estimated replacement value in excess of $800 million. The value of the Toronto urban forest, based on an average value of $700 per tree set by the Council of Tree and Landscape Appraisers in 1992, is over $16 billion.

Additional to the urban forest's landscape amenity value however, is the sizable contribution urban forests make to the efficient operation of cities and towns. The importance of urban forests as green infrastructure is frequently overlooked and, as a result, undervalued. The capacity of forests in populated areas to limit energy use, improve air quality, reduce noise, increase water storage, maintain fragmented ecosystems, and positively affect the societal sense of well-being has generally been accepted in theory. However, it is only recently that accurate measurement of these functions has become possible, particularly through the application of advanced remote sensing and physiological monitoring.

Critically, the urban forest's contribution to societal well-being aligns directly with current provincial, national, and international science policy drivers. As with natural forests and plantations, the hot issues of sustainable development, biodiversity, carbon budgeting, and socio-economic stability can be directly tied to methods and approaches of urban resource management. In addition, the urban forest is frequently where invasive exotic species, plants, insects, and

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pathogens, arrive. Given this "tight fit" of urban forest issues with current science concerns and policy drivers, it seems inevitable that urban forest policy linkages beyond individual municipalities will soon begin to emerge.

At present, responsibility for planning, managing, and developing the urban forest in Canada continues to rest, almost exclusively, within municipalities. Individual cities, particularly those with populations sufficient to support in-house forestry capacity, have developed sophisticated, inventory-based approaches to the stewardship and maintenance of the urban resource. To date however, few instruments, policies, or laws dedicated to the coordination of a national or provincial view of Canadian urban forests have been developed.

In the United States, recognition of the value of national-level urban forest programs dates to at least 1978, with the drafting by Congress of the *Cooperative Forestry Assistance Act.* The Act specifically provided funds to promote the maintenance, expansion, and preservation of urban tree cover and to encourage research and the development of technical skills at local levels. The Urban and Community Forestry Assistance Program of 1990 increased aid to state foresters and non-profit organizations working to promote and expand urban forest parklands.

The European context is reflected in recent working papers and analyses of urban forest policies and concepts. A comparison of case studies involving urban forests in 16 European cities, indicated policies, based in urban-specific theory and practice, were required for effective planning. It was noted that while the rapid rate of development in urban areas demanded specific expertise and practices, these had, so far, not been developed in a structural way.

National coordination of operational urban forestry in Canada does take place, largely through the Tree Canada Foundation. With the support of the Canadian Forest Service and other sponsors, Tree Canada focuses attention on the importance of urban forestry. The federation of Canadian Municipalities endorses many Tree Canada programs, such as Green Streets Canada. To date, the Tree Canada Foundation has engaged more than 60 top Canadian companies and government agencies to support tree planting, greening of schoolyards, national urban forestry conferences, and efforts to inform Canadians as to the benefits of planting and maintaining trees.

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Participants at the Fifth Canadian Urban Forest Conference, held in Markham Ontario, in 2002, provided a detailed road map for a national urban forest policy in Canada. When asked to identify key initiatives that would be most important in effectively addressing challenges associated with Canada's urban forests, participants identified the need to promote application of cost/benefit analyses for urban forests, to examine taxation and incentive programs, to achieve parity with other infrastructure components of the urban fabric, to articulate a consistent vision for urban forests across the country, and to develop a fully funded national body to serve as a catalyst for research.

The most recent indication that a national urban forestry vision is evolving can be seen in the recently released *A Sustainable Forest: The Canadian Commitment.* Published by the National Forest Strategy Coalition, it identifies key priorities (determined through extensive cross-country consultations and public dialogue with the forest community), and provides overall direction for the stewardship and sustainable management of Canada's forests. Among the document's eight strategic themes is a commitment to "actively engage Canadians in sustaining the diversity of benefits underlying the importance of Canada's forest, including the urban forest."

The extent to which these initiatives come into being and provide tangible results could, in coming years, provide a useful yardstick with which to measure the momentum, and direction, of urban forest policy development in Canada.

Alien Invaders The Impact of Invasive Species

Throughout the 20th century, urban forests were the point of arrival for alien exotic diseases and insects. Many subsequently migrated into natural forests, radically altering the North American landscape as they went.

Chestnut blight fungus (*Cryphonectria parasitica*) was first observed in North America in 1904, on a tree growing at the Bronx Zoo in New York City. Thought to have been introduced on nursery stock from Asia, in less than half a century chestnut blight eliminated mature chestnut trees from the landscape, thereby removing almost one quarter of all trees growing in eastern North American hardwood stands. This included an estimated two million mature chestnuts in Ontario.

In 1945, a highly virulent strain of Dutch elm disease (*Ophiostoma ulmi*) was introduced at Sorel, Quebec. Subsequently, more than 600,000 elms were killed in Quebec, and 28,000 in the City of Toronto alone. At present, approximately 300,000 American elms with a total estimated value of over one billion dollars are at risk from Dutch elm disease in communities across Saskatchewan.

Initially collected in 1990, the brown spruce long-horned beetle (*Tetropium fuscum*) has been confirmed on at least 88 sites in the Halifax Regional Municipality and throughout Pleasant Point Park in Halifax, Nova Scotia. Native to Europe, it probably was introduced in wooden packing crates shipped to the nearby Port of Halifax. In its native range, the brown spruce long-horned beetle attacks dead or dying spruce trees. In Canada, it shows a preference for live, healthy trees. As establishment of this insect in North America would have a devastating effect on the forests and forest industries of Canada and the United States, hundreds of mature trees in Pleasant Point Park and environs have been removed.

The Emerald Ash Borer (*Agrilus planipennis*), an introduced Asiatic beetle, has been confirmed in the City of Windsor, Ontario, and four neighbouring municipalities. The ash trees this beetle attacks are a major component of natural and urban forests in eastern North America. They are also a major component of nursery stock sales in Ontario, valued at about $500 million annually.

In September 2003, an estimated 2,000 mature trees in Toronto were found to be infested by the Asian long-horned beetle (*Anoplophora glabripennis*). The long-horned Asian beetle drills large holes in healthy broadleaf trees, eventually killing them. Since 1996, several cities in the United States have battled infestations by this insect, requiring the destruction of thousands of trees. The United States Department of Agriculture estimates that, left unchecked, the Asian long-horned beetle and other introduced wood-boring insects could cause as much as $138 billion in damage to the US economy.

Further information on invasive species can be referenced in the Natural Resource Canada, Canadian Forest Service publication: *Alien Invaders in Canada's Waters, Wetlands, and Forests*. 2002.

Making Natural and Human Capital Part of the Economic Equation

David J. McGuinty
National Round Table on the Environment and the Economy

Canada must take better account of the full range of assets that will be necessary to sustain a healthy society and economy. These assets represent our nation's "capital," an economic term first used to designate entities, such as buildings and equipment, that assured future economic production. But other types of capital are also important to the future well-being of Canadians. These include natural capital (which provides space to live, raw materials to use and a clean and stable environment within which to function) and human capital (which enables us to make the most of our knowledge and abilities).

A chief goal of sustainable development requires that subsequent generations have at least equal or greater means and options – adequate capital of all types – to pursue their own goals. To promote this goal, economic decision-making needs to account for the full range of national capital.

This is what the National Round Table on the Environment and the Economy (NRTEE) wishes to accomplish through its work on indicators.[1] Through a multi-stakeholder process and by working with key partners, such as Environment Canada and Statistics Canada, the NRTEE created six credible and easy-to-understand capital indicators for Canada. We can only manage what we measure, and these indicators that complement traditional economic indicators, such as the gross domestic product, will track the impact of current economic practices on the natural and human assets needed by future generations of Canadians.

Recommendations

As well as its recommendation that these six indicators be published annually by Statistics Canada, and incorporated by the Department of Finance into federal budget statements, the NRTEE recommends that, in the longer term, the System of National Accounts (SNA) be expanded to include more details on previously untracked types of capital, such as natural and human capital. This linking of information on natural and human capital to the economic domain would be a logical extension of how the SNA already incorporates data on traditional capital assets, such as buildings and machinery, and would help Canadians have more informed and constructive debates on issues, such as climate change, where the environment and economy are inextricably linked.[2]

Such an expansion of the SNA would require more data on the environment than are currently available. For this reason, the NRTEE strongly recommends the continued implementation of the Canadian Information System on the Environment (CISE) which, once fully established, will be a great asset in the preparation of indicators and in the expansion of the SNA. In fact, Environment Canada was tasked in the 2000 federal budget with preparing an improved environmental information system for Canada. Since then, it has made considerable headway through the creation of CISE, a distributed network of environmental databases linked via the Internet. Environment Canada is seeking to turn CISE into an arm's length institute that would work with all levels of government and other stakeholders.

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Indicators

Most of the indicators recommended by the NRTEE focus on natural capital, which is a particularly important component of our national wealth. It supports economic activity, not only by providing the raw materials and land on which we reside and undertake economic activity, but also by providing the many ecological services that support life, including the cleansing of fouled air and water, and the provision of productive soil. The set of indicators also includes one indicator of human capital.

Air Quality

The amount of ground-level ozone (O_3) or smog Canadians are exposed to is creeping up – it's up three percent over the past 20 years – and scientists are finding that air pollution sickens and kills people at lower levels than previously thought.

Existing air quality indices are calculated by many jurisdictions, but they often measure the concentrations of multiple pollutants and compare them against set air quality guidelines, and may report a value for only the worst pollutant on any given day. They are not suited to the analysis of long-term air pollution trends.

The National Air Quality Trend Indicator is the first readily available Canadian measure of air quality that weighs exposure to a pollutant by population, factoring in the number of people exposed to low-level ozone and the ambient concentrations of ozone in different parts of the country.

Ground-level ozone was chosen for this indicator because of the availability of reliable data linking human health effects to specific concentrations of low-level ozone, and the existence of an extensive ambient concentration time series. In other words, the data existed.

The indicator is not perfect; it does not measure other pollutants, such as fine particulate matter ($PM_{2.5}$). However, Environment Canada and Health Canada are working on an improved health-risk air quality index, which will inform the methodology for eventual development of a trend indicator based on more than one pollutant.

Freshwater Quality

Unlike data collection for air quality, data on freshwater quality in Canada have not been linked into a cohesive and consistent national information system.

The Freshwater Quality Indicator would provide a national measure of the overall state of water quality as measured against major objectives for water use in Canada, such as water for drinking, recreation, aquatic life habitat, and agriculture.

A preliminary calculation of the indicator provides a first approximation for a national picture of ambient freshwater quality; in 2002, approximately 22 percent of monitored waterways in Canada were classified as marginal or poor.

This indicator is based on aggregated data from existing provincial-level water quality indices, most of which are calculated using the Canadian Council of Ministers of the Environment methodology. Since the national aggregation methodology is new, further work on national consistency (e.g., in data sampling, reporting, and assessment), a more extensive monitoring network, and a better aggregation methodology will be necessary.

In the long term, the indicator may be further developed to cover more substances, other media, such as sediments and biota, and groundwater.

Greenhouse Gas Emissions

Environment Canada has already developed this indicator to track Canada's total annual emissions of greenhouse gases, including CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. The indicator will report aggregate emissions of all these gases in megatonnes of CO_2 equivalent.

All these gases are linked to global climate change. While a credible indicator directly measuring the impacts of climate change would be ideal, the complex nature of climate change makes the development of such an indicator impossible right now. The proposed Greenhouse Gas Emissions Indicator provides a more indirect gauge of natural capital by measuring the demand placed on the atmosphere to accept greenhouse gases.

Because of obligations under the Kyoto Protocol, and the wide-ranging possible impacts of climate change on this country's economy, social well-being, and ecological systems, Canada needs to be able to measure precisely and track its own emissions and progress in helping address climate change.

Forest Cover

Forests represent one of Canada's most valuable natural resource assets, because of their production of wood and fibre, as well as their provision of wildlife habitat, recreational opportunities, and mechanisms to clean air and water, and sequester carbon. To track changes in Canada's forests, this indicator will use a combination of satellite remote-sensing data and

ground measurements to determine areas of land with a crown closure[3] greater than 10 percent, a well-accepted threshold the United Nations defines as constituting a forest.

The forest cover indicator represents a new use for existing satellite data, and will provide the only regularly updated national indicator of forest cover.

Currently, sufficient data to assess the extent of Canada's forest cover is only available for 1998. That year, Canada was 41 percent forested, with 392 million hectares of forested land out of a total land mass of 951 million hectares.

The NRTEE proposes the satellite data used to calculate the Forest Cover Indicator be verified against Canadian Forest Service field data and updated annually. The indicator may be refined in the future through higher resolution satellite data, perhaps allowing for the detection and measurement of different types of forest ecosystems and other important factors.

Extent of Wetlands

Wetlands filter and purify water, and store large quantities of carbon. They help control floods, reduce erosion, and protect shorelines. As well, they indirectly support a range of economic activities, such as fishing, farming, and recreational pursuits. Canada is the steward of a large proportion of the world's wetland areas.

Based on satellite remote-sensing data, this indicator will measure the extent of wetlands in Canada, as well as the change in this area over time. Because time-series data for all of Canada do not yet exist, this is the only indicator that cannot be calculated right now.

The development of a robust national indicator will take roughly two years.

Despite the current lack of data, this indicator has been recommended because of the importance of wetlands, which support substantial economic activity and are good proxies for the overall condition of our biodiversity.

Educational Attainment (Human Capital Indicator)

It has only been in recent decades, with the study of productivity, that the notion of human capital has come to the forefront of economics. As a result, there are no official estimates of human capital in Canada at this time.

Measures of educational attainment are the most commonly used proxies for human capital. As the only human capital indicator among the six, this indicator measures the percentage of the population between the ages of 25 and 64 who have upper-secondary (vocational or apprenticeship training) and tertiary-level (e.g., community college, CEGEP or university) educational qualifications. This measure increased from 43 percent in 1990 to 55 percent in 2000.

The indicator has limits; it does not, for example, provide information on the quality of human capital being accumulated or lost. But the indicator will reveal the investment trend in an important aspect of human capital – a well-educated workforce – and will help us understand our ability to compete in a global, knowledge-based economy.

Where We Go From Here

The federal Cabinet has already made a formal commitment to review these recommendations on indicators. Environment Canada and Statistics Canada are preparing a memorandum to Cabinet based on these recommendations.

The NRTEE's annual Greening of the Budget Submission, one of the key ways the Round Table meets its mandate of giving policy advice to the federal government on promoting sustainable development, will also incorporate indicator recommendations.

Developing measures of the real costs and benefits of economic activity is a long-term process, but adoption of these six indicators by the federal government would be a viable and immediate step in the right direction.

Notes

1 The mandate of the NRTEE, established in 1994, is to identify, explain, and promote, in all sectors of Canadian society and in all regions of Canada, principles and practices of sustainable development. As part of this mandate, the NRTEE advises federal decision-makers on policies related to issues that have both economic and environmental implications. For more information on the indicators and other environment and sustainable development issues, check out the NRTEE Web site at <www.nrtee-trnee.ca>. (Accessed January 21, 2003.)

2 These recommendations are the result of a three-year NRTEE initiative announced by the federal Minister of Finance in the 2000 spring budget, who observed that "current means of measuring progress are inadequate." Full results of the initiative are in *Environment and Sustainable Development Indicators for Canada,* the NRTEE State of the Debate released in May 2003.

3 Crown closure is the percentage of the ground surface that would be covered by a downward vertical projection of the foliage in the crowns of trees. Crown closure is 100 percent when the forest crown covers all the ground.

Early Child Development in Vancouver

Clyde Hertzman, Sidney A. McLean, Dafna Kohen, Jim Dunn, Terry Evans, and Jacqueline Smit-Alex

Editor's Note

As researchers working on the Policy Research Initiative's project on New Approaches for Addressing Poverty and Exclusion, we were initially surprised by the extent of income mobility in Canada across generations. We may have been overly influenced by American and British data that show more intergenerational transmission of poverty than found in Canada. Low-income adults in Canada come from families at all income levels. This article is of great interest in that it explores what actually happens. Threats to healthy childhood development are found across the entire socio-economic spectrum, although at increasing intensity as one goes from high- to low-income levels. While the highest risk is found in the poorest neighbourhoods in Vancouver, the largest number of children at risk is more thinly spread across the (larger) middle class neighbourhoods. Consistent with these findings is research that shows the importance to early childhood development of factors other than low incomes. Clearly, policy responses based solely on parents' income – or those targeted to poor neighbourhoods – are only one part of an overall strategy for tackling vulnerability in children.

Profound influences on early child development are found in the environments where children grow up, live, and learn. These environments, in turn, are strongly influenced by socio-economic, civic, and family conditions. In Canada, inequalities in child development emerge in a systematic fashion over the first five years of life, according to well-recognized factors: family income, parental education, parenting style, neighbourhood safety and cohesion, neighbourhood socio-economic character, and access to quality child care and developmental opportunities. Threats to healthy child development are found across the entire socio-economic spectrum, though at increasing intensity as one goes from high to low levels. Concern for a good start in life unites all families. Yet, despite general knowledge of the importance of healthy child development, until recently, we have had no way of monitoring how it unfolded in specific communities, or understanding how local circumstances could be changed to improve the life chances of children.

Human Resources Development Canada, Statistics Canada, and several academic research teams across the country have been working to fill this gap. Here, we summarize one such initiative: a population-based developmental assessment of kindergarten children in Vancouver, using the Early Development Instrument (EDI). Our work addressed neighbourhood differences in children's school readiness, socio-economic characteristics, neighbourhood climate, early health risks, detection, and intervention, child care, literacy, and parenting programs, and school performance. The neighbourhoods were characterized by their socio-demographic status, developmental risk circumstances, and de facto access to services and facilities meant to assist child development. What emerges is a comprehensive understanding of Vancouver as an environment for early child development, rich in insights as to what we, as a community, should address to improve the life chances of our youngest citizens. The insights from Vancouver are worth consideration in communities across the country.

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The other authors are all with the University of British Columbia's Human Early Learning Partnership. Clyde Hertzman is Director, Sidney A. McLean and Dafna Kohen are Research Associates, Terry Evans is a Research Assistant, and Jacqueline Smit-Alex is Managing Director.

The Early Development Instrument

The EDI measures readiness for school across five dimensions of development: cognitive and language, social, emotional, physical, and communication skills in English. It is a group level measure, developed by Dan Offord and Magdelena Janus at McMaster University, and is completed by kindergarten teachers after several months of classroom interaction. Although one is completed for each child, data are interpreted at the group level (i.e., school or neighbourhood) to help communities assess how well they are doing in supporting young children and their families. In February 2000, the EDI was completed by all kindergarten teachers in the Vancouver School Board on 3,921 children (97 percent of the children of kindergarten age in Vancouver).

In the full report[1], results were presented according to the child's residence in one of Vancouver's 23 social planning neighbourhoods. These were used because they represented, better than the school of attendance, the environments where children spend their early years. Here, we base our summary on the proportion of "vulnerable" children by neighbourhood. These are the children with low scores on one or more dimensions of the EDI and found to be less ready for school than their peers.

Summary of the Findings

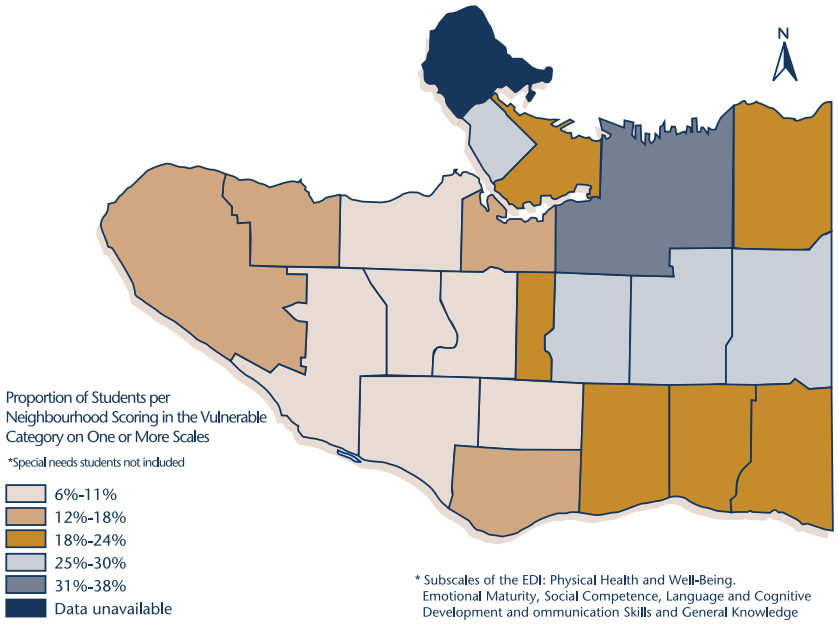
- Developmental vulnerability follows a gradient across Vancouver, such that, as one goes from most to least affluent neighbourhood, the proportion of vulnerable children on at least one dimension of the EDI rises from 6 percent to 38 percent (see accompanying map). This overall difference parallels neighbourhood differences on each individual scale. For the language and cognitive development scale, no children were identified as vulnerable in the lowest risk neighbourhood, while 21 percent of children in the highest risk neighbourhood fell into the vulnerable category. For physical health and well-being, the range was 0 to 22 percent; for social competence, the range was 1 to 17 percent; for emotional maturity, the range was 2 to 16 percent; and for communication skills in English and general knowledge, the range was 0 to 16 percent. As rates of vulnerability rise, so does the frequency of multiple vulnerabilities that cut across more than one dimension of the EDI. Although the highest risk is found in the poorest neighbourhoods, the largest number of children at risk is found more thinly spread across the middle class neighbourhoods that, taken as a whole, have a much larger number of young children than the poorest neighbourhoods. If the purpose of an early child development strategy is to increase resilience, decrease vulnerability, and reduce social inequality, then a strategy to provide universal access to the conditions that support healthy child development is needed. This may mean addressing issues in different ways in different neighbourhoods, but it does not mean focusing exclusively on the highest risk areas. Such a strategy would miss most of the vulnerable children in Vancouver.
- The urban environment can make an important difference for child development. Like most major Canadian cities, Vancouver's neighbourhoods are gradually becoming more economically stratified. Families with young children (ages 0 to 5) are concentrated in the areas of the city closest to commercial districts and transportation zones, rather than in neighborhoods designed for child rearing – largely due to housing affordability, zoning, and vacancy rates. Also, the majority of non-market housing for families in Vancouver has been built in existing low socio-economic areas - increasing the level of segregation. These are the neighbourhoods at highest developmental risk. However, Vancouver is also a showpiece for urban forms that support early child development. In two neighbourhoods where middle class and non-market housing have been carefully mixed together, developmental outcomes are better for all children. It would seem that children whose family backgrounds put them at risk, but who live in mixed-income neighborhoods, tend to be protected compared to their counterparts in low socio-economic segregated neighbourhoods. In other words, mixed neighbourhoods lead to lower levels of developmental vulnerability than economically segregated neighbourhoods.

Focusing exclusively on the highest risk areas would miss most of the vulnerable children in Vancouver.

- Although Vancouver has a rich variety of child-care centres and child development programs, funding levels are low, and programs are unstable. Neighbourhood accessibility varies, capacities and population coverage are often impossible to determine, and the mix of programs is ad hoc. For instance, there is a tenfold difference in neighbourhood child-care accessibility rates across Vancouver (from 0.89 slots per child to 0.09 slots per child). Ironically, the least-served neighbourhoods are found in the working class areas of the east side, where child care accessibility would likely have the greatest developmental benefit. Current spending in Vancouver on all child-care and development programs for the 0 to 5 age range appears to be less than one fifth what it is on public education starting at age 6.
- One of our most consistent findings is the role of "non-financial barriers to access" to programs and services that might assist child development. These barriers are clearly more significant in lower socio-economic neighbourhoods. As one goes down the socio-economic spectrum, the data reveal that many developmental issues are not identified and addressed until later in childhood. Yet, when it comes to child development, the earlier a problem is identified and addressed, the better for prevention. We do not have a thorough understanding of these barriers, although from ad hoc and indirect sources, the following factors seem to be at issue:

FIGURE 1

Vancouver –
Proportion of students living in each neighbourhood that scored in the vulnerable category on one or more scales



varying levels of parental knowledge and understanding of early child development, work-life and home-life time conflicts that make it hard to access services and programs at the times they are offered, transportation and local access constraints, and language barriers and feelings of illegitimacy in the face of middle class professionals. At the same time, several outreach programs in Vancouver, including the local Canada Prenatal Nutrition Program (Healthiest Babies Possible) show that non-financial barriers to access can be broken down, and developmental disadvantages overcome, through strategic program design and execution.

- At present, schools are society's principal child development agencies. However, school mandates do not start at birth and the notion of education is often interpreted much more narrowly than development. In Vancouver, we have shown that as much as 60 percent of the between-school variation in basic competency tests at Grade 4 can be explained by a combination of kindergarten vulnerability rates, using the EDI and the socio-economic status of the catchment area of the school. The proportion of children who, on entering school, are vulnerable on one or more dimension of develop-

ment is a powerful determinant of a school's success in assisting children to achieve their basic academic competencies.

- Creating the conditions for healthy child development will require a profound degree of inter-sectoral collaboration. The programs, services, and environmental influences on children's development involve federal, provincial, and municipal governments as well as philanthropies, businesses, neighbourhoods, and families. Some factors, such as how the housing market affects the neighbourhoods that children grow up in, are rarely thought about in this context. Decisions made in one sector can have a profound influence on the effectiveness of other sectors in assisting in child development. For instance, when regional health authorities decide to eliminate kindergarten screening for hearing, vision, and dental problems, they may do so on the understanding that such services are not central to their mandate of patient care. However, the repercussions for the school system, and for the long-term health, well-being, and competence of the children affected, may be significant.

References for this article can be found in the version that is posted on the PRI website at <www.policyresearch.gc.ca>.

Note

1 The complete report, with 55 colour maps and graphics, can be downloaded from <www.earlylearning.ubc.ca>. (Accessed January 23, 2004.) For those who cannot download colour maps, a hard copy of the report can be obtained by e-mailing: earlylearning@ubc.ca.

Stopping Urban Sprawl

"Sprawling communities are a major contributor to climate change and air pollution, in part because they require so much automotive transportation, which is heavily dependent on energy consumption from fossil fuels, the biggest source of greenhouse gases. In addition to burning gasoline, sprawling communities have to pump water in and waste out over long distances, deliver natural gas and electricity over long distribution networks, and provide solid waste, recycling pick-up and other services over a much wider area. Each of these services uses more energy and therefore produces more greenhouse gases than providing similar services to denser communities.

Population growth and greater wealth do not have to be based on an environment of parking lots, traffic and pollution. Instead we need to create 21st century cities that are liveable, prosperous and in harmony with nature."

From "Understanding Urban Sprawl: A Citizen's Guide" Available at <http://www.davidsuzuki.org/ Climate_Change/Sprawl.asp>. (Accessed January 22, 2004.)

Leaders and Laggards

Next Generation Environmental Regulation

Neil Gunningham and Darren Sinclair
(GreenLeaf Publishing, 2002)

Reviewed by
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Command-and-control regulation has long been the dominant policy instrument for environmental protection, despite the adversarial climate it creates and the expense of monitoring and enforcement. In some situations, such as is the case with many industries dominated by small companies, this style of regulation is inadequate. This is in part due to the prohibitive cost of sufficient monitoring and enforcement needed to form a credible threat to recalcitrant companies, and partly because traditional regulation only sets a bar to be passed, with no rewards for those who would go beyond the minimum.

Leaders and Laggards focuses on innovative instruments to supplement our environmental policy tool kit.[1] The book is laid out in two parts. The first explores the rapidly expanding range of alternative solutions available for encouraging environmentally sound practices in small- and medium-sized enterprises (SMEs). The second looks at the same ground in the very different context of large corporations. In each case, selected case studies follow a general discussion and survey of alternative environmental protection strategies. The generalist will be most interested in the overviews of instruments provided in chapters 2 (SMEs) and 6 (large companies). The various detailed Australian case studies (auto body repair, refrigeration and air conditioning, vegetable growers, the mining sector, and Victoria's experience with environmental improvement plans and community liaison committees) also offer interesting insights into how government can involve industry associations and individual large companies in coping with environmental challenges.

The SME context is characterized by a large number of small companies, such that effective monitoring and therefore a credible threat of enforcement are all but impossible. Small- and medium-sized companies represent more than 90 percent of all enterprises in Organization for Economic Cooperation and Development (OECD) economies, and account for approximately 70 percent of all pollution in the United Kingdom. Many SMEs operate at the margins of profitability, and view environmental protection as an added financial burden they cannot afford. While there may be some win-win solutions for SMEs, they often require an investment in processes, equipment, or expertise that many are ill-equipped to make, through lack of specialized knowledge or available capital. These characteristics make environmental regulation of SMEs particularly challenging from a public policy perspective.

Prominent among the approaches to SMEs discussed by the authors are various forms of third-party compliance verification (regulatory surrogates). As the term implies, regulatory surrogates are non-governmental actors that can play a state-like role in monitoring SMEs and encouraging actions toward environmental sustainability. The authors present this approach as a means to attain the effectiveness of state regulation, without overstretching state resources.

One version of such regulatory oversight is to require environmental audits or self-inspection, verified by accountants. These instruments encourage internal responsibility, but require the dissemination of information on risk and environmental management, and are best used where there is a strong industry association

to assist in industry education efforts. The creation of win-win solutions, whereby the implementation of the measures reduces company costs, enhances the uptake and the benefits of this approach. The approach was adopted in Australia to control the use of solvents in the auto body repair industry, by having commercial users of solvents submit a report on their waste management plan to the regulatory agency. To encourage industry actors to submit truthful reports, the regulator mitigates the penalties for violations in cases where the company acts in good faith and makes efforts to achieve regulatory compliance.

A second possibility is to apply pressure from suppliers or clients, as in the case of an Ontario auto body repair association arrangement with the insurance industry. This arrangement makes insurance coverage conditional on the individual repair shop honouring the association's code of conduct. Another type of third-party oversight is directly through an industry association, whereby government can offer incentives for companies to join an industry code of conduct supervised by an industry association. Such incentives can range from training opportunities to participation in a recognized green logo type of program.

In their approach to large companies, Gunningham and Sinclair focus on new forms of co-regulation or participatory frameworks that can provide an alternative to command and control regimes. They view the current regulatory context as suffering from regulatory overload, and the law as a blunt instrument, which cannot always be shaped to fit the complexity of environmental problems. They explore various forms of industry-government-civil society partnerships as an alternative to command-and-control regulation for large companies.

Whereas providing information to companies works in the SME context, a different type of informational tool is suggested to control the behaviours of large enterprises: the "shaming" of polluters through the public release of information. Large corporations are more likely than small companies to respond to threats to their public image, as they are more aware of the need for a social licence to operate, and are more likely to be targets of organized environmental campaigns. Providing environmental non-government organizations and community groups with information about the environmental records and future plans of large companies forces the companies to take into account the reactions of these groups at the planning stage, when it is least expensive to mitigate environmental impacts. At the extreme, companies involve community liaison committees to ensure future developments will not impair their local social licence to operate.

Another strategy uses negotiated agreements that set consensually identified goals. Three variants can be identified. The first sets goals that are not legally binding, and for which success can only be measured if clear deadlines, reporting methods, and public participation are guaranteed. A second type is the legally binding bilateral agreement used in the United States in which the state offers regulatory flexibility in exchange for beyond-compliance performance. A third type is the Dutch covenant where each plant must sign an agreement specifying environmental goals and the means through which they will be attained. The agreements are enforced by tougher permit requirements for non-compliant plants. The record of negotiated agreements is mixed, and their success clearly depends on the specific context.

Various voluntary and co-regulatory measures are discussed, but there is an underlying recognition that they are rarely purely voluntary. Most often, there is an external threat (such as a likelihood of a new and highly restrictive government regulation), which goads the industry into action. Companies voluntarily act in a manner of their own choosing, before the choices are made for them. Nevertheless, this is an important approach, as it does allow them to become compliant in the most cost-effective manner.

Overall, this book presents the first comprehensive review of these types of alternative policy instruments for environmental protection. There is a strong focus on Australian examples (all the major case studies are from the state of Victoria), but the review chapters range widely, from Australia to Europe, Asia, and North America. While not comprehensive, it provides an excellent overview of current trends in environmental policy instruments. Gunningham and Sinclair largely ignore more traditional policy instruments (such as taxation or an inspection-and-fines system) in this book, but do recognize their value as part of the regulatory tool kit. They clearly favour using an array of approaches, selected to match the array of issues and circumstances at hand.

Note

1 For related material, see the article by F. Maged in this issue of *Horizons*.

A Question of Trust

Onora O'Neill
(Cambridge University Press, 2002)

Reviewed by
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Delivered as the BBC Reith Lectures in 2002, *A Question of Trust* examines the status of trust in contemporary societies. Philosopher, Principal of Newnham College at Cambridge University, Baroness of Bengarve, and a cross-bencher in the House of Lords, O'Neill explores the emergence of a culture of suspicion, the causes and consequences of breakdowns in social trust, and the role of the news media in undermining conditions for trust.

Trust, O'Neill argues, is a precondition of stable, relatively peaceful social orders, and an integral element of psychological life and interpersonal interaction. To ride subways and trains, drive in a car on busy freeways, eat in restaurants, and buy food at grocery stores requires trust in other individuals and complex technological systems. Breakdowns in trust can be devastating, as when water treatment facilities prove to be improperly monitored, vehicles are sold with known defects, or police forces and judicial systems lose all credibility in the eyes of citizens. We need to be able to trust others around us. When this trust proves to be misplaced our sense of security and our capacity to rely on others is severely compromised. Once broken, trusting relations are not easily repaired. As O'Neill observes, the social capital acquired through building trust and a reputation for reliability, honesty, and fair dealings is not a resource to be casually squandered.

According to O'Neill, many contemporary social commentators argue that we are experiencing a crisis of trust. She notes that various polls indicate declining levels of trust in business and religious leaders, public authorities, health care providers and organizations, scientists, and members of the news media. Challenging these findings, O'Neill argues that the polls fail to capture the complexity of current attitudes toward various institutions and authorities. Individuals continue to rely on various professionals, and they interact with them in a trusting manner all the while exhibiting a culture of suspicion. When asked, we express our incapacity to trust authorities and agencies. In practice, we continue to rely on the services of physicians, nurses, airline pilots, medical researchers, engineers, and many other professionals and tradespersons. O'Neill suggests that contemporary societies are experiencing less a crisis in trust than a rise in public scepticism toward most agencies and authorities.

"Transparency" and detailed regulations, guidelines, and best practice standards are often promoted as mechanisms for promoting public trust. However, O'Neill argues that the mantra of transparency and the rise of an audit culture that carefully documents and monitors practices within organizations are unlikely to promote trusting relations. The emphasis on transparency means that a plethora of information is now available to the interested citizen. Committee minutes, institutional mission statements, professional codes of conduct, quarterly and annual reports, institutional report cards and organizational rankings, and publicly accessible financial reports all serve to increase transparency and make organizations accountable to the interested person.

While transparency is often touted as a mechanism for building trust, O'Neill argues that transparency and auditing mechanisms can generate their own modes of deception. Full disclosure of all organizational documents can make managers and staff

members reluctant to discuss decisions and practices with candour. A bland "corporate speak" can come to dominate organizational communiqués. Auditing systems, report cards, and performance measures can lead organizations to engage in dubious practices. Meeting the core obligations of organizations and professionals can be supplanted by pressures to achieve reportable, measurable performance indicators. Achieving high marks on performance indicators can replace the fulfillment of genuine responsibilities.

Educational institutions, for example, can begin to focus more on test results and objective measures than on ensuring that students are genuinely learning meaningful, important subject matter. Slavish devotion to benchmarks and other performance indicators can generate hypocrisy and deception. Even where professionals are forthright in their dealings, enormous effort is expended completing paperwork and satisfying bureaucratic requirements, rather than providing professional services, such as seeing patients and treating illnesses and injuries. O'Neill argues that better substantive evaluation by capable reviewers would often be more effective than meeting the crude standards of various performance indicators. She argues that we should worry less about transparency and focus on eliminating deception. She emphasizes the importance of fulfilling meaningful professional and institutional obligations.

Sharply critical of the role of auditing mechanisms in promoting social trust, O'Neill is equally critical of the news media. While O'Neill recognizes the effective role of the news media in challenging dubious corporate and governmental practices, she notes that journalists are among those professionals viewed as least trustworthy in social surveys. She suggests that we live in a culture of suspicion, because citizens are uncertain about the trustworthiness of news media commentary. Outstanding examples of critical investigative journalism are commonly intermixed with instances of sloppy reporting, failure to identify sources or to use reliable sources, inaccurate headlines, the blurring of careful analysis with partisan agendas, the silencing or neglect of important voices, and the destruction of the reputation of individuals deserving much better treatment.

Scepticism, suspicion, a loss of trust – call the phenomenon what you will – might reflect a certain maturity and practical wisdom.

O'Neill suggests that in contemporary societies, access to information is rarely a problem. Rather, the true challenge is access to meaningful, reliable information. Too often, O'Neill argues, the integrity of journalism is deeply compromised by financial and other forms of conflict of interest. Sensationalistic modes of journalism – journalism as entertainment and spectacle – leaves citizens sceptical of institutions and public authorities, yet ultimately uncertain about whether or not they should trust social organizations and public figures. A culture of suspicion emerges in which individuals are reluctant to extend trust, yet must have some trust in individuals and organizations if they are to navigate the world they inhabit. O'Neill argues that freedom of the press comes with responsibilities. Journalists should be held to high standards if their reporting is to play a meaningful role in informing the decisions of citizens.

While O'Neill is correct to note the challenges of determining what constitutes reliable, trustworthy knowledge in social settings where competing politicians, scientists, political leaders, and other authorities often draw on competing bodies of evidence and discrepant forms of expert testimony, her critique of journalistic practices misses an important point about declining levels of trust in institutions and authorities. Though journalists sometimes deserve to be criticized for scapegoating public figures, exaggerating the inadequacies of institutions, and drawing on unreliable sources of evidence and testimony, the increase in public scepticism toward institutions and authorities may not be a product of "gotcha" journalism and sensationalistic reporting. Rather, declining levels of public trust and increases in scepticism toward agencies and authorities may be connected to particular, specific incidents that deeply compromised the integrity of various organizations and professions.

Abuses of research subjects throughout the 20th century raised serious, troubling questions about the integrity of medical researchers and the adequacy of professional guidelines and regulatory standards. Richard Nixon's lies and scandals involving numerous other political figures and government agencies raised legitimate questions about the integrity of government organizations in the United States. The Vietnam War raised legitimate questions about the integrity of the US military, the Central Intelligence Agency, and the Pentagon. Episodes from the Ford Pinto debacle to the Enron meltdown generated profound

questions about the trustworthiness of corporations and senior business executives. Cover-ups by prominent religious authorities of sexual abuse by members of their organizations raised disturbing questions about the moral integrity of religious leaders.

O'Neill argues that we have always had untrustworthy individuals and organizations within societies, and that we should not presume a decline in levels of trust because of individual episodes of unethical or illegal conduct. However, in making this claim, O'Neill misses an important point – one that testifies to the profoundly important role of reliable investigative journalism. O'Neill suggests there is little reason to conclude that levels of trust are in decline. Rather, levels of suspicion have increased while individuals continue to exhibit trust in physicians, scientists, engineers, and other figures.

It may be argued, though, that levels of trust vis-à-vis many professions and social institutions have indeed declined. The point is not that social authorities and organizations have become increasingly untrustworthy. Such a claim would require detailed historical analysis of a host of organizations. Rather, it can be suggested that trust in social institutions and public authorities has often been misplaced. Government authorities, corporate leaders, military officers, professionals of various sorts have often advanced their own interests with little regard to the concerns of the common good or vulnerable citizens. What has changed is the emergence of modes of investigative journalism and other forms of social criticism that do not serve as mouthpieces for the military, government, corporate interests, and other powerful social institutions. Furthermore, a citizenry has emerged that does not automatically assume that government, the military, or corporations will always act with the best interests of citizens and communities in mind.

Declining levels of trust are often described in nostalgic terms as a great loss. The assumption is that it would be a considerable gain if we could return to prior levels of trust in professionals and social institutions. An alternative interpretation is that increasing levels of trust across the board – indiscriminate of particular situations and actions by organizations and individuals – would reflect rising levels of credulousness. In short, scepticism, suspicion, a loss of trust – call the phenomenon what you will – might reflect a certain maturity and practical wisdom.

As O'Neill and countless sociologists observe, trust is an integral element of social life. A complete breakdown in all trusting relations would constitute an unmitigated social, psychological, and institutional disaster. Full trust in every claim made by political, spiritual, medical, scientific, military, and business authorities would constitute a disaster of a different sort. A work of general social commentary rather than detailed case-by-case social analysis, *A Question of Trust* leaves unexplored the question of how to weigh evidence, sift the credibility of information, and assess the claims of various experts in particular circumstances. More fine-grained analysis of particular social institutions in specific historical contexts might provide practical insight into the circumstances when trust should be extended, withheld, or withdrawn. O'Neill acknowledges the integral role of trust in promoting democratic social orders. Scepticism, too, is an important part of life in democratic societies.

Towards Evidence-Based Policy for Canadian Education

Patrice de Broucker and Arthur Sweetman, eds. 2001.
Montréal and Kingston: McGill-Queen's University Press.

Reviewed by
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The de Broucker and Sweetman volume *Towards Evidence-Based Policy for Canadian Education* describes and assesses the use of evidence-based policy in Canada from perspectives drawn from different disciplines, researchers, and policy-makers within the field of education. Rich case study examples accompany these analyses. The volume is a valuable source for policy analysts, researchers, and decision makers, particularly within education policy.

The nature of governance and policy-making in Western societies has undergone a number of shifts and trends that, particularly since the 1990s, have influenced how policy and programs are designed and assessed. In the new paradigm of governance referred to by Gilles Paquet as horizontal, distributed governance (1999), power is dispersed among a large number of actors, including the civic, public, and private sectors, and governments.[1] Public opinion surveys reveal an increasingly less deferential public that demands more open and transparent governance, and greater accountability for public policy and programs.[2] The increased use of evidence-based policy has occurred within the new governance context.

Rather than the traditional focus on program performance that assesses curriculum and student performance,[3] de Broucker and Sweetman argue that evidence-based policy focuses on long-term, broad impacts and outcomes, rather than outputs.[4] The introductory comments to the volume pose questions that relate to broad educational experiences and outcomes, including the effect of educational programs on individuals in terms of fostering long-term skill acquisition and improving their labour market outcomes. For example, Benjamin Levin asks in the first chapter in the volume: What is the relationship between social science evidence and practice in education? How does evidence-based policy and research influence policy-making?

Given the particular relevance of evidence-based policy and research, its use, and its influence on the policy process, this review looks at the first four chapters that specifically focus on these issues, the fourth chapter case study, and the final reflections at the end of the volume. What is particularly relevant for education policy analysts and researchers within and outside of government is whether evidence-based policy processes and research can deliver on their promise of providing more effective analyses that demonstrate public policy outcomes.

Benjamin Levin provides a very valuable contribution to the volume in his chapter on "Knowledge and Action in Educational Policy and Politics," which examines the relationship between research and policy action. Levin points out that certain views claim that evidence-based research has had a disappointing record and a lack of impact on public policy. He argues that this finding is often based on a misunderstanding of the political process.

Policy-making processes are complex given pressures on governments, including the pressures and time constraints in office, effects of lobbying, crises and changes, influence of the opposition party, focus on re-election, and different approaches toward using research. These pressures influence and sometimes derail evidence-based research from becoming government policy. Levin makes the important

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point that *beliefs are more important than facts*. Beliefs and stories shape facts, placing limits on the ability of evidence (given the complexities of assessing outcomes) to shape policy.

Levin's conclusions are that researchers and policy-makers engaged in evidence-based policy must take a long-term perspective, as ideas take time to percolate through the political process. He makes the distinction between research dissemination and impact, arguing that research *impact* is based on learning. The task of researchers is to make sure empirical evidence and careful thinking inform public learning. Researchers must also make use of numerous communication vehicles to reach diverse audiences in an attempt to foster public learning.

Other contributions to the volume also offer valuable insights on evidence-based policy. Lorna Earl in "Data, Data Everywhere (and we don't know what to do): Using Data for Wise Decisions in Schools" examines the new pressures and requirements by school managers and administrators to use evidence-based reporting to show program performance and accountability. This process, however, is often not accompanied by support and guidance for doing this type of performance assessment. She argues that school administrations require support to identify, interpret, and analyze data and to understand the requirements, methodologies, strengths, and challenges of this type of reporting. She advocates using data wisely, and linking data to convincing arguments. Data and performance measurement, without a relevant focus based on logical causal arguments, is not very useful.

Harvey Weiner, in his appraisal of Earl, supports her arguments by claiming that there may be a tendency to use the data that are available and ready to use in school performance assessments, even though these data may not be relevant. He underscores the importance of a shared and coherent articulation to school administrators as to the data to collect and use, so decision making is informed for the benefit of education.

Certain views claim that evidence-based research has had a disappointing record and a lack of impact on public policy. This finding is often based on a misunderstanding of the political process.

Victor Glickman, in "Do Education Systems Count? The Role of Administrative and Assessment Data" echoes Levin by referring to *empirical story telling,* arguing that data are of no value unless linked to an evidence-based story that has meaning for those who will act on it. The effective use of data, he claims, requires fostering a performance management culture and tools that improve student achievement. In appraising Glickman's chapter, however, Penny Milton argues that evidence-based policy must be clearly linked to objectives. Are we interested in data on "average" student performance and achievement, or are we interested in educational policy as social policy with an aim of benefiting low socio-economic status students? Which educational outcomes are we concerned about, and for whom? Milton rightly points out that evidence-based performance and program assessment should be tied to clear policy objectives, or what she calls a *framework for performance management.* Otherwise, schools will not be held at all responsible for the outcomes of particular individuals or groups. The data we choose to measure reflect program goals.

Finally, Warburton and Warburton, in "Should the Government Sponsor Training for the Disadvantaged?," provide an innovative and interesting case study that demonstrates an effective use of evidence-based techniques to estimate the impact of training programs. This case study, appraised by Judith Wright, is regarded as both valuable and rare. Warburton and Warburton provide a number of common errors that might plague program assessment, and demonstrate a creative experimental design for assessing government training programs that avoids many of the common pitfalls in evidence-based analysis.

Judith Wright concludes the volume by claiming that the type of discussion in the volume relating to evidence-based policy should be extended to school boards, schools and teachers; a focused agenda for analyzing assessment data should be developed; and a wide range of perspectives to the discussion of a research agenda should be discussed.

This volume is a valuable contribution to a growing area of policy analysis

and research. It tackles many of the benefits of evidence-based policy, while also pointing to its limitations and challenges. The important point is that this type of analysis requires discussion, strategies, and support for those who have not been required to undertake it in the past. As Earl argues, this type of analysis requires wise interpretation of data and an awareness of the strengths and weaknesses. Or, as Levin states, the use of evidence-based policy needs to be informed by empirical evidence, careful thinking, and logical stories (i.e., arguments).

Caution is required in placing too much faith in evidence-based policy and program assessment. It is not a simple case of obtaining the "right facts" for assessing policy. Policy occurs within a politically mediated context, and policy and program goals are based on the articulation of the pre-existing political and policy paradigm. Further, as Levin argues, beliefs shape facts. The selection of data and facts for examination reflect the beliefs of the researcher, policy analyst, or decision maker. Facts can tell a variety of stories from a variety of angles.

Notably, the chapters reviewed do not discuss policy areas where it is extremely difficult to obtain data, particularly when launching a new or novel program. The risk of evidence-based policy is that it may be somewhat conservative at the policy formation stage. It may also risk the phenomenon of the "tail wagging the dog." Evidence, in this case, does not shape policy but rather, policy choice can be rationalized by use of certain evidence or data. Data are screened in if they support beliefs about the policy or program.

It can be argued that the use of evidence-based policy is a useful methodology for assessing program impact that should often be used in combination with other methods. Other methods can supplement or at times replace evidence-based policy. This could include traditional survey analysis and program evaluation, focus group feedback, public engagement, literature reviews, audits, and other methodologies as deemed appropriate.

Despite some of its limitations, evidence-based policy offers a positive prospect for improved policy and program formation and assessment aimed at improving accountability to the public for programs funded by the public purse. Given the promise and current practice of evidence-based policy in Canada, the de Broucker and Sweetman volume is strongly recommended. Evidence-based policy is valuable when used with a certain degree of knowledge and experience but it will also have, similar to other methodologies, limitations and challenges.

Reference

Paquet, Gilles. 1999. "Tectonic Changes in Canadian Governance." *In How Ottawa Spends 1999-2000: Shape Shifting: Canadian Governance Toward the 21st Century,* ed., Leslie Pal. Don Mills: Oxford University Press.

Notes

1 The new (western) model of governance, as opposed to the prior model that focused on *what governments do,* is not a complete, comprehensive, and fully developed model, but rather, a description of governance adhered to by a significant proportion of researchers and analysts.

2 Note that a number of public opinion polls have observed the decline in the trust of citizens of their governments, and demands for increased accountability measures. EKOS Research Associates conducted a number of these polls during the mid-1990s, in their series on governance.

3 Traditional student performance and achievement data include such measures as post-secondary education attainment rates, participation rates, and take-up data.

4 Policy outputs normally refer to changes or products that are directly attributable to the policy action. An output might be an increase in the number of students attending a particular educational institute as a result of a policy in which tuition is waived for a certain group, or grants are dispersed to low-income students. A policy outcome is usually a longer term policy impact linked to policy goals, such as increasing the labour participation rates of a particular group that has received support for acquiring higher education and/or particular skills.

Designing Protected Areas – Wild Places for Wild Life

September 9–11, 2003
Yellowknife, Northwest Territories

Ruth Waldick
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Despite the severity of the climate in the lands north of 60º, the environment is extremely sensitive to external stresses, such as pollution and climate change. This reality has shaped environmental strategies in the north, and has contributed to the development of policies of international significance, such as the restriction and banning of persistent organic pollutants. Both the sensitivity of the biota in the north, and the high reliance of many northern residents on species, such as caribou, fish, and berries as sources of food, creates a situation in northern Canada that is quite unlike any faced in more southern regions of the country. As a result, sustainable development and conservation policies in the north are heavily influenced by both science and social factors, and planning tends to be highly integrative, involving a wide range of stakeholders.

Held by the Canadian Council on Ecological Areas (CCEA), the conference, Designing Protected Areas - Wild Places for Wild Life, addressed these issues.[1] Focusing on science-based approaches to reducing the environmental risks associated with large-scale industrial development, the conference explored the need to encourage and promote sustainable use of natural resources for the benefit of northern residents. The conference drew a surprisingly large number of people from a wide variety of stakeholder groups, including local communities, Aboriginal communities from across the territories, environmental non-government organizations, governments, scientists, and various industries.

The first two days focused on science-based policy recommendations and examples of sustainable landscape management programs in northern Canada. During the remainder of the conference, breakout groups discussed policy directions for protected areas. During the presentations, it was apparent that a high degree of coordination and cooperation exists among the various interest groups in northern Canada, particularly with regard to sustainable development. Scientific presentations focused on two main issues: the conservation of species of importance to northern communities, such as caribou and fish, and the identification and use of appropriate species as indicators of ecosystem health. Several species were identified as being especially important, either for economic reasons, or due to their sensitivity to disturbance, including wetland species, lichens, caribou, and bears. The emphasis of much of the discussion was on strategies for reducing the conflict between large-scale development projects, such as the McKenzie pipeline, and the protection of species (and their habitat) of economic and cultural value to northern communities.

Caribou were a particular focus, partly because they contribute substantially to the economy, and partly because, biologically, they present an unusual management challenge. The main problem in protecting the integrity of caribou habitat is that there are no single areas on which caribou rely. In fact, not only do caribou move across large ranges during the course of any year, but their pattern of use changes unpredictably from one year to the

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next. As a result, fixed conservation areas will not ensure the long-term persistence of caribou. While this unpredictability makes caribou conservation difficult, it has promoted an integrative approach to landscape management. Innovative policy recommendations are evolving through collaborative initiatives between industry, community members, and biologists, including, for example, the idea of introducing a more flexible form of habitat protection that moves with the population.

One of the most impressive examples of an integrative landscape management initiative was that of the Muskwa-Kechika management area, which was created through a consensual agreement reached by all interest groups in a 63,000 km^2 area of northeastern British Columbia.[2] Gas and mineral exploration, forestry operations, tourism, and other development activities take place within special management zones, and the development approaches used were designed and agreed upon by all stakeholders, including industry (e.g., Abitibi Consolidated, Petro-Canada, Westcoast Energy Inc). This cooperative, voluntary approach was later reinforced by provincial legislation.[3]

The conference, although formally promoted as a meeting on wildlife conservation, was, inevitably, as much about socio-economics as it was about wildlife or the environment. In fact, discussions about the Mckenzie pipeline, caribou conservation, and the Muskwa-Kechika management area highlight the importance of sustainable development and conservation at the regional and community levels. The capacity shown for collaboration and setting mutually favourable goals for industry, local communities, and conservation organizations is noteworthy. The Muskwa-Kechika program, which has succeeded for more than a decade, and the in-progress Mckenzie pipeline initiative, both represent excellent models of integrative approaches to sustainable development policy.

Notes

1 Conference proceedings in preparation by the CCEA.

2 <www.muskwa-kechika.com>. (All URLs accessed January 20, 2004).

3 <www.qp.gov.bc.ca/statreg/stat/M/98038_01.htm>.

Biodiversity 101 for Policy Analysts

Since the 1992 UN Convention on Biological Diversity, there has been an increasing amount of research on the role of biodiversity for human and ecosystem health. The range of benefits from healthy ecosystems includes fertile soils, degradation of pollutants, flood regulation, soil retention, water filtration, and regulation of insect pest populations.

In the early 1990s, the first scientific experiment showing the importance of biodiversity was conducted at Imperial College London. It showed significant changes in carbon dioxide flux, plant production, and soil nutrient and water retention when the species mix was altered.

Biodiversity interactions are complex and far-reaching, involving a spectrum of issues from climate change to human health. To provide policy analysts with authoritative information on this complex mix of science and socio-economics, the Science and Development Network launched a new biodiversity Web site in February 2004.

Contributions by leading international experts cover the latest news, policy issues, and debates. Topics include the relationships between ecosystem functioning, biodiversity, human health, sustainable development, poverty, climate change, and modern agriculture.

The site can be found at <www.scidev.net/dossiers/> (accessed March 2, 2004).

Exploring the Promise of Asset-Based Social Policies

Gatineau, Quebec
December 8–9, 2003

Andrew Jackson
Canadian Labour Congress

Editors Note

A detailed synthesis report from this conference is available on the PRI website at <www.policyresearch.gc.ca>. The following article is a critical commentary from one of the attendees.

There is quite a buzz around the topic of asset-based social policies in Canadian social policy circles these days, and some community-level experimentation is underway with the support of Human Resources Development Canada. In December 2003, the federal government's Policy Research Initiative organized an extremely interesting and well-attended conference on this subject.

Asset-based policies are seen as new, very much in the sense of Blair's New Labour and Clinton's New Democrat philosophies. Proponents tend to view this approach as a logical continuation of welfare policies based on hand ups rather than handouts, and a focus on responsibilities to balance rights. "New" asset policies are often contrasted with "old" policies of income transfers, which are sometimes portrayed as promoting dependency rather than self-reliance.

The conference featured speakers drawn from the ranks of both proponents and more agnostic experts, and policy-makers from Canada, the United States, and the United Kingdom. The audience included many – from all levels of government, social development, and community-based organizations – who came to learn what the buzz was all about.

I came as an ill-informed sceptic, and left as a better-informed sceptic. At the end of the day, many of us were not very impressed with the specific policies being promoted under the asset-based label. However, the discussion at the conference did underscore the importance of assets as an escape route from poverty, and opened up some extremely important issues for social policy.

As of now, asset-based social policies mainly comprise a number of experiments that promote asset accumulation through savings or endowments for poor families, including both welfare recipients and the working poor. In the United States, and now in Canada under the sponsorship of Social and Enterprise Development Innovations (SEDI), there exist experiments designed to "top up" the savings of poor families (usually in the form of a generous match of $1 or $2 for every dollar saved). In Canada and the United States, the savings are generally restricted to particular uses, such as education and training, or home repair and purchase, while the Savings Gateway scheme in the United Kingdom has no such restriction. Experiments differ in terms of the extent of associated interventions, such as financial counselling.

The new, more general, Child Trust Fund program is now being implemented in the United Kingdom. The Fund provides a modest cash endowment at birth of about $1,000 for every child – more for poorer families – which the child can draw on at 18 when the trust fund has grown. This scheme will be implemented from 2005 and many details, such as administration costs and possible

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interactions with other social programs, are still being worked out. There will be no restrictions on the use of the funds when the child reaches age 18.

Proponents of these schemes make a number of excellent (though not terribly new) points. Assets, particularly financial assets, are hugely important in terms of giving people some control over their lives and future; the ability to take risks (such as investing in training, housing, small businesses, etc.); the ability to make significant purchases that can lead to new opportunities (such as purchase of a car or tools to access jobs); and the ability to withstand interruptions of income or deal with sudden financial emergencies, such as urgent home repairs.

As we know from the recent Statistics Canada survey of assets and liabilities, those who are poor in terms of income also tend to have almost no financial assets, and live in financially precarious circumstances. Lack of assets means lack of independence, especially for the welfare poor. Wealth at any given age is much more unequally distributed than income, and this gives rise to huge gaps in well-being among adults and in opportunities for their children. A highly unequal distribution of wealth contradicts the liberal ideal of genuine equality of opportunity, since the financial circumstances of parents have large impacts on the life chances of children.

Finally, government policies – mostly tax-based measures – actively support and promote asset accumulation for the middle class, for example through Registered Retirement Savings Plans (RRSPs), Registered Education Savings Plans (RESPs), and Canada Educational Savings Grants, and for the wealthy (low rates of tax on dividends, capital gains, etc. compared to taxes on wages). If we take asset accumulation seriously as a goal of policy, why then are the poor excluded? Many proponents even take the logical step of supporting direct redistribution of assets via programs funded from the taxation of large inheritances.

There are underlying hints of a Victorian-era ethos of promoting thrift among the shiftless poor.

In short, those who draw attention to the need for asset redistribution are flagging some very serious issues of social justice, and even pointing to the need for more radical policies than the status quo of basic income support for low-income families.

Proponents also put forward some more questionable arguments. In particular, there are underlying hints of a Victorian-era ethos of promoting thrift among the shiftless poor. Many argue that savings bonus schemes are good, not just because they give the poor assets, but also because they promote future thinking and better financial habits. These schemes can implicitly separate the "deserving" from the "undeserving" poor by rewarding only those who are prepared to save and invest in the future. Much of this is very objectionable for those who see poverty as a structural trap rather than as the product of individual pathologies.

In fairness, one must make a distinction between the views of community agencies that administer savings schemes and the political realities of new welfare schemes within which they are funded. Progressive community organizations at the conference saw a lot of merit in the financial literacy training and financial counselling often attached to savings schemes, even if some thought there was no compelling reason why financial advice and counselling have to be attached to savings schemes.

Generally, even proponents conceded that, to date, there is no strong evidence from the experiments that the benefits of the savings schemes go much beyond those one would expect from a cash transfer.

Regarding asset-based experiments, particularly savings bonus schemes, sceptics raise some excellent questions.

Why Force the Poor to Save?

The poor need income and resources now. It is perverse to reward savings out of very low incomes; any savings can come at the cost of meeting basic consumption needs, such as food, decent shelter, and medical care. (This is why the take-up rate for experimental schemes seems to be very low, and the resources accumulated are quite modest.) If we want (as we should) to give assets to the poor, why force them to save?

In this context, it is worth noting that transfers of fairly large sums to low-income families in one lump

sum, as opposed to monthly disbursements, can have very significant positive effects. For example, the annual Earned Income Tax Credit in the United States seems to be spent in a different way than monthly income supplements, since it can be and is used to finance large purchases, including home down payments or the purchase of a car. There may then be a strong case for asset transfers to supplement income transfers.

Why Not Invest in Public Programs, Supports, and Services?

Obviously, asset-based schemes come at the cost of alternative public expenditures, which could increase the capital or longer-term resources of low-income persons and families. More direct measures would include early childhood education programs, targeted training programs, and subsidized access to higher education to increase the human capital of low-income persons and households; direct subsidies to affordable social housing; and community and employment supports for persons with disabilities.

From the point of view of the efficient spending of public funds, rates of return on many public programs are probably much higher than financial rates of return. The UK Child Trust Fund seems a particularly questionable way to increase the stated goal of equality of opportunity compared to alternatives, such as expanded early childhood education programs, or subsidized tuition fees for post-secondary education. While individual and social returns to investment in education cannot be precisely determined, there is a lot of evidence that they are much higher than a long-term real financial rate of return of, say, three percent.

As well, increased assets in the hands of individuals will not necessarily increase the supply of the things proponents hope low income persons and households will buy as their savings vehicles mature, be it housing, or skills training, or higher education. The underlying assumption that it is better to have individuals purchase what they want from the market is also questionable for at least some investments, most notably skills training to gain access to better jobs, given the poor quality of much short-term private training.

Some of these efficient public finance arguments are most relevant if we think about moving from small, community-based schemes to national programs, and from short-term to long-term savings vehicles.

Is Individual Saving an Efficient Way to Accumulate Assets?

As suggested by the well-known example of RRSPs compared to public pension plans such as the Canada/Quebec Pension Plan, the overhead costs of individual savings vehicles can be very expensive. Financial institutions in the United Kingdom will likely charge one to two percent per year to administer Child Trust Fund accounts.

It is worth noting that that transfers of fairly large sums to low-income families in one lump sum, as opposed to monthly disbursements, can have very significant positive effects.

Experience has also shown that rates of return on individual savings vehicles are volatile over short periods, and subject to long swings as well. Real rates of return can vary a great deal between different periods of time, and market circumstances when savings funds mature can be very different. This means different cohorts of individuals will gain very unequal benefits from the same initial endowment simply due to the vicissitudes of financial markets and interest rates. These concerns obviously apply much more to longer-term savings vehicles such as lifetime individual accounts, which some see as a possible new vehicle for social policy.

Why Not Fix Current Problems First?

Several people at the conference noted that it is horribly perverse to promote asset accumulation among the poor when current social assistance programs actively work against this goal. In almost all provinces, a requirement for receipt of social assistance is that all financial assets above a very low threshold should be exhausted, including savings for retirement and for the education of children. Criticism of these rules has been widespread among anti-poverty organizations and many social policy experts for years.

At a minimum, asset schemes have to be protected against clawbacks from welfare incomes, which has proved to be an administrative challenge. Most important, the new focus on the importance of assets for escaping poverty and securing equality of opportunity for children should lead us to scrap perverse and punitive provincial welfare rules that force the welfare poor to liquidate almost all their financial assets as a condition for the receipt of benefits.

Where Should We Go from Here?

We can expect some growing experimentation in Canada with asset schemes, perhaps in the form of a child trust fund to accompany child benefits, and probably in the form of increased support for experimental individual savings/development accounts for poor families. We can probably learn from such experiments, but it would be preferable to take away the forced saving element. It is also critically important not to divert significant resources from existing programs that provide subsidies for early childhood education, training, higher education, home upgrading and ownership, which in turn directly increase the assets of low-income persons and families. Generally, these types of programs are more effective and efficient because of more effective targeting, lower overhead costs, and the need to increase supply as opposed to just demand.

Finally, we should draw on the genuine insights of the asset-based approach in the broader process of income security reform.

Canadian Health

Canada's health care system guarantees a basic level of care to all, regardless of income. And, at 79 years, Canadians enjoy one of the longest life expectancies in the world. Nevertheless, there are startling health differences between communities and socio-economic classes in Canada.

Inuit women have life expectancies 14 years less than those of non-Aboriginal women. On-reserve First Nations and Inuit infant mortality rates are two to three times the Canadian average. And 15 percent of Canadian children are obese – the same rate as in the adult population.

A new report, *Improving the Health of Canadians,* from the Canadian Population Health Initiative (part of the Canadian Institute for Health Information) reveals these and other sobering statistics, and considers some of the social factors leading to them. More optimistically, it also discusses some of the innovative ways public authorities in Canada are seeking to improve the health of Canadians.

The full report is available free from the CPHI at <www.cihi.ca> (accessed March 2, 2004).

Advancing Social Capital Research

A PRI–SSHRC Policy Research Roundtable

October 20, 2003
Ottawa, Ontario

Lori Brooks
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Editor's Note

The PRI-SSHRC Policy Research Roundtable is a joint effort by the Social Sciences and Humanities Research Council and the Policy Research Initiative. Its objective is to improve the quality of knowledge transfer between experts from academia and those responsible for the design and development of federal policies and programs.

How can the concept of social capital be harnessed for federal policy and program development? The Policy Research Initiative's (PRI's) Social Capital as a Public Policy Tool project team, with the Social Sciences and Humanities Research Council (SSHRC), organized a policy research roundtable, Assessing a Network-Based Approach to Social Capital from a Policy Perspective, to discuss this question.[1] The participants included Canadian academics working with the concept of social capital, and senior federal officials from various departments, as well as representatives of the PRI, SSHRC, and research organizations. The resulting discussion offered considerable support for the PRI's proposed analytical framework, but also pointed to substantial next steps that require consideration if social capital elements are to be incorporated into policy and program development.

Despite widespread interest in social capital, public officials from around the world have remarked that definitional confusion has hampered efforts to harness the concept. After reviewing the diverse social capital literature, the PRI focused on developing a theoretically informed conceptual framework for public policy use. Following an interdepartmental workshop held in June 2003, it was concluded that a lean definition of social capital would be the most useful foundation.

Building on a network-based approach, the PRI prepared a draft discussion paper outlining a framework wherein social capital refers to the networks of social relations that provide access to needed resources and supports. The proposed framework is a systems approach that allows us to see how social capital is developed, how it operates, and how it may contribute to the achievement of various outcomes.

As presented by Robert Judge in the previous issue of Horizons,[2] a network-based approach stands in contrast to the widely influential functional approach, which includes all social resources that facilitate collective action under the rubric of social capital. While it has merits, a functional approach may not provide the most conducive route to public policy application due to its conflation of characteristics, determinants, and outcomes, and its inclusion of sometimes contradictory processes under a single label. This said, the PRI's proposed framework attempts to draw on both approaches. For example, it does not call for the abandonment of studies of questions of trust or institutional performance, but rather suggests that these phenomena must be labelled separately so their interrelationships with social networks might be identified and studied more rigorously.

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For the most part, roundtable participants welcomed the approach proposed in the PRI framework. The core definition is lean, but still allows for the incorporation of the wide range of variables the literature has identified as being important. Discussions were also instrumental in formulating some potential modifications to the framework, and suggesting next steps for the project, if the framework is to move from being a largely academic exercise to one that provides real substance for policy and program development.

For example, participants made a number of concrete suggestions for improved measurement. Settling on a network-focused approach to the conceptualization of social capital clarifies many of the measurement concerns and possibilities. Key measurement tools might include position generators, whereby individuals are asked to indicate professions of others in their network, which is indicative of the degree of diversity and types of support available through network contacts. Similarly, a resource generator might be employed, whereby respondents can be asked about the resources available in their network, as in whether there is someone they can borrow money from, or perhaps go to for last minute child-care support. Although these methods have limitations, and should not exclude measurement of other variables important to social capital research, they do present a potentially robust and standardized tool for studying the potential roles of social capital.

Perhaps the clearest message from both academics and government officials was the importance of taking a concrete policy focus that speaks to federal priorities. For example, one federal area that has considerable potential for the inclusion of social capital is immigrant integration and the management of diversity. Results from the recent Longitudinal Survey of Immigrants to Canada, as well as other research, indicate that immigrants' networks are incredibly important to the integration process, and that the current human capital focus has limitations in terms of labour market integration. Indeed, the PRI Social Capital project is now turning its energies toward more policy-specific analyses to illustrate the role of social networks in the achievement of various outcomes.[3]

Notes

1 The PRI's Social Capital project was profiled in the previous issue of *Horizons* (Vol. 6, No. 3).

2 Judge, Robert. 2003. "Social Capital: Building a Foundation for Research and Policy Development." *Horizons* 6, no. 3: 7-12.

3 Of related interest is the full report from the joint PRI-OECD conference, The Opportunity and Challenge of Diversity: A Role for Social Capital. The report is available on the PRI web site at <www.policyresearch.gc.ca>.

Adding Up Local Connections and Networks

If social capital is a resource that can benefit voluntary organizations and the communities with whom they work, what is the role of public policy in building social capital? How sensitive is social capital to the intervention of policy-makers?

This joint report from the Centre for Civil Society (London School of Economics) and the National Council for Voluntary Organisations (United Kingdom) explores these issues using evidence from case studies of two communities in east London, each with different levels of social capital. The report suggests a need to recognize the varying degrees of social capital across communities, and argues that governments interested in building social capital will have to provide a corresponding range of policies to support that interest.

Social Capital in Action: Adding Up Local Connections and Networks **by Halima Begum, is published by the National Council for Voluntary Organisations (NCVO), December 2003, ISBN 07 19916216. The NCVO Web site can be found at <www.ncvo-vol.org.uk> (accessed March 3, 2004).**

Legislation, Jurisdiction, and the Species at Risk Act

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Human activity is contributing to the loss of species throughout the world at a rate much higher than any seen in the last two million years. During the past few decades, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) classified 340 species as being at risk of extinction in Canada, mostly due to habitat loss or degradation.

Under Canadian law, the protection of species and their habitats is the shared responsibility of the federal, provincial, and territorial governments. Most provinces have developed their own legislation to protect species at risk. Now, after nearly a decade of the legislative process, the first federal legislation, the *Species at Risk Act* (SARA, Bill C-5), has finally received royal assent (December 2002).

The expansive federal authority introduced by the Act, and the assignment of responsibility for the protection of listed species to three Ministers (Environment, Fisheries and Oceans, and Heritage) create interesting policy issues. To examine some of the key policy issues facing the Canadian Wildlife Service (the branch of Environment Canada responsible for the critical habitat portion of the Act), *Horizons* interviewed Ken Harris, Chief of Habitat Conservation for the Canadian Wildlife Service.

HORIZONS: The *Species at Risk Act* is a complex and contentious piece of legislation. What is the principal reason for its development?

KEN HARRIS: The short answer is that SARA is the result of an international commitment made by Canada, at the Convention for Biological Diversity over a decade ago, to develop a national endangered species act. But the longer and truly more accurate answer is that there was a recognized need in the overall Canadian biodiversity conservation community for a single legislative umbrella, under which all the various parties pursuing species recovery could operate and focus their efforts, but which would also put in place clear political accountability for certain things getting done in a nationally consistent manner.

HORIZONS: The Act really deals with inter-jurisdictional issues, and affects a wide variety of stakeholders. Who was involved in drafting SARA?

HARRIS: The long development process of SARA and the large number of clauses in the Act reflect involvement by environmental non-governmental organizations, industry, COSEWIC, First Nations, and the provinces. In short, many, many interests came forward over the decade of efforts to get this Act in place. The complexity of the Act, as you see it today, is reflective of the parliamentary process trying to address all that input.

HORIZONS: What is the biggest policy challenge associated with SARA?

HARRIS: The most overarching policy challenge of SARA from a federal perspective is that it assigns ultimate responsibility for numerous products and outcomes to three federal ministers – Environment, Fisheries and Oceans, and Heritage – but the reality is that the actual *mechanisms* to achieve many of these products and outcomes in the real world of Canadian working landscapes do not lie under direct federal government

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control. For example, if one examines the dominant causes of the decline of species that are officially at risk in Canada, it doesn't take too long to figure out that habitat alteration and destruction is the single most common factor. Therefore, it follows that the path to recovery of such species lies in reversing, or at least alleviating, those things going on out there on the landscape that are affecting that habitat. So, how does a federal minister achieve this? In Canada, and especially southern Canada, the federal government simply does not control the drivers of overall landscape change. For instance, mechanisms such as private and/or public land use planning are vested in provincial and municipal levels of government, who must of course operate with many competing interests in mind.

Now, it is very true that SARA contains some very potent override protection measures available to the three ministers, but an overreliance on such measures would have wide-ranging intergovernmental consequences and, as such, I anticipate they will be used very judiciously. We must also remember that things, such as the federal safety net (see accompanying sidebar), are largely about protection of remaining habitat and individuals, and do not provide all the steps necessary for species recovery. So, this leaves us with the policy challenge of having federal ministers legally responsible for outcomes that are by and large only realistically achievable through the use of mechanisms beyond the direct control of those federal ministers. The challenge of SARA is, in a nutshell, achieving cooperation with those who do hold the tools of species recovery, as it always has been.

HORIZONS: You spoke of an overarching policy challenge, which suggests that there are other challenges to be found in the specifics of the Act. Could you briefly highlight some of these as well?

HARRIS: There are quite a number. One that is top of mind is that the potential for prohibitions, restrictions, etc. to land and resource use that many will see in the Act will impart a level of scrutiny on all the decisions around species at risk that has, at least at the federal level, not existed previously. For example, because the listing of species will have greater consequences than before, the process of determining whether a species should be listed will, I think, become much more high profile and likely much more contentious. That has certainly been the experience in the United States with the *Endangered Species Act*.

The Species at Risk Act: The Basics

The legislation ensures that species are assessed under a rigorous and independent scientific process that operates at arm's length from the federal government. It also requires the development of recovery action plans for species found to be most at risk, and recognizes the essential role of Aboriginal peoples in the conservation of wildlife by requiring the establishment of a National Aboriginal Council on Species at Risk.

The Act requires that critical habitat for species at risk be effectively protected whether on federal lands, provincial Crown, or private land. Once critical habitat has been identified, the Act serves to provide cooperative and legislative authority to protect and preserve these areas, wherever they lie. It is worth noting that the definition of "federal lands" in SARA has been stated to include all land, internal waters, territorial sea, and "reserves or other land set apart for the use by Indian bands." These habitat protection requirements are anticipated to be one of the most controversial and contentious aspects of SARA, as they clearly have the potential to affect land use on both public and private land. The Act complements other federal and provincial strategies for species and habitat conservation, and identifies three ministers as being responsible for the protection of critical habitat for those species falling under their authority.

The tools available to protect critical habitat under SARA differ according to the type of species and the location it occupies during part or all of its life. Collectively, the range of habitat types that exist within Canada are encompassed by three federal agencies, and three "competent ministers" are assigned the responsibility and authority to protect critical habitat for species at risk anywhere across Canada: Environment, Canadian Heritage, and Fisheries and Oceans. The Minister of Fisheries and Oceans is responsible for the protection and recovery of aquatic species, such as fish and marine mammals, whereas the Minister of Canadian Heritage, through the

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Parks Canada Agency, is responsible for those species that occur primarily in national parks, national historic sites, and other federal protected heritage areas. This includes species, such as the eastern prickly pear cactus and the black rat snake. The Minister of the Environment is responsible for all remaining species on federal lands, with the understanding that the provinces and territories will undertake actions and enforce prohibitions for the conservation of species at risk under their jurisdiction. Since many species at risk are the responsibility of the provinces and territories, SARA explicitly encourages and provides for cooperative stewardship approaches to habitat protection. This is also true among federal agencies. For example, many migratory species, such as the whooping crane, are managed jointly between departments. Ultimately, however, it is the responsibility of the competent ministers to ensure that species at risk, their residences, and critical habitat are effectively protected for all species at risk within prescribed timelines.

The Act requires the coordination of various pieces of existing federal legislation that apply across several agencies and, as much as possible, must also integrate with provincial and territorial legislation and programs.

The first step in the process is the listing of species. This classification of species is completed by an independent review body, the COSEWIC, which recommends classifications to the ministers. By directing COSEWIC's recommendations to the federal Environment Minister, SARA has, in a sense formalized the process by which species are classified. The Cabinet may then, on the recommendation of the Minister, add these species to the list of species at risk. It is only once these species are listed that they become subject to the protection afforded under SARA.

The nature of critical habitat protection has been devised to be highly flexible, and may involve voluntary stewardship programs, general prohibitions, protected areas, or combinations of all of these. Indeed, the overarching policy vehicle for realizing habitat protection under SARA is voluntary stewardship. However, SARA also provides a Canada-wide regulatory safety net which may be applied should all the collective measures put in place not result in effective protection of critical habitat. Under this safety net, Cabinet has the power to take emergency action to protect critical habitat when stewardship arrangements cannot be made. For those situations where the application of land use restrictions are deemed to have resulted in an extraordinary loss to a landowner, SARA also includes enabling provisions for compensation.

The challenge here is to ensure that our science is sound and defensible when a minister is going forward with a recommended listing. That sounds simple but for many data-deficient species, the case will in fact be very challenging.

A second very interesting policy issue is compensation for extraordinary loss when critical habitat restrictions are applied to a property. While we have to remember that this is just an enabling section, and does not obligate compensation, the very existence of the forethought of compensation will be cause for much discussion as it broaches a subject that is inherently controversial. For example, municipal land use planning in Canada operates on the legal premise that determination of land use is a right of the Crown, and no compensation is considered when land is redesignated or rezoned. Compensation generally comes into play only in cases of true physical occupation, or in other words, expropriation. This is a very complex issue, and I will not deal with it in depth here, but it will be challenging to address what will inevitably be calls for compensation under SARA while not compromising the long-standing foundations of land use planning in Canada.

In addition, there are a whole range of challenges, both policy and operational, within SARA that pertain to the application of the Act on First Nations lands, and interaction with Aboriginal communities in general. These are far too extensive to go into within the scope of this interview, but, as with my earlier comments on compensation, this will also remain a focus of our work for quite some time.

HORIZONS: Are there any public policy risks with the arrival of SARA?

HARRIS: As with all new legislation, programs, SARA comes out of the gate with an extremely high profile, and correspondingly high expectations in

many quarters. In fact, this is even more exacerbated in the case of SARA, because just getting the Act in place turned out to be such a lengthy and arduous process. Therefore, to me, one of the greatest policy risks of SARA in the short term is the potential for it to eclipse the broader public policy goal of proactive biodiversity conservation, that is, for the public and decision-makers to interpret SARA as biodiversity conservation itself, not just a component of the overall effort. One can use a health care analogy: in a robust health care system, we find preventive measures, rehabilitative measures, chronic care, etc., all the way up to the emergency ward where heroic measures are required to save individual lives. And, while it is the emergency ward that gets a lot of the attention, one would not create an emergency ward alone and call that a health care system. We have to remind ourselves constantly that SARA is the biodiversity emergency ward: it deals with species that are literally about to be eliminated from Canada's biodiversity. It is extremely important that we have such an emergency ward in our biodiversity health care system, and that it be run well and be successful, but let us not make the mistake, of considering SARA alone to be the mechanism for achieving biodiversity health in this country. It is not, nor is it designed to be.

Sustainable Use of Water Resources

Information Requirements

Robert Smith
Statistics Canada

The information requirements to assess progress toward the goal of sustainable development are wide reaching. Practically all aspects of society's interaction with the environment must be monitored. Accordingly, a sound statistical framework is essential. Without one, the information will lack coherence and, therefore, be significantly less valuable for analyzing complex policy issues.

Statistics Canada has adopted a "capital approach" to building information for sustainable development.[1] The objective is to track stocks and flows of the various assets that support long-term human development. These assets represent the nation's wealth – what the current generation must pass on if those to come are to have at least the same development options we enjoy today. These assets can be divided into several categories of capital, one of which is *natural capital*. Natural capital comprises the timber, petroleum reserves, mineral deposits, and other resources that provide the basic building blocks of our economy, the land that provides space for human activities, and the ecosystems that provide the many environmental elements required for our well-being. To ensure that information on these assets is consistent with that on other forms of capital, Statistics Canada compiles the related data in a set of environmental accounts closely tied to the National Accounts.

Water Information Needs – A Natural Capital Perspective

Water is a central element of natural capital. It is both a raw material used by businesses and households and a component of well-functioning ecosystems. Regrettably, the current understanding of Canada's water does not reflect this importance. Substantial data gaps make building a comprehensive asset account for water impossible at the moment. A limited account measuring the rate of renewal of surface water is all that Statistics Canada has been able to compile with existing data.

One gap preventing a more complete asset account is data on quantity of water used in economic activity. Manufacturing industries are important water users, and information on their use is essential to monitoring demands on the resource. An important source for this information in the past was the Industrial Water Use Survey (IWUS), which was conducted every fifth year between 1976 and 1996. Resources were not available to conduct this survey in 2001, and updated data are badly needed. Statistics Canada and Environment Canada are considering options for such an update, but access to the necessary resources is still constrained. In addition to updating the IWUS, data for water users not covered by the IWUS would be useful, especially data for agriculture, large public institutions, and households.

Information on water quality is another important gap. There is no national monitoring system to track water quality trends. Some provincial-level systems do exist, but the resulting data vary from province to province. As a result, the potential for producing a national water quality measure from this source is limited. In addition to inadequate direct measures of quality, data on the factors that influence quality are also weak. Gaps of particular concern include data on

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dams and water diversions, runoff from landfill sites, agricultural land, and urban areas, and industrial discharges and waterborne pathogens. Some national data exist in these areas, but they are not comprehensive. For example, the National Pollutant Release Inventory (NPRI) tracks waterborne discharges from establishments meeting specific reporting criteria. But some important emitters are excluded from the inventory, and it is impossible, as a result, to estimate total emissions for certain pollutants.

Improved data on water use and water quality are only two of the needs in this domain. Other issues related to water, as a component of natural capital requiring improved data, include groundwater stocks and flows, surface water runoff (in some watersheds), rural water use and wastewater treatment, soil erosion, deposition of airborne contaminants, evapotranspiration and evaporation, and land use/land cover change. Clearly, collecting all the data required to produce a comprehensive water asset account would require a coordinated effort and sustained investment over the long term. Three initiatives that could be implemented in the near term are suggested below.

Options for Filling the Gaps

First, a new IWUS could be funded. With proper design, it would provide data that could be disaggregated by watershed. To reduce response burden, the survey could be divided into components, with a biennial questionnaire for large water users and a quinquennial questionnaire for smaller water users. Water use information from this new IWUS could complement water discharge information contained in the NPRI. Thought could also be given to collecting discharge data for establishments excluded from the NPRI, aiding in the calculation of total discharges to water.

Second, efforts could be directed toward acquiring administrative data on the quality of water as it enters and exits drinking water and sewage treatment plants. This information would provide an indication of the pressure exerted on the environment by industrial, commercial, institutional, and residential activities and of the quality of water at the interface between the environment and society. These data, when combined with the new IWUS data, would provide comprehensive measures of the quantitative and qualitative human impacts on water resources.

Third, special surveys/studies could be developed to capture water-related information that escapes measurement elsewhere. Priority could be given, for example, to collecting improved information on water demands and water quality impacts of the agricultural and mining industries.

Successful implementation of these initiatives would help clear the way for development of a comprehensive water account. And, it may well lead to other gaps being filled, since nothing creates the taste for data than having some where there were none before.

Note

1 National Round Table on the Environment and the Economy. 2001. *A Proposed Approach to Environment and Sustainable Development Indicators Based on Capital*. <www.nrtee-trnee.ca/eng/programs/Current_Programs/SDIndicators/Program_Research/StatsCanada-SDIreport_E.pdf>. (Accessed January 6, 2004.)

The Statistical Environment

A clean and healthy environment is important to Canadians, and we recognize that its capacity to supply resources while absorbing human impacts has limits. However, we need systematic information to evaluate whether our resource use is sustainable, whether we are maintaining resource quantity and quality, and how we can reduce our impact on the environment or respond to environment changes that are already upon us.

Human Activity and the Environment: Annual Statistics 2003 is the second annual update of the more extensive quinquennial compendium (last released in 2000). Along with the statistics and supporting highlights, the 2003 edition contains a feature article on a recent topic of concern to Canadians: "Freshwater Resources in Canada." The article outlines water availability, water use and threats to water, and government and business responses to reduce the negative effects of human activity on our water resources.

***Human Activity and the Environment: Annual Statistics 2003*, can be acquired at <www.statcan.ca/english/ads/16-201-XPE/index.htm> (accessed March 2, 2004).**

Navigating Pathways Between Policy and Science

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Pathways between Policy and Science

The concept of sustainable development has infused the policy world over the last few decades, and is a principle focus of numerous Canadian strategic policy initiatives. While it has achieved wide currency, there is an emerging sense of disillusionment in Canada over the lack of progress in implementing sustainable development strategies and a recognition that the concept of sustainability often embodies lofty ambitions that are rarely matched with the kind of structural change that is essential to reduce human impacts on the environment. Lack of public acceptance of the need for these structural changes is a major impediment to sustainability. This may be a product of declining trust in state institutions and a declining interest in civic engagement, which is seen as technocratic and tokenistic. Yet it is clear that governments can't make policy decisions that require significant change without a supportive political constituency. New means of engaging the public in the complex public policy issues surrounding sustainability are essential to build understanding of the policy trade-offs in the public and to learn what trade-offs and choices might be acceptable.

In a recent issue of *Horizons* (Vol. 6, No. 1, 2003), Nathalie Des Rosiers reminds us that "the journey from research to policy should not be a one-way voyage but rather an ongoing and facilitated commute between decision makers, academics and the general public." In the present article, we describe the results of a collaborative effort to involve a wide range of communities and stakeholder groups in a coherent conversation about regional sustainability issues in the Georgia Basin region of western Canada, where potential pathways between policy and science are navigated through user-driven backcasting scenarios and integrated assessment modelling. We outline the design of an integrated decision support framework being developed in partnership with the Earth Science Sector of Natural Resources Canada (PATHWAYS), in which these modelling tools can be nested, thereby facilitating analysis and negotiation of coherent sustainable development strategies across both domain and jurisdictional boundaries.

Backcasting and Integrated Assessment

There is a long tradition of futures studies in the environmental field, out of which four key concerns have been identified. The first involves undertaking research that integrates natural and physical science analysis of environmental systems with social science, health science, and humanities research related to the human systems that interact with the environment. The second is a focus on the future, and on studying the various ways we can work, collectively or individually, toward greater sustainability. The third is a growing recognition of the need to involve various stakeholders in the research process itself. The fourth is a concern with the appropriate temporal and spatial scale of analysis. While issues like climate change are inherently global in their scope, research that is truly problem-centred and policy-oriented must engage at temporal and spatial scales that are relevant to decision-makers.

The term "backcasting" was coined (Robinson 1982, 2003) to describe an approach to futures studies that involves working backward from a particular desired future end point or set of goals to the present, to determine the physical feasibility of that future and the policy measures required to reach that point. Unlike predictive forecasts, backcasts are not intended to reveal what the future will likely be, but to indicate the relative feasibility and implications of different policy goals. Thus, while the emphasis in forecasts is on discovering the underlying structural features of the world that might shape the future, the emphasis in backcasts is on determining the freedom of action, in a policy sense, with respect to possible futures. Development of the QUEST model was guided by a design approach to modelling, which focuses on representing the physical flows of matter and energy through a system (Gault et al., 1987). The use of the model in the process of community engagement was guided by a body of literature called "interactive social science," which recognizes the need to move beyond traditional extractive social science methods .

Integrated assessment is a rapidly evolving field of research, situated along the boundary zone between science and public policy. It is inherently an interdisciplinary process of "combining, interpreting, and communicating knowledge from diverse scientific disciplines in such a way that the whole set of cause-effect interactions of a problem can be evaluated from a synoptic perspective" (Rotmans and Dowlatabadi, 1998). There are two key elements of an integrated assessment approach. First, it must reach beyond the bounds of a single discipline and address more than one sector or one aspect of the problem under consideration. Second, it must have as a central purpose the informing of policy and decision-making, rather than merely advancing knowledge for its intrinsic value.

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Georgia Basin Futures Project

The Georgia Basin region of western Canada provides a context and focus to explore the integration and potential impact of scenario modelling and decision support tools on place-based sustainability planning. The Georgia Basin Futures Project (GBFP) is an interdisciplinary initiative funded by the Social Sciences and Humanities Research Council and supported by a number of governmental, non-governmental and industry stakeholders. The purpose of the GBFP is to increase public involvement in the discourse about sustainability issues, to explore pathways to sustainability in the region, to create a database of public scenarios, and to evaluate the relationship between the use of computer-based simulation tools and the beliefs, values, and behaviours of users of these tools . The project builds on the tradition of participatory integrated assessment modelling (and adopts an interactive social science approach, based on an explicit recognition of the value-laden nature of scientific analysis and modelling, and the need to engage the public and stakeholders in research activities in two ways.

- Work with partner organizations in the community to develop a modelling framework and interface that is relevant and that speaks to the key environmental, social, and economic issues in the region.
- Use an elaborate process of community engagement, whereby interested community members are actively involved in the generation of preferred sustainability scenarios using these modelling tools.

The core of the project is the GBQUEST modelling system , a computer-based scenario generation and evaluation system designed to encourage public participation in thinking about sustainability in a regional context. The goal is to acquaint users with the complex realities of decision-making, specifically the uncertainties involved, necessary trade-offs, and the role of subjective values. QUEST invites the user to make informed choices about future patterns of population, economic activity, transportation, how densely urban growth occurs, the style of neighbourhoods, agricultural development, forestry practices, and consumption. The consequences of these choices, represented as scenario outputs, include synoptic views of human well-being, environmental quality, economic and social health, and the policy choices needed to realize these outcomes.

QUEST does not provide a picture of the most likely future. Nor is it intended to reflect a detailed understanding of all the complex systems involved. Rather, it allows the user to learn about the linkages between choices and possible consequences and the trade-offs involved. The model represents a possibility space within which users can explore various pathways toward a desirable future scenario for their region. Collectively, these scenarios represent negotiated conceptual models of regional sustainability, and provide a useful framework for both policy research and strategic planning.

A Workbench for Policy Research and Social Learning

PATHWAYS is a an ontology-based knowledge integration and decision support system being developed as part of the new Sustainable Development through Knowledge Integration Program in the Earth Science Sector of Natural Resources Canada. The system builds on the results of the Georgia Basin Digital Library (Journeay et al., 2000; Talwar et al., 2003), and will provide an architectural framework and services for integrating scenario model results and distributed knowledge assets (spatial and non-spatial). In doing so, it promotes an evolving sense of place and understanding of sustainable development issues and strategies in the context of a particular region or community. The system is intended to provide the following capacities.

- Integrate, translate, and visualize existing Web-based natural and social science information and knowledge assets that describe current system conditions for a given geographic region, through the use of interoperable semantic Web and data mining technologies.
- Couple these information/knowledge systems with integrated assessment modelling tools to examine both likely and desirable future scenarios for a community or region.
- Assist in the research and development of local, regional, and federal policies that will support pathways toward preferred future scenarios.
- Monitor progress of identified planning objectives using sustainability indicators and related decision-support tools.
- Engage multi-stakeholder community groups in the development and use of these systems in support of specific planning and decision-making functions.

The model represents a possibility space within which users can explore various pathways toward a desirable future scenario for their region.

The system provides an interoperable framework for nesting and integrating information and knowledge outputs for a variety of scenario and assessment modelling tools. It is being developed using standards-based Web services technologies and emerging Canadian and international standards for information and system interoperability.

The coupling of Web-based knowledge integration systems and scenario modelling tools within a social learning network provides a venue for exploring viable sustainable development strategies and building coherence in policy negotiations across jurisdictional boundaries. Together, the approaches in the GBFP and PATHWAYS will contribute to a wider and deeper understanding of environmental, social, and economic issues, and offer the potential for transforming the ways in which regional urban centres and surrounding rural communities use and share information to make decisions about their collective future.

Both the GBFP and PATHWAYS have been developed to help connect scientists, policy-makers, and the public with the goal of moving beyond the lofty rhetoric of sustainable development to practical and meaningful interventions. QUEST has been used in case studies with the City of Richmond, the municipality of Bowen Island, and staff members of the Greater Vancouver Regional District. Conducted as full-day and half-day workshops, residents from Richmond and Bowen Island participated in a facilitated process to create their scenarios in QUEST. The workshops sparked lively discussions, in the scenario input and output stages, around issues, such as transportation, economic development, population growth, and agricultural land, and have increased demand for further workshops. In the case of Bowen Island, input data and key concepts

in the model results are explained in GBDL, and are available for public perusal. Both GBFP and PATHWAYS are fully functioning systems available for public engagement. Over the coming two years, the critical research goal is to test and evaluate the utility of these knowledge systems in a variety of contexts.

References

Caswill, C., and E. Shove. 2000. "Introducing Interactive Social Science." Science and Public Policy 27, no. 3: 154-157.

Des Rosiers, Nathalie. 2002. "The Journey from Research to Policy: Frictions, Impetus, and Translations." Horizons 6, no. 1:3-5.

Gault, F. et al. 1987. "The Design Approach to Socio-Economic Modelling." Futures 19, no. 1: 3-25.

Jasanoff, S., and B. Wynne. 1998. "Science and Decisionmaking." Human Choice and Climate Change, Volume 1 – The Societal Framework, ed. S. Rayner and E. Malone. Columbus, OH: Battelle.

Journeay, J.M., J.B. Robinson, S.K. Talwar, M. Walsh, D. Biggs, K. McNaney, B. Kay, B. Brodaric, and R. Harrap. 2000. "The Georgia Basin Digital Library: Infrastucture for a Sustainable Future." GeoCanada2000, Calgary, Alberta, May 27–June 2, 2000.

Kaemir, B. et al. 2000. "Involving the Public in Climate and Energy Decisions." Environmental Monitoring and Assessment 42, no. 3: 32-42.

Robinson, J. 1982. "Energy Backcasting: A Proposed Method of Policy Analysis." Energy Policy 10, no. 4: 337-344.

—. 2003. "Future Subjective: Backcasting as Social Learning." Futures 35: 839-856.

Rothman, D., J. Robinson, and D. Biggs. 2002. "Signs of Life: Linking Indicators and Models in the Context of QUEST." Implementing Sustainable Development. Integratd Assessment and Participating Decision-Making Processes, ed. Hussein Abaza and Andrea Baranzini. Cheltenham (UK): Edward Elgar.

Rotmans, J., and H. Dowlatabadi. 1998. "Integrated Assessment Modeling." Human Choice and Climate Change, Volume 3, ed. S. Rayner, and Elizabeth Malone. Columbus, OH: Battelle, pp. 292-377.

Talwar, S., M. Journeay, R. Harrap, B. Brodaric, J. van Ulden, R. Grant, and S. Denny. 2003. "The Georgia Basin Digital Library Project: A Framework for a Place-Based Exploration of Sustainability Issues," Geomatica 57, no. 2: 155-164.

Tansey, J., J. Carmichael et al. 2002. "The Future Is Not What It Used to Be: Participatory Integrated Assessment in the Georgia Basin." Global Environmental Change 12, no. 2: 97-104.

van Asselt, M., and N. Rijkens-Klomp. 2002. "A Look in the Mirror: Reflection on Participation in Integrated Assessment from a Methodological Perspective," Global Environmental Change 12: 167-184.

Water Protection in Ontario

Currently, water protection in Ontario is undertaken on a voluntary basis by municipalities and conservation authorities. This approach has led to striking inconsistencies across the province, and had tragic consequences in Walkerton in May 2000 when seven people died from E. coli contaminated drinking water.

The Government of Ontario has recently released a white paper proposing a comprehensive framework to protect the quality and quantity of water resources. The paper will form the basis of rules, funding mechanisms, and incentives to safeguard sources of drinking water.

The white paper proposes three significant modifications to the existing policy. First, a watershed protection program will designate areas of the province as ecological units for protecting water (rather than relying on political boundaries). Second, legislation will be introduced requiring water source protection plans to ensure that multiple barriers exist to prevent water contamination. Third, rules will be proposed to require high-volume users to pay an incrementally increasing amount for the use of the resource.

The white paper can be accessed at <www.ene.gov.on.ca/programs/3585e01.htm> (accessed March 2, 2004).

Genomics, Health and Society: Emerging Issues for Public Policy

Government of Canada Symposium

March 24-25, 2004

Genomics holds great potential for growth and prosperity, but it also poses significant legal, social and ethical challenges. If Canada is to reap the potential economic and health benefits of advancements in this field, a wide range of issues will need to be addressed, including those related to privacy and the use of genetic information, intellectual property protection, innovation, and the evaluation, financing and application of genetic tests to health.

The PRI, in partnership with the Canadian Biotechnology Strategy community and the Canadian Biotechnology Advisory Committee, will hold a symposium in March 2004 to examine the public policy implications of genomics.

For additional information on the symposium, contact Sushma Barewal at 613.943.2400 or by e-mail at s.barewal@prs-srp.gc.ca.

PRI–SSHRC Roundtable: Moving Towards a North American Customs Union

March 26, 2004

What are some of the policy issues surrounding a potential Canada-United States customs union? Based on preliminary empirical results on the potential economic impacts, this roundtable will examine several issues, including rules of origin, the impact on government revenues and operations, and a common external tariff.

For additional information on this roundtable, contact André Downs at 613.995.3655 or by e-mail at a.downs@prs-srp.gc.ca.

Economic Instruments for Freshwater Management in Canada

PRI Symposium

June 2004

This invitational symposium will bring together international and Canadian experts to examine the benefits and drawbacks of increasing the use of economic instruments to manage and conserve freshwater resources in Canada. Topics to be covered include: review of best practices in Canada and other countries; using market forces to allocate water resources; disincentives to the use of market-based instruments; and, ensuring the complementarity of market and other policy instruments to better conserve freshwater resources.

For additional information on this symposium, contact Bernard Cantin at 613.992.3660 or by email at b.cantin@prs-srp.gc.ca.