



Revenue Raising for Source Protection Planning - Innovative Tools

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Executive Summary

This report was prepared by the Canadian Environmental Law Association and the Canadian Institute for Environmental Law and Policy with funding from the Joyce Foundation of Chicago, Illinois. As of the spring of 2004, funding mechanisms for watershed based source protection and for agricultural participation in nutrient management are current policy debates in the province of Ontario. For example, the Implementation Advisory Committee on Watershed Based Source Protection Planning has been asked in its terms of reference to advise on innovative funding tools for source protection in the province, and the Nutrient Management Advisory Committee has also been asked to give the government advice on funding for certain agricultural practices. This research is intended to contribute to the discussion in Ontario about funding for water protection.

This review constitutes a selection of some of the possible applicable financing mechanisms for Ontario. It is organized by type of funding tool with a reference to a selected jurisdiction or paper for further information. It is a brief summary of some of the more interesting financing tools but is not an analysis or ranking of those tools. This report is best viewed on-line so that the links to the relevant jurisdictions or papers can be quickly accessed when the reader would like more detailed information.

Introduction

The Walkerton Inquiry, headed by Justice Dennis O'Connor, examined the safety of Ontario's drinking water and emphasized protecting water at the source as a key part of ensuring a sustainable water supply. Justice O'Connor considered the issue of funding watershed management and emphasized that a combination of funding mechanisms should be used for source protection planning. He recommended a leading role for the provincial government in ensuring that necessary funding is made available for what he called "this vitally important exercise." Justice O'Connor recommended that the necessary funding be constituted by a combination of provincial funding and contributions from other sources, such as municipal water rates, and implementation of the *user-pay* and *polluter-pay* principles.

This paper serves as a summary of some available financing tools for source protection planning in Canada, the US and other countries. The paper however does not include discussions on drinking water pricing and infrastructure financing since these topics were covered in many other papers submitted to Walkerton Inquiry. A wide range of instruments are examined from the US EPA guide called *Tools for Raising Revenue*. There are many approaches and many potential sources of funding for implementation of source protection programmatic and capital investments. However any source of financing must be stable, predictable, and sustainable for the long term - hence all of the potential mechanisms need to be evaluated against these principles.

Though separate economic mechanisms may provide good environmental results, the following case studies demonstrate that a combination of mechanisms and partnerships can give the best results. The case of the New York City Watershed Agreement cost sharing and leveraging works very well for many initiatives taken under the agreement. For example the Watershed Agricultural Program is primarily funded by New York City, with some US Department of agriculture (USDA) Natural Resources Conservation Service (NRCS) funds. NRCS also paid for the implementation of Nutrient Management Plans. Meanwhile the city's Department of Environmental Protection provided core funding for a watershed forestry program, while

matching grants came from the USDA forest service to develop forest management plans and to pay for a wide variety of other projects that benefit the water resources of the watershed.¹

This report provides a sample of jurisdictions using tools that could potentially be useful in Ontario. At least one illustrative example is presented for each type of source protection financing tool that we will examine, although many more jurisdictions were reviewed. A wide range of tools are identified in this summary, nonetheless it is not intended as an overview of the best practices in Ontario; rather it is intended to prompt further discussion.

The first part of the report is organized by the type of financing tool used, beginning with water taking levies and proceeding through selected other examples such as agricultural incentives. The second part focuses on a few examples of community-based initiatives that provided funds for aspects of watershed protection. In general these community projects are good supplements to the regulatory and fiscal tools used by governments for source protection.

¹ More information on New York City watershed management programs and their applicability for Ontario is available at [A Review of US Approaches to Integrated Watershed Management and their Applicability in the Ontario Region](#), Pembina Institute, 2003

1. Source Protection Financing Tools

1.1. Water Taking Levies

While water is obviously necessary for human life, it is also essential for a variety of economic activities like power generation, industrial processing and cooling, manufacturing and agricultural activities. In order to meet these wide-ranging needs without damaging an ecosystem water regulators must strike a balance between these competing demands. Water taking levies are usually charged with the purpose to manage water resources including monitoring, data gathering, information dissemination and management decisions, as well as to regulate takings. Levies also can provide incentives for implementation of modern technologies, as done in Germany.

Water Abstraction Taxes in Europe

Water abstraction in several European countries refers to ground and surface water takings. Some other states like the Netherlands only levy ground water takings, which is the source of 70 per cent of the country's total water supply.

Abstraction charges (other than administrative fees) have been used for several decades in France and Spain for the financing of river basin management. The charge revenues are used for water management and administrated by special purpose agencies in water management.

Abstraction taxes with a fiscal function have been in operation at the regional level in Germany, and they have been introduced recently at the national level in Denmark and the Netherlands. These two recent tax schemes differ considerably in scope and effective tax rate. The Dutch tax is relatively low and includes industry. The Danish tax is quite high, but applies to households and some service businesses only. The taxes in Denmark and the Netherlands however both exempt agriculture.

Comprehensive report on water abstraction taxes in Europe is available at [Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in European Union and its Member States](#), ECOTEC.

http://europa.eu.int/comm/environment/enveco/taxation/ch6water_abstruaction.pdf

Fees for Water Takings in Ontario

Fees for water takings are common in other jurisdictions (e.g. Minnesota, British Columbia and Nova Scotia). The implications of introducing a fee in Ontario are explored in the following paper:

[Water Allocation in Ontario Challenges to the Permit to Take Water Program](#), R.D.Kreutzwiser, R.C. de Loë, J. Durley and C. Priddle Available at <http://www.uoguelph.ca/gwmg/pubs.htm>

This document recommends that a fee for water taking permits in Ontario could provide support for enhancing the water use and supply data available for decisions on permits and costs of monitoring and enforcing compliance with the program and permit conditions.

More comprehensive information on water charges is also available in these papers:
[An assessment of the Impact of Charging for Provincial Water Use Permits](#), S.Ranzetti and D.Dupont, 1999, Canadian Public Policy, 25(3):361-378.

[Industrial Water Pricing for Ontario: Towards Realistic Pricing](#), D.Tate and R.Rivers, 1990, American Water Resources Association.

1.2. Discharges To Water Levies

The *polluter pays* principle is one of the leading methods for internalizing the costs of implementing water pollution control policies. Polluters then can have a choice between paying financial penalties or investing in mechanisms to reduce their impact on the environment. An emission to water charges usually apply to direct discharges to water and intend to recover water quality management costs.

Waste Water Taxes in the EU

Waste water taxes systems in Denmark, Germany and Holland represent different types of schemes and they are defined as compulsory payments independent of any service received. The Dutch scheme is uniform toward all dischargers to surface waters. By comparison, the German scheme is closely coupled with compliance with emission standards. The tax is reduced when standards are adhered to, and further reduced if dischargers keep their effluent at a quality that exceeds levels set in the regulations. The target for this improved performance has been set in advance and is subsequently verified.

Denmark's new scheme applies to all dischargers, municipal/industrial sources and individual dwellings not connected to sewers. However it offers considerable reductions for large industrial dischargers, and has combined fiscal and environmental purposes (part of the Green tax shift when taxation was shifted from income to the broader tax base). The exemptions in Denmark were given for industries that would be most seriously affected by the tax. As a result, the tax mainly affected sewage treatment plants.

The study on European waste water taxes cited below shows that the Dutch water pollution control policy was comparatively more efficient than similar programs in neighboring countries. This can be attributed to the levy system and an emphasis on cleaner technology measures, which were often promoted by subsidies from the levy.

Study on Environmental Taxes and Charges in the EU is available at: [Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in European Union and its Member States, ECOTEC](#)

http://europa.eu.int/comm/environment/enveco/taxation/ch7_waste_water.pdf

Emissions to Water Levy in the Netherlands

The emissions to water levy in the Netherlands was designed to collect revenue for government-run water quality management initiatives. A levy is imposed on private households and companies alike, based on the *polluter pays* principle. The original objective was to raise funds for the central purification of surface waters by government authorities. In practice however companies dramatically modified their discharges in response to the levy instead.

The levies are administered by regional Water Boards across the Netherlands and their rates vary widely. The variation reflects differences in water quality objectives, investment costs and waste volume.

More information on how Water Boards calculate the rates, differences between regions, etc... is available on the International Institute for Sustainable Development web site

<http://www.iisd.org/greenbud/nether.htm>

Effluent Charges in the US

While the US federal government and a number of states have considered effluent fees, only New Jersey, Louisiana, and Washington, have such programs based on measuring both the quantity and quality of pollutants discharged into water from point sources.

More information on effluent charges in US available at [EPA Tools for Raising Revenue](http://www.epa.gov/efinpage/guidbkpdf.htm)
<http://www.epa.gov/efinpage/guidbkpdf.htm>

Guide and Case Studies on Storm Water Management Financing

The paper cited below covers storm water management financing. It outlines options available to communities for storm water management, detailing successful financial mechanisms in seven different US communities.

Comprehensive information on storm water management available at: [Internet Guide to Financing Stormwater Management, Center for Urban Policy and the Environment at Indiana University-Purdue University Indianapolis](http://stormwaterfinance.urbancenter.iupui.edu/) <http://stormwaterfinance.urbancenter.iupui.edu/>

1.3. Pricing

The key concept for pricing is to recognize that fresh water is an asset. It has a value and it needs to be managed in such a way as to protect that value. The inference of protecting this asset leads one to the concept of sustainability — the protection of this asset for the needs of future generations, and the need to manage this asset in order to sustain its value.²

“Full-cost pricing”

To recover the costs associated with providing an adequate and reliable amount of safe drinking water, many jurisdictions have adopted a *full-cost pricing* system. This refers to the “total revenues required to cover operating expenditure, plus depreciation, plus a return on capital employed.” Although this is hardly a new concept, the merits of such a system become clearer with the growing pressure to comply with increasingly stringent regulations.

A report on the performance and challenges facing water management systems in OECD countries indicated that several jurisdictions have adopted a full-cost pricing scheme to recover costs associated with water and water services. The OECD divided water charges into two broad categories: (a) supply; and (b) sewerage and treatment. According to the report, Australia, Germany, the Netherlands, the UK, France and the US all use full-cost pricing to determine the appropriate rates for water supply. Except for France and the US, all those jurisdictions also use full-cost pricing to determine charges for sewerage and sewage treatment.

By comparison Austria, uses full-cost pricing for its sewerage and sewage treatment, but not for supply – this is probably because over 80% of the country’s drinking water is supplied from private groundwater wells. Canada and New Zealand do not use full-cost pricing to determine rates for either water supply or sewerage and sewage treatment, although Ontario has passed legislation to do so.

More information on financing drinking water infrastructure and prices is available at: [The Management and Financing of Drinking Water Systems: Sustainable Asset Management, Pollution Probe, 2001.](http://www.pollutionprobe.org/Publications/Water.htm) <http://www.pollutionprobe.org/Publications/Water.htm>

Submission of the Canadian Environmental Law Association to the Standing Committee on General Government Re: Sustainable Water and Sewage Systems Act, 2002;
http://www.healthyenvironmentforkids.ca/img_upload/f8e04c51a8e04041f6f7faa046b03a7c/434bill175.pdf

² The Management and Financing of Drinking Water Systems: Sustainable Asset Management; Pollution Probe, 2001.

Differential Pricing

Differential (non-linear) pricing, including declining block rates and progressive rate systems, as opposed to single tariff pricing, gives utilities flexibility to handle demand management and service affordability issues. Increasing block rates, peak hour and/or day surcharges, seasonal rates, and excess loading surcharges are forms of conservation pricing. In these systems the unit price rises as use rises or the time period changes, giving customers a real and growing incentive to control use. Increasing block rate systems charge higher unit prices for higher levels of usage. By contrast, with a declining block rate the unit price decreases when consumption exceeds a threshold amount. This form of marginal cost pricing recognizes that high volume users may contribute to economies of large scale for a facility or service. Single tariff pricing spreads costs over a wider population so that service to high-cost areas is subsidized by areas with greater cost efficiency. Utility design can affect demand for services as it affects the ability of businesses and households to pay for them.

More information on differential pricing is available in the Guidebook by EPA [Tools for Raising Revenue](http://www.epa.gov/efinpage/guidbkpdf/tools1-5.pdf): <http://www.epa.gov/efinpage/guidbkpdf/tools1-5.pdf>

1.4. Source Protection Incentives For Agriculture

All citizens want to have high quality, locally grown food, but not at the expense of surface and groundwater quality. Incentive and cost-share programs are designed to offset the cost and reduce the risks of converting to and the adoption of less polluting farm management practices. Across Canada farming communities have taken the lead in developing Environmental Farm Plans that serve as guides for farmers, encouraging and enabling them to incorporate sound environmental practices into their operations.

New York City Funds BMPs and Farm Plans

Through its customers, the municipality of New York finances upstream activities for the improvement of the hydrological services downstream for 1-1.5 billion dollars rather than investing in an artificial filtration plant (6-8 billion \$US plus 300.000 \$US/year).

The Watershed Agricultural Program (WAP) is a voluntary program developed by New York City with upstate farm groups. Under this program the city funds farm plans and Best Management Practices (BMPs) through a Watershed Agricultural Council. More than 90 percent of farms now participate. Although the WAP is voluntary, the web of factors bringing together the parties included the fact that New York City, needing to satisfy the daily demand for drinking water, and the additional costs of filtration if it could not obtain the filtration waiver, had the incentive to ensure farms participate. Farmers and landowners are motivated to participate at least in part by available funds.

A city-federal cost sharing program called the Conservation Reserve Enhancement Program pays farmers to take sensitive riparian buffer lands out of active farm use in order to re-establish a vegetative buffer. More than 85 percent of the farms are funded by the New York City Department of Environmental Protection to undertake Whole Farm Plan programs.

More information on the Reserve Enhancement Program is available at:

<http://www.fsa.usda.gov/dafp/cepd/crep.htm>

More information on Whole Farm Plans available:

http://www.nycwatershed.org/clw_wholefarmplanning.html

New Zealand: Overview of Farming Plans

Farm planning is a mechanism for identifying and documenting actions and timeframes to achieve desired outcomes. These can range from purely financial and production objectives to a wide range of environmental outcomes. Since the 1940's, farm plans have assisted New Zealand farmers and the councils in catchment management. Soil conservation programmes dominated early environmental farm plans. However since the early 1990's, these farm plans have expanded to address a range of farm improvements in addition to soil conservation (e.g. water quality, waste, biodiversity, animal welfare, riparian zones, etc).

More information on Farm Plans and the best practice examples in New Zealand is available at: <http://www.mfe.govt.nz/publications/land/environmental-farm-plans-review-may03.pdf>

Ontario Environmental Farm Plans

Environmental Farm Plans are documents voluntarily prepared by farm families to increase awareness of the environment on their farms. Farmers assess the current level of environmental concern related to different aspects of their operation, including water wells, soil and site evaluation, manure use and management, milking centre and wash water, and field crop management. Using this information, farmers identify the environmental strengths and weaknesses within their operations. They develop action plans, with realistic goals and timetables, to improve environmental conditions.

EFP funds have been provided federally through Agriculture and Agri-Food Canada (AAFC). Current funding for the EFP is provided through AAFC's CanAdapt program administered in Ontario by the Agricultural Adaptation Council. The EFP is delivered locally by the Ontario Soil and Crop Improvement Association in partnership with the Ontario Ministry of Agriculture and Food.

More information on Ontario Environmental Plans is available on the Ontario Soil and Crop Improvement Association web site <http://www.ontariosoilcrop.org/EFP.htm>

1.5. Fertilizer/Pesticide Levies

Farm applied nutrients and pesticides may seep into ground water, lakes and rivers contaminating sources of drinking water. The major agricultural pesticides in use are increasingly associated with water contamination and a variety of deleterious effects on human and wildlife health. Agriculture levies can generate substantial revenue that can be used to fund important programs, such as monitoring, research and technical assistance regarding the use of alternatives to hazardous chemicals, farmland preservation, and agricultural pollution clean up.

Fertilizer/Pesticide Taxes in the US

States like Wisconsin, Iowa, Minnesota and Oregon assess surcharges on fertilizer/pesticide sales or charge producers/distributors directly. Typically, they also charge for fertilizer/pesticide product inspection, registration and/or licensing fees. California, Minnesota, and Iowa have each adopted nominal pesticide taxes (0.3 - 1.5 % of sales) and are directing some of those funds towards grant programs that encourage more research and the adoption of sustainable practices.

A number of states have fertilizer registration programs, some of which finance nonpoint source pollution control. For example Kansas charges a \$1.70/ton fertilizer fee, with \$0.30/ton dedicated to the fertilizer program and \$1.40/ton dedicated to the State Water Plan which funds conservation, water quality and water use projects. Other states with dedicated pesticide registration fees include Iowa, New York, Wisconsin, and Minnesota (which raises \$3 million annually).

More information on US pesticide taxes is available in the Guidebook by EPA [Tools for Raising Revenue](http://www.epa.gov/efinpage/guidbkpdf/tools1-5.pdf) <http://www.epa.gov/efinpage/guidbkpdf/tools1-5.pdf>

Levies on Pesticides in the Europe Union

At the moment only four countries in the EU impose levies on pesticides: United Kingdom, Finland, Sweden and Denmark. The first two use a levy purely with the aim to finance their pesticides registration system, while the latter two countries use a levy in order to reduce the use of harmful pesticides in agriculture.

Swedish experience shows that the indirect effects of a relatively small tax on pesticides could be quite significant by using the revenues effectively. The Denmark experience shows that a differentiated levy on pesticides is possible and useful if some pesticides need to be reduced more than others. Denmark and Sweden experiences show that a levy on pesticides charged on the retail price of pesticides rather than the active ingredients has different effects.

A comprehensive study on a European Union wide regulatory framework on levies on pesticides is available at: <http://europa.eu.int/comm/environment/enveco/taxation/eimstudy.pdf>

1.6. Land Conservation Incentives

Some communities have found that an effective way to protect the quality of drinking water sources is to own or control land in upstream watershed or ground water recharge areas where development or other land activities can impair the quality of the drinking water source.

New York City Department of Environmental Protection

New York City's water utility, the Department of Environmental Protection (DEP), has embarked on a 10-year program of land acquisition within its watersheds. Each watershed has been divided into priority areas, based on natural features and proximity to reservoirs, intakes, and DEP's distribution system. These priorities determine the geographic focus for acquisitions. Fair market value is paid for all land, and DEP pays property taxes on the land.

As part of a 1997 Watershed Agreement, DEP has a 10-year water supply permit from the New York State Department of Environmental Conservation. The permit enables DEP to acquire, through purchase or conservation easements, undeveloped land near reservoirs, wetlands, and watercourses, as well as land possessing other water-quality-sensitive features.

More information on this case is available at [Protecting Sources of Drinking Water: Selected Cases on Watershed Management](http://www.epa.gov/safewater/swp/swpcases.pdf), EPA, 1999. <http://www.epa.gov/safewater/swp/swpcases.pdf>

Land Acquisition in Small Communities

The Portland Water District, small in relative size to other utilities involved in watershed acquisition, has made significant use of this management tool. Even with limited resources and staff, in 1997, the utility spent \$600,000 to establish a buffer zone by purchasing land within 1,000 feet of the shoreline of Sebago Lake and its tributaries. The district purchased 5 properties, at market value, from willing sellers. The money for the district's land acquisition program comes from 1993 legislation allowing water utilities to set aside up to 5 percent of the prior year's revenues for drinking water source protection.

More information on Portland Water District is available at: <http://www.epa.gov/safewater/swp/swpcases.pdf>

Florida Preservation 2000 Program

The Florida Preservation 2000 program is projected to be funded for 10 years through the sale of bonds that annually total \$300 million. The five water management districts receive 30 percent of this fund, and the Northwest Florida Water Management District receives 10 percent of that total. This important source of funding has been used to accelerate acquisitions under the Save Our Rivers program.

More information on criteria for acquisitions and arising problems is available at:
<http://www.dep.state.fl.us/lands/acquisition/P2000/index.htm>

Land Acquisition Funded by Real Estate Transfer Tax

Maryland has been nationally recognized for programs that provide funding for state and local parks and conservation areas. The state was one of the first to fund land conservation through a real estate transfer tax, which funds Program Open Space. It is one of several programs that will give the state the ability to protect land at nearly the same pace as development. The Program provides funding for the acquisition of park land, forests, wildlife habitat, greenways, and natural, scenic and cultural resources.

More information on this program is available at American Farmland Trust web site:
<http://www.farmlandinfo.org>

Purchase Of Agricultural Conservation Easement Programs

Purchase of agricultural conservation easement programs (PACE) in US compensate property owners for restricting the future use of their land. PACE is known as Purchase of Development Rights (PDR) in many locations. PACE programs are based on the concept that property owners have a bundle of different rights, including the right to use land, lease, sell and bequeath it, borrow money using it as security, construct buildings on it and mine it, or protect it from development, subject to reasonable local land use regulations. Some or all of these rights can be transferred or sold to another person. When a landowner sells property, generally all the rights are transferred to the buyer.

PACE programs enable landowners to separate and sell their right to develop land from their other property rights. The buyer, however, does not acquire the right to build anything on the land, but only the right and responsibility to prevent development. After selling an easement, the landowner retains all other rights of ownership, including the right to farm the land, prevent trespass, sell, bequeath or otherwise transfer the land.

More information on this kind of program is available at American Farmland Trust:
<http://www.farmland.org/pnw/PACE%20questions.pdf>

TRCA Land Acquisition Program

The Toronto Region Conservation Authority uses land acquisition as a tool to protect environmentally significant natural heritage lands; to regenerate and rehabilitate of degraded areas; and to provide relief from flood and erosion hazard. In October of 2000 the TRCA adopted a new 5-year project for acquisition called the "Natural Heritage Lands Protection and Acquisition Project 2001-2005".

More information on this program is available at:
http://www.trca.on.ca/land_protection/conservation/default.asp?load=acquisition

Ecological Gift Program in Ontario

An Ecological Gift or ecogift is a donation of land, or an interest in land such as a servitude, a covenant or an easement, from a private or corporate landowner to the federal government, a province or a municipality in Canada, or to a qualified registered charitable organization. Administered by Environment Canada, the Program is made possible by provisions of the *Income Tax Act*. In Ontario, Environment Canada must certify the land as ecologically sensitive, the qualification of the recipient agency and the fair market value of the donation.

For more information visit Environment Canada web site:
<http://www.on.ec.gc.ca/wildlife/ecogifts/glossary-e.html>

1.7. Other Water Source Protection Initiatives

A wide variety of revenue raising tools was developed by different jurisdictions in Canada and other countries. US EPA Guidebook mentioned below suggests 340 financial tools to raise revenue for the environment protection efforts.

Regional Municipality of Waterloo, Ontario

To ensure a safe supply of water, the Regional Municipality of Waterloo has developed a ten-year Water Resources Protection Strategy to preserve and protect water supplies in the area.

One aspect of the strategy involved establishing “Well Head Protection Areas” around each municipal groundwater supply well, thus encompassing the recharge area.

The Water Resources Protection Strategy also includes a number of other initiatives. The Rural Water Quality Program is a municipally funded incentive program designed to encourage farmers to protect surface and groundwater quality. Measures, such as fencing cattle from creeks, creating buffers beside creeks, and building manure storage facilities, are cost-shared with farmers. A parallel program for businesses, called the Business Water Quality Program, has also been established. Costs are shared for providing spill containment structures, as well as training employees to improve chemical handling and reduce spills to groundwater, surface water and sewers.

More information Waterloo Municipality program is available at [Source Water Protection Primer](#), Pollution Probe <http://www.pollutionprobe.org>

City of Toronto

The City of Toronto has been actively pursuing demand side management activities. The city has invested in programs such as ultra low flush toilet incentives, industrial water capacity buyback, and horizontal axis washing machine promotion, with the goal of reducing peak water demand. Toronto estimates that its demand side reduction efforts will cost about one-third as much as creating an equal amount of new capacity. In addition, thousands of dollars in savings have accrued to end users using less water. Such programs not only help to save money for users but also delay need to expand or build new water and wastewater facilities.

For more information visit
<http://www.city.toronto.on.ca/watereff/>

Incentives to Protect Riparian Buffers in the Watershed

The *Green Banks Program* in Manitoba is a voluntary, stewardship-based initiative that has focused on riparian fencing, new cattle grazing and management systems. Economical benefits of the project were evaluated and showed measurable benefits to landowners, to the environment and to rural communities.

More information on this program is available at:

<http://www.gov.mb.ca/agriculture/livestock/livestockopt/papers/sopuck.pdf>

Sealed Surface Charge in Germany

A wide-spread concern is the impermeabilisation or sealing of the soil surface, usually in urban areas, which reduces ground water recharge and increases the risk of flooding in cases of heavy rain. Increasingly, municipalities are beginning to finance the treatment of rainwater run-off throughout a charge based on the area in m² of sealed surfaces. This creates an incentive to cover suitable surfaces with porous stones or to allow the flow from sealed surfaces to discharge onto the ground rather than into sewers.

More information on this incentive is available in the paper:

Water Management and Policy in Germany, R.A. Kraemer

http://www.ufrgs.br/iph/kraemer_water_management_and_policy_in_germany.pdf

The Guidebook by US EPA - Tools for Raising Revenue

This *Guidebook* is intended to be a working tool to enable practitioners in the public and private sector to find the appropriate methods to pay for environmental protection efforts. It is divided into 10 sections, outlining information on approximately 340 financial tools.

In addition to tools mentioned earlier in this report, the source protection planning could examine other tools described in the Guide Book such as: Green Product, Hotel and Resort, Watercraft Sale, Septic System Impact, Water Rights Application taxes, Well permit/Pumping fees, Direct Water Use charges.

The Guide also lists a wide range of tools for lowering project costs: Cost-Benefit Analysis, Cost-Effectiveness, Deduction of Agricultural Conservation Expenses and others. There are also some tools for encouraging pollution prevention such as Development Rights Purchases, Environmental Self-auditing, Full-Cost Environmental Accounting, Green Investments, Pollution Charges, and Tax Incentive Programs.

The Guidebook is available at US EPA web site:

<http://www.epa.gov/efinpage/guidbkpdf/tools1-5.pdf> (large document 315 pages)

2. Financing Community Watershed Management Initiatives

In addition to centralized watershed source protection financing tools, there is a wide range of examples of community based initiatives that may supplement the regulatory and fiscal initiatives. The US EPA Guidebook *Tools for Raising Revenue* mentioned above lists 26 categories of tools available for community based environmental protection. Some of them, which are most applicable to the source protection in Ontario, are briefly described below. In addition to the following revenue raising examples, it is important to recognize the value of in kind contribution.

Adoption Programs

Adopt an Animal/Habitat programs run by National Wildlife Federation, the Adopt a Beach program in California, and License Plates and Stamps, promote conservation in various communities.

Conservation Easements

Conservation easements are deed restrictions or covenants that prohibit, limit, or permit certain activities on privately-owned land in perpetuity. The easements do not restrict ownership or sale of the parcel, although purchasing an easement constitutes partial ownership in some sense. Not only do easements prohibit or limit the density of development, but also may require additional landowner work, e.g., soil conservation and weed control, or monitoring particular types of plants, animals and habitat.

Direct Contributions

Direct contributions of environmentally-sensitive land from individuals and businesses can reduce the need for outright governmental expense. Alternatively, the land can be sold to raise revenue for other environmental projects. Land donated through conservation easements and the US Department of Agriculture conservation reserve program were discussed earlier in this report.

Ecotourism

Ecotourism is the use of recreational revenues to fund conservation activities in natural areas which are visited. Australia established a National Ecotourism policy that mandates environmental impact review in areas that experience significant natural resource tourism. Issues of participation by and impact on indigenous peoples also arise.

Lotteries

Lotteries sell tickets for a chance to win a sum of money or other valuable prize. Minnesota has had an environmental lottery for over ten years and voted in 1990 to require that not less than 40 percent of net proceeds go to the Environmental and Natural Resources Trust Fund. Colorado has a lottery-funded conservation program (GOCO). Maine's lottery dedicates most profits to the Outdoor Heritage Trust. Kansas also dedicates a small, fixed percentage of lottery proceeds to wetlands and nonpoint source control.

Green Credit Cards

A private company or a nonprofit environmental organization may work with a bank or other financial institution to issue a major credit card on a State, regional, or even national basis. The card is structured to benefit an existing or new fund in an organization dedicated to watershed protection, habitat management, species protection, or other environmental goals. The Chesapeake Bay Foundation has issued a regionally-based green credit card to help finance projects and activities in the Bay watershed.

Small Denomination Bonds

Small denomination bonds sold directly to the general public may finance capital projects, such as tree planting, that promote stream restoration. An example is the Maryland Governor's Blue Ribbon Panel's *Financing Alternatives for Maryland's Tributaries Strategies*.

All tools mentioned above available at US EPA [Tools for Raising Revenue](http://www.epa.gov/efinpage/guidbkpdf/tools6-10.pdf) Chapter 8.
<http://www.epa.gov/efinpage/guidbkpdf/tools6-10.pdf>

Conclusion

The samples provided in this report demonstrate that there is a wide range of available and effective tools to finance source protection.

In Ontario's Source Protection Advisory Committee report of April 2003, the committee called for sustainable, predictable sources of funding in the long term. Most of the examples given in Part I of this report would satisfy these criteria. In addition, many of them satisfy the criteria of *polluter pay* and *beneficiary pay* that Justice O'Connor mentioned in the Part II Walkerton Inquiry Report. Critical to the success of any of the tools, however, would be clear demonstration that the levies, fees or charges are being used for discrete aspects of source protection planning.

For example, levies on water takings could be used for ground and surface water data collection, including in-field data gathering, as well as for data compilation, dissemination and analysis in managing source protection in Ontario. Similarly, emissions charges could be used for contaminant-reduction programs in the province. Rates could contribute to some aspects of source protection but the capacity to cover all of the needed source protection activities would be limited. It may be that differential pricing would provide some of the contribution to source protection funding from rates. For example, if base prices are charged that cover full infrastructure costs, higher prices for uses beyond basic needs may provide additional revenues for conservation programs and data collection in the municipality.

In many cases charges may be matched directly to the impact. The charges themselves may even assist with mitigation and reduction of the source of the problem, as in the case of the impermeable surfaces charge described earlier in the report.

As demonstrated in the discussion of incentives, the potential scope for agricultural source protection incentives and conservation incentives is enormous, limited only by the imaginations and visions of the participants, as long as there are no statutory or other barriers to implementing the programs.

In many cases, a combination of initiatives and participants results in the overall protection needed for the watershed. The New York/New York City example is demonstrative of the need to understand the benefits and costs on a broad, watershed basis, taking account of all of the participants from land owners and land users to water treatment providers and urban water users.

Given the size of the province of Ontario, the variety of watersheds in Ontario and the number of source protection issues in Ontario, a similar visionary approach to source protection financing is needed.

Bringing together disparate actors from across the watershed, and linking the costs and benefits in creative ways across sectors, users and beneficiaries will provide the needed basis for success of watershed based source protection planning in Ontario.