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Ontario conservation authorities: principles, practice and challenges 50 years later

Dan Shrubsole
Department of Geography, University of Western Ontario, London, Ontario, Canada N6A 5C2

In 1996, Ontario conservation authorities are 50 years old. This paper reviews the origins and founding principles of the conservation authority programme. After describing recent events in Ontario water management, the six founding principles—watershed jurisdiction, local initiative, a provincial–municipal partnership, coordination and cooperation, a healthy environment required for a healthy economy, and a comprehensive approach—are used to examine the practices of the Upper Thames River Conservation Authority (UTRCA). Conclusions suggest that the six principles were and are sound, although they have been 'rediscovered' under new names. The formation of new forms of partnerships and broadening the funding base have been the UTRCA's primary responses to recent developments in Ontario resource management. Given the strong probability of future changes, conservation authorities and all other public and private resource managers must create new ways of delivering an even greater level of service to the public. Copyright © 1996 Elsevier Science Ltd

One challenge arising from the 1992 Earth Summit was to better protect the quality and supply of freshwater resources through the application of integrated management approaches. To achieve this goal, several management principles were adopted in *Agenda 21*, including:

> a 'bottom-up' approach of putting emphasis upon people, communities and NGOs; the need for 'open governance'; the importance of adequate information; the need for adequate crosscutting institutions; and the complementarity between regulatory and market mechanisms for addressing development and environmental needs. (Grubb *et al.*, 1993: 17)

Since water supports all aspects of life, particular attention has often been placed on that resource under initiatives such as 'comphrehensive water management', 'unified river basin management', 'integrated catchment management', 'sustainable water management' and 'integrated water management' (Mitchell, 1990; Downs *et al.*, 1991; Mitchell and Hollick, 1993; Mitchell and Shrubsole, 1994; Born and Sonzogni, 1995). These approaches and the principles noted in *Agenda 21* require institutional arrangements to plan, deliver and monitor initiatives that meet the needs of people.

Improving existing institutional arrangements will enhance the effective implementation of sustainable development. The establishment of watershed or catchment-based agencies has been a long-standing approach to addressing some water and related land

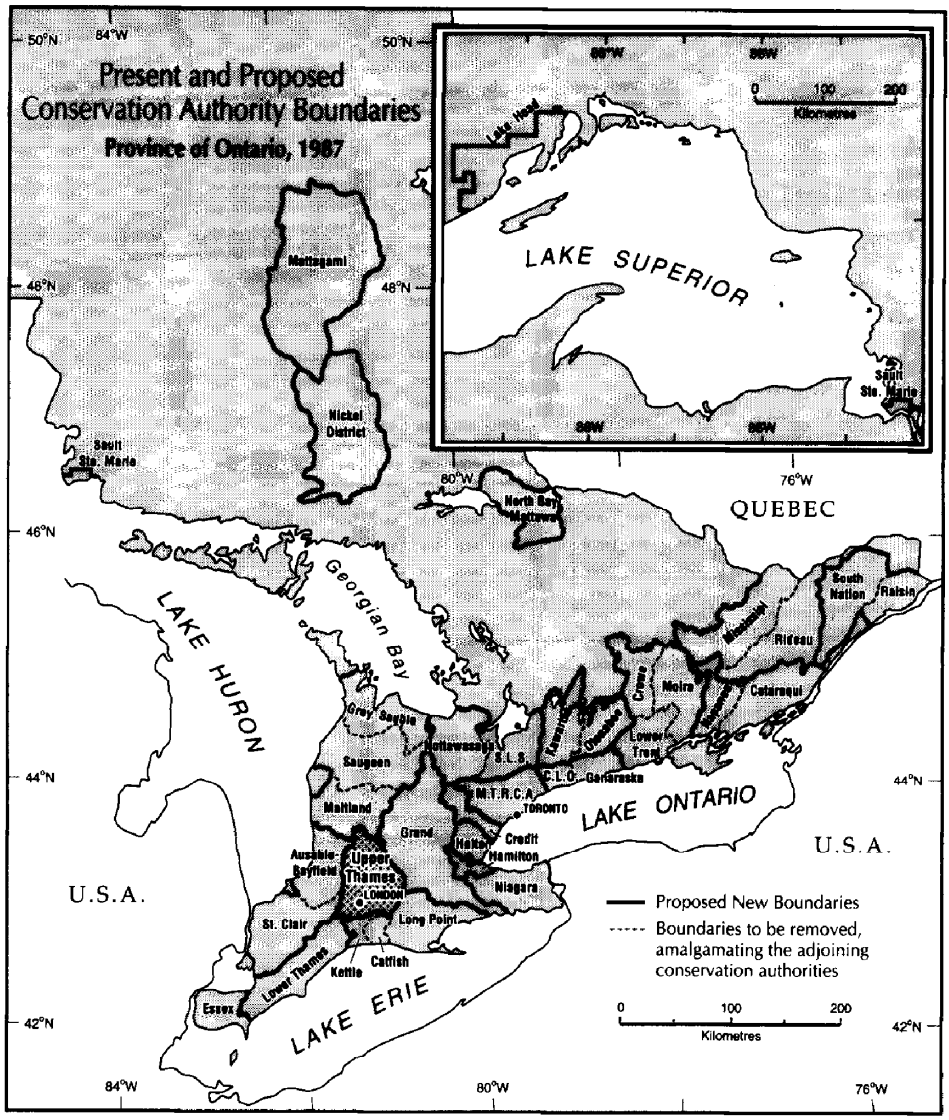

Figure 1 Ontario conservation authorities: present and proposed boundaries

management issues. Between the early and mid-twentieth century, New Zealand (Burton, 1985), England and Wales (Mitchell, 1970), the United States (Browning, 1949; Owen, 1973; Jenkins, 1976), Australia (Mitchell and Pigram, 1989) and Canada (Mitchell and Shrubsole, 1992) established agencies to address regional environmental, social and economic issues. While the idea of integrated management approaches has been attractive, its effective application has often been 'hesitant and unsystematic. In part, this is a result of the presence of real obstacles to integration. It also reflects a situation in which participants are learning as they proceed, with no obviously correct model' (Mitchell, 1990: 3). Some of these difficulties include a lack of consensus over what terms like 'sustainable development' mean, and practical obstacles such as

professional bias and fragmented administrative arrangements (Mitchell, 1990; Born and Sonzogni, 1995).

In Ontario, Canada, the Conservation Authorities Act was passed by the Provincial Legislature in 1946 to further the 'conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals'. Since 1946, 38 conservation authorities have been formed (*Figure 1*). They have been described by Leopold as 'one of the most advanced approaches to conservation anywhere', and by Williams as 'an outstanding example of community action for conservation' (Ontario Select Committee on Conservation Authorities, 1967: 16). Hamilton (1971: 110) suggested on a world scale that conservation authorities had come the closest to achieving unified action in water management, and Sewell (1962: 150) commented that in Canada 'perhaps the most successful example of an administrative agency for multiple-purpose development at the municipal level of government is that of Conservation Authorities'. Hale (1988: 34) observed that 'the key to the success of conservation authorities has been flexibility and adaptability'. Lord (1974: ix) concluded that 'the success of conservation authorities has resulted from sound basic thinking and shrewd planning in the formative years. The initial concepts were simple, but so fundamentally right that only minor adjustments have been necessary'. These initial concepts referred to by Lord are that conservation authorities require local initiative and involvement, represent a municipal–provincial partnership, and use the watershed as a management unit. These comments suggest that conservation authorities have the community-based orientation and some of the other traits noted in *Agenda 21*.

Despite these positive comments, there have been criticisms. Campbell *et al.* (1974: 493) stated that conservation authorities' 'governing boards . . . are susceptible to rapid turnover in membership, are subject to the vicissitudes of municipal priorities and interest, and sometimes find themselves in conflict with the province'. Voison (1976: 38) claimed that 'the irrelevancies, duplications and redundancies caused by the deliberate extension of Conservation Authorities are unnecessary'. A Royal Commission on the Future of the Toronto Waterfront (1990: 102) observed that many people who appeared before the commission

> . . . expect that the primary responsibility of conservation authorities is conservation—protecting valley lands and natural areas, taking the lead in restoring water quality, planting trees and shrubs to attract wildlife. Whey they see, instead, is the recreation and development side of conservation authorities: building spits of lakefill into water, developing marina and active recreation parks, turning streams into sterile ditches in the name of flood control.

And a review by the government of Ontario expressed concern that:

> . . . the broad mandate of C.A.s as contained in current legislation has resulted in C.A.s becoming involved in a wide range of activities. This has resulted in overlap with the program of various ministries . . . The resultant duplication of effort creates public confusion and some real inefficiencies in the delivery of these services. (Ontario Ministry of Natural Resources, 1987: 79)

This committee advocated that conservation authorities should focus their efforts on flood and erosion control, low flow augmentation, water quality sampling and the management of regionally significant parks. Despite the broad mandate, other water management functions in Ontario are divided among several provincial ministries: Environment and Energy (OMOEE, water quality), Natural Resources (OMNR, fisheries, forestry, public lands, conservation authority programme), Agriculture, Food and Rural Affairs (OMAFRA, diffuse pollution sources), Municipal Affairs (OMMA, land use planning policy), the Ontario Clean Water Agency (OCWA, water supply), and local municipalities (land

Table 1 The range of differences among conservation authorities in Ontario

	Smallest authority	UTRCA	Largest authority
Area of jurisdiction (km^2)	215	3433	10933
Watershed population	9282	398919	2696194
Watershed assessment ($000000 Cdn)	191	6856	89749
Participating municipalities	1	27	42
General members	7	33	53
Three-year average budget ($000 Cdn)	245	3818	19600
Permanent staff	4	45	193

Source: Ontario Ministry of Natural Resources (1987)

use planning, supply, sewerage). Since the late 1980s, Ontario's water and environmental management arrangements have been reviewed and adjusted on an almost continuous basis.

Now that the Conservation Authorities Act has reached its golden anniversary and significant changes have occurred recently at global and provincial scales, it is appropriate to explain the origins of the programme, describe recent developments in Ontario resource management, and review its fundamental concepts in historical and contemporary contexts. While it is acknowledged that 'no two conservation authorities are exactly alike' (Lord, 1974: x), the experience of the Upper Thames River Conservation Authority (UTRCA) (*Figure 1*) illustrates how a predominantly rural-based conservation authority with a relatively well funded programme (*Table 1*) has addressed contemporary challenges. Information was obtained from an examination of audited financial statements, interviews with relevant conservation authority officials, annual reports, and related documents.

The article is organized into four parts. First, the origins of the programme are reviewed to identify its original principles. Secondly, recent activities that have significantly affected resource management and conservation authorities are outlined. The six founding principles of the conservation authority's programme provide a framework for considering how the UTRCA has responded to these changes. Finally, a summary is provided.

Origins

Concern over the employment of second world war veterans and the degraded state of Ontario's renewable resource base prompted senior governments in Canada to reconsider institutional arrangements for resource management. In 1941, Canada was involved in the war. Although it would continue for several years, Canadian senior government officials were already thinking about how jobs would be provided to returning armed forces personnel once the war ended. The success of the US Civilian Conservation Corps in creating over 5 million jobs for individuals during the Depression was viewed as an idea that might be adapted for Canadian conditions in the post-war period (Thomas, 1966). The war effort was also placing increased demands on soil, forest and water resources, and added to the degraded landscape (Latornell, 1968).

These concerns led the Federation of Ontario Naturalists and the Ontario Conservation and Reforestation Association to pass motions at their respective annual meetings in February 1941 for the government to initiate conservation programmes (Richardson, 1968). These two groups cooperated in organizing the Guelph Conference, held in April

1941, to which all organizations active in conservation were invited. A key conclusion at the Guelph Conference was that:

> All the renewable natural resources of the Province are in an unhealthy state. None of these natural resources will restore themselves under present conditions, and the need for far reaching measures of restoration and conservation is acute: without them the conditions will get progressively worse. (Guelph Conference, 1942: 3)

The participants at the Guelph Conference suggested that a conservation programme would not only restore and protect natural resources, but would integrate veterans into civilian life after the war. It was believed that the best strategy would be one based on watersheds and one that considered renewable resources as an integrated whole (Richardson, 1966).

When presented with these suggestions, the Federal Advisory Committee on Reconstruction was supportive. Together with the Ontario government's Interdepartmental Committee on Conservation and Reconstruction it sponsored a pilot study of the Ganaraska River watershed. Completed in June 1943, *The Ganaraska Watershed* report identified a wide range of water and land-related projects. Regarding how implementation should occur, it concluded that an existing provincial agency

> . . . would be the most obvious solution . . . but . . . no one department is equipped at present with a staff of experts trained in all sciences represented. Even if a department were so equipped, it is questionable whether the best interests of the community would be served by having a government department take absolute responsibility for such a programme. (Richardson, 1943: 238)

Ontario officials looked to the experience of the Grand River Conservation Commission, and toured the Muskinghum Conservancy District (Ohio, USA) and the Tennessee Valley Authority (TVA, USA) in 1944 (Shrubsole, 1992). This context and these experiences contributed to the development of six fundamental principles. Three of these principles (watershed, local initiative, provincial–municipal partnership) were explicit in the discussions leading to the creation of conservation authorities (Richardson, 1974). The other three principles (a healthy environment being necessary for a healthy economy, a comprehensive approach, coordination and cooperation) were frequently addressed but remained more implicit than explicit (Mitchell and Shrubsole, 1992).

Since 1946, the conservation authority programme has been reviewed three times: *Report of the Select Committee on Conservation Authorities* (1967), *Report of the Working Group on the Mandate and Role of the Conservation Authorities of Ontario* (1979), and *The Review of the Conservation Authorities Program* (1987). There was also a 1950 review of conservation efforts by provincial agencies (Ontario Select Committee on Conservation, 1950). New provincial agencies have been created or amalgamated, most recently with the development of the Ontario Clean Water Agency, the Ontario Ministry of Environment and Energy, and the Ontario Ministry of Agriculture, Food and Rural Affairs. Environmental legislation, such as the Environmental Protection Act and Environmental Assessment Act, was introduced in the 1970s and has been subsequently amended (Shrubsole, 1990; Mitchell and Shrubsole, 1992). The formation of regional governments was initiated in 1969 and there have been amendments to the Planning Act. The significance of these activities for conservation authorities was reviewed by Mitchell and Shrubsole (1992). Since the 1990s, all levels of government have reduced the funding available for resource management activities as part of a general financial restraint effort, and there have been several administrative and legislative changes (Mitchell and Shrubsole, 1994). The next section focuses on several significant developments in Ontario's institutional arrangements for resource management.

Recent initiatives

Ontario Round Table on the Environment and Economy (1987–92)

In 1987, the Brundtland Commission introduced the concept of sustainable development. It believed that implementing sustainable development posed 'problems for institutions ... established on the basis of narrow preoccupations and compartmentalized concerns' (World Commission on Environment and Development, 1987: 9). Given the broad mandate of the conservation authorities, Ontario could have positioned itself to avoid this shortcoming. However, many public agencies operating under a variety of legislation, a lack of strong commitment to integrated water management, means-biased funding arrangements, inadequate mechanisms to foster inter-agency collaboration, and an organizational culture that frustrated effective communication and education among line managers have impeded the development of integrated resource management in Ontario (Mitchell and Shrubsole, 1992). Round Tables on the Environment and Economy have been Canada's principal response to the challenge of sustainable development (Doering, 1993). In Ontario, this multi-stakeholder group established six principles of sustainable development and created six task forces. The task force reports and the draft strategy document, entitled *Restructuring for Sustainability*, recognized the need for effective water management. The six principles for sustainable development are of particular relevance to resource managers. They suggest that managers should be concerned with proactive and well-informed planning, and recognize the value of water as both a natural and as an environmental resource. These statements support and extend the six founding principles of conservation authorities.

Review of the conservation authorities programme (1987)

An interministerial committee reviewed the conservation authority programme and concluded that: (1) except for flood control, there was a lack of consensus about specific responsibilities of conservation authorities; (2) there was inconsistent programme delivery and large variability of financial resources among the 38 conservation authorities (see *Table 1*); (3) the membership was often too large (*Table 1*); and (4) the grant structure created difficulties for conservation authorities (Ontario Ministry of Natural Resources, 1987). The committee made several recommendations. First, conservation authorities should continue to operate on a watershed basis with strong local initiative and through municipal–provincial cost sharing. Secondly, all conservation authorities should carry out specific programmes. Thirdly, the number of conservation authorities in southern Ontario should be reduced from 33 to 18 through amalgamations (*Figure 1*). Fourthly, some authorities should reduce their membership. Fifthly, the grant rate structure should be altered and the province should contribute an additional $5 million to meet present and future funding needs.

In 1991, the Minister of Natural Resources announced several decisions. First, public information programmes were to be part of the core set of conservation authority responsibilities, while outdoor education programmes offered to school-children were viewed as non-core. Small-scale erosion and sediment control projects on private land were considered core responsibilities, with the local share of costs to be provided wholly or partially by the benefiting landowner. Flood and in-stream erosion control, and conservation area operations (parks) were confirmed as part of the core mandate. Membership reductions and amalgamations were only encouraged rather than made mandatory. Concerning funding, cost-sharing arrangements would vary at 50 or 70 per cent for operating programmes and 50 per cent for capital programmes. Conservation authorities with low populations and assessments would receive the 70 per cent grant rate. Conservation authorities in northern Ontario would receive

enhanced levels of funding (Wildman, 1991). No comment concerning additional funding was made.

The reform of the Planning Act (1992–5)

In response to concerns regarding the effectiveness of the land use planning process, the province established a Commission on Planning and Development Reform. During its hearings, OMNR and OMOEE (1993) published guidelines to promote more effective land use development through subwatershed planning. In its final report, the Commission maintained that:

> Conservation Authorities already have a strong track record for studying and attempting to protect the health of watersheds. The experience and expertise should be used in preparing watershed studies and recommendations, in helping mesh the local concerns of municipalities with the broader concerns for the natural environment, and for studying the long-term implications of changes. (Ontario Ministry of Natural Resources and Ontario Ministry of Environment and Energy, 1993: 79)

It also noted the need to provide more timely decisions, to allow better opportunities for public involvement, and to better protect the natural environment (Sewell Commission, 1992).

In May 1994, the government responded to the report with a set of proposals to reform the development and planning system. Central to these reforms was the formulation of a comprehensive set of policy statements under the Planning Act that municipalities would be required to follow. Municipalities are to prepare an Official Plan, and are empowered to make development decisions that must 'be consistent with' the provincial policy statements. Increased responsibilities may be assigned by OMNR to conservation authorities and/or municipalities for the administration of the Lakes and Rivers Improvement Act. Other changes included provisions that supported subwatershed planning, the preparation and review of environmental impact statements, and the monitoring of environmental conditions and cumulative impacts. The comprehensive policy statements describe general provincial policy and place less emphasis on specific application. Increased decision-making power will be transferred from the provincial government to local bodies. Conservation authorities could play a significant role in subwatershed planning, impact assessment and environmental monitoring.

Restructuring provincial agencies (1993)

A new crown corporation, the Ontario Clean Water Agency (OCWA), was established in 1993 to operate as a commercial enterprise and to create partnerships with municipalities and private companies. It assumed the responsibilities of the OMOEE for managing sewage treatment plans and water treatment facilities. OCWA's activities regarding water supply and conservation are to be guided by Ontario's Water Conservation Strategy goal that is to maintain 1991 water use levels constant until the year 2011.

Changes to the administrative structures within the OMNR and OMOEE have occurred (Mitchell and Shrubsole, 1994). In the OMNR, the traditional administrative structure highlighting functional resource issues—lands and waters, forestry, parks, fisheries and wildlife—has been replaced by new divisions: Aquatic Ecosystems; Terrestrial Ecosystems; Resources Stewardship and Development; and Research, Science and Technology. Similar changes occurred within the OMOEE following the combining of the former ministries of Environment and Energy (Mitchell and Shrubsole, 1994). This reorientation is expected to embrace both the ecosystem approach and funding restraints. However, it makes the issue of which agency has responsibility and leadership for water management in Ontario less clear. There are at least three implications of these organizational changes.

First, former compartmentalized units are being replaced by divisions that better reflect ecosystem perspectives. Secondly, there is an increasing emphasis on recovering costs from the users of a water service, rather than relying on contributions from the taxpayer. Thirdly, one new agency, the OCWA, has been added to an already complex set of institutional arrangements.

Financial restraint and restructuring resource management in Ontario—A Blueprint for Success (1993–5)

After 1989, the Ontario economy was in recession, and in 1992 the provincial government addressed its deficit problem through significant spending cuts. The conservation authorities suggested that these cuts failed to address the fundamental problems of resource management, and in particular the issue of overlapping institutional arrangements for water management. The inefficiencies associated with this overlap were estimated at over $100 million (ACAO, 1993). Conservation authorities suggested that improved services could be achieved through: (1) managing resources on a watershed ecosystem basis by reconfigured and restructured conservation authorities; (2) focusing the efforts of relevant provincial ministries on the strategic planning aspects of resource management; and (3) combining the water-related mandates of the OMNR and OMOEE into a single agency. As yet, the province has made no effective response to this proposal.

A new provincial government was elected in June 1995. In its November 1995 financial statement, it responded to its continuing financial difficulties through further expenditure reductions to all provincial agencies, municipalities, and provincially supported agencies (including hospitals, universities, school boards and conservation authorities). Over the next two years, conservation authorities are to lose 70 per cent of the operating funds from the province and receive no provincial funding for capital works. These reductions, combined with the reduced levels of transfer payments provided to municipalities, may prompt a reconsideration of the institutional arrangements for water resource and environmental management in the province. Fundamental issues such as the functions, mechanisms and structure of not only conservation authorities, but of federal, provincial and municipal governments have yet to be systematically reviewed and renewed within the current social, economic and environmental context. Private managers should also reconsider their role in resource management.

Recent initiatives and the fundamental principles of conservation authorities

The six founding principles of the conservation authority programme provide a framework for considering how the UTRCA has responded to the challenges of the early 1990s.

The watershed as the management unit

The watershed jurisdiction had been an important feature of the Muskinghum Watershed Conservancy District (Ohio), the TVA, and the water authorities of England and Wales. It is also an important element in contemporary water management efforts (Mitchell, 1990). Generally, catchments have been used in the 38 Ontario conservation authorities, although there have been exceptions (see *Figure 1*). One is the Thames River, where administration is divided between the Upper and Lower Thames River Conservation Authorities. It was intended that a single conservation authority be created. However, a 1947 meeting failed to generate the required two-thirds majority to form a conservation authority over the entire basin. Examination of the vote showed sufficient support from municipalities located in the upper catchment and a second meeting three months later provided the

support needed to form a conservation authority in the Upper Thames River watershed. It would be 1961 before a similar initiative was successful in the lower catchment. The decision to fragment conservation authority administration within a catchment was based on local considerations, often indicating that any other arrangement would result in no authority being formed (Mitchell and Shrubsole, 1992). The 1987 Review Committee on the Conservation Authority Program suggested that an amalgamation between the Upper and Lower Thames River Conservation Authorities was desirable (*Figure 1*). This has not been realized because, in large part, the province has not required it and there are few tangible incentives offered to municipalities and existing conservation authorities.

While there are some exceptions to the use of the watershed as the administrative unit, studies undertaken or sponsored by conservation authorities have adopted a catchment perspective. This tradition was firmly established with the publication of *The Ganaraska Watershed* (Richardson, 1943). When a conservation authority was formed, the provincial government would provide a conservation report that served as an initial and long-term management guide (Mitchell and Shrubsole, 1992). Unfortunately, little effort was devoted to updating these, and the provincial government's ability to continue this service effectively was being severely strained by the early 1970s. During the 1970s and much of the 1980s, there was no effective action taken to renew the conservation reports.

Subwatershed planning is believed to be an appropriate planning response to the management issues of the 1990s. By focusing on a smaller geographic area, a more responsive understanding of problems can be attained. These studies are framed within the context of a watershed plan that identifies environmental and resource management goals (OMNR and OMOEE, 1993). The intent is to use an ecosystem-based approach to water resource and land use management using the boundaries of a subwatershed to achieve several purposes including: (1) identification of the significance and sensitivity of the existing natural environment; (2) establishment of management goals and objectives; (3) identification of areas for development and noting appropriate environmental management practices; (4) addressing the cumulative impacts of future land use changes; and (5) providing appropriate conflict resolution mechanisms (OMNR and OMOEE, 1993). This information can then be incorporated into appropriate municipal planning documents, and the policies and programmes of other relevant management agencies. This impact assessment approach is consistent with the intent of the most recent reforms to the Planning Act.

With their watershed jurisdiction, conservation authorities are already playing a key role. For instance, the UTRCA is co-chairing with the City of London the completion of 10 subwatershed studies. Besides it supervisory responsibilities, it is providing services towards the development of terrestrial resources management strategies and streamflow and water quality sampling services, helping with public participation exercises, and assisting in rural diffuse source assessments. These roles highlight the UTRCA's concern for water as a natural and environmental resource.

Local initiative

Local initiative was a particularly important feature of the conservation authority programme. While the 1943 *Ganaraska Watershed* report questioned the wisdom of institutional arrangements dominated by provincial agencies delivering services, it also realized that municipalities often lacked the capacity to deal effectively with resource issues. The government of Ontario would not force conservation authorities upon the municipalities. In the Ganaraska River catchment, carrying out this principle resulted in the incremental expansions of the conservation authority in 1962 and 1970. The 1970 expansion realized the inclusion of part of the Trent River system that it shares with three other conservation authorities (see *Figure 1*). Local initiative was also established by

having most of the members of a conservation authority from participating municipalities, rather than the provincial government. Legislation also specified that a conservation authority was to be a corporate body, thus assuring its autonomy. This sense of local initiative led to the terms 'community based', 'grassroots' and 'bottom-up' being applied to the conservation authorities (Mitchell and Shrubsole, 1992).

For the UTRCA, the involvement of individual landowners represents an important element of local initiative. Through the Clean Up Rural Beaches (CURB) Implementation Program, grants are provided to landowners for remedial works (such as upgrading domestic septic systems, manure runoff containment, proper disposal of milkhouse washwater, fencing of livestock from streams). Since its inception in 1991, over 174 projects have been completed at a total cost of $1.9 million. In addition, an 'Innovative Farm' Program, co-sponsored by the UTRCA and OMAFRA, promotes farmers who have incorporated environmentally friendly farm practices.

The practice of local initiative in the 1990s has several implications. First, conservation authorities must maintain close contact with all their clients (urban/rural, upstream/downstream and so on) and provide responsive and effective services. Secondly, future users of conservation authority services will be attracted by how the programme is delivered and on the basis of results. Thirdly, as partners, farmers have a significant influence regarding the final projects supported through CURB. Indeed, conservation authorities and other resource agencies in Ontario are forming many types of partnerships with other public agencies, non-governmental organizations, business groups and individual citizens.

Provincial–municipal partnership

While the province would not impose conservation authorities on local governments, it provided a strong incentive for their establishment by contributing funds for authority activities. Such funding was not available to municipalities on their own. This practice led to the idea that conservation authorities would represent a partnership between provincial and municipal governments. Local participation in the form of municipal cost sharing was one key factor that contributed to the passage of the Ohio Conservancy Act (Jenkins, 1976). This form of partnership ensured that conservation authorities did not undertake activities for which the local governments were not prepared to contribute financially. However, this arrangement also meant that in areas with low populations or modest levels of economic activity, the conservation authority would not have a strong financial base. Furthermore, in catchments where much of the land was owned by government, it would be unlikely that a conservation authority would be created. It was this point that led to conservation authorities becoming primarily an institution of southern Ontario, and in those relatively few places in northern Ontario with concentrations of populations (see *Figure 1*).

The financing of the partnership has changed recently (*Figure 2*). In current dollars, UTRCA revenues have ranged between $6.1 and $7.6 million for the period 1989 to 1993. Contributions from the OMNR declined, while revenue from conservation areas and municipalities was near constant. The constant review of conservation authorities, combined with the province's approach in dealing with its fiscal problems, prompted the UTRCA Chairman to comment:

> After some five and one half years of review by senior government officials, agreement was substantially reached on what programs the Conservation Authorities should undertake, and to what level the province needed to provide funding to restore the 'Partnership'. Cautious optimism was beginning to emerge as the glimmer of light at the end of the tunnel. Before year end, however, a disturbing rumble in the form of a constraint of Provincial transfer

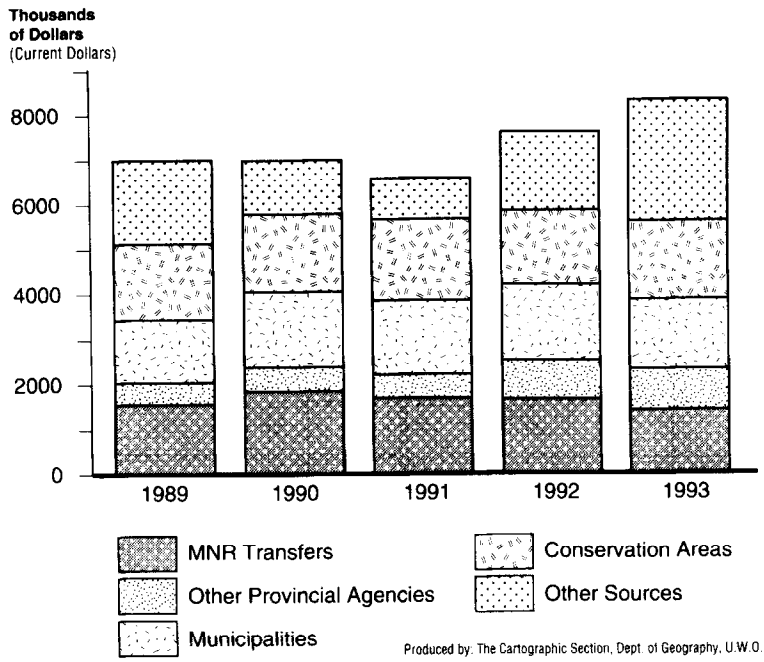

Figure 2 UTRCA income sources, 1989–93

> payments confirmed that the light was indeed that of an oncoming train. Faced with the probability of a further $2.5 million dollar constraint to our collective $25 million dollar operating grant for 1992, the Authorities may have finally reached the conclusion that their priorities are not shared by the Ministry of Natural Resources. (UTRCA, 1991: 1)

Besides reducing transfers, the government also increased operating costs for conservation authorities. In 1993, the Conservation Land Tax Rebate Program, which had allowed owners of wetlands and other areas of natural interest to recover municipal taxes, was eliminated. For the UTRCA, this decision increased municipal taxes by $130 000 (Cdn) between 1992 and 1993. The November 1995 financial statement indicated that there would be further and significant lower levels of funding over the next two years. Adjusting to transfer reductions before this recent statement was difficult. In adjusting to these recent cuts, it is appropriate that Ontario's institutional arrangements reflect the principles of sustainable development advocated in *Agenda 21* and *Restructuring for Sustainability* (Ontario Round Table on Environment and Economy, 1992).

Coordination and cooperation

After the 1944 tour of the Muskinghum Watershed Conservancy District, one Ontario delegate commented that the farm planning done on private land in collaboration with the Soil Conservation Service was so effective that 'their activities may be regarded as one' (Ontario Department of Planning and Development, c.1944: 44). Achieving this level of cooperation within the fragmented institutional arrangements for Ontario water management has been difficult (Shrubsole, 1990).

While the financial support from the OMNR has declined, funding from other provincial agencies and other operations has increased (see *Figure 2*). This trend suggests that new partnerships are developing and new opportunities are being explored. It also illustrates the ability of conservation authorities to respond to changing circumstances. In 1991, the general manager of the UTRCA noted the public's increasing concern regarding degraded water quality, green spaces and natural areas (UTRCA, 1991). Since then, the UTRCA has increased the funding for its 'Special Projects' (such as the CURB initiative, the private sewage programme, manure waste and application, and pesticide studies), and successfully sought funding from agencies such as the OMOEE, the OMAFRA and Agriculture Canada, and from private donations. Thus, the UTRCA is maintaining strong links with its traditional funding partners—the OMNR and municipalities—and building new alliances.

Responding to local needs has been a strength of the programme. For instance, during the 1970s there was no strong provincial commitment to diffuse source pollution control. At that time, the UTRCA and some other conservation authorities formed partnerships with farm organizations, municipalities and relevant provincial agencies to piece together remedial initiatives. Unfortunately, these efforts were inadequate, as illustrated by the frequent closing of beaches in the 1980s and 1990s (UTRCA, 1991). When the provincial government increased its commitment to the problem in the 1980s, the UTRCA obtained funding through the CURB Program to investigate the nature and extent of the problem. Since 1991, landowners in designated subwatersheds within the UTRCA's jurisdiction have been eligible to receive subsidies (ranging between 50 and 75 per cent) for appropriate remedial measures. Applications are made to a committee comprising representatives of the OMOEE, the OMAFRA, the Ontario Soil and Crop Improvement Association, the Health Unit, the farming community, and the UTRCA, which acts as the committee's chair. Water-taking permits and residential septic system approvals, traditionally the primary responsibility of the OMOEE, are other areas where the UTRCA and other conservation authorites are obtaining more responsibilities.

This trend represents some of the consequences associated with the downsizing of higher levels of government. It is significant that a special-purpose body—the UTRCA—has been successful in obtaining the support of relevant provincial and municipal agencies. If fiscal constraints continue to face senior governments in the future, the delegating of responsibility to lower levels of government is likely to continue.

A healthy environment required for a healthy economy

In 1946, river valley development was to ensure better management of renewable resources and future prosperity (Mitchell and Shrubsole, 1992). The TVA was a model in this regard, as it was also designed to facilitate social and economic change, and required the integration of water and land management with other considerations (White, 1969). It was believed initially that conservation authority programmes would contribute to protecting the resource base of the province, and in that way contribute to economic development, especially regarding forestry and agriculture. Furthermore, through flood damage reduction programmes, more economic development in urban areas could be supported. Like other conservation authorities, the UTRCA has undertaken a variety of structural and non-structural flood initiatives (Gardner and Mitchell, 1980). Early structural projects included constructing dykes and multiple-purpose reservoirs. Some flood-prone, wetland reforestation lands have been acquired, a flood warning system established and land use regulations have been applied (Shrubsole *et al.*, 1995).

Some land owned by conservation authorities offers opportunities for income generation through resource development (gravel extraction, timber, hydroelectric

generation and so on) or sale. With the cutbacks in OMNR transfers, these activities have been an increasingly important source of income for the UTRCA (see *Figure 2*). In managing watershed resources wisely, the UTRCA must consider not only the fiscal aspects of its resource development but also their environmental and social implications. Finding an appropriate balance among these values highlights the need for an open, accountable and on-going dialogue with its partners.

A comprehensive approach

The experiences in Ohio and the TVA highlighted the importance of considering the interactions of different renewable resources. As a result, a comprehensive approach to resource management within watersheds became a key consideration for conservation authorities. Comprehensive was interpreted as meaning considering both water and land-based resources, and urban and rural areas (Mitchell and Shrubsole, 1992).

Conservation authorities have demonstrated a willingness to update their plans and priorities in response to changing public needs. In 1992, the Association of Conservation Authorities of Ontario (ACAO) completed a *Conservation Strategy*. This document redefined the comprehensive approach and offered a vision of 'watersheds where human needs are met in balance with the needs of the natural environment' (ACAO, 1992: 4). Other parts of the strategy outlined the need for effective leadership, advocacy and communications, watershed planning, accurate and timely information for incorporation into management decisions, and the need for technological innovation and professional development.

In May 1994, the UTRCA completed a draft watershed strategy and identified the following goals: (1) to build broad community support for a healthy watershed; (2) to be a lead agency in watershed ecosystem management; (3) to achieve a balanced watershed ecosystem; (4) to develop an organizational focus that encourages innovation and excellence among stakeholders; and (5) to develop management systems, practices and resources that ensure accountability, financial stability and on-going professional development (UTRCA, 1994). These goals support and further the original six principles, and are consistent with the spirit of the ACAO *Conservation Strategy* and the thoughts offered by the Ontario Round Table on Environment and Economy in its *Restructuring for Sustainability*.

Clearly, comprehensive management now embraces the significance of water as serving functional, aesthetic and ecological needs. The adoption of this comprehensive approach requires the UTRCA to consider a range of issues and resources that are already the responsibility of existing public agencies. It will be necessary for it to enhance its partnerships with these and other agencies. This approach also requires the UTRCA to think beyond its individual projects and to have vision for management and development for the entire watershed.

Summary and implications

Some principles upon which conservation authorities were established have been 'rediscovered' under new names. The two initial concepts of managing on a watershed basis and a comprehensive approach are reflected in ecosystem approaches. Local initiative is incorporated today by 'public participation' or 'stakeholder involvement'. The principle of partnership continues under the same name. New concepts such as the precautionary principle have been embraced, and increased importance has been attached to intergenerational equity. These observations suggest that the basic principles associated with the conservation authorities were sound ones. The task is to relate them to contemporary conditions and needs.

Through initiatives such as the Ontario Round Table on Environment and Economy's *Restructuring for Sustainability*, the ACAO's *Conservation Strategy* and the UTRCA's *Strategic Plan*, the vision of integrated water management is being refocused. Clearly, there is a better appreciation of the role of water as a natural and environmental resource. There is also more sensitive consideration of present and future generations. Ontario's vision also emphasizes the need for effective public participation and ecologically based planning. It also appreciates that implementation must be carried out in a socially and fiscally responsible manner.

Planning is a frequently mentioned process in achieving the vision of resource management in Ontario. Subwatershed planning and the amendments to the Planning Act illustrate the following important principles: (1) they are informed by the best available data and analysis; (2) they consider surface and subsurface water; (3) they are guided by extensive public participation; (4) they address both ecological and human requirements; and (5) a targeted approach focuses on watersheds which: (i) demonstrates the need for increased levels of management, and (ii) offers an appropriate geographic scale. Effective subwatershed management may require a departure from the traditional approach to water planning. In the past, planning has been dominated by a rational and comprehensive model of thinking and analysis. With specific reference to master watershed plans in Ontario, it was suggested that 'there is often a need to develop management plans which contain untested or unproven concepts' (Gardiner *et al.*, 1994: 64). This statement implies that adaptive planning strategies that emphasize the importance of on-going learning, of learning from mistakes, and of trial and error are required. Adaptive management accepts the need for an interactive and consultative approach in which the understanding and knowledge of local participants are recognized as legitimate and important contributions. One way of reducing uncertainty is to develop an effective monitoring network that examines the nature of the physical resource and its uses (Kassem and Tate, 1994). Despite the high value placed on this information, the surface water monitoring programmes managed by Environment Canada have reached a 'crisis point' (Day *et al.*, 1994). The Water Survey of Canada, which has played a key role in establishing hydrometric and sediment stations, has been restructured in response to recent federal fiscal restraint programmes. Incremental cutbacks have jeopardized its ability to collect basic data about water flows (Bruce and Mitchell, 1995). This situation is in contrast to the principles of *Agenda 21* and *Restructuring for Sustainability* which suggest that more effective data should support water and other resource management decisions.

Another challenge associated with watershed management concerns the matching of problems and solutions of a watershed within the realities of administrative boundaries. Provincial and municipal agencies are the pillars of resource management in Ontario. Under the reforms to the Planning Act, the province will establish policies and municipalities will comply with them. In commenting on the past 40 years of environmental planning in Ontario, Richardson (1994: 23) concluded that 'planning confined to municipal boundaries is impractical'. This suggests that municipalities often lack the capacity and the appropriate boundaries to deliver effective environmental management. *Agenda 21* refers to the need for all levels of government to develop capacities to serve all peoples' needs. The experience of the conservation authority programme highlights the advantages and difficulties of developing planning and management processes that enable effective collective decision-making. The response from all public agencies in Ontario to the recent financial constraints has inadequately dealt with the institutional aspects of capacity-building. Instead, attention has been focused on promoting individual awareness and responsibility through information campaigns and user fees, and refining policy and administrative arrangements. Without more attention to institutional capacity, the performance of Ontario's management efforts could decline.

Given the severity of the recent provincial budget cuts and the possibility that this trend could continue, it might be appropriate to review the functions, mechanisms, financing and structure of existing institutional arrangements. This type of reconsideration has not taken place since the restructuring of provincial agencies (1970) and the formation of regional governments (1969–74) (Shrubsole, 1990). Some options for the province include alternative water policy models such as Canada's Federal Water Policy, Australia's Intergovernmental Agreement on the Environment, or New Zealand's unified Resource Management Act (Mitchell and Shrubsole, 1994; Australian Government, 1992; Fenemor, 1992). The desirability and feasibility of amalgamating municipal governments, conservation authorities, provincial agencies and/or other appropriate bodies may also be contemplated. The role of NGOs and private interests in formulating, implementing and monitoring policies, programmes and projects could also be explored. In the context of wetlands and natural areas, it is appropriate to consider how the existing regulatory and subsidy-based programmes can be replaced or supplemented with covenants and easements. Given the state of flux in Ontario's water management environment, designing effective institutional arrangements is likely to be a continuous process of adapting to and coping with changing economic, social, political and ecological circumstances. Documents such as *Agenda 21* and *Restructuring for Sustainability* can guide the renewal of these environmental management systems.

These comments do not suggest that these obstacles have prohibited improvements being made. On the contrary, conservation authorities and other public agencies have overcome some of the constraints associated with existing institutional arrangements. Where conservation authorities have lacked a clear legislative mandate and uncertain financing through the OMNR, they have legitimized their activity on the basis of strong municipal support (Mitchell and Shrubsole, 1992). Funding has been obtained through federal, other provincial, or NGO partnerships. Income from conservation authority operations has also supplemented these efforts. For instance, when inadequate efforts were forthcoming from provincial agencies concerning diffuse source pollution control, the UTRCA convinced its member municipalities to support some projects. The key elements in achieving success related to demonstrating that a significant problem existed and showing that the conservation authority was capable of addressing it. In this manner, conservation authorities offer programmes that respond to local conditions. Thus, conservation authority initiatives outside core mandate areas are legitimized, in large part, through strong municipal support. Without a visible 'top-down' provincial commitment, integrated water management could be initiated through these 'grassroots' efforts.

While the provincial–municipal partnership has been historically defined by financial arrangements, other types of partnerships have been formed. One outcome of recent events has seen different types of partnerships (Kernaghan, 1994) form between agencies and other participants. For conservation authorities, the contributory partnership between the OMNR and municipalities remains important although it has evolved since 1946 in response to changing circumstances. More recently, collaborative partnerships as exemplified by CURB have involved not only the pooling of funds, but the sharing of information and consensus decision-making between private interests and public agencies. The UTRCA has developed operational partnerships in providing the water-taking permit and domestic sewage treatment programmes. In these arrangements, the requirements of the sponsoring agencies are specified and must be met by the UTRCA. Consultative partnerships are also evident through the UTRCA's efforts to solicit comments from relevant interests in subwatershed planning and watershed strategy exercises.

Conservation authorities have been particularly successful in demonstrating the need for action and in developing new partners and partnerships to address problems. However, the ability of conservation authorities and all public agencies to meet the perceived needs

of the public is in doubt. The 1987 Interministerial Committee identified conservation authorities' requirements for an additional $5 million to meet current needs, and the recent amendments to the Planning Act place a very significant increased set of demands on municipalities, and potentially on conservation authorities. Funding constraints and an ineffective response to that challenge could impair the implementation of important public services. By their performance to date, conservation authorities have confirmed that the comments of Leopold, Williams and others were well deserved. To meet current needs, all participants in Ontario resource management must recommit themselves to the principles of *Agenda 21* and *Restructuring for Sustainability.* In this manner, the practice of sustainable development will come closer to its stated intent.

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