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The State of Canada's Environment '1996

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Highlights**Agriculture**

Some agricultural lands remain at high risk of degradation from wind and [water erosion](#), salinization, [soil compaction](#), and [organic matter](#) loss. In addition, the protection of water quality has emerged as one of the key environmental challenges facing agriculture in the 1990s. Nitrate is found in virtually all [groundwaters](#) in the agricultural regions of the country; levels are usually below recommended safe limits, but areas of intensive agriculture and areas under heavy manure application or irrigation are prone to levels above safe limits. Other agricultural contaminants, such as [pesticides](#) and bacteria, have also been detected in certain areas.

Considerable progress has been made in ensuring long-term [sustainability](#) of [agroecosystems](#) through the increased use of sustainable land management practices. For example, in 1991, conservation tillage (including no-till) was used on about one-third of Canada's cultivated land, compared with minimal use 10 years earlier; there was a 27% reduction in [summerfallow](#) between 1971 and 1991; and changes in cropping and tilling practices resulted in a 7% decrease in the risk of [wind erosion](#) in the Prairie provinces between 1981 and 1991 and a decrease of 11% in the risk of water erosion in Canada during the same period. Initiatives aimed at minimizing water [pollution](#) include improving manure storage and management and more selective application of pesticides and fertilizers.

Forestry

Nationally, area harvested is minimal compared with area affected by natural [disturbances](#). Regionally, however, harvesting may be a major agent of disturbance. [Clear-cutting](#), while controversial, remains, by far, the preferred harvest method of industry. The harvest of old growth continues to be an issue of major regional significance.

Positive trends include greater efforts to regenerate trees removed by harvesting (between 1975 and 1993, the area harvested increased by 42%, whereas the area planted or seeded increased by 228%); reduced [pollution](#) from pulp and paper mills (almost all are meeting current [effluent](#) standards); increased use of recycled material for pulp and paper production (the amount has tripled since 1980); and large declines in the use of chemical [pesticides](#) ' a trend that is expected to continue with increasing use of biological insecticides.

Fisheries

Many [groundfish](#) stocks in the northwest Atlantic and some salmon

stocks on the Pacific coast have been overharvested. Some fisheries have been closed on the Atlantic coast. Overharvesting, inappropriate fishing practices, changes in environmental conditions, and changes in predator and prey abundance all contributed to the severe decline in stocks. The ability to harvest some marine resources (excessive amounts of labour and capital in the industry) exceeds sustainable levels. Assessment, [monitoring](#), and [conservation](#) of fishery resources need strengthening.

â€¢ Many initiatives are contributing to more sustainable fisheries for the future. For example, new management approaches include taking a "fish first" view to managing the fishery; setting cautious harvest levels; a larger role for the harvesting industry; increased industryâ€™government partnerships to improve information on stock status and reduce harvesting to sustainable levels; a transition to a truly multispecies approach; the introduction of individual quotas; and reduction of fishing capacity and workforce.

Minerals, metals, and mining

â€¢ There are a number of environmental concerns related to the mining, smelting, and refining of minerals and metals. Acidic drainage is the largest environmental problem facing the global metal mining industry. In Canada, there are an estimated 12 500 ha of acid-producing [tailings](#) and 739 million tonnes of acid-generating [waste rock](#). Smelting and some refining take place in furnaces at high temperatures. Emissions from these furnaces include sulphur dioxide, [particulate](#) matter, and [heavy metals](#). The largest emission source of sulphur dioxide in Canada is the smelting of metal concentrates, which contributed 50% of total eastern Canadian sulphur dioxide emissions in 1994. Post-operational waste management is a major long-term issue because of high costs, the number of sites, and the limited number of technical options.

â€¢ Canada has a significant [recycling](#) industry. During 1994, Canadian trade in [recyclable](#) metals exceeded 4 million tonnes, valued at over \$2 billion. By reducing demand for "new" metals, recycling has significant environmental benefits, including reduced discharges to water and air, reduced [habitat](#) disruption, and overall energy savings. There have been substantial reductions in quantities of sulphur dioxide released from eastern Canadian smelters and refineries owing to a combination of equipment installation and changes in metallurgical processes since the 1980s. In recent years, various multistakeholder cooperative programs have been launched to further reduce the environmental impacts of mining. The Whitehorse Mining Initiative, the Assessment of the Aquatic Effects of Mining in Canada process, the Aquatic Effects Technology Evaluation program, the Mine Environment Neutral Drainage program, and the Accelerated Reduction/Elimination of Toxics program indicate that it is in the best interests of all concerned to work together to develop and implement sound environmental policies and practices to ensure [sustainable development](#).

Energy use

â€¢ Energy production and use are leading sources of atmospheric pollutants that contribute to [climate change](#), [acidic deposition](#), and [urban smog](#). About 90% of Canada's human-produced emissions of [carbon dioxide](#) arise from energy usage, with [fossil fuel](#) use accounting for 98% of this total in 1992. Without further action, carbon dioxide emissions are expected to increase by 10â€™20% between 1990 and the year 2000. Energy-related sources also account for about 55% of sulphur dioxide emissions, 90% of nitrogen oxide emissions, 55% of volatile organic

compound emissions, and 35% of [methane](#) emissions. In addition, about 70% of the total carbon monoxide emissions in Canada are energy related.

Progress is being made in controlling [pollution](#) from energy systems. Under the Canadian Acid Rain Control Program, national targets for aggregate sulphur dioxide emissions were met ahead of schedule. In addition, a comprehensive management plan to control [nitrogen oxides](#) and [volatile organic compounds](#) was agreed to by the Canadian Council of Ministers of the Environment in 1990. Under the Framework Convention on Climate Change, Canada has committed to aim at stabilizing [greenhouse gas](#) emissions at 1990 levels by the year 2000. It is unclear at the moment whether Canada will be able to meet this objective. However, governments, industry, and other stakeholders are now working together to develop programs and measures that will facilitate meeting this goal.

Transportation

Innovation and regulation have resulted in impressive gains in [fuel](#) efficiency and emission control on a per vehicle-kilometre basis in Canada during the past 20 years. The average Canadian passenger vehicle (in-use fleet) improved 39% in energy use per kilometre travelled between 1974 and 1994. Similarly, the average new car in 1990 produced only 24% of the [nitrogen oxides](#), 4% of the [volatile organic compounds](#), and 4% of the carbon monoxide of a new car in the early 1970s. However, gains in energy efficiency and emission reductions per vehicle based on improved technology have slowed in recent years and are being offset by the fact that Canadians now own more vehicles per capita and, on average, drive them further annually.

Barring a fundamental breakthrough, technological innovation alone in transportation systems is insufficient to bring about lasting change towards more environmentally sustainable transportation in Canada. Significant changes by millions of Canadian households in the way they use the automobile and other transportation modes will be required. Many Canadian communities are pursuing a variety of initiatives to improve the [sustainability](#) of transportation, ranging from [urban](#) design and demand management to transit efficiency and education/outreach. However, many of these efforts are currently at the planning or testing stage, not the action or achieving stage. Transportation involves every member of society and all levels of government; hence, a high degree of cooperation is required to effect long-term, sustainable, and equitable results.

Manufacturing

Manufacturing is a significant contributor to atmospheric emissions. In 1990, 23% of total sulphur dioxide emissions, 21% of [particulate](#) emissions, 4% of total nitrogen oxide emissions, and 4% of volatile organic compound emissions were from manufacturing.

Depletion of the [stratospheric ozone](#) layer has been linked to the action of a number of manufactured chlorine and bromine compounds. Under the Montreal Protocol of 1987 and subsequent amendments, action by government, the scientific community, industry, and individuals has led to a decrease in new Canadian supplies of ozone-depleting substances, from 27.8 kt in 1987 to 5.7 kt in 1994.

Outdoor recreation and tourism

In 1992, Canadians took 97 million overnight trips, 55% of which were

to small city, town, rural, and wilderness destinations. Activity on this scale has substantial consequences for the [environment](#), particularly in terms of transportation-related impacts, resource consumption, and disruption of [wildlife habitat](#) and natural [ecosystems](#). Recreation and tourism have provided Canadians with considerable economic returns, which are well documented; their social and their environmental significance are not.

â€¢ Given the scarcity of data and analysis on the environmental effects of recreation and tourism in Canada, it is difficult to draw firm conclusions about their overall implications with respect to environmental [sustainability](#). Nevertheless, visitor/tourism facilities are a major source of ecological impact on specific areas such as parks. To deal with some of these impacts, governments and industry are developing management tools and strategies, including awareness program development, codes of ethics and conduct, and environmental impact and other studies.

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