NATIONAL ROUND TABLE ON THE ENVIRONMENT AND THE ECONOMY
TABLE RONDE NATIONALE SUR L'ENVIRONNEMENT ET L'ÉCONOMIE

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ENVIRONMENT WRITER AND CONSULTANT

Media, Fish and Sustainability

a paper on sustainable development and the Canadian News Media

for

The National Round Table on the Environment and the Economy

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INTRODUCTION

Environment stories have traditionally been relatively straightforward. There were bad guys in black hats, pumping out the toxic chemicals, and there were good guys in green hats trying to expose the bad guys. The role of the media was to tell the story of conflict between good and bad. The reader would figure out what to do about the situation. End of story.

In recent years, the environment story has become more complex with the introduction of the term, sustainable development. The phrase is being used by both environmentalists and business people. What's going on? Did the black hats cave in, or did the green hats sell out? Do the media know? The answer is, "no, no and not yet."

Sustainable development is about maintaining both a healthy economy and a healthy environment by changing many of the ways we make decisions, do business and use products. This process of gradual adaptation, involving co-operation among different groups does not fit the mold of the polluter of the day story. Traditional environment reporting is hard enough because it draws on complex sciences, such as atmospheric physics, organic chemistry and risk assessment. Sustainable development requires people to understand environment issues and economics. It brings in such terminology as "full cost accounting" and "pricing the environment."

There is no simple formula for shifting society to sustainable development. Some government policies have had sustainability written into them, and new institutions such as round tables have been created. Some businesses say they are practicing sustainable development and they have made important environmental improvements. The idea of a form of development that allows business activity and reduces many environmental impacts has brought a growing number of environmentalists and business leaders to the same table. They are often sitting with each other and with representatives from government, academe, native peoples, labor and other groups, on round tables on environment and economy.

The news media have found it difficult to get a clear fix on the concept of sustainable development. One way to look at it is through the story of the northern cod stock in the Atlantic Ocean off Newfoundland. The collapse of that fishery has put thousands of people out of work, disrupting the economy and a society that has existed for centuries. There are lessons of sustainability that can be learned from that story and applied across the country.

ECONOMICS AND NATURAL RESOURCES

From beaver pelts to pulp and paper, Canada's economy has been based largely on natural resources— the environment. By the late 1980s, Canada was the world's second largest fish exporter in terms of dollar value, the world's largest exporter of forest products, largest producer of newsprint, second-largest producer of wood pulp and third-largest producer of softwood lumber. Forestry and fishing employed more than 400,000 people.

Natural resources built this country, but the history of that development has been marked by boom and bust. A number of fisheries have collapsed because of overfishing, habitat destruction and the introduction of foreign species. Despite major recent improvements in forestry, more land is still logged each year than grows into commercially productive forest. Across the country, soil fertility is declining an must be maintained with expensive fertilizers. Single-industry towns based on natural resources often risk economic disaster. Forest products provide the economic base for almost 350 single industry communities. In Atlantic Canada, about 1,000 communities are wholly or mostly dependent on fishing.

For more than a century the answer to each natural resource collapse was to simply exploit another resource. There were different species of fish to catch or game to shoot. There was always another forest to cut, just over the hill. More land could be opened up if the farms failed. If the wells, lakes and rivers got too polluted or over-used, people simply built a pipeline to a new water supply.

Now the limits are coming into view. Across the country there are growing conflicts over the fate of remaining forests. The number of endangered wildlife species increases every year. In 1989, there were 180 species on the endangered list; in 1993 the count was 236, a 30 per cent increase in five years. A number of major fisheries are in trouble, and there are so few cod off Newfoundland that the fishery has been closed. The northern cod collapse serves as a dramatic example of what happens when a resource is not used sustainably.

THE SEAS AND SUSTAINABILITY: THE NEWFOUNDLAND COD STORY

"When John Cabot reached the shores of Newfoundland in 1497 he found the sea 'swarming with fish which can be taken not only with net, but in baskets let down with a stone.'"
—The State of Canada's Environment— 1991

"The last buffalo hunt is taking place on the ocean, because people have not yet realized that fish are wildlife."
—Carl Safina, marine ecologist, National Audubon Society

For the past 500 years the seas off Atlantic Canada have been known as one of the world's richest commercial fisheries. The Grand Banks are part of the nation's history and culture. The fishery was sustainable for centuries because people were, in effect, skimming off the excess of what nature could produce. The very technology— long lines of baited hooks, inshore traps and small nets— limited the catch and resulted in little waste. Humans had not yet begun to undermine the very base of the productivity.

That began to change in the 1950s, when modern fishing technology and expanding markets for seafood combined to start increasing the catch. Powerful new boats equipped with electronic navigation and fish-finding sonar allowed crews to follow the fish right to their spawning grounds. At first the big trawlers came mainly from Europe, but Canadians, often with government subsidies, adopted the new technologies. Boats could now fish year round, day and night, even in ice and at great depths. There was no place the fish could hide. Along with the desirable species such as cod and haddock, the nets also sweep up many non-commercial species or commercial fish so young they should be left in the ocean to reproduce. Leslie Harris of St. John's said that less than one-third of the fish caught is actually landed and the rest is dumped. Dr. Harris, head of the 1990 federal review of the northern cod fishery, called the modern fishing technology, "the greatest killing machine ever invented."

Not only was the fishing pressure being increased by Canadians, but more boats kept arriving from Europe, the United States, Latin America and Asia to scoop up the riches of the sea. Within about 20 years the highly efficient boats decimated a resource that had been sustainable for centuries. The fishery was no longer being harvested on a renewable basis, it was being mined, and, like a mine, the ore played out. The new harvesting systems

were supposed to bring new wealth to this poor region of Canada. For a while they did, but once the resource was mined out the economic, social and ecological picture was bleaker than ever.

Reports of the annual catches show how quickly the northern cod disappeared when the new fishing equipment was used. Between 1850 and 1950 the annual northern cod catch only grew from about 200,000 to about 300,000 tonnes. With the introduction of the new trawlers, the catch shot up in a few years to a peak of 800,000 tonnes by the late 1960s. There was a sudden drop to around 200,000 tonnes a year by the mid 1970s, followed by a slight recovery, and the crash of the late 1980s. Dr. Harris, then president of Memorial University, wrote that: "In the case of the northern cod, the madness in which we indulged in the decade 1964-1974 ought to stand as a great warning beacon that we should never forget."

Similar stories are being played out along the Atlantic coast. The Scotia-Fundy Groundfish Task Force said that the region's groundfish fleet had four times the fishing power necessary to take the permissible catch. (Off the Atlantic coast there are more than 40 species of groundfish, including cod, haddock and pollock, that feed on the bottom of the ocean.)

According to Dr. Harris "we have brought four or five species currently to a state where they are facing the possibility of complete extinction." These include northern cod, American plaice, yellow-tail flounder, redfish and possibly turbot. In recent years, fishing has been stopped or drastically curtailed for a number of species, including cod, haddock, salmon, capelin and silver hake. The haddock has almost disappeared, and the northern cod reduced to a remnant. No one knows for certain when or even if the cod stock will recover to normal levels because in some years, young fish do not survive in the cold and hostile environment of the north Atlantic.

The future shape of the fishery is stake. *The State of Canada's Environment* report says that: "Some fisheries are characterized by too many people chasing too few fish, and reduction of the fishing effort is needed to allow these stocks to recover." That is a polite way of saying that people are going to be thrown out of work. By the late 1980s, more than 120,000 people had jobs catching, handling or processing fish in Atlantic Canada. They worked on 20,000 boats and in 900 fish processing plants and helped to support 1,300 communities. The catch included more than 1.1 million tonnes of fish and shellfish. Cod alone accounted for only about 10 per cent of the weight but about 28 per cent of the value of the total catch.

Since 1989, the federal fisheries department has been announcing dramatic reductions in fish quotas, and in July 1992 a two year moratorium was imposed on fishing the remaining northern cod. Closing the northern

cod fishery idled about 20,000 workers and virtually stopped the economy in 400 of 700 fishing communities in Newfoundland. When other quota reductions are counted, about 32,000 fishers and fish plant workers have been put out of work and depend on compensation along the Atlantic coast.

Unemployed fishery workers in five provinces that depend on the Atlantic and Gulf of St. Lawrence fisheries are being offered to up $400 a week to study and to train for jobs outside the fishery, costing the federal government hundreds of millions of dollars a year. "We've got a huge social experiment going on," said Federal Fisheries Minister John Crosbie. But many people in Atlantic Canada are uncertain what jobs there will be in a region where unemployment figures are often in the double digits. Mr. Crosbie has said that the fishery will never again support 120,000 people.

According to Dr. Harris, "we have brought close to extinction, of course, the society that was built upon the basis of these resources. In fact, it is probably finished in the way that we have known it, because out of the current crisis there will emerge, I am sure, a totally differently structured fishery." He suggests that many of the big deep-sea trawlers now tied up at piers will end up in scrap yards, and if the cod stock recovers it will be fished by smaller boats taking fewer fish at a time.

There is no single explanation for why one of the world's great natural resources was allowed to disappear right under our noses. An article in the prestigious *Science* magazine in April 1993, says that governments in many parts of the world have failed to protect fish stocks. It says that the possibility of high profits to be made from exploiting fish stocks leads to a gold rush mentality and governments, "ally themselves with special interest groups in order to facilitate the exploitation." Fishing quotas are often set too high, based on the catches of good years. When overfishing, natural fluctuations in productivity or a combination of the two cause the catch to drop, governments typically prop up the fishery, assuring that over-harvesting will continue into the future.

There are some comparisons between the plight of the Atlantic fishers and many Canadian farmers. In both cases, there was the promise of high profits for those who invested in high technology, so both farmers and fishers bought expensive equipment. The fishers tried to pay for this equipment by catching more fish, and some people made a lot of money. In order to catch more fish, a number of people simply ignored quotas. One fisherman told the Standing Senate Committee on Fisheries that, "There is no shame in getting caught and paying a $400 fine. It is almost a badge of honor."

Foreign over-fishing was another problem. Foreign vessels are allowed to catch "surplus" the fish within Canada's 200 mile (370 kilometre)

exclusive economic zone. Beyond that border there are no controls at all, and many boats have been landing as many fish as they can. In fact, no one really knows how many fish have been hauled from the sea. Statistics are based on what is reported, and only some of that is confirmed by actual monitoring.

Around the world the situation is the same. Whether on the Grand Banks or the Andaman Sea, whether the fisher is Canadian or Thai, the pressure grows to catch more fish. The global commercial catch of fish and shellfish is close to 100 million tonnes per year, a fivefold increase during the past 40 years. The UN Food and Agriculture Organization says this is about the maximum amount it thinks the oceans can sustainably produce at a global level. But the demand keeps growing. There are now about 5.5 billion people in the world, and this will grow to 6.25 billion by the year 2000 and 8 billion by the year 2020.

The story of overfishing is an analog for what is happening to natural resources in general. The forest industry is under growing pressure to reduce its environmental impact. Almost 90 per cent of logging in Canada is carried out by clear-cutting, which means felling virtually every tree in a given area. Forestry continues to reduce the amount of wilderness and, according to *The State of Canada's Environment— 1991*, "there will be no substantial ancient forest left on the British Columbia coast by the year 2008" at current cutting rates. Canada's best farmland is mostly in use, but large tracts are becoming less fertile due to erosion, loss of organic matter, salinization and other forms of soil degradation. About 20 per cent of Canada's farmland is deteriorating, and in the breadbasket of the Prairies, about 50 per cent of the organic matter has disappeared in just a century of farming. This reduces natural soil fertility and requires farmers to add costly artificial nutrients. Across the country, soil degradation costs Canada more than $1 billion a year. More prime farm land is being turned into subdivisions, shopping plazas, offices and industrial parks.

It is important to understand that there are alternative forms of development that will sustain the economy without destroying the environment. The challenge for the news media is to understand and explain the current situation and the choices that lie ahead.

WHAT IS SUSTAINABLE DEVELOPMENT?

"Since 1900, the world's population has multiplied more than three times. Its economy has grown twenty fold. The consumption of fossil fuels has grown by a factor of 30, and industrial production by a factor of 50. Most of that growth, about four-fifths of it, occurred since 1950. Much of it is unsustainable. Earth's basic life-supporting capital of forests, species and soils is being depleted and its fresh waters and oceans are being degraded at an accelerating rate."

—*Beyond Interdependence: The Meshing of the World's Economy and the Earth's Ecology,* by Jim MacNeill, Pieter Winsemius and Taizo Yakushiji.

There is no simple answer to the question: how many people can the earth support on a long-term basis? It depends on how many people there are and how much impact each one has on the environment. About 30 industrialized nations with one-quarter of the world's population consume 92 per cent of the world's new cars, 85 per cent of metals, 85 per cent of chemicals, 81 per cent of paper and about 80 per cent of the commercially produced energy. A number of experts have estimated that one Canadian has the environmental impact of 40 to 50 people in a less developed country, such as India.

We know the planet has a finite capacity to produce resources and purify our wastes. It is in our common interest to live within that carrying capacity, but with the world carved up into competing nations and companies it is not always easy to get agreement on how the goodies are shared. The problem of sharing is not new. In 1883, William Forster Lloyd noted that a grazing area could be used indefinitely as long as people did not try to graze too many cattle, damaging the pasture and reducing the number of animals that it could sustain. Mr. Lloyd, a political economist, wrote that it was in the common interest of herdsmen to control the number of cattle, but not in their individual interest. As a result, each herdsman put more cattle on the pasture than it could support in order to maximize his personal gain. Mr. Lloyd called this the tragedy of the commons. The same story has been repeated many times. In parts of the world, people graze too many animals and reduce the land to desert or they cut too many trees. Off Newfoundland and many other coasts fish is the prize, and too many people scoop up as many fish as they can carry without worrying about the future.

Preserving the fish stocks for this and future generations will require international agreements and some form of penalty, particularly when people are fishing on the high seas.

There is also a need for a change in the way we think about the value of natural resources and the environment in general. A growing number of economists argue that our current techniques for measuring the health of the economy are seriously flawed because they do not account for the value of a healthy environment. Some people have tried to price the environment by adding up the cost of cleaning up contaminated sites or repairing the damage acid rain does to cars and buildings. It is easy to get sums in the billions of dollars.

This is just the surface of the picture. A healthy environment provides valuable services that we generally take as free goods. These include clean air and water, food, recreation, and many other "environmental services." A forest or marsh provides real economic value by conserving soil, providing a steady flow of clean air and water, providing habitat for wildlife and creating opportunities for recreation. However, these values are often not calculated when comparing the value of cutting the forest and selling it as lumber or paper or filling in a wetland to build houses.

In the United States, Herman Daly and John Cobb, two well-known authors on environmental economics, argue that while the Gross National Product of the United States has risen in the past few decades, that is not an accurate indicator of the nation's health. They say that when you calculate such factors as the loss of farmland and wetlands, the costs of cleaning up pollution and health costs, the economy may not have improved at all. They say that, "By consuming our natural capital, we endanger our ability to sustain income." A number of economists are calling for something called "full cost accounting" to measure not only economic growth but changes in the stock of natural resources and environmental services such as natural purification of water.

Accounting for nature is not an easy job. It requires a change in the way we calculate profit and measure progress. Many companies calculate profit on a quarterly basis, while political decisions are made in four-year framework. Nature operates on very long cycles. Cod may not reproduce successfully for a period of four to six years. Trees can take half a century to reach harvesting age, while true old-growth forests only mature over several centuries. It takes between 100 and 400 years for a centimetre of soil to be formed naturally.

The ideas of resource conservation and environmental protection have been around for centuries, but are still generally seen as adjuncts to "normal" business planning and lifestyles. As a result, we are constantly reacting to and trying to solve one environmental crisis after another. Experts say that we have to move from the react and cure mode to one of anticipate and prevent. The only way to do this is to build environmental

considerations into all decision making. This does not mean stopping development, but it does require making changes so we do not continue to undermine our own environmental support system.

Sustainable development is the term that has emerged in the past decade. It was popularized in the 1987 report of the UN-sponsored World Commission on Environment and Development, the Brundtland Commission, which defined sustainable development this way:

> "Humanity has the ability to make development sustainable—to ensure that it meets needs of the present without compromising the ability of future generations to meet their own needs." The Brundtland Commission went on to say that: "At a minimum, sustainable development must not endanger the natural systems that support life on earth: the waters, the soils and the living beings."

Sustainable development is often associated with environmental protection, but it is a much broader concept. It clearly states that economic development should continue, though in a form that is less damaging to the environment. It has a third component, that of cultural and social sustainability. The three are closely intertwined, as one can see in the collapse of the northern cod fishery, which has shattered the economy and put a centuries old society at risk.

Economic development and modern lifestyles dictate that natural resources will continue to be used and some pollution will be released. If development is to be sustainable in the future, it must not run down the resource or undermine ecological stability. Pollution has to be reduced, and in the case of toxic substances that build up in the food chain, discharges must be virtually eliminated. Chemicals that change the atmosphere, destroying the ozone layer and adding greenhouse gases, must be controlled. For renewable resources, sustainable development means not using them faster than they naturally regenerate.

It is not always easy to tell when too much environmental pressure is building up. The sudden decline of the northern cod stock is a classic example of humans failing to accurately measure an impending collapse.

One of the major principles agreed upon by nations at the 1992 Earth Summit in Rio de Janeiro is called the "precautionary principle." The Rio Declaration on Environment and Development said that in order to protect the environment, nations shall use "the precautionary approach." This means that: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

Sustainable development is hardly a radical idea. In the mid-1980s, it was promoted by the Brundtland Commission, which included a number of business executives and politicians. The concept was endorsed in Canada by The National Task Force on Environment and Economy, which included seven cabinet ministers, six business leaders as well as environmentalists and academics. Their report said that Canada's, "long-term economic growth depends on a healthy environment." It said that, "environmental considerations cannot be an add-on, an afterthought. They must be made integral to economic policy making and planning, and a required element of any economic development proposal." The task force recommendations on how Canada could move toward sustainable development were adopted by the prime minister and premiers and a growing number of business experts. The federal, provincial and territorial governments and a number of municipalities have created round tables to provide advice on how to integrate economic and environmental decision making. A number of government programs and businesses have stated that their goals include sustainable development.

Sustainable development has been written into the North American Free Trade Agreement as a legitimate objective for government policies. There is a Canada-Nova Scotia Sustainable Economic Development Agreement. Its aim is to create a business climate favoring sustainable development, develop public awareness of the issue and establish a track record of decision-making on sustainable development.

The Earth Summit of 1992, the largest meeting of world leaders in history, was aimed at trying to get agreement on how to make global development more sustainable. The conference brought the signing of specific agreements on climate change, biodiversity and forests. It also produced Agenda 21, a 40 chapter blueprint on how to move toward sustainable development from now into the next century. Agenda 21, which was endorsed by the world's leaders, calls for national strategies, plans and policies for sustainable development. It says they must be developed with the broadest public participation.

COVERING SUSTAINABLE DEVELOPMENT

Environmental coverage began decades ago as nature and conservation reporting with stories about the need to create parks and preserve wildlife species. Modern environment reporting started in the early 1960s when the risks of toxic chemicals such as DDT were made public. During the 1970s and 1980s, the environment beat was stretched to cover everything from acid rain, the greenhouse effect and the hole in the ozone layer to logging, contaminants in drinking water, the role of the automobile, garbage dumps and whether "green" products were doing anything for the environment. Many newspapers and a number of radio and television stations have an environment reporter, or at least someone who is supposed to keep an eye on these issues. However, environment reporting often suffers from the fact that most reporters go onto the beat completely unprepared for the complex science issues they must cover.

Meanwhile, business reporting generally continues to ignore the environmental implications of economic development. If the environment is covered on the business beat, it is usually about how environmental assessment will slow down a project, or how some company is cleaning up financially by selling a process to clean up pollution.

Covering sustainable development requires at least a basic knowledge of how the environment works, but it also demands a knowledge of economics and business practices. It needs the skills of an environment reporter and a business reporter, with at least a look at social implications of decisions.

Robert Costanza, director of the Maryland International Institute for Ecological Economics, wrote that: "The environment and economy are often mistakenly presented in the media as independent entities that must be traded off against each other. In fact, they are highly interconnected." Mr. Costanza added that people have to understand that the economic system is part of the larger ecological life support system, and that, "in the long run, a healthy economy can only exist in symbiosis with a healthy ecology." Writing in the newsletter of the Washington-based Society of Environmental Journalists he said that journalists have a key role in pointing out cases in which short-term economic gain will lead to long-term problems. The media have a responsibility to help explain that there are economic alternatives that maintain the resource base and some economic revenues. The revenues may not be as high as those gained from using up a resource, but they will last much longer.

Covering the northern cod story

According to Dr. Harris, head of the inquiry into the northern cod fishery, the media covered that story, "mainly as reaction to a crisis, as opposed to a long-term problem of coping with renewable resources." Many stories have done a good job of laying out the facts and figures. Story after story talked about quota numbers as if they were a magic formula for saving the fishery. There were plenty of reports of foreign overfishing, particularly the confrontations with trawlers from Spain and Portugal. However, there has been little probing into what constitutes sustainable use of the resource and what kind of economic development plans would encourage such use. There was little examination of the vast quantities of fish that were jettisoned as bycatch, thus reducing the breeding stock. Few people added up the cost of the new equipment and calculated how many fish would have to be caught to pay for the investment. There was no analysis of the myth of the limitless sea. The cod story is not an easy one to cover. According to Dr. Harris, there are many things about the cod that we do not know and cannot predict. But, if we do not learn from the northern cod story we will be condemned to repeat it.

The public is now deeply worried about the state of the environment, and frustrated by the fact that there seem to be few solutions. There is no simple formula for sustainable development, but there are many options for change. People need to know that while over-harvesting a resource does provide a lot of money and employment in a short time, in the long run it leads to an economic crash that produces even less money and fewer jobs. The media could do a much better job of laying out the choices to help stimulate public debate. Dr. Harris said that by explaining the ecological impacts of economic decisions, such as overfishing, the media could "help to set a moral tone for society."

The story of the northern cod is still being played out in the cold, deep waters of the North Atlantic. Dr. Harris believes that the cod stock can probably recover if given enough time, though no one knows how many years that will take. He says that any future fishery will have to be much less intensive than that of the past few decades. "The fishery cannot employ everyone, but it could be a profitable employer for a substantial number of people," he said. "We can have a reasonably comfortable life with reasonable productivity."

Checking for sustainability

There is no magic test for sustainability, but if you ask the following questions (and others that you can develop) you will get a sense of whether a new product, project or idea is more or less sustainable than the alternatives:

- Is it sustainable in that it can be carried on indefinitely without running down its resource base? Can that claim be proven?

- Is the project economically sound, and able to be financially viable while respecting the environment, or does it require the discharge of harmful substances or over-harvesting of resources?

- What impact will this project or program have on society? Is it being developed and carried out with input from those people who will be affected?

- Will this project or program use up non-renewable resources? (Will it use them at a greater or lesser rate than some alternative program?)

- Will it use renewable resources at a rate greater than natural replacement? (What is the quality of replacement? For example, will the wood of new trees be as good as the old, and will it be ready in time for need?)

- Does it erode or degrade soil?

- Does it reduce available fresh water supplies?

- Does it reduce food supplies?

- Does it pollute the air, land or water?

- Does it damage the ozone layer?

- Does it add greenhouse gases to the atmosphere?

- Does it result in more or less garbage?

- Does it reduce the diversity of living species?

- Does it release toxic substances into the environment?
  - Do they persist in the environment?
  - Do they bioaccumulate and build up in the food chain?
  - What are their breakdown products in living creatures?
  - What is known about their health effects in humans, wildlife or test animals?
    - short-term effects: death, injury, sickness.
    - long-term effects: cancer, mutations, birth defects, reproductive effects, genetic changes, neurological effects, immune system suppression, damage to organs, etc.
  - What standards or guidelines exist in any jurisdiction (domestic or foreign) for allowable concentrations in humans, wildlife, foods, air, land or water?

In many cases, there will be no easy answers for these questions. No project or product will come through such a screen showing zero impact. The challenge is to find those that are least environmentally damaging, and to find a mix which, in total, will not put too heavy a strain on the biosphere.

APPENDIX I— PRINCIPLES OF SUSTAINABILITY

The National Round Table on the Environment and the Economy has produced the following Objectives for Sustainable Development, with a preamble:

The natural world and its component life forms and the ability of that world to regenerate itself through its own evolution has basic value. Within and among human societies, fairness, equality, diversity and self-reliance are pervasive characteristics of development that is sustainable.

1. Stewardship
   We must preserve the capacity of the biosphere to evolve by managing our social and economic activities for the benefit of present and future generations.

2. Shared Responsibility
   Everyone shares the responsibility for a sustainable society. All sectors must work towards this common purpose, with each being accountable for its decisions and actions, in a spirit of partnership and open co-operation.

3. Prevention and Resilience
   We must try to anticipate and prevent future problems by avoiding the negative environmental, economic, social and cultural impacts of policy, programs, decisions and development activities. Recognizing that there will always be environmental and other events which we cannot anticipate, we should also strive to increase social, economic and environmental resilience in the face of change.

4. Conservation
   We must maintain and enhance essential ecological processes, biological diversity and life support systems of our environment and natural resources.

5. Energy and Resource Management
   Overall, we must reduce the energy and resource content of growth, harvest renewable resources on a sustainable basis, and make wise and efficient use of our non-renewable resources.

6. Waste Management
   We must first endeavor to reduce the production of waste, then re-use, recycle and recover waste by-products of our industrial and domestic activities.

7. Rehabilitation and Reclamation
   Our future policies, programs and development must endeavor to rehabilitate and reclaim damaged environments.

8. Scientific and Technological Innovation
   We must support education, and research and development of technologies, goods and services essential to maintaining environmental quality, social and cultural values and economic growth.

9. International Responsibility
   We must think globally when we act locally. Global responsibility requires ecological interdependence among provinces and nations, and an obligation to accelerate the integration of environmental, social, cultural and economic goals. By working co-operatively within Canada and internationally, we can develop comprehensive and equitable solutions to problems.

10. Global Development
    Canada should support methods that are consistent with the preceding objectives when assisting developing nations.

Strategic Imperatives

The National Round Table has also adopted a series of strategic imperatives

1. Acknowledging the need for growth sufficient to meet human needs and aspirations.

   but also:

2. Rapidly reducing the energy and resource content of growth.

3. Increasing equity within nations and between developed and developing nations.

4. Reducing high rates of population growth.

5. Reducing certain forms of consumption.

6. Conserving and enhancing the resource base.

7. Establishing more open information systems.

8. Encouraging high rates of investment to restore capital that has been lost.

9. Changing institutions in ways that will ensure environmental and economic issues are integrated during decision making.

APPENDIX II— SUSTAINABLE DEVELOPMENT CONTACTS

Round Tables on Environment and Economy

There are round tables in every province and territory. A number are developing sustainable development (conservation) strategies. In addition, there is a growing number of municipal round tables.

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St. John's, Newfoundland A1B 4J6
Tel, (709) 729-0027 Fax, (709) 729-1930

Nova Scotia Round Table on Environment and Economy
P.O. Box 2107
Halifax, Nova Scotia B3J 3B7
Tel, (902) 424-6346 Fax, (902) 424-0501

New Brunswick Round Table on Environment and Economy

P.O. Box 6000
Fredericton, New Brunswick E3B 5H1
Tel, (506) 453-3703 Fax, (506) 453-3843

Prince Edward Island Round Table on Environment and Economy
P.O. Box 2000
Charlottetown, Prince Edward Island C1A 7N8
Tel, (902) 368-5274 Fax, (902) 368-5830

Table ronde Québécoise sur l'environnement et l'économie
3900, rue Marly, 5e étage, boite 78
Sainte-Foy, Québec G1X 4E4
Tel, (418) 643-7860 Fax, (418) 643-7812

Ontario Round Table on Environment and Economy
1 Dundas Street West, Suite 2502, P.O. Box 4,
Toronto, Ontario M5G 1Z3
Tel, (416) 327-2032 Fax, (416) 327-2197

Manitoba Round Table on Environment and Economy
Unit 305 - 155 Carlton Street
Winnipeg, Manitoba R3C 3H8
Tel, (204) 945-1124 Fax, (204) 945-0090

Saskatchewan Round Table on Environment and Economy
218 - 3085 Albert Street
Regina, Saskatchewan S4S 0B1
Tel, (306) 787-1627 Fax, (306) 787-0197

Alberta Round Table on Environment and Economy
Suite 400, 9925 - 109 Street
Edmonton, Alberta T5K 2J8
Tel, (403) 427-5792 Fax, (403) 427-0388

British Columbia Round Table on Environment and Economy
Market Square, 560 Johnson Street, Suite 229
Victoria, British Columbia V8W 3C6
Tel, (604) 387-5422 Fax, (604) 356-9276

Northwest Territories Round Table on the Environment and the Economy
P.O. Box 1320
Yellowknife, Northwest Territories X1A 2L9
Tel, (403) 920-3210 Fax, (403) 873-3297

Yukon Council on the Economy and the Environment
P.O. Box 2703
Whitehorse, Yukon YIA 2C6
Tel, (403) 667-5939 Fax, (403) 668-4936

Expert Groups on Sustainable Development

Institute for Research on Public Policy
275 Slater Street
Ottawa, Ontario K1P 5H9
David Runnalls, Director
Environment and Sustainable Development Program
Tel, (613) 238-2296 Fax, (613) 235-8237

International Institute for Sustainable Development
212 McDermot Avenue
Winnipeg, Manitoba R3B 0S3
Created by Federal and Manitoba governments to provide international research and leadership on sustainable development.
Bonnie Bisnett, Communications
Tel, (204) 958-7700 Fax, (204) 958-7710

Centre for Our Common Future
This organization was created to carry on some of the work of the Brundtland Commission and it is also monitoring follow-ups to the 1992 Earth Summit in Rio de Janeiro. The Geneva-based group is a key centre of information on who is doing what about sustainable development around the world.
Palais Wilson, 52, rue des Pâquis
CH-1201 Geneva, Switzerland
Warren H. Lindner, Executive Director
Tel, (41 22) 732 71 17 Fax, (41 22) 738 50 46

Department for Policy Coordination and Sustainable Development
United Nations, Secretariat Building, Room S-3060
New York, N.Y. 10017 U.S.A.
Tel, (212) 963-5900 Fax, (212) 963-1010
This department was created to help implement recommendations of the Earth Summit. There is also a UN Commission on Sustainable Development.

Worldwatch Institute
Publishes annual State of the World report, issue papers and Worldwatch Magazine. It is an excellent source of commentary on sustainable development.
1776 Massachusetts Avenue NW
Washington, D.C. 20036, U.S.A.
Lester Brown, President
Tel, (202) 452-1999 Fax, (202) 296-7365

World Resources Institute
1709 New York Avenue NW
Washington, D.C. 20006 U.S.A
This organization publishes a major world environmental data report biennially, as well as separate papers on issues.
Tel, (202) 638-6300 Fax, (202) 638-0036

ECODECISION
276, rue Saint-Jacques Ouest, Bureau 924
Montréal, Québec H2Y 1N3
This bilingual magazine provides ideas from around the world on environment and sustainable development.
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