



A GUIDE TO AGENDA 21

International Development  
Research Centre

ISSUES, DEBATES  
AND CANADIAN  
INITIATIVES

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# A GUIDE TO AGENDA 21



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**ISSUES, DEBATES  
AND CANADIAN  
INITIATIVES**

Edited by Theodora Carroll-Foster



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## TABLE OF CONTENTS

ACKNOWLEDGEMENTS 6

INTRODUCTION 7



### SECTION I

SOCIAL AND ECONOMIC DIMENSIONS 11

**CHAPTER 1** PREAMBLE TO AGENDA 21 12

**CHAPTER 2** INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES 14

**CHAPTER 3** COMBATTING POVERTY 17

**CHAPTER 4** CHANGING CONSUMPTION PATTERNS 20

**CHAPTER 5** DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY 23

**CHAPTER 6** PROTECTION AND PROMOTION OF HUMAN HEALTH 26

**CHAPTER 7** PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT 29

**CHAPTER 8** INTEGRATING ENVIRONMENT AND DEVELOPMENT INTO DECISION-MAKING 32



### SECTION II

CONSERVATION AND MANAGEMENT OF RESOURCES FOR DEVELOPMENT 35

**CHAPTER 9** PROTECTION OF THE ATMOSPHERE 36

**CHAPTER 10** INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES 40

**CHAPTER 11** COMBATTING DEFORESTATION 42

**CHAPTER 12** MANAGING FRAGILE ECOSYSTEMS: COMBATTING DESERTIFICATION AND DROUGHT 45


**CHAPTER 13** MANAGING FRAGILE ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT 47

**CHAPTER 14** PROMOTING SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT 49

**CHAPTER 15** CONSERVATION OF BIOLOGICAL DIVERSITY 52

**CHAPTER 16** ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY 55

<b>CHAPTER 17</b>	PROTECTION OF THE OCEANS, ALL KINDS OF SEAS INCLUDING ENCLOSED AND SEMIENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE, AND DEVELOPMENT OF THEIR LIVING RESOURCES	57
<b>CHAPTER 18</b>	PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES	60
<b>CHAPTER 19</b>	ENVIRONMENTALLY SOUND MANAGEMENT OF TOXIC CHEMICALS, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN TOXIC AND DANGEROUS PRODUCTS	63
<b>CHAPTER 20</b>	ENVIRONMENTALLY SOUND MANAGEMENT OF HAZARDOUS WASTES, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN HAZARDOUS WASTES	66
<b>CHAPTER 21</b>	ENVIRONMENTALLY SOUND MANAGEMENT OF SOLID WASTES AND SEWAGE-RELATED ISSUES	68
<b>CHAPTER 22</b>	SAFE AND ENVIRONMENTALLY SOUND MANAGEMENT OF RADIOACTIVE WASTES	70



**S E C T I O N I I I**  
**STRENGTHENING THE ROLE OF MAJOR GROUPS**

<b>CHAPTER 23</b>	PREAMBLE TO SECTION III	73
<b>CHAPTER 24</b>	GLOBAL ACTION FOR WOMEN TOWARD SUSTAINABLE AND EQUITABLE DEVELOPMENT	74
<b>CHAPTER 25</b>	CHILDREN AND YOUTH IN SUSTAINABLE DEVELOPMENT	75
<b>CHAPTER 26</b>	RECOGNIZING AND STRENGTHENING THE ROLE OF INDIGENOUS PEOPLE AND THEIR COMMUNITIES	78
<b>CHAPTER 27</b>	STRENGTHENING THE ROLE OF NONGOVERNMENTAL ORGANIZATIONS: PARTNERS FOR SUSTAINABLE DEVELOPMENT	80
<b>CHAPTER 28</b>	LOCAL AUTHORITIES' INITIATIVES IN SUPPORT OF AGENDA 21	82
<b>CHAPTER 29</b>	STRENGTHENING THE ROLE OF WORKERS AND THEIR TRADE UNIONS	84

<b>CHAPTER 30</b>	STRENGTHENING THE ROLE OF BUSINESS AND INDUSTRY	88
<b>CHAPTER 31</b>	SCIENTIFIC AND TECHNOLOGICAL COMMUNITY	91
<b>CHAPTER 32</b>	STRENGTHENING THE ROLE OF FARMERS	93



S E C T I O N I V  
MEANS OF IMPLEMENTATION 95

<b>CHAPTER 33</b>	FINANCIAL RESOURCES AND MECHANISMS	96
<b>CHAPTER 34</b>	TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY, COOPERATION, AND CAPACITY-BUILDING	99

<b>CHAPTER 35</b>	SCIENCE FOR SUSTAINABLE DEVELOPMENT	101
-------------------	--	-----

<b>CHAPTER 36</b>	PROMOTING EDUCATION, PUBLIC AWARENESS, AND TRAINING	103
-------------------	---	-----

<b>CHAPTER 37</b>	NATIONAL MECHANISMS AND INTERNATIONAL COOPERATION FOR CAPACITY-BUILDING	106
-------------------	--	-----

<b>CHAPTER 38</b>	INTERNATIONAL INSTITUTIONAL ARRANGEMENTS	108
-------------------	--	-----

<b>CHAPTER 39</b>	INTERNATIONAL LEGAL INSTRUMENTS AND MECHANISMS	110
-------------------	--	-----

<b>CHAPTER 40</b>	INFORMATION FOR DECISION-MAKING	112
-------------------	------------------------------------	-----

<b>APPENDICES</b>		
<b>A</b>	ACRONYMS	114
<b>B</b>	CONTACTS	117



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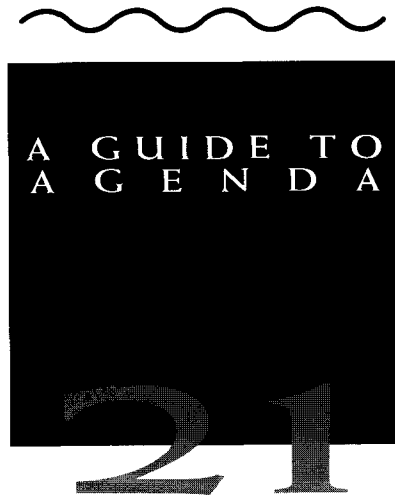
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Theodora Carroll-Foster  
Editor

Coordinator  
Agenda 21 Unit



## INTRODUCTION

Agenda 21 is many things. It is a document of over 600 pages; an Action Plan and Strategy for the world's governments and citizens; and a compendium of environmental and economic problems and proposed solutions to these problems. It is one outcome of the Earth Summit or the United Nations Conference on Environment and Development (UNCED) that was held in Rio de Janeiro, Brazil, during 1–12 June 1992. Agenda 21 is not the end result of UNCED, but the beginning of a process between global partners to move toward achieving environmentally sustainable development. It is a constructive initiative, or greenprint, to help the Earth and its peoples survive by taking an integrated and holistic approach to environment and development. It is an attempt to reconcile the differences between the North and the South, the industrialized and developing countries. Ultimately, Agenda 21 is a direction, or a vision of what might be, if we all — governments, non-governmental organizations, women's associations, indigenous groups, business and industry communities and constituencies, youth and seniors — all work together to overcome confrontation and to foster genuine cooperation and a new cooperative global partnership.

Agenda 21 emerged as a consensus from the Earth Summit. This largest intergovernmental conference ever held saw 105 Heads of State and Government agreeing formally to the principles and programs outlined in five key documents — Agenda 21, the Conventions on the Atmosphere and on Biodiversity, the Earth Charter, and the Forests' Principles. These were negotiated during

UNCED and the four Preparatory Committee conferences (PrepComs) leading up to Rio.

To understand Agenda 21 it is useful to know why and how it came about, through the UNCED process. UNCED was a successor to the landmark Stockholm Conference on the Human Environment (1972), which first put environment on the international agenda. The idea of holding a conference on environment and development arose from the World Commission on Environment and Development (or Brundtland Commission, named after Norway's Prime Minister, Gro Harlem Brundtland) held in 1986. At that time, the Commission advocated the need for the world to move toward "sustainable development," which is defined as:

**...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.**

On 22 December 1989, the United Nations General Assembly passed resolution 44/228 that called for the United Nations Conference on Environment and Development and on the need for the nations of the world to take a balanced and integrated approach to environment and development questions. By the same resolution, a Preparatory Committee was established to identify common objectives and concrete actions appropriate for endorsement by heads of governments. This Committee met four times before UNCED: in Nairobi, in August 1990; in Geneva, in March and August 1991; and in New York, in



March 1992. At each of the month-long meetings, delegates considered numerous issue papers prepared by the Conference Secretariat, under the direction of UNCED's Secretary General, Maurice Strong. As a Canadian who has long espoused the need for dealing with environmental and developmental issues as a whole, Mr Strong acted as a major catalyst for bringing together leaders from a wide range of countries and encouraging the participation of nongovernment organizations (NGOs). These included environmental groups, women's associations, business councils, and indigenous peoples, who normally would have been excluded by tradition from the negotiations.

Negotiations on the 40 chapters of Agenda 21 and the other UNCED documents took place formally and informally, in working groups, plenary sessions, in corridors and over coffee cups. NGOs were allowed to participate formally in a UN meeting; new partnerships and alliances were forged; new, productive approaches to resolving conflict were undertaken; and consensus was reached on a broad range of issues. In fact, over 90% of the Agenda 21 document was agreed to even before the Rio Conference convened.

Canada was one of the key leaders in the UNCED process and approached UNCED as a partnership between different sectors, interests, and groups. The Canadian delegation to the UNCED PrepComs and UNCED itself was almost unique in including not only government experts, diplomats, and politicians, but also including representatives from environment and development NGOs, women's organizations, youth and indigenous groups, business and industry, and from the provinces and territories. All contributed to the framing of Canada's positions on the many issues presented at UNCED.

Although not an official part of the Earth Summit Conference, a major parallel event, the International Non-Governmental Organization Forum (Global Forum), was also held in Rio. Over 3,180 nongovernmental organizations (NGOs) registered and participated in this gathering to discuss, plan for, and network on environment and development. Out of this, emerged a parallel set of documents, the NGOs' Earth Charter and Alternative Treaties. It is not the intent of this Guide to discuss those documents, but the reader would find that the documents provide an interesting and different perspective on issues from Agenda 21.

In this *Guide to Agenda 21*, we will be discussing the individual chapters that make up Agenda 21 and were intensively negotiated during the UNCED process. Overall, Agenda 21 is basically a statement of principles and policy actions for sustainability. It is not a legally binding instrument. It is

based on the premise that environmentally sustainable development is no longer an option but *an imperative*. Hence its implementation will depend upon the political commitment and will of countries, their leaders and their peoples, their capacity, and their resources to implement the document's recommendations completely or partly. Agenda 21 is divided into four sections, comprising 40 chapters:

**Section I:  
Social and Economic Dimensions (Chapters 1–8)**

This section focuses on international cooperation to accelerate sustainable development in developing countries; combatting poverty; consumption patterns; demographic dynamics and sustainability; protection and promotion of human health and sustainable human settlements; and environment and development decision-making.

**Section II:  
Conservation and Management of Resources for Development (Chapters 9–22)**

This block of issues includes: protection of the atmosphere; integrated planning and management of land resources; deforestation; fragile ecosystems, such as sustainable mountain development and combatting desertification; agriculture and rural development; protection of oceans, seas, freshwater resources; and management of toxic, hazardous, and solid wastes.

**Section III:  
Strengthening the Role of Major Groups (Chapters 23–32)**

This third section focuses on the participation and responsibility of all peoples and at all levels that are essential to achieving the goals of Agenda 21. They include: women, youth, indigenous peoples, NGOs, local authorities, workers, business and industry, the scientific and technological community, and farmers.

**Section IV:  
Means of Implementation (Chapters 33–40)**

The last section addresses the crucial issues of financial resources and mechanisms, transfer of environmentally safe and sound technology, capacity-building, science, public education, awareness and training, and international institutional arrangements, legal instruments, and mechanisms — all of which are necessary if Agenda 21 is to be implemented.

Besides Agenda 21, four other key documents were negotiated:

- 1) THE RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT ("THE EARTH CHARTER"), which is a statement of principles to provide a framework for the integration of environment and development.
- 2) The STATEMENT OF GUIDING PRINCIPLES ON FORESTS — a statement of principles on forest management as a step towards negotiations on an International Convention on Forests.
- 3) The CONVENTION ON CLIMATE CHANGE; and
- 4) THE CONVENTION ON BIODIVERSITY.

These Conventions were negotiated by the International Negotiating Committees, separate from the UNCED Preparatory Committee process, and were presented for signature by the Heads of Government at UNCED in Rio in June.

This "Guide" cannot, by its very nature, be comprehensive. It is meant to give a brief overview of the complicated issues and complex process that finally culminated in Agenda 21. In the following pages, the reader will find that each Chapter from 2 to 40 is broken down into four parts:

- 1) *The Nature of the Problem*, from both a North and South perspective;
- 2) *Summary of Chapter*, which is a brief résumé of the main points in each chapter of Agenda 21;
- 3) *The Nature of the UNCED Debate*, which indicates some of the problems encountered during negotiations and why some parts of Agenda 21 were necessarily compromised on;
- 4) *Some Canadian Initiatives*, including initiatives by IDRC, CIDA, various other government departments, NGOs, etc. Because the *Guide* is a summary, a reader who wants more comprehensive and detailed information about what else is being done in Canada or elsewhere may wish to follow-up with other readings or contact listed organizations.

For each chapter, we have provided Suggested Readings, a short list of readings and information sources for those readers who want to delve more deeply into a dynamically evolving subject. In addition, we have provided some contacts (See Appendix B) for those who would like to become more actively involved in implementing some aspect of Agenda 21 locally, regionally, or nationally. Appendix A will help you wend your way through the complexity of acronyms.

We hope that you will find this Guide useful and that you will pass it on to others who want to know more about the follow-up to UNCED and Agenda 21. The successful implementation of Agenda 21 will ultimately necessitate a global partnership for sustainable development. This will mean that all nations will have to make political, environmental, social, and economic commitments, both individually and collectively. They will also need to ensure the allocation of essential resources for a viable and sustainable human future, while not forgetting that they *share* the Earth with other species.

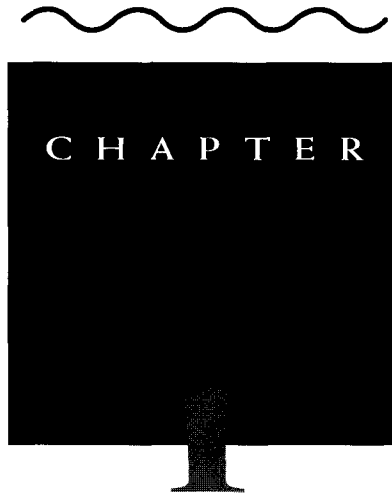
Ultimately, it is up to each of us, singly and collectively, to show leadership in working toward a sustainable world, a world in which all — humans and other living natures — can live with dignity and the fragile Earth can be repaired, nurtured, and sustained. Ultimately, it is up to each and every one of us to be responsible and accountable for the wonderful world we live in.





S E C T I O N

SOCIAL  
AND ECONOMIC  
DIMENSIONS



## **PREAMBLE TO AGENDA 21**

### **SUMMARY**

The Preamble emphasizes that Agenda 21 is "a dynamic program," which "could evolve over time." In fact, to be effective, Agenda 21 will have to exhibit a certain "evolutionary dynamism" in order to keep up with the constant fluctuations of the physical, social, economic, political, and cultural environment. As the Preamble warns:

**Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening poverty, hunger, ill health and illiteracy, and the continuing deterioration of the eco-systems on which we depend.**

Only a global partnership, which takes a balanced and integrated approach to environment and development will ultimately result in the world solving these problems and attaining sustainable development.

The Preamble points out that Agenda 21 reflects a global consensus and political commitment at the highest level to address today's problems and prepare for the challenges of the 21st century. The Preamble indicates that primary responsibility for this is not only given to Governments and the United Nations system, but also to regional, sub-regional and international organizations, NGOs, and many other groups. All are envisaged as having key roles to play in moving forward this important World agenda.

However, for the objectives of Agenda 21 to be achieved, it is recognized that the following will be needed: substantial flows of new and additional financial resources, especially to developing countries; the strengthening of capacity and institutions; and well-conceived implementation strategies, plans, and processes. Particular attention will need to be paid to "economies in transition" that face unprecedented transformation challenges in an atmosphere of heightened social, economic, and political tensions.

### **THE NATURE OF THE UNCED DEBATE**

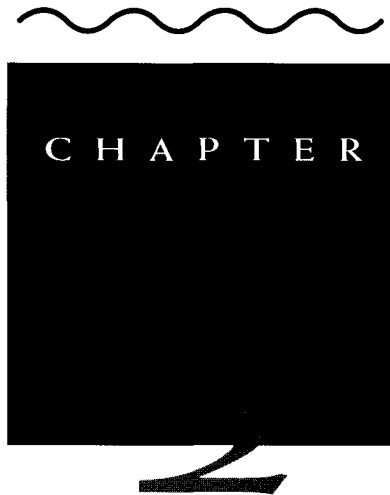
The Preamble reflects a few difficult issues that surfaced during the discussions and negotiations of the other Agenda 21 chapters (2–40), and was a means for diffusing some sensitivities or tensions. For example, the G77 countries and countries undergoing transition to a market economy compromised by allowing the Preamble to recognize the need for "special attention to be given to the particular circumstances facing the economies in transition," which then allowed repetitious references to "economies in transition" to be deleted from the rest of the Agenda 21 text. Another compromise was reached between the energy-producing

## PREAMBLE TO AGENDA 21

countries and others, such as the United States, when the term "environmentally sound" was defined to mean "environmentally safe and sound" especially when applied to energy sources, supplies, systems, or technologies.

At PrepCom IV, Canada helped to ensure that there would be a Preamble to Agenda 21. Canada, Australia, and New Zealand (CANZ) worked to ensure that Agenda 21's implementation would be moved forward or driven by all

governments in both the developed and developing countries, based on their own national sustainability plans instead of initiatives moved by international or UN organizations. Canada consistently pressed for broad public participation, and set an example by its own brand of an open, transparent, and inclusive process in Canada prior to UNCED. This was, which eventually termed "The Rio Process."



**INTERNATIONAL  
COOPERATION TO  
ACCELERATE  
SUSTAINABLE  
DEVELOPMENT  
IN DEVELOPING  
COUNTRIES**

**THE NATURE OF THE PROBLEM**

As Chapter 2 states: "Economic policies of individual countries and international economic relations both have great relevance to sustainable development." The 1980s saw the Third World weighted down by external debt, inadequate finance, trade barriers and restrictions, and depressed commodity prices. But, since then, for many countries (except in Africa), conditions have somewhat improved — financing has become easier due to lower interest rates and rebounding economies. The commodity sector continues to dominate Third World economies — their production, employment, and export earnings. And yet, some Northern governments have avoided or minimized discussion of such issues. Moreover, agricultural subsidies, high tariffs, and unfair trade terms have limited exports from developing countries to developed countries. Considerable expectations were raised by the Uruguay Round of Multilateral Trade Negotiations (GATT), but those have since been considerably reduced by the outcomes to date.

The cost of paying interest on external debt at inflationary rates generally, in the 1980s, far exceeded developing countries' export earnings and their financial receipts. Consequently, in many instances, domestically mobilized resources have been transferred abroad rather than invested internally to support local economic development initiatives. As well, stringent structural adjustment policies and mechanisms, though necessary for balancing fiscal budgets

and balance-of-payments accounts, have harmed many countries by causing a reduction in imports, investment, and consumption. Structural adjustment has also translated into decreased government spending on education, health services, and social and environmental programs. In 1990, the Paris Club, a group of Western financial and foreign affairs officials who meet to negotiate terms for rescheduling payments on loans issued or guaranteed by creditor governments of debts, took measures to provide some relief from the debt burden to the poorest, most indebted countries by providing longer repayment periods. Canada initiated a debt-for-nature swap program.

Canada, too, has not been immune from these economic concerns. For example, the possibly detrimental impact of trade on the environment has been an important issue during the negotiation of the North American Free Trade Agreement (NAFTA) with the United States and Mexico. There is a fear that a free-trade zone will bring harmonization of environmental standards to the lowest common denominator (which could be considerably lower than many of the Canadian standards now in place). Several incidents have recently shown that the principles of free trade are still generally accorded a higher priority than the environment. There is also concern that economic growth, resulting from free trade or the liberalization of trade, could add to the environmental problems of some countries, because of relaxed environmental standards, waste dumping, inadequate application of environmental legislation, etc. On the other hand, free-trade advocates argue

that protectionist agricultural policies keep prices low and force farmers to use more pesticides, fertilizers, and marginal lands to enhance productive capacity and to generate enough income to survive. Both arguments are relevant and suggest a need for free-trade agreements that uphold environmental sustainability as a fundamental requirement for any negotiations.

## SUMMARY OF CHAPTER 2

The Chapter calls for international cooperation, policies and measures that complement and support sound domestic economic policies and management, as well as sound environmental policies, in both developed and developing countries. Such measures are necessary in order to achieve global progress on sustainable development. The Chapter is split into four main program areas.

- (a) *Trade Liberalization*, which includes: eliminating unfair trade barriers and promoting an equitable multilateral trading system; improving access to export markets; improving commodity markets and promoting fair commodity pricing; supporting policies that "make economic growth and environmental protection mutually supportive."
- (b) *Making Trade and Environment Mutually Supportive* in terms of sustainable development, such as by encouraging international and regional economic institutions (e.g., GATT and UNCTAD) to consider how existing trade measures affect environment and development.
- (c) *Providing Adequate Financial Resources to Developing Countries and Dealing with International Debt*, including measures to reduce Third World debt; refinancing interest on non-concessional loans through multilateral financial institutions; and meeting the long-established targets for official development assistance funding. (See also Chapter 33, "Financial Resources and Mechanisms.")
- (d) *Macroeconomic Policies Conducive to Environment and Development*, which would include measures to ensure monetary stability; reduce deficits and inflationary growth; provide assistance to developing more efficient and effective economic and social policies; encourage more international and regional cooperation and coordination, and greater capacity-building, including in the area of natural-resource planning and use.

The Chapter is quite comprehensive and covers most of the key international economic issues. It is somewhat weaker on domestic economic policies and their relationship to international cooperation. Social policy, democratic government, arms trade and military spending, and technology transfer are topics barely or not mentioned.

## THE NATURE OF THE UNCED DEBATE

At UNCED and the four PrepComs, the United States was the main developed nation that was unwilling to recognize that the prevailing consumption patterns in industrialized countries influence the sustainable resource use in developing countries and have a major impact on the global environment. The United States' objections affected the outcome of proposals at UNCED concerning domestic economic reforms that would have limited or reduced consumption in developed countries. At the same time, there was concern that reduced consumption in developed countries would result in reduced demands for imports from developing countries, thus hindering development prospects for developing countries. Canada assisted in reaching a compromise by rewording paragraph 2.33 to read:

**In developed countries, continuing policy reform and adjustment, including appropriate savings rates, would help generate resources to support the transition to sustainable development both domestically and in developing countries.**

Canada's interest in these negotiations was to ensure stable, predictable access to export markets in the context of a multilateral trading system and market-oriented economic system. Recognizing that trade and environment must be mutually supportive, Canada continued to support GATT as the international body responsible for international trade rules and their relationship to the environment. In terms of the need for external finance as well as debt relief, Canada also promoted policies for developing countries to encourage domestic savings and to promote investment.

## SOME CANADIAN INITIATIVES

Canada supported the four program areas outlined above. This is in keeping with its support for the liberalization of international trade, including the reduction of tariffs that currently hinder the free movement of goods globally. This position has been consistently advocated by Canadian representatives to the GATT and other trade organizations.

Regarding financial resources, the Canadian Government has, over the years, committed itself to work toward allocating 0.7% of its GNP annually to Overseas Development Assistance (ODA) by the Year 2000. But, in 1990–91, foreign aid amounted to 0.4% of GNP. The recent trend in Canadian ODA has been down, from 0.5% in 1986–87, its highest year. However, Canada has contributed to the reduction of Third World debt by forgiving the repayment of \$182 million of ODA debt of the Commonwealth Caribbean and African nations during the Canada/Commonwealth Heads of Government meeting in Barbados. In the past, CIDA has provided macroeconomic



INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE  
DEVELOPMENT IN DEVELOPING COUNTRIES

policy support and adjustment to developing countries in the form of balance-of-payment assistance and direct budgetary support.

At UNCED, Canada announced a decision to convert up to \$145 million of ODA debt in Latin America into local currency to finance environment and other sustainable development projects. CIDA initiated negotiations and sought such proposals from five Central American countries. The proposals will be reviewed by a committee that will give priority consideration to projects that integrate environmental protection, sustainable resource management, and social development. These could include projects that integrate, among other areas, pollution control, watershed management, soil conservation, sound forest management, biodiversity conservation, and strengthening of national and community-based institutions.

Over the years, IDRC, through its Economic and Technology Policy Program, has undertaken a range of economic policy research, including incorporating social and environmental costs into resource pricing to provide a clear picture of the real costs of development and resource use. It has also emphasized building local capacity in developing national economic policy and Third World perspectives. As well, CIDA has sought to ensure that social costs are accounted for before and during the structural adjustment process.

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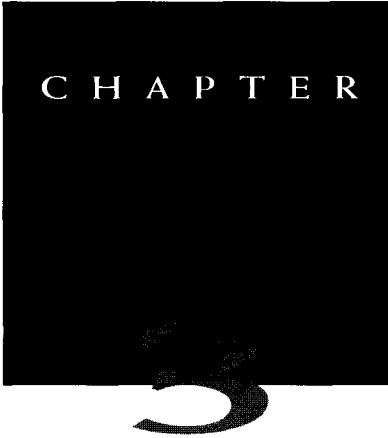
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C H A P T E R  
3

**COMBATTING  
POVERTY**

**THE NATURE OF THE PROBLEM**

Twenty-five per cent of the 4.2 billion rural and urban people who live in developing countries live in conditions of extreme poverty. They are deprived of adequate food, drinkable water, basic education, sanitation, and health care. Large concentrations of the world's poor also live in areas that are ecologically fragile or are being rapidly depleted of their natural resources. To survive from day-to-day, the poor must use whatever is at hand, including their limited — and diminishing — natural resources. The impact of world population growth at an average rate of 1.7% each year and the sheer pressure of numbers — between 11 and 12.5 billion by the year 2050 — exacerbates these problems. Accordingly, the poor are forced onto progressively less arable and more marginal lands. As these lands become less able to sustain more intensive cultivation, they become more depleted and contribute to more soil erosion, polluted and depleted waters, and reduced crop yields. A vicious cycle is then set up, with the poor becoming poorer, their lands becoming poorer, and their children stuck in degrading poverty.

Impoverishment and poverty in Canada — and other developed countries — have not reached the same dimensions as in most developing countries. But, in the last few years, for example, Canada has seen an unprecedented increase in the number of individuals and families who are defined as being below the poverty line, who are poor, homeless, and unemployed. In 1989, one of every eight Canadians, some 3,129,000, had incomes below the

poverty line. Many of these people belong to Canada's native communities or are women who are sole heads of households.

**SUMMARY OF CHAPTER 3**

The Chapter stresses that "poverty is a complex, multidimensional problem with origins in both the national and international domains." Neither single nor global solutions exist for its eradication. Rather, both national and international efforts are needed, as are policies that address poverty and environmental and developmental issues together instead of in isolation from each other. Ultimately "the struggle against poverty is the shared responsibility of all countries." The Chapter states that an effective anti-poverty strategy, which would ensure sustainable development, would focus on "resources, production, and people" and should cover demographic issues, women's rights, health care, education, public participation, and improved governance. In the spirit of this Chapter, sustainable development is a broader issue than the protection of the physical environment or natural resources. It recognizes that an integrative approach involving cross-cutting issues, regional and international cooperation, and various actors (women, youth, indigenous people) must be used to achieve sustainability for the poor.

The only program area — *Enabling the Poor to Achieve Sustainable Livelihoods* — urges governments to:

- Generate employment on a scale that takes care of present and future job needs;

- Give priority to basic education and professional training;
- Set up accessible primary health care and maternal health care systems;
- Rehabilitate degraded resources;
- Establish new community-based mechanisms to enable communities to access resources to overcome poverty; and
- Implement ways in which popular participation by the poor, especially women, might occur.

The Chapter especially emphasizes that governments should implement, "as a matter of urgency, measures to ensure that women and men have the same right to decide freely and responsibly on the number and spacing of their children," including access to information, means, facilities, and to women-managed and -centred reproductive health care.

To a certain degree the Chapter treats poverty from a primarily economic perspective, and downplays its political-economic-social linkages and dimensions. It hardly addresses the legal, institutional, and policy-planning links that affect poverty, or the obstacles that impede anti-poverty strategies, such as wars, armed conflicts, and military spending. Given the sensitivity and emotion surrounding population-growth concerns, it does try to link in those concerns by advocating people's right to decide on the number and spacing of children.

### THE NATURE OF THE UNCED DEBATE

During both UNCED and the PrepComs, considerable attention was focused on the linkages between poverty, health, population, and consumption patterns. The developing countries, supported by the Vatican, largely downplayed the poverty-population nexus for their own countries while insisting that the industrialized countries consumed an inequitable share of the world's resources. Some developed countries countered by noting that population growth in the Third World was eroding any economic or developmental gains and hastening environmental deterioration.

The CANZ Group (Canada, Australia, and New Zealand) tried to refocus the debate by pressing for national governments to become more responsible for developing plans, budgets, and follow-up on poverty eradication. Canada urged that more attention should be directed toward community-based strategies appropriate to local needs,

including the empowerment of communities and strengthening the role of women in decision-making, rather than mainly concentrating on national and international programs. As well, Canada urged the establishment of a focal point for information exchange, and sought to ensure that poverty eradication would be accorded a high priority in UNCED follow-up arrangements. The NGO Poverty and Affluence Working Group produced some key ideas, such as the need for empowering communities; the need for a supportive international framework; and the need for an examination of South-North financial flows.

### SOME CANADIAN INITIATIVES

Poverty in Canada has been and continues to be addressed through a large variety of programs. For example, Federal policy is increasingly including aboriginal peoples as active participants in community decision-making. A number of programs are being established through native land claims to transfer control over natural resources on settlement land to aboriginal peoples so that they can manage their own resources directly. The recent Nunavut land settlement, the largest in Canadian history has granted a large chunk of Canada's North to the local residents for self-government in exchange for certain resource-exploitation rights. This affects local communities in terms of control over their resources, their livelihoods, and, ultimately, their poverty.

Between 1985 and 1991, CIDA committed CA\$131 million on "sustainable livelihood" projects. These tend to focus on programs dealing with the rehabilitation of local environments and the promotion of environmentally sustainable socioeconomic development. Overseas development aid from CIDA and IDRC has increasingly been directed toward projects that improve conditions for the poor, raise the status and educational level of women, and address the causes of poverty in developing countries.

Over the years, IDRC has supported research on a number of basic human needs issues that directly fit in with anti-poverty strategies. For instance, its research has included basic health care systems, productive income-generation and income-distribution strategies, primary education and technical training, improved governance, more effective human capital investments, knowledge networks between communities, a number of projects that target women and indigenous peoples, and data- and information-gathering for policy and practice.

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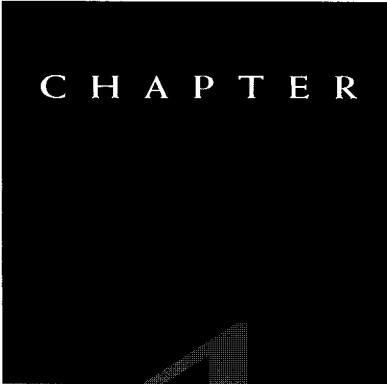

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**CHANGING  
CONSUMPTION  
PATTERNS**

**THE NATURE OF THE PROBLEM**

Industrialized countries consume the majority of the world's natural resources. For example, per capita energy consumption in high-income countries is almost 10 times that of low- and middle-income countries.

Industrial nations use close to two-thirds of the world's steel and more than two-thirds of its aluminum, copper, lead, nickel, and zinc. In the past century, industrial economies have produced two-thirds of all greenhouse gasses, three-quarters of sulphur and nitrogen oxide emissions (acid rain), and 90% of chlorofluorocarbons (CFCs) that contribute to the destruction of the ozone layer. Continued consumption of resources at present levels in industrialized countries and increasing consumption of resources in developing countries (due to their adoption of Western life-styles, a transition to a more industrialized economy, and the growth of populations and middle upper classes) pose grave threats to the world's ecosystem, its finite natural resource capital, and peoples' overall survival quality of life.

For instance, in Canada, consumption and production patterns are creating on-going, serious environmental problems. In some areas, poor farming practices and an often misuse of chemical applications (fertilizers, pesticides, etc.) have led to the loss of 30–50% of organic material from soils. Between 1970 and 1988, total irrigated area more than doubled, overall population increased by 15%, thereby imposing more stress on arable lands. Ten per cent of Canada's most productive forests were clear-cut and abandoned. In 1988, the difference between the area

logged and the area regenerated to commercial standards was about 200,000 hectares. In addition, 193 known and documented species of Canadian wildlife are classified as endangered, threatened, or vulnerable mainly as a result of accelerating habitat loss (wetlands, forests, bush, and prairies) and the wide-spread use of toxic chemical pollutants. Canadian per capita consumption of energy and raw materials is among the highest in the world. In fact, it is second only to the United Arab Emirates in per capita consumption of energy.

**SUMMARY OF CHAPTER 4**

As Agenda 21 notes, considerably more attention needs to be paid to "the demand for natural resources generated by unsustainable (levels of) consumption." Efficient use is necessary to minimize depletion and reduce pollution. Excessive demands and unsustainable lifestyles place immense stress on the environment, while the poorer segments of the world are unable to meet food, health, shelter, and educational needs. The Chapter recognizes that "changing consumption patterns will require a multi-pronged strategy focusing on demand, meeting the basic needs of the poor, and reducing wastage and the use of finite resources in production." Chapter 4 stresses that the major cause of the deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries. It tends not to deal with the impacts of poorly regulated production and overconsumption on populations, their health and quality of life at local levels in both developed and developing countries.

Although Chapter 4 focuses on consumption, it recognizes its interrelatedness with population dynamics (Chapter 5); energy, transportation, and wastes (Chapters 9 and 21); and technology transfer (Chapter 34). Two main program areas are identified.

- (a) *Focusing on Unsustainable Patterns of Production and Consumption.* This calls on all countries to promote sustainable consumption patterns, with developed countries taking the lead in achieving that goal and helping developing countries with technological and other assistance to that end. It also advocates research on linkages among consumption, production, and the environment; new concepts of sustainable economic growth and prosperity; and international cooperation and coordination.
- (b) *Developing National Policies and Strategies to Encourage Changes in Unsustainable Consumption Patterns,* which urges governments to promote research, development, and the use of environmentally sound (and safe) technologies at home and abroad. It also advocated that governments and industry together should work toward the reduction of wastes; the assistance of individuals and households in making environmentally sound purchasing decisions; exercising leadership through government purchasing policies and procurement; environmentally sound pricing to indicate to producers and consumers the full environmental costs of energy, materials, and natural resources; and greater efficiency in energy and resource use.

In essence the Chapter emphasizes moving toward policies and values that promote and reinforce sustainable (not excessive) consumption, but it is rather weak in pinpointing the range and scope of the problem, and the scale of activity, political commitment, and attitudinal change that is necessary to counter excessive consumption.

### THE NATURE OF THE UNCED DEBATE

The Canadian delegation worked to shift the often heated debate about consumption patterns from morality to the economics of overconsumption and excessive waste. It

promoted the use of market mechanisms to assess environmental costs; worked to align the objectives of Agenda 21 with Canada's Green Plan objectives; and encouraged programs that educate and inform consumers about reducing waste and wise choices in the marketplace.

Among the participating nations, the United States was the only country unwilling to recognize a link between consumption patterns in developed countries, environmental degradation, and poverty in developing countries. This disagreement led to long, heated debates at the PrepComs, and then at UNCED, where the United States agreed to withdraw its objections when the text was amended to address "unsustainable lifestyles in developed countries" less directly.

### SOME CANADIAN INITIATIVES

Gradually, the Federal and all provincial governments are putting more emphasis on the problems of consumption and waste of resources. All levels of government have supported environmental education programs for children and adults, and the Federal "Environmental Choice" program aims to help consumers make better purchasing decisions. Provincially run utilities are making increasing efforts to promote electricity conservation, so as to meet future energy demand. Canada's Green Plan outlines a national waste-reduction plan aimed at reducing waste by half by the year 2000 through recycling, composting, and reduced packaging. It also promotes increased efficiency of appliances and buildings, and promises to promote alternative forms of energy through funding for research, development, demonstration, and marketing. However, a number of leading-edge solar and other new and renewable sources of energy programs were severely truncated or eliminated due to government budget cuts in the 1980s. The remaining programs are mainly "passive," in that they encourage Canadians to reduce consumption but do not set or enforce conservation targets, initiate positive compliance procedures, or provide economic incentives to reduce consumption. To date, the programs have barely changed basic consumer patterns in Canada, and so the use of most resources by Canadians continues to grow.

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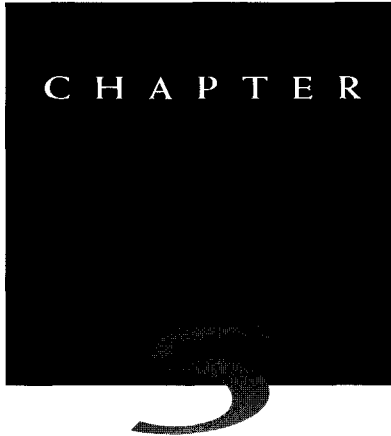
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CHAPTER  
5

**DEMOGRAPHIC  
DYNAMICS AND  
SUSTAINABILITY**

**THE NATURE OF THE PROBLEM**

Population growth estimates were recently revised upwards by the United Nations Fund for Population Activities (UNFPA) — to 5.7 billion in 1992, 6.4 billion by 2001, and between 8 and 9 billion in 2020. It is forecast that population growth will not peak until 2045 at over 11 billion. Ninety-five percent of this growth will occur in developing countries making it increasingly difficult for most Third World governments to keep pace with their peoples' growing needs for development services (health, education, potable water, sanitation, waste disposal, liveable cities, etc.) and a better quality of life.

Some of the fastest growth (an average of 6% per year, or three times world population growth rates) will occur in cities, such as Mexico City, Shanghai, Cairo, and Rio de Janeiro, where infrastructure is already inadequate and where the lives of the majority of their inhabitants are miserable and qualitatively unsustainable. Even a country such as Canada has experienced a major growth in urban population — from 5.5 million in 1931 to 19.4 million in 1986. Seventy-seven percent of Canada's population is now urban with the majority concentrated in its four largest cities.

Massive migrations between rural and urban areas have created another set of demographic problems for governments, already faced with the formidable task of supplying food for food-deficient urban populations, while simultaneously experiencing declines in food security and self-sufficiency. This trend has also diminished the quality of life in both urban and rural environments, and contributed to such problems as transboundary air pollution, ozone depletion,

global warming, excessive energy use, solid and hazardous waste disposal, deteriorating water supplies and quality, and the conversion of agricultural lands to concrete or tarmac.

**SUMMARY OF CHAPTER 5**

As Chapter 4 notes: "The growth of world population and production combined with unsustainable consumption patterns place increasingly severe stress on the life-supporting capacities of the Earth." The population–production–consumption interactions affect the use of land, water, air, energy, and other resources. Rapidly growing cities face major environmental problems, yet relatively little attention has been paid to this phenomenon. Agenda 21 has helped to move the dialogue on demographic dynamics from a statistical perspective to a recognition of the interrelationships between growing population pressure and the alarming depletion of natural resources. It recognizes that the challenge that population growth poses to sustainable development is multifaceted. It concerns policies, processes, research, attitudes, values, and women's status and reproductive behaviour.

Chapter 5 outlines three main program areas.

- (a) *Developing and Disseminating Knowledge Concerning the Links between Demographic Trends and Factors and Sustainable Development.* This would entail research into plans of action and strategies on the interactions among population, natural resources, and the environment, and life-support systems.



- (b) *Formulating Integrated National Policies for Environment and Development Taking into Account Demographic Trends and Factors.* This section emphasizes the need for all countries "to improve their capacities to assess the environment and development implications of their demographic trends; ... to address the consequences of population growth"; and to work to bring about demographic transition within a holistic view of development.
- (c) *Implementing Integrated Environment and Development Programs at the Local Level, Taking into Account Demographic Trends and Factors.* This program area recognizes that population programs are more effective when implemented within a range of cross-sectoral policies and through an effective local consultative process involving community, women's groups, and NGOs.

The three programs focus on the links between demographic trends and factors and the environment. They advocate a wide range of research, such as building and strengthening national databases; developing measurements of population-related damages to the environment and sustainability; undertaking analyses of demographic processes and population policies and programs. Each program specifically raised the need to address women's status, access to education, primary and reproductive health care, economic independence, and equitable participation in decision-making.

The Chapter barely touches on the need to learn from or evaluate past population policies or programs, especially given the incorporation of environment into population and economic policies and vice versa. However, it encourages governments to share their experience on the implementation of Agenda 21 at the United Nations Conference on Population and Development in September 1994 in Cairo, Egypt, without specifying mechanisms for collecting, comparing and analyzing lessons learned.

### NATURE OF THE UNCED DEBATE

Developed countries, including Canada, pointed out the importance of integrating family planning and population programs into economic development programs if sustainable development was to be achieved. The G77 countries disagreed. They were supported by the delegation from the Holy See (Vatican), which strongly lobbied against the inclusion of population issues. Also, due to the United States' resistance to programs aimed at reducing resource

consumption in developed countries, the G77 tried to have all references to women removed from Agenda 21 and also objected to the program supported by the developed countries to implement integrated population programs locally. The NGO Women's Caucus strongly protested against using women as negotiating pawns, and the G77 finally agreed to retain references to women. A further compromise was worked out by including in Chapter 5 the need to improve the general status of women; to educate men on population issues; and to integrate population policies into national economic development programs. Generally, many Third World NGOs denied the exigencies arising from rapid population growth and the need to ensure that population issues were well integrated into economic development plans.

### SOME CANADIAN INITIATIVES

Although Canada does not have a national population policy or plan as such, unlike many developing countries, it has recognized, at least internationally, that demographic issues must be addressed if sustainable development is to be achieved. It has therefore promoted universal literacy, primary health care, and enhanced social and economic status for women. Canada has consistently promoted comprehensive, affordable, and accessible reproductive health services aimed at reducing maternal mortality and morbidity, increasing child survival, and allowing couples to determine the number and spacing of children.

Seventeen percent of CIDA's development aid between 1985 and 1990 went to support projects designed to reduce, directly and indirectly, population growth. This represented the Agency's largest single category of environment and development programming. These programs included research on contraceptive technologies and monitoring or evaluating their effects on users; education and training in family planning; programs to decrease fertility and to improve health; the establishment of family planning clinics, information centres, and mother-child healthcare facilities in urban and rural areas; and many initiatives to improve the status of women. In total, CIDA spent CA\$225 million on population, family planning, and other demographic projects. Throughout its history, IDRC has been involved in a number of demographic studies on the impact of urbanization and urban growth on food security and arable land, and has supported for 17 years, in partnership with India's National Institute of Immunology, the development of an antipregnancy or anticonceptive vaccine.

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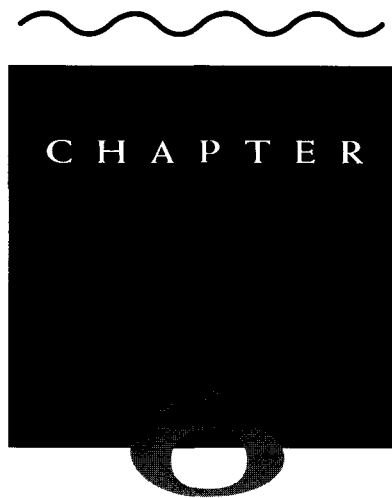
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## **PROTECTION AND PROMOTION OF HUMAN HEALTH**

### **THE NATURE OF THE PROBLEM**

Every year in the developing world, nearly 15 million children under 15 years old die from infection and malnutrition, that is, 40,000 each day or nearly 2,000 every hour. At least 0.5 million women die from complications associated with pregnancy. Women's overall health has generally been low, but, during the 1980s, their poverty, malnutrition, and ill-health appeared to rise. Newborns who survive face repeated onslaughts of disease. Millions more suffer parasitic diseases, injury, blindness, and serious disabilities. Although good health is supposed to be a basic human right, about 1.5 billion people still lack basic health care. Health, development, and poverty are inextricably related. Thus, poverty and the burden of illness in childhood and the productive years of adult life cause untold suffering and hamper socioeconomic development. Increasingly, environmental deterioration is contributing to health problems in both the developing and developed world, and is exacerbating the health difficulties of millions already experiencing illness and disease. Millions of people are killed and over a billion diseased each year by infectious diseases spread primarily through polluted drinking and bathing waters. Diarrheal diseases, which kill more than 3 million people each year, and typhoid and cholera are all spread through infected food or water, as are roundworm infections and schistosomiasis. These last two, at any one time, infect 900 million and 200 million people respectively.

Although many communicable diseases are being brought under control, as Agenda 21 notes, the HIV pandemic is estimated to increase to 30–40 million by the year 2000. The socioeconomic impacts and the related costs, apart from direct health costs, are

expected to be devastating for all countries, and increasingly for women and children. With half of the developing world's population under 25, youth are viewed as being particularly vulnerable to AIDS, STDs, and substance abuse. Thus, much remains to be done before the UN's target of "Health for All" is achieved by the year 2000.

### **SUMMARY OF CHAPTER 6**

Chapter 6 affirms that the primary health needs of the world's population must be met, if the "goals of sustainable development and primary environmental care" are also to be met. The links between health, environmental, and socioeconomic improvements will need the involvement of many sectors of society — education, housing, public works, community groups (business, schools, universities, civic organizations, etc.), NGOs, various government levels, and international organizations (particularly WHO, the World Health Organization). Agenda 21 recognizes the need to undertake multidisciplinary research; to address country-specific needs and conditions; to introduce monitoring and participatory decision-making; and to include prevention programs rather than just remediation and treatment programs.

Chapter 6 outlines five program areas on which governments should undertake action.

- (a) *Meeting Primary Healthcare Needs, Particularly in Rural Areas.* This program directs attention to food safety, safe water supply and sanitation, health education, immunization, essential drugs, and "education and appropriate services regarding planning of family size." It urges the development of health education programs focusing on women's roles, and mechanisms for sustained community involvement in environmental health.
- (b) *Controlling Communicable Diseases.* This component strongly notes that, along with health and hygiene education, environmental control measures within or outside the health sector are indispensable to disease-control strategies. It reaffirms a number of health and disease control or elimination goals by the year 2000 agreed to by virtually all governments (e.g., the elimination of guinea worm and a 50% reduction in children's diarrhoeal deaths).
- (c) *Protecting Vulnerable Groups.* This section suggests the need for more research and programs that target infants and children, women, youth, indigenous peoples, the very poor, the elderly and disabled, with their active participation.
- (d) *Meeting the Urban Health Challenge.* This program area points out that "urban growth has outstripped society's capacity to meet human needs, leaving hundreds of millions with inadequate incomes, diets, housing and services." To this end, it advocates coordinated action by all levels of government, businesses, health-care providers, etc. and the development of municipal and health plans, community-based action and decision-making, and health and environmental impact assessments.
- (e) *Reducing Health Risks from Environmental Pollution and Hazards.* The fifth program deals with the fact that the health of hundreds of millions are adversely affected by badly polluted environment and that countries do not have policies that integrate health, environment, and development. It advocates the establishment of nationally determined action plans in a number of areas, such as air and water pollution, solid waste, and human settlements.

The Chapter lacks emphasis on population growth and family planning as issues for health, sustainable development or the environment (see Chapter 5.) It downplays the health risks associated with economic productive activities

(e.g., occupational health). Although health promotion is mentioned, little attention is given to it. And among other omissions, no mention is made of war's impacts, migrations and refugees, food security, tobacco-related disease, and environmental degradation. (A number of health issues cut across the entire Agenda 21 document but are not adequately discussed in Chapter 6. These are found in Chapters 3, 5, 7, 14, 16, 18, 20, 21, and 24.)

### THE NATURE OF THE UNCED DEBATE

Negotiations on this Chapter gave all delegations a welcome opportunity to cooperate on a relatively noncontentious issue and helped to bring about compromise on the more difficult issues of population growth and resource overconsumption. However, at one point, for whatever reason, health issues almost disappeared off the UNCED agenda because delegations, with a few exceptions, did not attribute sufficiently high priority to this sector. Canada was among the few that worked to put health back onto the agenda, by promoting health and well-being as fundamental objectives of economic development and all development initiatives. The concept that individual awareness of health is empowering and contributes to development was also introduced.

### SOME CANADIAN INITIATIVES

Health and Welfare Canada and Canada's Green Plan acknowledge the link between environment and health in the 1991 "Health and Environment Action Plan." This document outlines a proposed "Drinking Water Safety Act," and details investigations into the effects of air pollution, climate change, and waste management on human health. A sample of programs underway include the Air Health Effects Program, Environmental Radiation and Radioactivity, Environment-Related Disease Surveillance, and a St Lawrence Health Effects Program. It notes that the Canadian Arctic and Canada's aboriginal peoples are at additional environmental and health risks resulting from traditional lifestyle patterns and food sources that rely heavily on the natural environment. For instance, Project Eagle is a study involving 63 aboriginal communities that looks at the impact of Great Lakes contaminants on the fish and wildlife that are central to aboriginal livelihoods. As well, the Government has promised to "significantly accelerate the provision of water and sewer systems to Indian reserves in order to address health and safety problems." However, the Action Plan does not yet make the broader connection between poverty, the environment, and health. Increasingly, there is a call for more government programs that emphasize action rather than study, particularly where a relationship between environmental contaminants and health has already been demonstrated.

In 1986, Canada hosted the first International Conference on Health Promotion, which then led to the development of the Ottawa Charter for Health Promotion. Although the Charter is not a binding agreement, the participants pledged, among others, "to counteract the pressures towards harmful products, resource depletion and unhealthy living conditions and environments, and bad nutrition; and to focus attention on public health issues such as pollution, occupational hazards and housing and settlements." Canada, through the Department of Health and Welfare, has also taken a leading role in its Healthy Communities Program, which integrates economic and health concerns with the environment to contribute to a better understanding of the health problems faced by Canadian urban areas. This program was launched in 1988 and was officially completed in March 1991.

CIDA, IDRC, and Health and Welfare Canada have supported a number of health care, prevention, and promotion initiatives in Third World countries. For example, IDRC has supported research on the effects of air pollution on health; the health effects of pesticide use in public health and agriculture; the control of vector-borne disease (e.g., malaria) by environmentally friendly methods; and on sociocultural and behavioral factors that affect health and human development.

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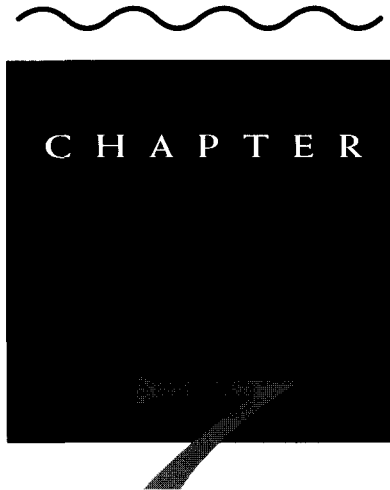
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## CHAPTER

### **PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT**

#### **THE NATURE OF THE PROBLEM**

Cities worldwide are growing at an average rate of 6% per year, or two to three times faster than the world's population. The burden of such growth on present infrastructure is already enormous and practically insupportable in many developing countries. In 10–20 years, their cities will have doubled, and will be beyond the present coping mechanisms of most municipalities or local authorities. In industrialized countries, overconsumption severely stresses both local and global ecosystems. In developing countries, the impact of numbers descending upon the cities will undermine improvements and developments, create additional health and environmental problems, and deleteriously affect peoples' quality of life. Yet, at the same time, such cities will need more raw materials, energy and other resources, and economic development just to meet the most basic of human needs.

To date, insufficient attention and investment have been directed to the urban sector. For example, in low-income countries only 5.6% of central government expenditure went to housing and related amenities; 1% of the United Nations systems' total grant-financed expenditures went to human settlements (1988); and loans for urban development, water, and sewerage from the World Bank and the International Development Association (IDA) amounted to only 5.5% and 5.4% respectively of all lending (1991). Yet it has been shown, by UNDP, that for every US\$1 invested in this sector another US\$122 for

follow-up investment results. In fact, urban settlements tend to generate upwards of 60% of GNP. Hence, with sound management, they could develop a capacity to sustain their productivity and their people.

Access to safe and healthy shelter has been proclaimed to be a basic human right, yet over 1 billion people do not have that at present. Between the year 2000 and 2025, another 2 billion people will become urban-dwellers, in addition to the 1990 level of 2.7 billion. Urban living conditions will further deteriorate unless the action advocated by Agenda 21 and the United Nations' 1988 Global Strategy for Shelter to the Year 2000 is fully financially and politically supported.

Another major problem for human settlements is energy-related. Most commercial energy now produced is used in and for human settlements. Developing countries need to accelerate development, and therefore energy production, while maintaining energy efficiency and reducing both costs and pollution locally. Developed countries, as the largest energy consumers, must reduce energy consumption and pollution and introduce new behaviour patterns. With transport accounting for about 30% of commercial energy consumption, both developed and developing countries have to deal with poor urban-transport planning, pollution, injury, congestion, noise, etc. that affect their societies. Yet the energy issue as it pertains to human settlements is often ignored or side-stepped.

## SUMMARY OF CHAPTER 7

This Chapter of Agenda 21 is a wide-ranging chapter that attempts to draw together many issues of a human-settlements nature that have often, to date, been inadequately addressed. The overall objective is "to improve the social, economic, and environmental quality of human settlements, and the living and working environments of all people, in particular the urban and rural poor." These improvements require technical cooperation, partnerships between different players, and participatory decision-making. Countries are called upon to use these core principles in developing their own national settlement strategies, in setting priorities, and in monitoring the impacts on vulnerable groups, especially women. To this end, eight program areas were identified. The substance of the following programs are clearly defined by their titles:

- (a) *Providing Shelter for All,*
- (b) *Improving Human Settlement Management,*
- (c) *Promoting Sustainable Land-Use Planning and Management,*
- (d) *Promoting the Integrated Provision of Environmental Infrastructure: Water, Sanitation, Drainage, and Solid-Waste Management,*
- (e) *Promoting Sustainable Energy and Transport Systems in Human Settlements,*
- (f) *Promoting Human Settlement Planning and Management in Disaster-Prone Areas,*
- (g) *Promoting Sustainable Construction Industry Activities; and*
- (h) *Promoting Human Resource Development and Capacity-Building for Human Settlement Development.*

## THE NATURE OF THE UNCED DEBATE

Chapter 7 was agreed on at the PrepComs before UNCED. The initial negotiations focused on the need to consider consumption patterns in developed and developing countries. Canada's delegation, together with Australia, New Zealand, Tanzania, Guyana, and Ghana worked in a collaborative spirit to put together a comprehensive document that addressed a range of issues in a positive and constructive

way. The document drew upon the many initiatives taken by the UN's Habitat and its Urban Management Program and Sustainable Cities Program, the Global Strategy for Shelter, WHO's Healthy Cities Program, the International Union of Local Authorities (IULA), the International Council of Local Environmental Initiatives (ICLEI), and the World Federation of Twin Cities. Considerable emphasis was placed on using and strengthening existing networks through coordination and cooperation, and involving more community or locally based groups.

## SOME CANADIAN INITIATIVES

Canada has endorsed and funded many international activities related to human settlements. For example, IDRC has supported a major South American network to evaluate ways of improving drinking-water distribution and solid-waste collection and disposal, in 14 cities in seven countries. In Africa, it funded research to assess the privatization of municipal functions and better cost recovery of service delivery. Research has been undertaken on how to improve the poor's access to safe, reliable food supplies, including urban agriculture.

In early 1992, the Canadian Mortgage and Housing Corporation (CMHC), CIDA, IDRC, and the UN's Commission for Human Settlements (UNCHS or "Habitat") completed a worldwide state-of-the-art study on the relationship between sustainable development and human settlements in each region of the world. CIDA is on the Steering Committee, acting as a facilitator and providing financial support to the following programs: Open China Cities Project and Africa 2000 (both managed by the Federation of Canadian Municipalities); the creation of two urban-oriented centres of excellence at Canadian universities; Management Development Program (sub-Saharan Africa); and the SACDEL program (the Regional Training System for Local Urban Development and Improvement of Municipal Administration in Latin America).

CMHC has also been involved in a strategy that approaches development through the integration of social, economic and environmental dimensions. *Sustainable Development: The Urban Dimension* is a CMHC strategy paper that examines the urban issues relating to sustainable development.

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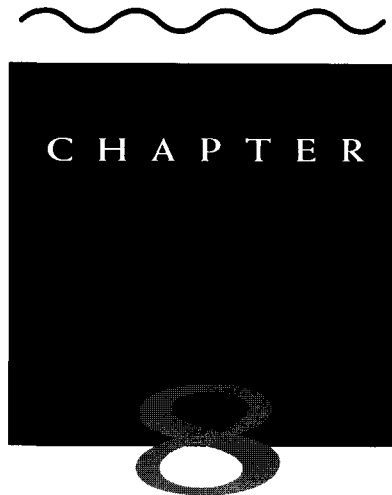
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**INTEGRATING  
ENVIRONMENT  
AND DEVELOPMENT  
INTO  
DECISION-MAKING**

**THE NATURE OF THE PROBLEM**

Most systems for decision-making separate economic, social, and environmental factors at the policy, planning, and management levels. Accordingly, many past decisions have been made on a nonintegrative basis, that is, with incomplete information and without reference to interacting concerns and possible impacts. If environment and development are to be properly integrated into economic and political decisions, a fundamental reshaping of decision-making — and institutional structures — is increasingly becoming necessary.

Laws and regulations suited to individual countries are needed to transform environment and development policies into action, including implementation and enforcement. Beyond laws, pricing, markets, and fiscal and economic policies are important complementary approaches to shaping attitudes and behaviours towards the environment, for example, the "polluter-pays" principle and the "natural-resource-user-pays" concept. Also, if sustainability is to be integrated into economic management, better ways are needed for measuring the environment as "a source of natural capital and as a sink for by-products generated by man-made capital and other human activities." To date, there is no consistent system of integrated environmental and economic accounting for countries.

Due to their more pressing concerns about economic and social stability, most developing countries have pushed the longer-term environmental issues down their priorities' list. Although a number of countries have established environmental departments or agencies, and have formulated environmental policies and laws, these have rarely been integrated with economic decision-making.

Almost all countries include the consumption — and even the destruction — of nonrenewable resources into their GNP calculations, but exclude environmental degradation and depletion as a cost of economic activity and development. This lack of integrated environmental and economic accounting (IEEA) tends to skew the data available to decision-makers and contributes to an inadequate or undervaluation of and accounting for the environment and its deterioration (or, conversely, its improvement).

**SUMMARY OF CHAPTER 8**

The Chapter endorses the improvement and restructuring of decision-making processes and institutions to integrate social, economic, and environmental policies, and to ensure a broader range of public participation by a variety of groups, organizations, and governments at all levels. It sets out four distinct program areas, the content of which is clearly identified by the following titles:

- (a) *Integrating Environment and Development at the Policy, Planning, and Management Levels;*
- (b) *Providing an Effective Legal and Regulatory Framework;*
- (c) *Making Effective Use of Economic Instruments and Market and Other Incentives; and*
- (d) *Establishing Systems for Integrated Environmental and Economic Accounting (IEEA).*

### THE NATURE OF THE UNCED DEBATE

Before UNCED, the text of the final document was accepted by all delegations with the exception of the financing and institutional questions. Canada's delegation was not in favour of specific targets and unrealistic timetables or shifting the tax base away from income taxes toward resource taxes. Canada supported actions proposed in this Chapter that dealt with the dissemination of public information and access to information in the public domain. Also, the Canadian delegation sought to avoid questions that related to private or protected scientific or economic data or environmental technology.

It should be noted that two program areas were proposed but subsequently deleted before UNCED, on the basis that they would be dealt with in post-Rio activities. These areas were: *Full Cost Environmental Accounting* (advocated by Sweden and Norway) and *Global Corporate Environmental Management* (promoted by China and the G77).

### SOME CANADIAN INITIATIVES

Canada has undertaken a number of initiatives toward integrating environment and development into the decision-making process. Round Tables on the Environment and Economy have been set up by the Federal Government and by the 10 provinces and 2 territories to facilitate cooperation between business, government, environmental organizations, and community groups. Canada has become a leader in resource accounting, state of the environment reporting, program and policy impact assessments, and the integration of the environment and the economy in policy development. In large part, this progress has come about because of demands from increasingly informed Canadian consumers and the electorate.

Canada's recent Environmental Assessment Act received Royal Assent in June 1992 and is expected to be proclaimed into law by the summer of 1993. Under the Act, the

Federal Government will be involved in the environmental assessment of projects and proposals for which it has decision-making authority. Four regulations required to implement the Act are currently being developed, as well as a "law list," which is a list of statutory and regulatory provisions subject to the Act; a list of projects requiring comprehensive studies; and lists of projects both included and excluded from environmental assessment. The new Act calls for the restructuring of the Federal Environmental Assessment Review Office (FEARO) into the Canadian Environmental Assessment Agency (CEAA) which will administer the expanded and streamlined environmental assessment (EA) process. Such legislation will help to facilitate the integration of environment and development into decision-making. Although this legislative requirement was not extended to the government's policy-making, since June 1990, government policy requires that all new policy initiatives brought before Cabinet for approval must include environmental assessment culminating in a public statement of the environmental implications of the initiative. Canada is one of the first nations in the world to act on this recommendation of the Brundtland Commission. The Act is seen as an improvement over the previous legislation because it requires some public accountability for environmental impacts arising from government policy. Nevertheless, the lack of any enforceable legislative requirement for policy assessment was — and remains — a cause for concern among Canadian environmental organizations.

In 1991, the Federal Government adopted a Code of Environmental Stewardship that covers all areas of federal operations and activities. As well, the Government is examining many of the activities set out in Agenda 21, such as environmentally sound pricing, taxes on resource consumption and environmental degradation, and the elimination of environmentally unsound subsidies.

Since sustainable development emerged as a key concept, CIDA has taken a leading role in the formulation of an international policy on sustainable development, prepared discussion papers on the five pillars of sustainability, and developed training modules and courses on sustainable development. Increasingly, sustainability policies and programs are being implemented as capacity to integrate the environment with development is expanded. IDRC has long been involved in programing that could be termed sustainable, but it, too, is putting more emphasis on determining what sustainability actually means and how research programs can increasingly contribute to that goal.

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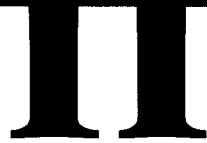
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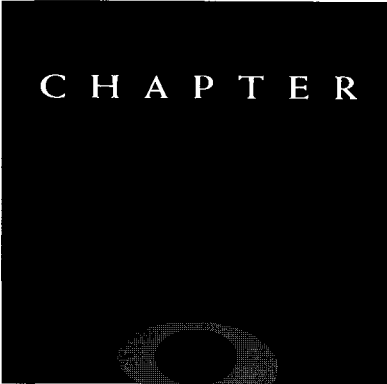





S E C T I O N



CONSERVATION  
AND MANAGEMENT  
OF RESOURCES  
FOR DEVELOPMENT

**PROTECTION  
OF THE  
ATMOSPHERE**

**THE NATURE OF THE PROBLEM**

The deteriorating quality of the Earth's atmosphere is the result of two main factors: increased emissions of greenhouse gases (GHGE), including chlorofluorocarbons (CFCs), methane and carbon dioxide (CO<sub>2</sub>); and higher concentrations due to human activities, e.g., burning fossil fuels (coal and petroleum), rice cultivation, livestock production, clearing and burning forests, and releasing industrial chemicals (e.g., CFCs). CFCs, in addition to being a major contributor to green house warming, also destroy stratospheric ozone. The world's atmosphere is faced with three simultaneous and related problems: the destruction of the protective stratospheric ozone layer; "global warming," leading to higher global average temperatures than in the last 10,000 years of human history; and air pollution, local and transboundary. The ramifications of the destruction of the ozone layer are: increased incidences of skin cancer (Health and Welfare Canada alone reports 25,000 new cases of all forms of skin cancer per year, and the incidence of melanoma is growing at over 5.5% annually); increased numbers of eye diseases (in Canada, it is conservatively estimated that 100,000 new cases of cataracts are occurring every year); and worldwide, reduced crop yields plus severe threats to marine life.

The result of greenhouse warming is still somewhat unknown as existing models and data to estimate the effects of rapid global climate changes are variable and not always reliable. There could be substantial rises in sea levels, inundating islands and coastal areas; more intense storms; droughts and desertification in some regions, and

floods in others. However, the consequences of air pollution have been more substantively quantified: reduced growth in trees and crops; acidification of lakes, loss of habitat and species; the damage of cultural treasures; and the deterioration of human health, especially among the young and vulnerable. For example, WHO's analysis indicates that acid rain is responsible for a global doubling of deaths from asthma in the last decade. In Europe, over 50 million hectares or 35% of its forests have been damaged, and are dead or dying, due to acid rain.

Transboundary air pollution has likewise caused severe acidification of forests, lakes, and soils, which has threatened such important economic sectors as tourism, agriculture, fisheries, and forestry. To date, more than 150,000 of Canada's lakes have been damaged and over 14,000 are considered "dead" — the result of acid rain generated by both American and Canadian industry. The cost — over CA\$1 billion annually, not to mention irreparable damage. Local air pollution is especially harming the urban population of developing nations. For instance, World Bank estimates indicate that up to 5% of all urban deaths are attributable to complications arising from air pollution. Atmospheric lead from car emissions in Bangkok is estimated to cause the average IQ of local children to fall four or more points by the age of 7 years.

Depletion of the stratospheric ozone layer over Canada is continuing to occur at an alarming rate. For example, total ozone just over the City of Toronto declined by approximately 4% between 1975 and 1987, and by 6–8% during the last 25 years. The ozone over the Antarctic declined

by up to half between 1970 and 1985, leading to an "ozone hole" that is enlarging at a rate not originally anticipated by scientists. A second "hole" was discovered over the Arctic in 1986 by Environment Canada. Despite the Montreal Protocol on Substances that Deplete the Ozone Layer, signed in 1987 — and considered to be a major breakthrough in international environmental agreements — no abatement of destruction of the ozone layer is yet in sight. Recent (1992) scientific findings show that the ozone hole — sometimes called the "smoking gun that threatens life on Earth" — is enlarging at an even faster rate than predicted in 1987. This is resulting in scientists and environmental organizations calling for a moving up of the targets from the year 2000 to 1996, and urging governments to adapt the "precautionary approach" principle, which advocates taking positive action even if all the hard and fast data are not yet in.

Global warming, ozone depletion, and air pollution all arise from the same causes: the growth of human population and (human) wealth. Fundamentally, climate change is being caused by the developed countries at this time, but, surprisingly, the developing world accounts for about one-third of all greenhouse gas emissions and, as both population and economic development both increase, its contribution will swell. For many developing countries, reducing GHGE that contributes to the depletion of stratospheric ozone is *not* a priority. But the consequences of tropospheric or ground level ozone that hurts human health are becoming more of a concern. If developing countries are to reduce either GHGE or the toxic pollutants in ground-level smog — and their involvement is crucial — they will need substantial assistance — money, skills, technology — from developed countries to meet their targets.

### A SUMMARY OF CHAPTER 9

Chapter 9 is closely related to the 1985 Vienna Convention for the Protection of the Ozone Layer, the Montreal Protocol (1987), and the 1992 Framework Convention on Climate Change among others. It implies coordination with those international agreements, and with the bodies mandated to deal with them.

Chapter 9 covers four program areas.

- (a) *Addressing the Uncertainties: Improving the Scientific Basis for Decision-making.* These includes the interactions between the atmosphere, various affected ecosystems, health impacts, and socioeconomic factors.

- (b) *Promoting Sustainable Development.* This section especially emphasizes:

- Energy development, efficiency, and consumption;
- Transportation;
- Industrial development; and
- Terrestrial and marine resource development and land use.

- (c) *Preventing Stratospheric Ozone Depletion;* and

- (d) *Transboundary Atmospheric Pollution.*

The Chapter basically suggests that programs (a) and (d) can best be addressed through scientific research activities, better collection and sharing of data, and more international collaboration and training. Governments are called on to "promote" scientific research; the greater use of databases, including the Global Atmosphere Watch and Climate Observing System; and to establish or strengthen regional agreements on pollution control, monitoring, and evaluation. Program (c) is largely a call on governments to ratify the Montreal Protocol, its 1990 amendments, and implementing mechanisms.

Program (b) attempts to tackle the energy issue, which was virtually buried because of its controversial nature between North and South. The ultimate objective of this program is "to reduce adverse effects on the atmosphere from the energy sector by promoting policies or programs" that increase the use of environmentally safe, sound, and cost-effective energy systems, particularly new and renewable ones, at both supply and demand ends. In other words, more efficient production, transmission, distribution, and use systems are needed, and soon. The program outlines a number of initiatives that could be taken: removal of barriers to energy technology; integrated energy and environmental assessment methods; coordinated regional energy planning; consumer awareness and information programs; less polluting transportation systems; and more public transit planning and implementation.

### THE NATURE OF THE UNCED DEBATE

The profligate and inefficient way that energy is used in developed countries and the need for greater energy (albeit often inefficient) use in developing countries led to considerable controversy. Canada and the United States are well-known to be the highest energy-consuming countries in the world on a per capita use and per dollar GDP basis, and hence were not in a strong position to take the lead on the promotion of energy conservation and efficiency. Nevertheless, Canada played a role in moving the UNCED discussions beyond just climate change to a wider range of

issues pertaining to protection of the atmosphere. In part, this was achieved through bringing in information from the scientific community and its broader consultative process.

Middle Eastern oil-producing countries wanted to remove the entire chapter from Agenda 21, claiming that Chapter 9 duplicated and prejudged the work of the climate change negotiations being undertaken by the Inter-governmental Panel on Climate Change (IPCC) and that new and renewable energy sources were too much emphasized. Many countries wanted to delete the term "safe" from references to energy sources, seeing this as a bias against nuclear energy. The Canadian and international nuclear industry used the arguments in the Chapter to justify more exports of the controversial technology to the Third World. But, Saudi Arabia, an opponent of nuclear power, wanted the term retained. A compromise was reached by stating in the Preamble to Agenda 21 that "environmentally sound" would mean "environmentally safe and sound" when applied to "energy systems."

Viable energy technologies (including those termed "new rent and renewable") and policies exist, but implementation costs are high. The United States said it would sell its "clean" technology on favourable terms to developing countries, if it could retain intellectual property rights. The developing countries stated that they had already paid enough for the wasteful energy use of the industrialized nations, and that the Western-dominated Global Environmental Fund (GEF) was an inadequate answer. Fossil fuels, a major contributor to the deterioration of the atmosphere, was barely touched on, due to the protests of the Gulf States, and of China and India, the largest producers and users of coal.

In order to get widespread endorsement, this Chapter could not elaborate on a number of issues, namely: fossil fuels; energy pricing policies; energy efficient and renewable energy technologies; the allocation of the costs of technology transfer; industrial process and materials technologies. It basically avoided key economic and social issues, such as valid environmental costs of energy use; measurements and accounting for economic viability; and the immediate costs of (local) air pollution on human health. While the developing countries laid the blame for degradation of the global atmosphere on the developed nations, they generally avoided dealing with low-level ozone depletion and local air pollution that are having increasingly deleterious effects on their citizens' health and productivity.

### SOME CANADIAN INITIATIVES

The proposals in Chapter 9 are largely compatible with Canada's Green Plan and its signing of the 1987 Montreal Protocol. Canada has pledged to phase out the production and imports of CFCs by 1997; to stabilize methylchloroform and other major ozone-depleting substances by the year 2000; and to stabilize emissions of CO<sub>2</sub> and other greenhouse gas emissions at the 1990 level by the year 2000. The "World Conference on the Changing Atmosphere: Implications for Global Security," held in Toronto in 1988, recommended a 20% reduction below the 1988 level of CO<sub>2</sub> emissions. This objective has not been yet adopted by the Canadian government. The Federal Government has set, as its target, the stabilization of greenhouse gas emissions at the 1990 level by the year 2000. These targets, however, are not sufficient: according to the Intergovernmental Panel on Climate Changes, the stabilization of only CO<sub>2</sub> will necessitate a global reduction of human-related CO<sub>2</sub> emissions by 60–75%.

Canada's National Action Strategy on Global Warming is a joint initiative of the Federal Government and the provinces that was signed at a meeting of the Canadian Council of Ministers of the Environment (CCME) in November 1990. Its strategy is three-pronged: limiting the net GHGE; helping Canada to anticipate and prepare for the potential effects of global warming; and improving scientific understanding and predictions of climate change. Canada is also developing partnerships, incentives, cooperation, and improved decision-making to cope with atmospheric pollution rather than specific goals and targets. This compliance, rather than regulatory, approach is viewed with concern by some in the environmental and scientific communities that Canada will not be able to meet goals on atmospheric pollutants without enforceable, legislated targets to ensure the bringing about of change and the meeting of minimum standards.

IDRC initiated studies of air quality at the household level in the 1970s, improved woodstoves, and fuelwood supplies. It has funded studies on global warming, including a recent joint effort between Tanzania and Zimbabwe to measure their actual contributions to GHGE.

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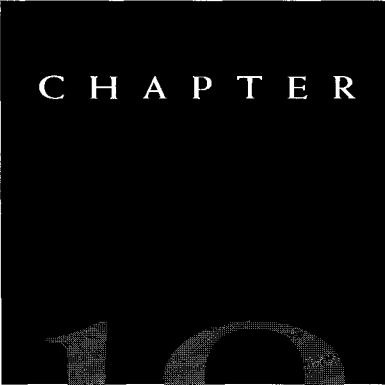
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CHAPTER  
10

**INTEGRATED  
APPROACH TO THE  
PLANNING AND  
MANAGEMENT OF  
LAND RESOURCES**

**THE NATURE OF THE PROBLEM**

The bottom line is that "land is a finite resource." Moreover, "expanding human requirements and economic activities are placing ever increasing pressures on land resources, creating competition, and conflicts." If future human needs are to be properly met, the land and its natural resources will have to be soundly planned for and managed in an integrated way. Despite more food per capita being produced than ever before, hundreds of millions go hungry every year. In part, this is due to losing worldwide 14 million tonnes of grain production annually to soil erosion, air pollution, and acid rains. Increased food production owed much to changing technology, including the ability to irrigate twice as much land in the 1980s as in the 1950s. But nine times more chemical fertilizers and 32 times more pesticides were used, thereby polluting much of the planet's groundwater and causing the poisoning of 10,000 people in the Third World yearly. Production increases nevertheless fell behind population increases by 13 million tonnes per year.

"Land degradation" encompasses soil erosion, desertification, the destruction of forests, the encroachment of growing populations, and other abuses of land resources. Accordingly, the lack of integrated long-term planning and management of land is causing worsening situations in developed and developing countries alike. For example, soil erosion exceeded soil formation on one-third of US cropland, and affected 30% of all farmland in India. The Food and Agriculture Organization (FAO) indicates that the

world will lose 544 million hectares (1.9 million square miles) of rain-fed cropland, or one-third of the world's farms will be destroyed, through soil erosion. Poorly planned irrigation is causing farmers to abandon over 10 million hectares of irrigated land each year due to water-logging, salinization, or alkalization. At the same time, urbanization is intruding on arable land and removing it from production. In the 20 years between 1966 and 1986, urbanization claimed more than 300,000 hectares of Canada's rural land, 58% of which was agricultural lands. Increasingly, its limited store of arable land is being submerged under tarmac and concrete.

**SUMMARY OF CHAPTER 10**

Chapter 10 really only has one program area: *Integrated Approach to Land-use Planning and the Management of Land Resources*. This integrated approach is seen as the most effective way to handle land pressures, competition, and conflicts and to move toward more effective and efficient use of land and its natural resources. The Chapter advocates integration in two ways: first, by taking into account environmental, social, and economic factors; and second, by looking at all environmental and resource components together, such as air, water, land, biota, etc. It tends to emphasize the reorganization and strengthening of the decision-making structure (policies, planning, procedures) and is thus related to Chapters 8 (Policy-making), 37 (National Capacity), and 38 (Institutions). But it leaves the operational aspects of planning and management on a sectoral basis to the other chapters, such as forests, oceans,

## INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES

desertification, and biological diversity. However, while the Chapter advocates raising awareness, strengthening information systems, promoting public participation, and involving NGOs as collaborators, it still tends to take a "top-down, technocratic" approach through emphasizing and using government as the lead in such actions.

### THE NATURE OF THE UNCED DEBATE

Canada promoted the active cooperation and involvement of stakeholder groups, such as indigenous peoples, women, and local communities. With Australia and New Zealand, Canada supported an ecosystem approach to the management of land resources, which built on the sustainable land practices of the stakeholder groups, and which entails collecting information on the status and changes of land resources (soils, forest cover, wildlife, climate, etc.). Overall, there was no real conflict over this Chapter.

### SOME CANADIAN INITIATIVES

Because most land-use planning activities fall within provincial and municipal jurisdictions, Canada, at the Federal level, is unable to have land planning and management policies as broad in scope as Agenda 21. All levels of government increasingly acknowledge that environmental issues cannot be isolated from economic and social challenges of urban or rural land-use planning. But, the political will and the mechanisms to bring planning and resource management together are still somewhat embryonic. However, the Federation of Canadian Municipalities (FCM), the Canadian Housing and Mortgage Corporation, and the Canadian Institute of Planners among other institutions have undertaken a number of studies and activities that try to address the relationships among planning, resource management, and sustainability.

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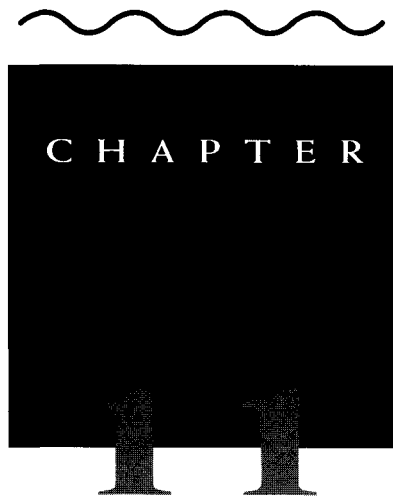
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## COMBATTING DEFORESTATION

### THE NATURE OF THE PROBLEM

Forests are related to the entire range of environmental and development issues and opportunities, but they are also essential to the maintenance of all forms of life. However, the Earth is facing serious declines in forest cover. In the early 1980s, the Food and Agriculture Organization (FAO) estimated the annual rate of deforestation at approximately 11.3 million hectares. By the 1990s, with new methods of monitoring, this estimate is considered to be seriously understated and deforestation was considered to be possibly twice this figure (anywhere between 15 and 25 million hectares). Each year an area of tropical rainforest equivalent to the size of Portugal is eliminated. Such forests cover 9% of the world's land area, but they hold over 50% of all known plant and animal species, plus 80% of the insects and 90% of the primates. All forests are a source of genetic diversity, the extent of which is still not fully documented.

Temperate forests are sustaining the same fate. In 1988, Canada lost over 1,000,000 hectares of forest while only 823,000 hectares were replanted for a total loss of 177,000 hectares or 18% of its cutover. Canada's forests cover 453 million hectares or 45% of the land surface, but old growth forests have almost disappeared. For example, only about 9.3% of the old growth forest on the coast of British Columbia remain, on which 79 vertebrate species depend partially or entirely. With the demise of tropical or temperate forests goes the demise of countless species.

Increasingly it is recognized that forests "prevent soil erosion; maintain water quality; and regulate the flow of water

in different seasons, thus providing the bloodstream of agriculture, industry, and human communities," as well as for all other species. Forests act as "CO<sub>2</sub> sinks," converting CO<sub>2</sub> into solid matter and establishing a global carbon reservoir. "They filter particulate pollution from the air, and improve local and regional climates," while returning upwards of 80% of the rain to the atmosphere and protecting the Earth from erosion. Yet forests are being cleared or degraded for a variety of reasons — to satisfy consumer demands for a range of products: to enable small farmers in poor countries, through slash- and-burn agriculture, to produce more food and cash crops; to provide poor women and their families with fuelwood for cooking, light, and heating; to convert land to other uses such as agriculture, ranching, monocultures, highways, urban centres, suburbs, and shopping malls. Deforestation is causing "serious and potentially catastrophic" consequences — deterioration of watersheds, loss of soil and land productivity, flooding, sedimentation, loss of genetic diversity, desertification, increased CO<sub>2</sub> in the atmosphere, and 15–20% of global warming. But, for many countries, particularly Canada, the forest sector is of overwhelming national economic significance. In Canada, current statistics indicate that this CA\$44.3 billion industry generates 1 in every 15 Canadian jobs and is the economic mainstay of 350 single-industry towns.

### SUMMARY OF CHAPTER 11

Chapter 11 identifies four main program areas that resulted from the negotiations held at the fourth PrepCom in New York. These are:

- (a) *Sustaining the Multiple Roles and Functions of all Types of Forests, Forest Lands, and Woodlands;*
- (b) *Enhancing the Protection, Sustainable Management, and Conservation of All Forests, and the Greening of Degraded Areas, through Forest Rehabilitation, Afforestation, Reforestation, and other Rehabilitative Means;*
- (c) *Promoting Efficient Utilization and Assessment to Recover the Full Valuation of the Goods and Services Provided by Forests, Forest Lands, and Woodlands; and*
- (d) *Establishing and/or Strengthening Capacities for the Planning, Assessment and Systematic Observation of Forests and Related Programs, Projects, and Activities, including Commercial Trade and Processes.*

The four program areas basically outline actions that are related to the *management* of forestry activities and planting programs (including urban forestry), but do *not* really address "combatting deforestation." The Chapter emphasizes the need for institutional or human resource strengthening related to the development of (more) holistic or integrated approaches to sustainable forest development, including programs, plans, policies, and projects on management, conservation, and sustainable development. Its largely curative approach puts emphasis on rehabilitation forestry, which involves the promotion of planting activities, industrial/nonindustrial plantations, the improvement of planning and management of existing forests for multiple benefits, and some buffer, transition, or protected forest zones. It addresses the need to determine social, cultural, economic, and biological values; and the need for improved, efficient industries, the efficient use of fuelwood and energy, and "ecotourism." The Chapter advocates the need for more and better information and databases, including improving economic information on forest and land resources, and increasing capacities for planning and assessing integrated forest planning.

Overall, Chapter 11 advocates curative, rather than preventative, action. Thus it emphasizes planting trees rather than conserving forests. It has ignored the fundamental concept that forests are the lungs of the Earth and hold the germ plasm for future generations and the potential for some problem-solving. It neglects the ultimate causes of deforestation (e.g., poverty, landlessness, and population pressures in the South and excessive consumption in the North). It tends to ignore interrelated issues, such as fragile ecosystems, water resources, land-use activities (including tenure), terrestrial biodiversity, and desertification. And it proposes a number of activities (village woodlots, government plantations, afforestation techniques, and improved woodstoves) that have been shown in the past to

have not been too effective, economical, or socially useful in reversing or reducing tropical forest loss in a number of countries, without advocating research into and analysis of what has or has not worked, and what can or cannot be usefully replicated.

### THE NATURE OF THE UNCED DEBATE

Forestry issues are central to the North-South debate on global resources. The North wants to treat all forests — tropical and temperate — as global resources that contribute to global ecological balance, maintain biodiversity, act as CO<sub>2</sub> sinks, store carbon, and produce oxygen; and minimize or reduce global warming. The South thinks that this approach threatens their sovereignty over their own national forest resources, which are needed for their development and growth. This came to a head when the North refused to recognize the South's sovereignty in the Convention on Biodiversity. (The South was especially critical of the United States' offer of US\$150 million annually in bilateral assistance for forest management projects, interpreting the offer as "a bribe" to preserve the tropical forests as "sinks" for the North's excess CO<sub>2</sub>.) The disagreement was intensified by the PrepCom negotiations on the Convention on Biological Diversity and the Statement of Forest Principles document.

Prior to UNCED, the Canadian Council of Forestry Ministers (CCFM) adopted the National Forestry Strategy in March 1992, which allowed Canada to be ready for obligations that would emerge in the context of Agenda 21 or other international legal instruments on forestry. Canada helped to bring about a compromise between the North and South on both Chapter 11 and the Forest Principles document by championing a multivalue, ecosystem approach to forests; linking environmental and developmental issues together; and, by involving the international forestry community in the discussions.

### SOME CANADIAN INITIATIVES

The provinces have primary responsibility for the management of forests and forested areas, and have policies, legislation, and programs in place to manage their resources in a manner consistent with Agenda 21. Generally, the provinces are perceived as not having been too successful in enforcing legislation and implementing comprehensive, sustainable forestry-management practices, although improvements are gradually occurring. Developing countries are unlikely to accept demands from Northern countries such as Canada if such countries have not themselves converted rhetoric into action, such as with comprehensive restoration and replanting of once forested areas, and less concentration on monoculture practices. The National

Forestry Strategy is helping to counter criticisms about unsustainable forest management practices because of its commitments to principles of responsible management and sustainable development for forests.

Through CIDA, Canadian aid continues to support forestry training and skills on local and national levels, social forestry programs, and the development of sustainable forestry action plans in Third World countries. In the past, IDRC undertook research on village woodlots and fuel consumption. More recently, IDRC has sponsored research on the intrinsic value of forest ecosystems and is ascertaining the ways in which indigenous peoples successfully managed forest resources in the past and the applicability of those methods to the present.

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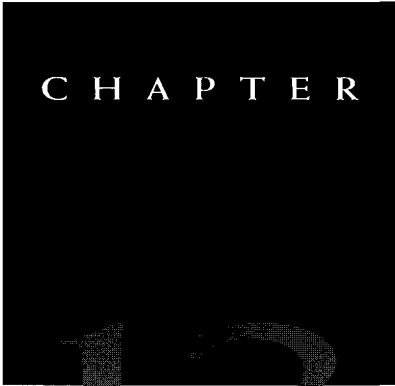

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**MANAGING  
FRAGILE  
ECOSYSTEMS:  
COMBATTING  
DESERTIFICATION  
AND DROUGHT**

**THE NATURE OF THE PROBLEM**

Fragile ecosystems encompass deserts, semi-arid lands, mountains, wetlands, small islands, and some coastal areas. Such ecosystems have unique features and resources but are under tremendous pressures from civilization. Most are regional in scope but many cross national boundaries. (See also Chapters 13 and 17 on sustainable mountain development and small islands/coastal areas.)

Desertification is "land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities." It threatens 70% of the Earth's drylands (i.e., up to 3.3 billion hectares). It affects 17% of the world's population, and 25% of the world's total land area. The impact of desertification has been massive poverty and the degradation of 3.3 billion hectares of rangeland; the decline in soil fertility on 47% of dryland, rainfed croplands; and the degradation of 30% of dryland, irrigated croplands. In the early 1980s, the UN Environment Program (UNEP) classified 88% of the 473 million hectares of productive drylands in Sudano-Saharan Africa as desertified. Each year, the Earth now loses, often permanently, 6 million hectares or 20,000 square miles of productive land to desertification. The parallel process of deforestation is exacerbating the situation, including detrimentally affecting both local and global climate. All of this translates into many grasslands becoming converted into deserts; rangelands being subjected to overgrazing and their carrying capacities being exceeded by as much as 100%;

and enormous losses of land, livestock, and human resources. Ultimately, such conditions affect people, resulting in their sinking into greater poverty, hunger, and malnutrition.

**SUMMARY OF CHAPTER 12**

This Chapter recognizes that priority for combatting desertification should be given to preventive actions for lands that are not yet or are only slightly degraded. It states that "severely degraded areas should not be neglected," however. But the underlying assumption is that land degradation can be stopped in its initial stages at a reasonable cost, whereas desertification at certain stages becomes virtually irreversible and requires huge investments to reverse. On that basis, Chapter 12 outlines six program areas:

- (a) *Strengthening the Knowledge Base, and Developing Information and Monitoring Systems for Regions prone to Desertification and Drought, Including the Economic and Social Aspects of the Ecosystems;*
- (b) *Combatting Land Degradation Through, among other Measures, Intensified Soil Conservation, Afforestation, and Reforestation Activities;*
- (c) *Developing and Strengthening Integrated Development Programs for the Eradication of Poverty and Promotion of Alternative Livelihood Systems in Areas prone to Desertification;*

## MANAGING FRAGILE ECOSYSTEMS: COMBATTING DESERTIFICATION AND DROUGHT

- (d) *Developing Comprehensive Antidesertification Programs and Integrating them into National Development Plans and National Environmental Planning,*
- (d) *Developing Comprehensive Anti-Desertification Programs and Integrating them into National Development Plans and National Environmental Planning,*
- (e) *Developing Comprehensive Drought Preparedness and Drought-Relief Schemes, Including Self-help Arrangements, for Drought-prone Areas and Designing Programs to cope with Environmental Refugees, and*
- (f) *Encouraging and Promoting Popular Participation and Environmental Education, Focusing on Desertification Control and Management of the Effects of Drought.*

The Chapter does not place much emphasis on research into or on provisions for measuring the effects of recommended antidesertification initiatives on the environment and social/economic systems. It tends to concentrate on Africa and the Middle East, and ignores degraded-lands problems elsewhere. And it over-emphasizes intervention by government and international agencies, with little regard for the useful and integrated involvement of women, community groups, and NGOs. However, unlike the Forests Chapter, it takes more of a precautionary or "anticipate and prevent" approach than an after-the-fact, curative approach.

### THE NATURE OF THE UNCED DEBATE

The major source of disagreement during the PrepComs arose over the need for a global Convention on Desertification. The African countries believed that such a convention would show the world the extent and severity of desertification and drought in Africa. They thought that only radical measures would make a major difference to the present grave situation. But the proposal for such a convention was questioned by the United States and the European Community (EC), and even other donor nations, including Canada, were not convinced that a convention was the only or appropriate way to combat desertification. They thought that desertification reflected the larger problems of poverty and unsustainable rural development, which should be addressed foremost. A major impasse between the African Group and the donor delegations resulted, and even caused the African countries to feel isolated from the larger G77, which wanted a positive outcome on the desertification issue given their opposition to the Forest Principles.

Canada recognized that desertification was an extremely important issue for the African nations and worked with African delegations to build support for a desertification convention. As well, Canada recognized that the outcome of the debate could affect Canada's development assistance programs in its relationship with Africa. Finally, at Rio, when the debate surfaced again, a text calling for a convention on desertification was agreed to by the G77 and donor countries. Canada attempted to act as a bridge "between the different national delegations on the complex interrelationships between diverse land uses and sustainable land management."

### SOME CANADIAN INITIATIVES

Canada's position on desertification has arisen from its dual approach to the use of soil and agriculture. On the one hand, Canada recognizes that developing countries will generally have to practice — over the short-term — somewhat nonsustainable agriculture if they are to meet the overwhelming challenge of feeding their growing populations. On the other hand, Canada realizes that sustainable practices are crucial to long-term survival and, to that end, is seeking commitments from developing countries that they will prepare national soils policies that will gradually move their agriculture — and other soil uses — toward sustainability.

Both CIDA and IDRC have actively supported rangeland management, soil conservation, and soil management throughout Africa, particularly in the Sahel region, the Middle East, and North Africa. Some of IDRC's programs, for example, have focused on assessing the local causes of and their contributions to land degradation, and on evaluating low-input technologies for restoring degraded lands, including alley-cropping and tree-planting to enhance soil productivity. It has funded research to reduce the risk of drought and also supported international and regional conferences on rangeland management and common property.


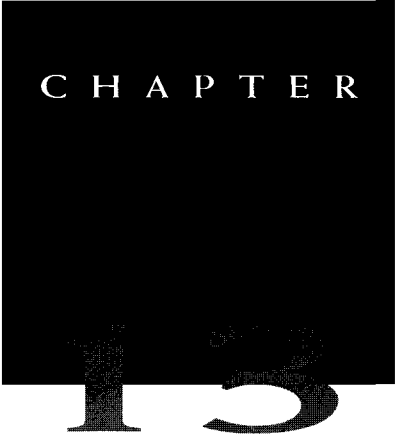
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## MANAGING FRAGILE

### THE NATURE OF THE PROBLEM

Mountain environments, as inhospitable as they may sometimes seem, are major ecosystems that are sources of water, energy, minerals, forest and agricultural products, recreation, and biological diversity. Although about 10% of the world's population depends directly on mountain resources, over 50% of that population is actually affected by mountain ecology and its watersheds. Mountain ecosystems are vital to the survival of the global ecosystem, but they are rapidly changing. Accelerated soil erosion, landslides, rapid loss of habitat and genetic diversity, loss of indigenous knowledge, and increasingly widespread poverty among mountain inhabitants are all signs of the disintegration of mountain ecosystems. Hills and mountains are the source of all river systems; they have a key influence on climate, and they protect the valleys and their inhabitants below. Highlands are critical for marginal economic activities, such as grazing and gathering; they help low-income people to create sustainable livelihoods; and they are sources for income from tourism. Finally, mountain ecosystems are key features of nature reserves or national parks, which are part of countries' and the world's heritage. But "mountains are highly vulnerable to human and natural ecological imbalance," and yet a lack of knowledge about mountain ecosystems (and the variations of climatic systems on any one slope) prevails to a large extent.

### ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT

### SUMMARY OF CHAPTER 13

The Chapter recognizes the need to use an integrated approach for conserving, upgrading, and using the natural resource base of land, water, plants, animals, and humans. To that end it identifies two specific programs.

- (a) *Generating and Strengthening Knowledge about the Ecology and Sustainable Development of Mountain Ecosystems.* This includes surveys of soils, forest, water use, crops, plant and animal resources; maintaining and generating databases; participatory research with local communities; and coordination of regional efforts to protect fragile mountain ecosystems.
- (b) *Promoting Integrated Watershed Development and Alternative Livelihood Opportunities.* This ambitious program sets a target of the year 2000 by which appropriate land-use planning is developed to prevent soil erosion, increase biomass production, maintain ecological balance, promote sustainable income-generation, and develop various institutional arrangements for risk-prone countries.

Although the Chapter talks about an integrated approach, in fact it takes a limited holistic approach, resulting in environmental issues being separated from socioeconomic concerns. The equitable distribution of costs and benefits are not equated with the rational use of natural resources and the preservation of the environment. Without that, developing countries will be hard-pressed to protect the environment. As in most other chapters, human resource



development or capacity-building, especially at the local level — among groups, such as women, or local decision-makers — and the promotion of environmental awareness and knowledge at all levels are inadequately addressed.

### THE NATURE OF THE UNCED DEBATE

Generally, there were no major contentious issues leading up to UNCED. Austria introduced the concept of developing regional legal instruments to protect local or regional fragile mountain ecosystems. Czechoslovakia proposed identifying areas threatened by air pollution from neighbouring industrial and urban areas. Canada supported the developing countries' interest in sustainable mountain development as a way of helping themselves economically and better managing their own ecosystems. Canada also supported the involvement of local communities in decision-making. The resultant chapter did indicate that local communities should be part of decision-making and improving the local ecological knowledge base; that mountain economies should be diversified, but such economic activities should be environmentally sensitive.

### SOME CANADIAN INITIATIVES

The Brundtland Commission recommended that countries should set aside 12% of their lands and waters to protect representative samples of the Earth's ecosystems. Canada, to date, has set aside 7.1% of its area for this purpose. The Federal Government has committed itself to achieving the 12% target of the Brundtland Commission by the year 2000, and a portion would be within mountain zones. Canada has also indicated its commitment to ensuring sustainable

mountain land use through its Green Plan, Canada Land Inventory, and Forest Inventories. Recent controversies over the development of the Carmannah and Stein valleys in British Columbia, for example, are seen as highlighting the need for a careful examination of how much and in what way development should occur within fragile mountain ecosystems.

In developing countries, IDRC has supported projects that focus on the management of highland resources so as to promote ecological and economic sustainability. Its research has examined "swidden" (slash-and-burn); the linkages between the local use of renewable resources and the involvement of local inhabitants; and the effective management of new and old nature reserves in such different locales as the Mexican Sierra and the Himalayas.


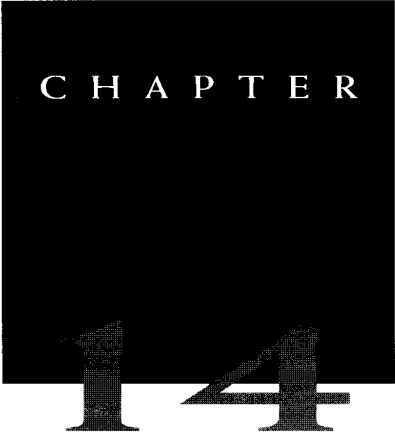
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CHAPTER  
14

**PROMOTING  
SUSTAINABLE  
AGRICULTURE  
AND RURAL  
DEVELOPMENT**

**THE NATURE OF THE PROBLEM**

One of the greatest challenges facing the world is to produce enough food for a human population that is now 5.7 billion and will exceed 6 billion by the year 2000 and 8.5 billion by 2025. Over 96 million people are added every year. The need is especially acute in developing countries where hunger and malnutrition are common and steadily increasing because 84% of the world's population are concentrated on steadily declining land resources. Most of the food in the Third World is produced by small-scale male and female farmers, who are being forced by population pressures onto ever more marginal lands or onto space cleared of forests.

The practice in Northern agricultural systems of intensive use of synthetic fertilizers and pesticides is beyond the financial means of most of these farmers, besides being environmentally unsustainable over the longterm, especially in fragile ecosystem areas. In fact, there is increasing concern that even the Northern countries cannot sustain such practices for much longer. For example, soil loss, erosion, degradation, and depletion of lands are rampant in Canada. The organic content of Prairie soils declined by 40–50% and the lands of Ontario and Quebec by as much as 30–40% during the last 30 years. In New Brunswick, erosion has severely affected one-third of the land on which potatoes are grown intensively. On some potato fields, up to 12 cm of top soil has been lost during the last 20 years. (In Canada, under natural conditions, soil development takes place at an average rate of less than 0.5 cm per century.)

The on-going cultivation of marginal farmlands and wetlands, excessive tillage, monoculture, the removal of hedgerows and tree blocks, summer fallow, the excessive use of artificial chemical inputs, etc. have all contributed to these problems in both the North and South.

Overall the capacity of available resources and technologies to meet the growing demands remains uncertain at best. But, as Agenda 21 states, "Agriculture has to meet this challenge," by increasing production on existing farmland and preventing further encroachment on marginally suitable lands. Alternative farming practices, such as low-input sustainable agriculture, are seen as viable ways of better using locally available resources (including soils, organic fertilizers, waters, plants, trees, natural biocides, and local, traditional cropping skills).

**SUMMARY OF CHAPTER 14**

The primary goals of this Chapter are to increase food production sustainably and to enhance food security. The main tools identified for achieving sustainable agriculture and rural development are policy and agrarian reform, local farming-community participation, income diversification, land conservation, and improved management of inputs. The following 12 program areas clearly indicate the contents of the Chapter.

- (a) *Agricultural Policy Review, Planning, and Integrated Programming* — This is to undertaken on a multifunctional basis, especially for food security and sustainable development;
- (b) *Ensuring People's Participation and Promoting Human Resource Development for Sustainable Development*;
- (c) *Improving Farm Production and Farming Systems through Diversification of Farm and Nonfarm Employment and Infrastructure Development*;
- (d) *Land-resource Planning Information and Education for Agriculture*;
- (e) *Land Conservation and Rehabilitation*;
- (f) *Water for Sustainable Food Production and Sustainable Rural Development*;
- (g) *Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Sustainable Agriculture*;
- (h) *Conservation and Sustainable Utilization of Animal Genetic Resources for Sustainable Agriculture*;
- (i) *Integrated Pest Management and Control in Agriculture*;
- (j) *Sustainable Plant Nutrition to Increase Food Production*;
- (k) *Rural Energy Transition to Enhance Productivity*; and
- (l) *Evaluation of the Effects of Ultraviolet Radiation on Plants and Animals caused by the Depletion of the Stratospheric Ozone Layer*.

While the Introduction to the Chapter states that "major adjustments are needed in agricultural, environmental, and macroeconomic policy, in developed and developing countries," the emphasis of the Chapter is on the situation in developing countries. It virtually ignores the need for developed countries to follow the same sustainable agricultural principles being set out for the developing nations. Food production problems are not linked with questions of distribution and consumption, especially with respect to the interrelationships between developed and developing countries. Generally, the focus is on policy formulation, while implementation (including bureaucratic structures and barriers, links between governments and NGOs, incentives and sanctions, monitoring and evaluation) is barely touched upon.

## THE NATURE OF THE UNCED DEBATE

The paragraph dealing with plant genetic resources caused the most disagreement. The United States thought that the phrase "fair and equitable sharing of benefits" would affect the control of the results and benefits of research and development in plant-breeding between the sources and users of plant genetic resources. Although it wanted "mutually agreed sharing," the United States acceded to the earlier phrase.

Another contentious issue was the relationship between agriculture, trade, and the environment. Canada worked to ensure consistency between its UNCED and GATT positions, and it urged recognition of the need to address the trade and agricultural policies and practices of multinational business corporations.

Canada also tried to ensure consistency between its approach to the Biotechnology Chapter and the broader implications of biotechnology for sustainable agriculture. Canada promoted the concept that sustainable agriculture involves not only increased productivity but also food availability and security, and local self-sufficiency that entails public participation, including women and indigenous peoples, in decision-making on agricultural and rural development. Canada supported the use of alternative fuels over expanded fossil-fuel use and stronger international standards for pesticide use. Most of Canada's objectives were met in the final document, with the exception of strengthened international standards for pesticides. Instead Chapter 14 calls for the implementation of the International Code of Conduct on the Distribution and Use of Pesticides.

## SOME CANADIAN INITIATIVES

Canada is working toward its own adoption of sustainable agriculture and rural-development policies and initiatives through its National Soil Conservation Program (NSCP). This Program was set up by the Federal Government in December 1987. The money allocated to the Program will be distributed by the Federal Government according to the specific needs of each province. This money will encourage farmers to use soil-conservation strategies, and will support demonstrations, research, monitoring, and public awareness. Canada's Green Plan is expected to expand on NSCP activities by including such issues as water quality and quantity, wildlife habitat enhancement, and agricultural waste management. Strategies for rehabilitating land in Canada are also being implemented, including initiatives that encourage land-use practices that halt or reverse land degradation and "shelter belts that change microclimatic conditions."

Many of CIDA's efforts in sustainable agriculture and rural development have been directed toward helping small landholders in those regions that have experienced severe environmental degradation due to poor agricultural practices.

IDRC has also undertaken a variety of initiatives — low-input sustainable agriculture that uses organic cropping to maintain soil fertility and control pests and plant diseases; research on farming systems and aquaculture, and on natural biological pesticides; and considerable focus on farmers' (including women farmers) and indigenous peoples' traditional knowledge and practices.

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CHAPTER  
15

**CONSERVATION  
OF BIOLOGICAL  
DIVERSITY**

**THE NATURE OF THE PROBLEM**

The world teems with life — in the mountains, the oceans, forests, and fields. An amazing “variety of plants, animals, and microorganisms coexist in complex, interlocking ways in a wide range of natural habitats.” This is biological diversity — the many genetic traits, the numbers of species, and the varied ecosystems that coexist together and upon which the Earth’s health — and humans — depends. At present, only about 1.7 million species have been identified, yet it is estimated that at least 5 million species, and possibly as many as 33.5 million, have not been formally named let alone identified. The biological “treasure trove” is vast, but daily three species are being eradicated, or 1,200 in 400 days. Unwittingly, hundreds of unnamed or unknown species are being destroyed yearly. At the present rates of extinction, “a quarter of the world’s known and identified species (over 400,000) will be gone by the end of this century, that is, in only 8 years.” The loss of even one species causes changes that often are unfathomable, complex, and unpredictable.

The loss of biodiversity is largely due to human-caused threats or effects or misuses and exploitation of the environment. These range from habitat alteration or destruction (e.g., clear-cutting of forests, drainage of wetlands, mining of coral reefs) to human population increases and thus greater demands for livestock ranges, more cropping, or urbanization. Biological diversity is also threatened by pollution and degradation from chemical contamination and poor waste disposal; excessive commercial “harvesting” (e.g., the Atlantic cod stocks and Bangladeshi frogs); global

climate change or the “greenhouse effect” on many ecosystems; and the introduction of foreign species. Besides wild or natural biodiversity, domestic biodiversity (i.e., the diversity of agricultural, forestry, and livestock species) is also highly important and subject to enormous losses. This is due to the widespread adoption of monocropping and because it has been overlooked by mainstream research.

Biological diversity has an intrinsic value and a critical ecological function. However, its worth is largely couched in terms of its utility and benefits to humans. In pragmatic terms biodiversity is important: to agriculture (improved strains of crop plants and livestock; increased productivity); to the development and testing of new drugs and medical treatments (a quarter of all prescription drugs are made from organic substances from forests); to the economy (wildlife-type recreation, “ecotourism”); and to keeping the planet healthy (fixing of solar energy; protection of soil; breakdown of pollutants). But, despite its vital importance, biodiversity faces its greatest threat from human ignorance and lack of understanding.

**SUMMARY OF CHAPTER 15**

The Chapter calls for “urgent and decisive action to conserve and maintain genes, species, and ecosystems, with a view to the sustainable management and use of biological resources.” The primary goals are “to improve the conservation of biological diversity and the sustainable use of biological resources, as well as to support the Convention on Biological Diversity.” Only one program area is speci-

fied — *Conservation of Biological Diversity*. (See also Chapters 14, 16, 17, 26, 34, 36, and 40 for topics that link into this area.) The following represent some of those activities advocated in program:

- Reinforcement of capacities for studies and assessments of biodiversity at the national and international levels;
- National action and international cooperation for in situ protection of ecosystems and ex situ conservation of biological and genetic resources; and
- The participation and support of local communities (including indigenous peoples and women).

In particular, governments, in cooperation with UN, regional, and intergovernmental agencies and NGOs are urged to:

- "Press for the early entry into force of the *Convention on Biological Diversity*";
- Develop national conservation strategies;
- Undertake country studies on the conservation of biological diversity and the sustainable use of biological resources;
- Foster the traditional methods and knowledge of indigenous peoples, including the role of women, and ensure their participation; and
- Implement mechanisms for the sustainable use of biotechnology and its safe transfer.

This approach largely places the onus on national governments and recognizes their sovereignty over their own resources.

Chapter 15 is basically a document which is supportive of, and somewhat subordinate to, the larger *Convention on Biological Diversity*. It focuses mainly on the utility value of biodiversity, in terms of the goods and services for human benefit. It briefly acknowledges the ecological function of biodiversity, but gives no recognition to its intrinsic value. As such, it tends to undermine the concept of ecosystem sustainability and fails to integrate resource management adequately into ecosystems.

### THE NATURE OF THE UNCED DEBATE

The issue of biodiversity conservation has been somewhat politically charged. Developed countries, partly pressured by their "electorates seeking to protect rainforests and elephants," have generally recognized the need for biodiversity conservation for its economic and human benefits, for its sustainable use, and for its own sake or value. Developing countries have wished to retain sovereignty over their resources and to receive fair payment for their

use or conservation. Developed countries desired continued — and often unlimited — access to genetic resources. Developing countries, on a quid pro quo basis, wanted equitable compensation, "fair and equitable sharing of benefits," and improved access to biotechnology and related developments. During the negotiations leading up to UNCED, the United States particularly opposed these demands. Third World countries also wanted the biodiversity chapter merged with the biotechnology chapter, on the basis that biodiversity is a major component of biotechnology. And some delegations at UNCED tried to reopen negotiations on issues that had been agreed to during the parallel negotiations on the Biodiversity Convention by the Intergovernmental Negotiating Committee (INC) for a Convention on Biological Diversity. As the Chapter is subordinate to the Convention, the wording on the issues of rights of country of origin of genetic resources and fair and equitable sharing of benefits were retained because the Convention is the legally binding document.

Canada, during negotiations, undertook to ensure that biodiversity was recognized for two fundamental values: as a resource of use to humans if sustainably managed and as a necessity for the Earth's survival. Canada tried to promote an ecosystem approach throughout the text and helped to rewrite the Chapter to make it consistent with the Biodiversity Convention.

### SOME CANADIAN INITIATIVES

In order to protect habitat and maintain biodiversity, Canada has participated in a number of international agreements. These include: the 1972 Convention on the Protection of the World Cultural and Natural Heritage (The World Heritage Convention); the Unesco Man and the Biosphere Program; the 1971 Convention on the Conservation of Wetlands of International Importance, drafted in Ramsar, Iran, in 1971; and the International Tropical Timber Agreement reached in Geneva in 1983. It also actively participates in the Tropical Forest Action Program and the International Tropical Timber Organization located in Japan and which became operational in 1987. Canada is also a signatory to the 1946 International Convention for the Regulation of Whaling; the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which is designated to control trade in about 48,000 listed plants and animals and their derived products; and to the 1979 Convention on the Conservation of Migratory Species of Wild Animals. Since 1980, international and UN efforts have been guided by the principles contained in such key documents as the World Conservation Strategy (1980) and the World Charter for Nature (1982).

At UNCED, Prime Minister Mulroney, on behalf of Canada, was the first to sign the Convention on Biological Diversity and, on 4 December 1992, Canada became the first country to ratify the agreement. This quick and decisive action has provided leadership and encouragement to other countries — developed and developing — to sign (157 have already) and ratify the Convention.

In November 1992, the Tri-Council meeting, made up of Canada's Federal, Provincial, and Territorial Governments, adopted a follow-up plan to the Biodiversity Convention. The meeting resulted in a *Statement of Commitment* calling on provinces, territories, and the federal government to complete, among other actions, the national parks system by the year 2000 as outlined in the Green Plan. The Tri-Council meeting also agreed to a process for completing a National Biodiversity Strategy in 2 years. As well, in November 1991, the Green Plan introduced a National Wildlife Strategy designed to maintain and enhance the health and diversity of Canadian wildlife. Work already undertaken includes a funding arrangement with the World Wildlife Fund to protect and recover Canadian wildlife species at risk, the Federal Policy on Wetland Conservation (adopted in March 1992), and the creation of National Wildlife Areas and Migratory Bird Sanctuaries. The implementation of this policy will be assessed by an independent auditor in 1995.

Over the years, IDRC has supported various programs on habitat protection — the Mount Everest Preserve, the Sierra de Santa Marta Biological Reserve in Mexico, the Keystone Dialogue on Plant Genetic Resources and Intellectual Property Rights and farmers' rights, resulting in the publication, *A Patent on Life*. Between 1986 and 1991, CIDA committed just over CA\$1 million on biodiversity projects. These fall into two categories: consolidation of protected areas and support to delegations from developing countries at international conferences on biodiversity and conservation.

IDRC has identified the following priority research issues in response to the Biodiversity Convention:

- *Wild Biodiversity* — Habitat protection and utilization and valuation of natural biodiversity;
- *Domesticated Biodiversity* — In-situ germplasm conservation, farming system diversification, and aquatic biodiversity; and
- *Biodiversity and Biotechnology* — Intellectual property rights, biosafety and access to biotechnology.

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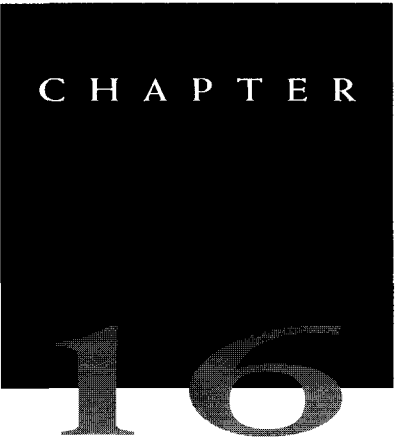
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- *Indigenous and Traditional Knowledge* — Support for indigenous peoples' networks and common property management institutions;

CHAPTER  
16

**ENVIRONMENTALLY  
SOUND  
MANAGEMENT OF  
BIOTECHNOLOGY**

**THE NATURE OF THE PROBLEM**

The planet harbours millions of microscopic lifeforms that have long been used by humans to improve their quality of life. More recently, biotechnology — “the practical utilization of microbial, plant, and animal cells” — has emerged as a major new field of knowledge and techniques for providing numerous benefits to humanity. It can help to increase food production; reduce dependence on artificial pesticides and fertilizers; leach metal from low-grade ores; increase industrial capacity; control pollution and clean up wastes or spills; and improve health through new drugs. But, “by itself, biotechnology cannot resolve all the fundamental problems of environment and development, so expectations must be tempered by realism.” This realism also encompasses an awareness that hazards and dangers surround the production and use of biotechnology. Deliberate misuse of both technologies and techniques, such as for weapons and war, resulted in the 1972 Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and then its 1986 Review to deal with compliance issues. Laboratory risks and accidents, due to lax standards, have caused growing concern that grafted genetic materials could escape uncontrolled into wild organisms and cause mutations. And the creation of products with potentially long-term harmful effects to the environment and humans — including their society and economy — have often not been adequately studied or the results of such studies widely disseminated.

**SUMMARY OF CHAPTER 16**

The Chapter identifies five program areas that are intended “to foster internationally agreed principles ...[for] the environmentally sound management of biotechnology; to engender public trust and confidence; and to promote the development of sustainable applications of biotechnology” among others.

The five program areas are:

- (a) *Increasing the Availability of Food, Feed and Renewable Raw Materials;*
- (b) *Improving Human Health;*
- (c) *Enhancing Protection of the Environment;*
- (d) *Enhancing Safety and Developing International Mechanisms for Cooperation;* and
- (e) *Establishing Enabling Mechanisms for the Development and the Environmentally Sound Application of Biotechnology.*

The Chapter does not mention the issue of intellectual property rights (IPR) and its particular significance in limiting the diffusion and access of technologies, processes, and products. It does not mention the dominant role of multinationals in biotechnology research and transfer, or the high cost of research as a major constraint for developing countries. Nor does it put emphasis on the need for maintenance, maintenance training, and their adequate financing and support. (The Chapter should be read in conjunction with Chapters 6, 10, 11, 14, 15, 18, 21, 26, and 34.)



### THE NATURE OF THE UNCED DEBATE

To date, the greatest investment in modern biotechnology has been in the industrialized world. While most of the wealth of biological species and genetic diversity is located in the Third World, most of the specialized technology, skilled human resources, and research funding is located in the private sector of the developed countries. The South has contended that the exploitation of its natural resources by the North has long been unfair and that, if such biological species are to be regarded as the "common heritage for the world," they should be properly compensated for allowing access to and use of those resources. This was addressed by the Chapter stating: "Significant new investments and human resources development will be required in biotechnology, especially in the developing world."

Other major concerns arising during the negotiations were: safety in biotechnology; the need for an international code of conduct; liability; compensation; the transfer of technology; and the use of biotechnology for human reproduction. The United States strongly resisted "the undue emphasis" on the safety aspects of biotechnology. Almost all other countries disagreed, believing that those risks were great enough to warrant such an emphasis. The Holy See delegation, representing the views of the Vatican, and several developing countries raised ethical issues pertaining to biotechnology and its application to human reproduction. They were especially opposed to uses that could restrict fertility or would support contraception.

Canada took an active role, including as part of CANZ, in maintaining the distinction between biodiversity and biotechnology; ensuring an emphasis on the health and safety aspects; urging the recognition of indigenous knowledge and practices; and supporting the broad participation of the people involved in and affected by biotechnology.

### SOME CANADIAN INITIATIVES

The Canadian position on biotechnology is directed by the National Biotechnology Strategy (NBS) — a multiyear, multimillion dollar venture established in 1982 by the Federal Government. Since this time, it has fostered the development of biotechnology as an important focus of research activities in governmental departments as well as stimulating a biotechnology industry in Canada. The NBS has spawned a variety of networking groups linking government, industry, and academia. It has designated biotechnology as a "national priority for economic development based upon its future contribution to Canadian resource and manufacturing industries." NBS activities typically are directed toward the speedy development and application of biotechnology and, until recently, few resources had been devoted to understanding the ecologi-

cal impacts and ecosystem responses to engineered organisms released into the environment.

There is no single regulatory body or legislation to deal with biotechnology in Canada, instead it is covered under several different Acts across five federal departments — Agriculture Canada, Environment Canada, Health and Welfare Canada, Labour Canada, and Consumer and Corporate Affairs Canada. At present, Environment Canada is developing new regulations to be included under the Canadian Environmental Protection Act (CEPA) that will require notification and assessments of new technologies.

As well, Canada's Green Plan commits the Federal Government to setting up a national regulatory body to address environmental risks associated with the biotechnology industry by 1995. It seeks to publish national standards and codes of practice concerning accidental or deliberate release of genetically engineered organisms or improperly treated biogenetic wastes into the environment.

IDRC has supported a number of initiatives in three broad groupings: product and process development (biopesticides; anticontraceptive vaccine; sugarcane waste use); policy and priority setting (regional reviews of agricultural biotechnology; intellectual property issues); and technology transfer and access to information, including reviews of information studies and Canadian expertise in agricultural biotechnology. CIDA-supported biotechnology projects have contributed to or enhanced the biological control of pests in a number of developing countries. Commitments for these projects totaled over CA\$6 million between 1986 and 1991.

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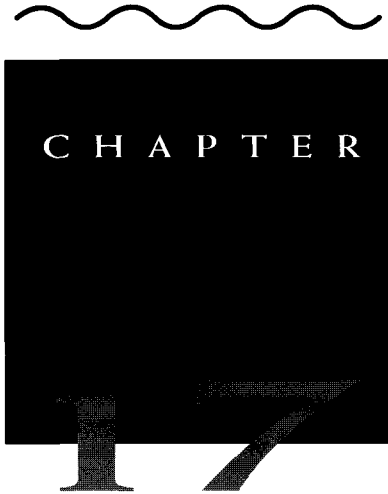
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**PROTECTION OF THE  
OCEANS, ALL KINDS  
OF SEAS INCLUDING  
ENCLOSED AND  
SEMIENCLOSED  
SEAS, AND COASTAL  
AREAS AND THE  
PROTECTION,  
RATIONAL USE, AND  
DEVELOPMENT OF  
THEIR LIVING  
RESOURCES**

**THE NATURE OF THE PROBLEM**

The marine environment — the oceans, seas, and adjacent coastal areas — is a critical element of global life and its support system. Life depends on the oceans — for rain and fresh water for agriculture, human uses, and industry; for plant life on land and in the sea, for nutrients for the soil, and oxygen for animals. The seas moderate temperatures and climate. As well, oceans are a major source of food, employment and trade for people. Fish account for between 17 and 30% of the animal protein in human's diets, in both developed and developing countries. Coastal zones are home to a myriad of microscopic plants and animals; to hatcheries and feeding grounds for fish, shellfish, birds, animals, and humans. Of every 10 humans, 7 live within 80 kilometres of a coast. About 50% of the world's cities with populations over 1 million are on or near tidal estuaries; and 30,000 species of mollusc and crustaceans live in coastal zones. Marine fisheries yield 80–90 million tonnes of fish and shellfish per year, having increased their production five-fold in 40 years. The marine environment thus is vital to life but it has been misused and abused to a point where its finite resources are under severe stress throughout the world.

The threats to oceans, seas, and coastal areas are enormous — large-scale dumping of raw sewage by poorly managed cities; runoffs of fertilizers and feedlot wastes from agriculture; dumping by vessels; deforestation; and ill-planned river

basin developments. Municipal wastes contribute about 50% of land-based marine pollution, industrial and urban runoff another 30%, and atmospheric pollutants another 20%. Altogether about 600,000 tonnes of waste are legally or illegally discharged into oceans each year. The clean-up costs are equally enormous. A project involving surrounding countries in the clean-up of the Mediterranean is estimated to be over US\$10 billion. In 1989, over 39% of the shellfish harvesting areas in the Atlantic provinces were closed due to sewage, urban, and agricultural run-offs, at great cost to the local economies. Victoria, BC, was recently heavily criticized for its ongoing practice of dumping untreated sewage into its beautiful surrounding waters and may be subject to some forms of economic sanctions by the United States. Meanwhile the United States continues to be a major polluter of the Great Lakes and St Lawrence River.

Besides pollution, the marine environment is suffering from extensive over-fishing. Most fisheries, in developing or industrialized nations, have been overexploited and have suffered from the lack of cooperation between fishing nations or the unwillingness of some to exercise sound management of fish stocks. Several of the world's largest fisheries have collapsed since the late 1970s — the Peruvian anchoveta, Californian sardine, North Atlantic herring stocks, etc. This is exemplified by the depletion of Atlantic Canada's vast cod stocks through overfishing by foreign fishing vessels in the high seas and off the cod's

breeding grounds. The Canadian government had to take the unprecedented action of closing down fishing of Cod for 2 years to allow stocks to replenish. Pressure is mounting for similar actions to be taken for capelin.

## SUMMARY OF CHAPTER 17

Although the United Nations Convention on the Law of the Sea (UNCLOS) sets forth the rights and obligations of states to "pursue the protection and sustainable development of the marine and coastal environment," the Chapter acknowledges that new approaches to the management and development of the marine environment are essential. Such approaches need to be integrated, precautionary, and anticipatory, and taken at the national, regional, and global levels. On that basis seven, often over-lapping, program areas are detailed.

- (a) *Integrated Management and Sustainable Development of Coastal Areas, including Exclusive Economic Zones.* This urges coastal states to commit themselves to integrated management and sustainable development of coastal and marine areas under their national jurisdiction, using preventive and precautionary approaches in their planning.
- (b) *Marine Environmental Protection.* This, too, advocates an "anticipate and prevent" rather than reactive approach.
- (c) *Sustainable Use and Conservation of Marine Living Resources of the High Seas.* This would involve management of high-seas fisheries; the adoption, monitoring, and enforcement of conservation measures; and better cooperation between nations.
- (d) *Sustainable Use and Conservation of Marine Living Resources under National Jurisdiction.* States are urged to identify marine ecosystems showing high levels of biodiversity (e.g., coral reefs, estuaries, wetlands, seagrass beds, spawning and nursery areas) and take action to limit their uses.
- (e) *Addressing Critical Uncertainties for the Management of the Marine Environment and Climate Change.* This would require more research, data, and information-sharing and cooperation between nations.
- (f) *Strengthening International, including Regional, Cooperation and Coordination.*
- (g) *Sustainable Development of Small Islands.* This program recognizes the particularly ecologically fragile and vulnerable nature of small islands and their communities.

The Chapter overall is very comprehensive and addresses many complex, interrelated issues, including the effective implementation of the UN Convention on the Law of the Sea.

## THE NATURE OF THE UNCED DEBATE

A major issue was the need for a high-profile conference to address the issues of straddling and migratory fish stocks that are inadequately covered by existing international agreements. Although the Exclusive Economic Zones (EEZ) were supposed to help coastal states, in fact the developing countries have been hard-pressed to protect their fisheries from the incursions of foreign, more powerful, fishing fleets. Canada helped to obtain agreement from the international community for a high level conference on "straddling fish stocks," to be convened in 1993 at St Johns, Newfoundland. Other major issues were the over-fishing of the high seas, and the need for the conservation and sustainable use of high seas living resources; the need to balance integrated management and sustainable development of coastal and marine areas with the sovereign rights of states to develop their own planning; the need for a strategy and action plan on land-based sources of marine pollution; and the need for an integrated approach to coastal zone management (CZM). UNCED endorsed a conference to be held on CZM to be held in November 1993, hosted by the Netherlands. In addition, a meeting under the auspices of UNEP will be held on land-based sources "as soon as practicable."

Canada worked to promote a holistic approach to coastal-zone management and urged the recognition of women and indigenous people both in managing marine living resources and in developing coastal areas. Canada raised the profile of overfishing, due to its own problems with overfishing on the nose and tail of the Grand Banks in Atlantic Canada, and proposed the elimination of the ocean dumping of radioactive waste.

## SOME CANADIAN INITIATIVES

Canada's ocean fishery as a major contributor to the economy cannot be underestimated. Accordingly, the Federal Government has undertaken a number of conservation measures, e.g., minimum fish size, mesh size, and gear type; higher penalties for illegally caught fish; more monitoring or surveillance activities; public information campaigns in Canada and internationally. And it is committed to the July 1993 major conference on the high-seas fishing to be held in New York during July 1993. Canada's official position continues to favour the full implementation of UNCLOS and amendments to fill the gaps caused by new, emerging problems. Canada also favours the strengthening of

PROTECTION, RATIONAL USE, AND DEVELOPMENT OF OCEANS, SEAS,  
AND COASTAL AREAS

regional organizations so as to control overfishing in the high seas; recognizing the sovereign rights of coastal states over stocks that straddle national and international waters; and the overall fisheries management measures detailed in Agenda 21.

Canada has also been strongly involved in international efforts to curb land- and sea-based sources of marine pollution. At the 1990 Houston Economic Summit of G7 countries, Canada sponsored an initiative to develop a comprehensive international strategy to deal with land-based marine pollution. This was adopted and followed up by a meeting in Halifax in May 1991, hosted by Canada in cooperation with UNEP and other international agencies, where worldwide experts began to prepare a framework for reducing pollution from land-based sources. Canada has likewise been a supporter of the London Dumping Convention, established in 1972, to control ocean disposal activities.

In the fall of 1991, the Federal Government announced a 5-year Ocean Dumping Control Action Plan, which includes stringent regulations prohibiting the ocean disposal of industrial wastes; a strengthened scientific basis for controls; and a national research and information program to help address the presence of persistent plastic debris in the oceans. As well, it includes the establishment of a dump-site monitoring network.

IDRC has played a pioneering role in introducing a multidisciplinary approach to coastal zones and inland watersheds, including research into various social issues related to common property resource management and community-based management and into Maximum Sustainable

Yield (MSY) of harvested fish without damaging their reproductive capacity. Both IDRC and CIDA have been involved in small-scale aquaculture systems, irrigation, and water-supply projects as part of rural development. And IDRC continues research into a number of initiatives that might help to bring about a "Blue Revolution" and better management of a vital resource.

CIDA has taken over operation of the International Centre for Ocean Development (ICOD).

**SUGGESTED READINGS  
AND INFORMATION SOURCES**


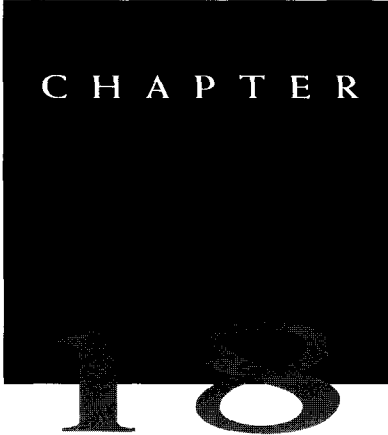
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CHAPTER  
18

**PROTECTION OF  
THE QUALITY AND  
SUPPLY OF  
FRESHWATER  
RESOURCES**

**THE NATURE OF THE PROBLEM**

Water is the most important molecule on the Earth. It is essential to the survival of all living things, and vital to sustainable development. Despite water covering three-quarters of the Earth's surface, under 5% of this is freshwater, much of which is underground or permanently frozen and therefore not renewable. Of the 41,000 cubic kilometres of water that is recycled between ocean, air and land each year as rain, snow, or run-off, only 9,000 cubic kilometres remain as the world's renewable freshwater supply. What has been treated as an infinite resource is, in fact, a limited resource that is being rapidly used up or degraded. Compounding the problem is the unequal distribution of freshwater between different parts of the world and even within countries. Basically, the world can be divided into water-rich and water-poor countries. At present, 80 countries — most of them on the Asian and African continents — with 40% of the world's population are suffering severe water shortages. In Asia, per-capita freshwater supplies are less than half the global average of 7,690 cubic metres. In Africa, the lack of water has caused malnutrition to at least 30 million people during this past decade. Drought has become a prevailing feature of life for many Africans.

Canada has about 9% of the world's renewable freshwater. But over two-thirds of its river-flow runs northward while 90% of its population lives southward, i.e., within 300 kilometres of the Canada-U.S. border. Within that band, concentrations of industrial, agricultural, and household use, geographic disparities of supply, and excessive demands

make clean water supplies for the future increasingly problematic. This is exacerbated by the profligate use of water by Canadians. For example, the average Canadian uses 50 times more water each year than the average Ghanaian. Between 1972 and 1986, Canadian water use rose from approximately 22.5 to 41 billion cubic metres — an increase of 55% — due to rising demands for irrigation, municipal uses, and electric power stations. By 1990, that water use was 42.2 billion cubic metres. Not only did Canadians continue to waste water, but they severely contaminated their water supplies, with many cities in Ontario and Quebec continuing to treat their rivers as open sewers. Over 300 toxic chemical compounds, many dangerous to human health and causing cancerous tumours in fish, have been discharged into and found in the Great Lakes. The Canada-US partial clean-up of the Great Lakes has cost almost CA\$9 billion over 15 years.

The forecasts for water-deficient areas, most of which are in the Third World, are even less encouraging. Annual per-capita freshwater availability in those countries already in a water-crisis state will continue to decline severely, due to population pressures, a variety of water demands, and accelerating pollution of water sources. At present, only two persons out of every five has access to some clean water supplies. WHO estimates that at least 30,000 deaths every day are caused by contaminated water and poor sanitation. Five million children die annually from diarrheal diseases. Cholera outbreaks are on the increase in a number of countries. The rapid growth of urban areas has resulted in the quantity of waste far exceeding the capacity

of existing water to purify itself. For example, in India, it is estimated that over 70% of its total surface water is polluted because of the lack of sewage-treatment facilities for its almost 3,200 urban areas (about 220 have partial treatment). With industrialization has also come a rise in organic and toxic pollution, which has detrimental impacts on water, land, ecosystems, and humans. Ultimately, the degradation of freshwater affects everyone and knows no boundaries.

## SUMMARY OF CHAPTER 18

The Chapter, one of the longest and most comprehensive, recognizes the need for cooperation on transboundary water resources between neighbouring states and for integrated planning and management of both surface- and ground-water resources. It accordingly sets out seven priority program areas and, in some instances, suggests specific target dates.

- (a) *Integrated Water Resources Development and Management.* This is an attempt to develop a holistic approach to managing freshwater, given the anticipated rapid water demands during the next decade or so — 70–80% for irrigation, around 20% for industry, and about 6% for domestic consumption — and the need for integrating water plans into national environmental, economic, and social policies.
- (b) *Water Resources Assessment.* This program is based upon the Mar del Plata Action Plan (1977) to assess and forecast the quantity and quality of water resources, and to provide a scientific database for rational water use.
- (c) *Protection of Water Resources, Water Quality, and Aquatic Ecosystems.* Again, this recognizes the need for a holistic, “preventive” management approach to water whereby ecosystem integrity is maintained, public health is protected, human resources are developed, and costly rehabilitation of water supplies is avoided.
- (d) *Drinking-Water Supply and Sanitation.* This program reiterates the basic right of people to have access to drinking water and the “some for all” approach. It advocates the protection of the environment, safeguarding health, institutional reforms (including women’s full participation), community management of services, sound financial practices, and the setting of targets.
- (e) *Water and Sustainable Urban Development.* Since 60% of the world’s population or 5 billion will be in urban areas, by 2025, this program area evinces an urgency about dealing with the growing effects of urbanization on water demands, usage, and treatment, and the involvement of local authorities.

- (f) *Water for Sustainable Food Production and Rural Development.* This program area recognizes water as a finite resource with significant economic and social values, and vital to food security and agriculture, livestock production, freshwater fisheries, and rural people. Among others, it advocates the full involvement of local communities and women in all phases of water management.
- (h) *Impacts of Climate Change on Water Resources.* Consistent with the UN Framework Convention on Climate Change, this last program calls for more information, research on, and monitoring of the potential impacts of climate change on freshwater resources.

## NATURE OF THE UNCED DEBATE

At PrepCom IV, many developing countries believed that referring to water as an “economic good” would obscure the fact that water is, above all, a basic necessity and a social good. In the end, it was agreed that water should be referred to as a social and economic good. Some countries (India in particular) were also concerned about calls for the cooperative management of transboundary water resources for sovereignty or territoriality reasons, preferring that freshwater resources be managed on a local or national basis rather than on a cooperative intercountry or international basis.

CANZ, along with the Nordic countries, put special emphasis on capacity-building and on the need to recognize and strengthen the role of women in freshwater management in all its phases. Canada had wanted more specific commitments to implementation, particularly at the international level. A somewhat softened compromise was reached under program area (a) *Integrated Water Resources Development and Management*, and within the “activities” subheading (item 18.12.(o)): Development and Strengthening, as appropriate, of cooperation, including mechanisms where appropriate, at all levels concerned, namely..., etc. As well, the Canadian delegation successfully discouraged the suggested creation of new institutions (i.e., a world water council or forum), which would undermine or detract from existing ones.

Many developing countries did not agree to setting target dates until the financial resources and technology transfer issues had been dealt with, this being achieved by inserting generic wording into all Agenda 21 chapters.

## SOME CANADIAN INITIATIVES

Canada is a signatory to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention, 1971), and has been an active participant in several international water-quality programs such as

the GEMS/WATER or Global Water Quality Monitoring Program, and the FAO regional inland fishery bodies.

Many of Chapter 18's goals and proposed activities are addressed in Canada by existing or planned programs at the Federal, provincial, and municipal levels. But the achievement of the goals is often hampered by the lack of coordination between the various competing bodies, although this appears to be improving. The Federal Water Policy (1987) sets out a national strategy for managing Canada's water resources. Basin-wide action plans have been developed for the Fraser River; in 1991, the CA\$100 million Sustainable Management Program for the Fraser River Basin was announced; the St. Lawrence River plan was launched in 1988 with CA\$110 million from the Federal Government; and the Great Lakes initiative was launched in 1988 with CA\$125 million from the Federal Government over 5 years.

The 1978 Great Lakes Water Quality Agreement (GLWQA) between Canada and the United States sets broad objectives for cleaning up the largest collection of freshwater lakes in the world. The five Great Lakes and their connecting water bodies, tributary rivers, streams, and upland lakes make up 20% of the world's supply of freshwater in lakes and rivers. A protocol to the GLWQA signed by Canada and the United States in 1988 called for new action and support of CA\$125 million through the Federal Government. The Agreement set in motion Remedial Action Plans (RAPs) for 17 priority "hot spots" of the Great Lakes and St Lawrence on the Canadian side. The "RAPs" process has successfully created dialogue between government officials and local communities, but overall progress is reportedly still slow. To date implementation of the RAPs has included improvement of municipal sewage treatment plants, habitat restoration work around major centres on the Great Lakes system, and innovative techniques to deal with contaminated sediments.

The Federal Canadian Environmental Protection Act (1988) will contribute to meeting Chapter 18's proposals to assess and protect the quality of freshwater. But uncoordinated provincial responsibility for water quality and municipal responsibility for drinking water may undermine some of the Act's intentions. Various efforts are currently underway to identify targets and timelines for the elimination of the dumping of priority chemicals from industrial waste, but overall control of the release of persistent toxic chemicals into Canada's waters is still relatively lacking. Initiatives under the Green Plan are leading to various improvements in water and sanitation services for some of Canada's native communities.

The Green Plan has committed Canada to working with the United States to develop a bilateral action plan for comprehensive pollution prevention in the Great Lakes and St Lawrence River basin. In May 1992, a Great Lakes Pollution and Prevention Centre in Sarnia, Ontario, was officially opened. The goal of the Centre is to promote pollution prevention through public education and training and by providing a resource centre for information on the issue.

Canada has been involved through CIDA and IDRC in a number of programs for the management of water resources, especially related to rural development and agriculture. Over the last 5 years, CIDA has supported numerous projects of this kind, committing just over 16% of the agency's spending on environment and development programming (second only to population projects in total spending).

IDRC has been involved in a number of activities related to freshwater resources, including on-farm approaches, policy guidelines to maintain the resource. Assessing community and socioeconomic factors and the introduction of new technology to preserve the resource. Over 200 IDRC projects deal with fisheries, aquaculture, and groundwater supply.

#### **SUGGESTED READINGS AND INFORMATION SOURCES**


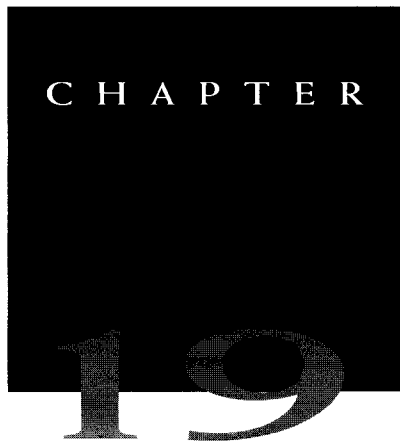
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CHAPTER  
19

**ENVIRONMENTALLY  
SOUND  
MANAGEMENT OF  
TOXIC CHEMICALS,  
INCLUDING PREVEN-  
TION OF ILLEGAL  
INTERNATIONAL  
TRAFFIC IN TOXIC  
AND DANGEROUS  
PRODUCTS**

**THE NATURE OF THE PROBLEM**

Whether in developed or developing countries, economic growth has resulted in two major problems: widespread use of chemicals in homes, businesses, agriculture, and industries and the proliferation of all types of waste. Worldwide it is estimated that between 70,000 to 100,000 chemicals are on the market, with only a small percentage having been tested for toxicity. Even the 1,500 chemicals that constitute 95% of total world production have not all been tested. Moreover, a complete inventory of all chemicals has never been prepared. And crucial data for resource-intensive risk assessment of chemicals are often lacking, especially in Third World nations. "These threats have alarming potential for harming both the environment and human health." Unfortunately, large disparities exist in standards, internationally and within countries, for the use, storage, and disposal of dangerous and toxic substances. Canada itself has not been immune to the improper production, transportation, storage, and disposal of chemical substances that have threatened human lives and health, and the environment. Canadian awareness was especially heightened by the Mississauga train derailment in 1979 that leaked chlorine from damaged tank cars and forced the evacuation of over 200,000 people, and the 1988 fire at the St. Basile-Le-Grand polychlorinated biphenyls storage site.

Because of weak legislation and the lack of enforcement resources in most developing countries, they have become dumping grounds for industrial toxic wastes by corporations, and even the governments of industrialized countries, as well as targets for deceptive marketing, double standards, unsafe operations, and dangerous exports of rejected goods (e.g., dieldrin, DDT, out-of-date drugs and medicines). The consequences for developing countries have been severe: three-fifths of the world's pesticide poisonings or deaths occur there; pitiful compensation is paid for being the repository of hazardous wastes (Bénin received US\$3 per metric tonne whereas in Europe up to US\$2,000 is paid per tonne); waste disposal by incineration and many Third World countries "lose" hard-earned currency on imports that are "bad" for or detrimental to their healthy development (e.g., the United States exports over US\$300 million a year of goods banned or restricted in that country).

**SUMMARY OF CHAPTER 19**

Agenda 21 identifies two major problems, especially in developing countries, that need to be overcome in order to ensure the environmentally sound management of toxic chemicals: (a) the lack of sufficient scientific information for the assessment of risks through the use of many chemicals; and (b) the lack of resources for assessment of chemicals for which data are available.



Chapter 19 proposes six programs for action:

- (a) *Expanding and Accelerating International Assessment of Chemical Risks;*
- (b) *Harmonization of Classification and Labeling of Chemicals;*
- (c) *Information Exchange on Toxic Chemicals and Chemical Risks;*
- (d) *Establishment of Risk Reduction Programs;*
- (e) *Strengthening of National Capabilities and Capacities for Management of Chemicals, and*
- (f) *Prevention of Illegal International Traffic in Toxic and Dangerous Products.*

The Chapter notes that a number of international bodies — UNEP, ILO, WHO, OECD, and the EC — are already involved in work on chemical safety, with the first three having formed the International Program on Chemical Safety (IPCS). Accordingly, it advocates strengthening the collaboration between these bodies and others at all levels. Although it mentions “community right-to-know programs,” community involvement and participation in all aspects of decision-making and management appear to be somewhat minimized, and the main efforts are relegated to governments and industry.

This Chapter should be read with Chapters 20 (Hazardous Wastes), 21 (Solid Wastes and Sewage), 22 (Radioactive Wastes), and 34 (Transfer of Technologies). None of the chapters clearly define the different wastes, thus an overlap exists between them as well as some confusion.

#### THE NATURE OF THE UNCED DEBATE

Developing countries wanted to make Prior Informed Consent (PIC) procedures legally binding instruments in order to better control the entrance of toxic chemicals into their countries. But Canada and other industrialized nations objected on the basis that not enough experience with PIC yet exists, and were not prepared to take the precautionary approach being advocated.

Venezuela called for a ban or phase-out of asbestos (which increases the risk of lung cancer when dust is present in the air) and organo-halogen compounds (which are also carcinogenic, are produced in paper-bleaching operations, and are possibly contributors to ozone depletion). Canada took the position that, because Agenda 21 is not intended to be a regulatory document, it was not appropriate to identify specific chemicals. It therefore proposed that bans or phase-outs should be considered as last steps and only after control and safe management were deemed inadequate. The CANZ group and the United States advocated employing a life-cycle management approach and other options for the environmentally sound management of chemicals. Canada supported calls for industry to develop a code of principles for international trade in chemicals; to adopt responsible care programs; and to adopt “community right-to-know” programs. Overall, Canada wanted better coordination of the efforts of existing institutions already working on such matters.

The final text was viewed as representing considerable advancement of international initiatives for managing toxic chemicals, and was useful for developing countries trying to build up their national systems for the management of toxic chemicals.

#### SOME CANADIAN INITIATIVES

Canada's Environmental Protection Act (1988) provides the authority to implement many of the government-related activities outlined in Chapter 19. But, for the moment, “Prior Informed Consent” mechanisms and the banning of certain substances, e.g., asbestos, go beyond that Act. In July 1991, the Federal Government established a National Office of Pollution Prevention within Environment Canada to promote a shift of pollution prevention policies from “react and cure” to “anticipate and prevent.” The Office is now developing, in coordination with the provinces, a strategy framework for pollution prevention in Canada. As part of the Green Plan, a National Pollutant Release Inventory database, listing major Canadian industrial pollutants, where they are found, and in what quantities, will be established and available for public use. As well, in 1991, a “New Directions Group,” composed of representatives from industry and environmental groups recommended that a process to reduce or phase out selected toxic substances be established. This resulted in the establishment in February 1992 of an ARET (Accelerated Reduction or Elimination of Toxics) Committee composed of representatives from labour, business and industry, environmental groups, and the Federal and Provincial governments. The Committee is developing criteria for selecting substances for action and setting targets and timetables for reduction. The implementation of the process will rely entirely on voluntary

compliance by all groups involved. A Pollution Prevention Initiative was also established for the Great Lakes and St Lawrence Basin in March 1991 backed by CA\$25 million in Federal funding from Environment Canada (see Chapter 18). Overall, Canada's present approach to managing toxic chemicals is to combine regulatory controls with pollution prevention, and to work with industry to control and reduce both toxic chemicals and their emissions.


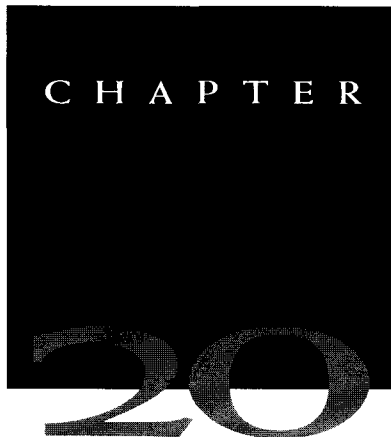
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**ENVIRONMENTALLY  
SOUND  
MANAGEMENT OF  
HAZARDOUS  
WASTES, INCLUDING  
PREVENTION OF  
ILLEGAL  
INTERNATIONAL  
TRAFFIC IN  
HAZARDOUS  
WASTES**

**THE NATURE OF THE PROBLEM**

Millions of tonnes of hazardous wastes are indiscriminately dumped into rivers, abandoned along roadsides or in fields, and poured directly into storm sewers and the oceans. OECD countries are estimated to be producing 2.5 million tonnes of toxic waste every year. Illegal traffic in hazardous wastes abound, and developing countries particularly suffer because of lack of regulations, monitoring, and enforcement to protect them against a proliferation that is increasingly threatening the integrity of the environment and human health. To date, many Third World countries have paid minimal attention to this problem, due to the need to deal with the more pressing problems of economic growth and development. Moreover, they have lacked the resources to develop and implement "improved techniques to treat, detoxify, or incinerate hazardous wastes within their own borders." They are not alone. The treatment, disposal, and transportation of hazardous wastes accounts for 20% of Canada's total waste that requires sound management practices. In 1986, in Canada, 8 million tonnes of hazardous waste were generated by industry. This is a cost that cannot be supported by most developing countries. At the same time, developing and developed countries alike will increasingly find it difficult to sustain the direct and indirect costs of hazardous waste production and improper waste management and disposal.

**SUMMARY OF CHAPTER 20**

The main targets of the Chapter are to prevent or minimize the generation of hazardous wastes; eliminate or reduce transboundary movements and exports of such wastes; ensure environmentally sound waste management; and to ratify two key conventions on hazardous wastes. Four program areas were specifically identified.

- (a) *Promoting the Prevention and Minimization of Hazardous Waste.* This program encourages a movement toward an integrated, cleaner production approach and greater knowledge about the economics of preventing and managing wastes.
- (b) *Promoting and Strengthening Institutional Capacities in Hazardous Waste Management.*

In this program, it is recognized that there is a "lack of knowledge about environmental contamination and pollution and the associated health risk to populations, especially women and children, and ecosystems," from hazardous wastes.

- (c) *Promoting and Strengthening International Cooperation in the Management of Transboundary Movements of Hazardous Wastes.* Here a precautionary approach is advocated, as well as "harmonizing" various criteria, procedures, etc., and ratifying the Basel and Bamako Conventions.

(d) *Preventing Illegal International Traffic in Hazardous Wastes.*

On the whole the Chapter does not give local populations, including NGOs, major consideration as participants in hazardous waste management. They are given a passive role, while governments and industry are given very active roles. The emphasis of the Chapter is on the wastes produced by large corporations, yet the majority of industries and businesses, producing products and waste, are small- and medium-sized.

**THE NATURE OF THE UNCED DEBATE**

Two major concerns were: the illegal movement of toxic and hazardous wastes and other dangerous products from industrialized countries to developing; and the environmental impacts of military establishments. At PrepCom IV, the United States especially objected to references to wastes resulting from military activities or "national security reasons." In the final document, the addition of "nationally applicable" environmental norms allayed US apprehensions. Canada supported the developing countries regarding the illegal dumping of waste from developed countries in the Third World, and advocated consistency of Chapter 20 with the Basel and Bamako Conventions. The Bamako Convention was an attempt by African nations to ban imports of hazardous wastes into Africa and control the transboundary movement of hazardous wastes within Africa. Canada also introduced the idea of the appropriate handling of hazardous materials, but not much immediate progress occurred on this issue.

Because, in industrialized countries, there is merit in sharing environmentally sound facilities within a reasonably accessible area, CANZ promoted the idea that the transboundary movement of recyclables and waste could minimize distances for hauling and thus be cost-beneficial. In this context, Canada promoted "a cradle-to-the-grave" approach to hazardous waste management. This approach involves controlling chemicals at each of the seven stages of their life cycle: research and development, market introduction, manufacturing, transportation, distribution, use, and disposal. Canada and the United States, through a 1986 bilateral agreement, permit hazardous wastes to go both ways for treatment at the nearest licensed waste-treatment facilities.

**SOME CANADIAN INITIATIVES**


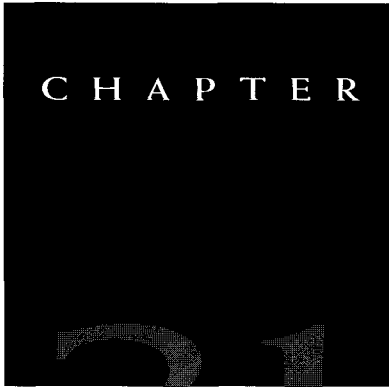

Of the 30 million tonnes of garbage produced by Canadians annually, 8 million tonnes is classified as hazardous waste. Under the Green Plan, Canada has established a 50% waste-reduction target to be met by the year 2000. Proposals in Agenda 21 to establish inventories of hazardous waste and disposal sites, assess the impacts associated with these sites, and clean them up are being addressed under the Green Plan through the development of a computerized inventory and tracking system to monitor the movement of hazardous waste, and through a 5-year program to clean-up 30 high-risk contaminated hazardous-waste sites by 1995.

As the provinces are mandated to look after waste management, implementation of these Green Plan initiatives will likely vary from province to province. Canada's Pollution Prevention Initiatives and the establishment of pollution prevention offices at the Federal and provincial levels are designed to promote waste reduction and minimization through "cleaner production methods" and to manage the transboundary movements of hazardous wastes. In March 1989, Canada signed the landmark Basel Convention (the Global Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal) and followed up with ratification on 28 August 1992.

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**ENVIRONMENTALLY  
SOUND  
MANAGEMENT OF  
SOLID WASTES AND  
SEWAGE-RELATED  
ISSUES**

**THE NATURE OF THE PROBLEM**

By the year 2000, over 2 billion people will be without access to basic sanitation. Half of the urban population in developing countries will lack adequate solid waste disposal services. At present, less than 10% of urban wastes receive some treatment and an even smaller percentage complies with acceptable standards. Already 5.2 million people, including 4 million children under 5, die yearly from waste-related diseases. The situation will worsen as urban areas grow and absorb rural populations. By 2025, urban populations will reach between 5 and 6 billions and will generate five times today's waste. Most cities in developing countries are already hard pressed to provide adequate services for a minority of their citizens. Their infrastructures are inadequate or fragile at best, their waste management minimal or nonexistent, their human settlements often unserved. They lack resources to collect and recycle all city waste. Not only do Third World cities' residents, especially the urban poor, and their environments suffer, but unmanaged, uncontrolled waste is resulting in wider and wider water, land, and air contamination and pollution. Health hazards are forecast to increase and become worse, unless improved and extended waste collection and safe disposal are brought in to control the pollution.

Canada appears to be better off than the developing world. But, because of its heavy consumption patterns and the lack of adequate planning in the past, municipalities across the country are being confronted with a burgeoning and costly

waste problem. At present, Canadians produce over 30 million tonnes of garbage annually. However, only 10% of that garbage is recycled, resulting in existing landfill sites being almost filled to capacity and in difficulties finding or using new sites due to resistance from communities that object to hazards associated with waste disposal and are practicing "NIMBY" (Not In My Back Yard).

**SUMMARY OF CHAPTER 21**

This Chapter defines "solid wastes" as "all domestic refuse and nonhazardous wastes such as commercial and institutional wastes, street sweepings, and construction debris," as well as various types of human wastes. The second half of the Chapter's title, "sewage-related issues" encompasses municipal and industrial wastewaters, as well as sludges from septic tanks and sewage treatment plants. The Chapter advocates going beyond safe disposal or recovery of generated wastes to the "root cause of the problem" — unsustainable patterns of production and consumption. To that end it outlines four program areas, which are interrelated.

- (a) *Minimizing Wastes*. This program area uses an "anticipate and prevent" or precautionary management approach.
- (b) *Maximizing Environmentally Sound Waste Reuse and Recycling*. Not only are resource-efficient approaches to controlling waste advocated, but also public education programs and the development of markets for recycled products.

## ENVIRONMENTALLY SOUND MANAGEMENT OF SOLID WASTES AND SEWAGE-RELATED ISSUES

- (c) *Promoting Environmentally Sound Waste Disposal and Treatment.* In particular, this program emphasizes the treatment and disposal of fecal matter, including its residues, due to its threat to human health.
- (d) *Extending Waste Service Coverage.* This program area recognizes the need to provide health-protecting, environmentally safe, waste collection and disposal services to all people.

This Chapter should be read in conjunction with the other waste chapters and with Chapters 4 (Consumption), 6 (Health), 7 (Human Settlements), and 18 (Freshwater Resources). Overall the Chapter is rather "top-down," and reflects mainly the concerns of industrialized countries with the increasing costs in solid waste management. But developing countries face severe health problems related to their populations' lack of access to basic services such as the safe treatment and disposal of a fecal matter and wastewaters. In this respect, the Chapter addresses neither the involvement of communities and women in planning and implementing solutions, nor the need to understand local social, economic, and cultural contexts, and equity issues. It puts little emphasis on cost recovery and the need for linking intersectoral and interrelated sanitation and hygiene programs. It does not mention hygiene or hygiene education and its relevance to effective waste collection and treatment.

### THE NATURE OF THE UNCED DEBATE

During discussions, there were suggestions or proposals to treat or dispose of wastes within countries of origin; to set target dates; and to include biomedical wastes. The G77 did not want to agree to targets and timetables for achieving the Chapter's objectives on waste management on the basis that they lacked sufficient financial resources and adequate technology. Their ultimate agreement was based upon receiving financial and technical assistance, as well as waste technology, from the industrialized countries.

### SOME CANADIAN INITIATIVES

Under the Green Plan, Canada is committed to reaching a target of 50% waste reduction by the year 2000. This is to be accomplished through the National Waste Reduction Plan (NWRP) and will include: (a) regulations to reduce waste from packaging; (b) national standards, codes, policies, and regulations for the reduction, reuse, and recycling of wastes; (c) support for research into technological innovations to reduce waste; (d) waste reduction information through the Canadian Environmental Citizenship Program and Environmental Choices Program; (e) expansion of the National Waste Exchange Program; and (f) the establish-

ment of a Federal Office of Waste Management within Environment Canada. Because the provinces largely have responsibility for the implementation and funding of solid waste management programs, the effectiveness of the Federal waste reduction initiatives will vary from region to region and be subject to local community demands and pressures on municipalities and the provinces.


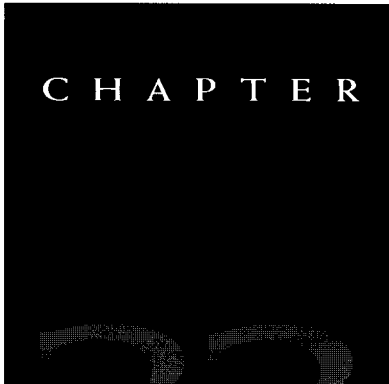

For over 15 years, IDRC has supported research in the development, adaptation, and dissemination of different waste management technologies, including composting latrines; low-cost collection; recycling and disposal systems for solid waste; low-cost wastewater treatment systems; use of treated excreta and domestic wastewaters in agriculture and aquaculture; household management of solid and liquid wastes in rural and peri-urban settlements; and health and hygiene education. The Centre is also involved in a waste management project that looks at options for managing urban organic and inorganic wastes, as well as assessing bottlenecks in the waste cycle, facilities and methods for disposal, public education and funding, and the involvement of the local community in finding solutions.

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**SAFE AND  
ENVIRONMENTALLY  
SOUND  
MANAGEMENT OF  
RADIOACTIVE  
WASTES**

**THE NATURE OF THE PROBLEM**

Between 1970 and 1990, nuclear fission, as part of the world's energy supply, increased from 0.4% to 5.3%. By 1990, 16.5% of the world's electricity generation of 11.3 trillion kilowatt-hours came from nuclear energy. The consequence of this energy activity is the annual production of about 200,000 m<sup>3</sup> of low- and intermediate-level waste and 10,000 m<sup>3</sup> of high-level waste. While nuclear energy "does not produce conventional air pollutants or (generally) contribute to global warming," ... it poses radiological hazards that, although generally modest in routine operation, can become severe in the event of accidents at reactors, fuel reprocessing plants, waste repositories, or in shipment of spent fuel and radioactive wastes." As well "the spread of nuclear energy technology spreads access to nuclear-explosive materials and related capabilities that make it easier for additional countries to acquire nuclear weapons."

Global concern over safety has increased as more radioactive waste is generated due to more nuclear power plants coming on-stream; more nuclear facilities are decommissioned; and more radionuclides are used in medicine and science as measuring instruments, etc. The largest radiological hazards come from the high-level waste that contains 99% of the radionuclides. Given the potentially dangerous characteristics of nuclear wastes and greater public concern, countries with nuclear power, or moving toward it, need stringent protection measures, but the majority lack these. As well, oceans and the marine envi-

ronment need protection from the dumping of radioactive wastes at sea and their unsafe transportation by sea (e.g., the recent sea shipment of plutonium by Japan between Cherbourg and Japan).

**SUMMARY OF CHAPTER 22**

The primary objective of this Chapter is "to ensure that radioactive wastes are safely managed, transported, stored and disposed of, with a view to protecting human health and the environment." In this context, it lists a number of activities that countries and international organizations should undertake, including an integrated radioactive waste management and safety approach; and efforts to implement the Code of Practice on the Transboundary Movements of Radioactive Waste under the auspices of the IAEA. It also stipulates no exports of radioactive wastes to countries that prohibit the imports of radioactive wastes, such as signatories to various international agreements, including the Bamako Convention, and the 1989 fourth Lomé Convention, which bans the export of nuclear and toxic wastes to 66 African, Caribbean, and Pacific countries. Chapter 22 tentatively encourages countries to move the London Dumping Convention along, from a "voluntary moratorium" on disposals at sea to a "precautionary approach."

Overall, the Chapter is silent on the perspective of Third World countries that do not have nuclear power or that are the passive spectators or victims of countries that do. It does not deal with low-level radioactivity found in the

## SAFE AND ENVIRONMENTALLY SOUND MANAGEMENT OF RADIOACTIVE WASTES

mine tailings of some developing countries (e.g., uranium, bauxite, copper, phosphate, etc.). It does not discuss the wastes from military testing that result in environmental contamination, and it does not raise the issue of the adequacy of present technology for the management and disposal of radioactive waste over the long-term.

Radionuclides are radioactive species of atoms that are products of the natural decay of uranium. Although radionuclides occur naturally in low concentrations, concentrations in uranium tailings are considered low-level radioactive wastes.

### THE NATURE OF THE UNCED DEBATE

At the PrepCom meetings, the United States was initially opposed to including a chapter on radioactive wastes. It finally agreed, provided the text was "neutral and objective," and did not go beyond what was being discussed or negotiated internationally. The United States also opposed Sweden's proposal that the management of military radioactive waste should be included in the Chapter. Generally, the divide during negotiations was less between North and South than between those that have nuclear power (including India and China) and those that do not have it. Canada was largely instrumental in ensuring that text on the storing of radioactive wastes at sea should be included. This was included in the final text but qualified by language that gives states the responsibility for determining risk rather than specific international bodies.

### SOME CANADIAN INITIATIVES

Canada has long been a strong supporter of the London Dumping Convention and of the International Atomic Energy Agency (IAEA), based in Vienna. Canada's position basically supports the reduction and proper management of radioactive wastes, with international management being best handled by the IAEA. In Canada, radioactive wastes are regulated and managed by the Atomic Energy Control Board (AECB), which works closely with the IAEA and other international agencies to ensure that higher standards of waste control and management are applied globally.

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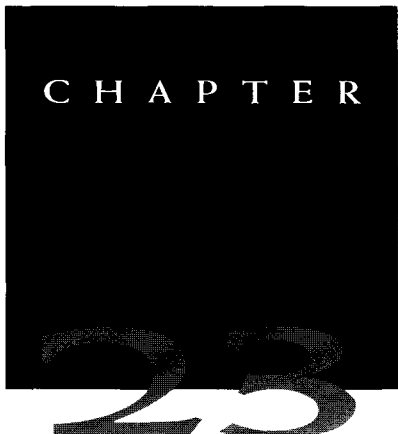




S E C T I O N

III

STRENGTHENING  
THE ROLE OF  
MAJOR GROUPS

**C H A P T E R**

**23**

**PREAMBLE TO  
SECTION III**

**NATURE OF THE PROBLEM**

It was recognized during the UNCED process that governments and international organizations were not the only bodies that could bring about the achievement of the goals of sustainable development generally and Agenda 21 specifically. All social groups are critical to the implementation of Agenda 21's objectives, policies, and mechanisms. Yet, in the past, they were often treated as passive spectators and rarely invited to make major inputs into policy and decision-making. The UNCED Secretariat tried to change that approach by ensuring that the people most likely to be affected by the decisions coming out of Rio would be involved and included.

**SUMMARY OF CHAPTER 23**


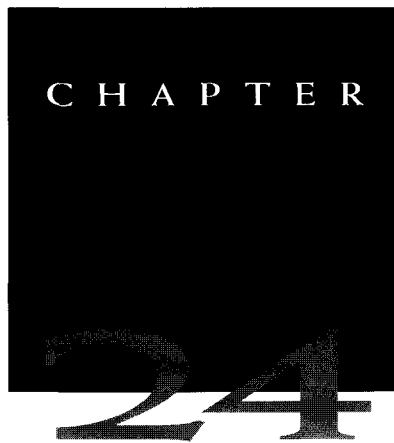
In the context of strengthening all major groups, nine separate program areas were identified. These are contained in Chapters 24 through 32.

**THE NATURE OF THE UNCED DEBATE**

Widespread support at PrepCom III in Geneva for the inclusion of women generally throughout the Agenda 21 document and for a specific chapter on women helped to

give the UNCED Secretariat the necessary mandate to prepare the chapter on women, and then on all major groups. Those chapters were negotiated at PrepCom IV in New York.

Certain countries during PrepCom IV attempted to reduce the time allocation for negotiating this Section and so tried to minimize its importance. The entire NGO community reacted promptly and vociferously, resulting in the appointment of the representative from The Netherlands to meet with each group's representatives to sort out the issues and concerns. As well, the Women's Caucus convened a high-level meeting of ambassadors and members of official delegations to hear their concerns and press for assurance that Section III would be dealt with fairly and responsibly. Throughout, Canada played a fundamental role by preparing and circulating well-researched and well-prepared discussion papers that included a framework for the broadened participation of all major groups in the UNCED process and Agenda 21 follow-up.

**GLOBAL ACTION FOR  
WOMEN TOWARD  
SUSTAINABLE AND  
EQUITABLE  
DEVELOPMENT**

**THE NATURE OF THE PROBLEM**

Despite various international conventions, such as the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (1985); the ILO and UNESCO Conventions to end gender-based discrimination and to ensure women's access to land and water resources, education, and employment; and the 1990 World Declaration on the Survival, Protection, and Development of Children, the improvement of the status of women is still largely ignored or minimized. Overall, women continue to be treated as second-class citizens. Women, as a majority of the world's population, play triple roles in environment and development, but are still not properly represented or involved. With better integration, women could play greater roles in development, including determining family size; as environmental managers, they could more effectively look after resource stocks; and, as educators, they could contribute even more effectively to their families' and communities' improvements. For example, within parts of sub-Saharan Africa, women are responsible for up to 70% of the production, processing, and marketing of food. In Kenya, as the main participants in the National Soil Conservation Program, women have terraced 40% of the nation's more than 360,000 farms. In countries such as Nepal and Burkina Faso, women spend as much as 4 hours a day seeking fuelwood and water; cook and care for their families; seek poorly paid employment; and continue to become pregnant because of the lack of adequate family

planning services. Consequently, at least 500,000 die each year of pregnancy and birthing complications. Women are thus "denied the opportunity to contribute to sustainable development," to manage the environment and husband resources, and thereby to reduce poverty and environmental degradation.

**SUMMARY OF CHAPTER 24**

Chapter 24 is an attempt to reassess women's pivotal role in the environment and development process, which has mostly been overlooked in national development strategies and treated circumspectly by many leading international organizations and policymakers. It notes that effective implementation of Agenda 21 programs and others will require national governments to:

- (a) *Implement the Nairobi Forward-looking Strategies for the Advancement of Women, especially women's participation in national ecosystem management;*
- (b) *Increase proportions of women decision-makers;*
- (c) *Develop strategies to eliminate various obstacles to women's full participation;*
- (d) *Establish ways of assessing the impact of development and environment policies on women;*

## GLOBAL ACTION FOR WOMEN TOWARD SUSTAINABLE AND EQUITABLE DEVELOPMENT

- (e) *Improve all types of education and training for females;*
- (f) *Improve women's access to healthcare, resources, credit, property rights, and agricultural inputs;*
- (g) *Ensure that women and men have the "same right to decide freely and responsibly the number and spacing of their children," and to have access to family planning information and means; and*
- (h) *Take measures to reduce violence against women.*

Governments are furthermore called on to take a number of steps to empower women and their organizations, and to eliminate persistent negative images of women, including the ratification of all conventions pertaining to women.

The Chapter does not make a linkage between it and other key Agenda 21 chapters, such as Poverty or Consumption, Waste Management, etc. Nor does it make a linkage to the other major groups. Means of implementation are weak and the financial cost assessment is very low given that this Chapter affects 51% of the world's population. As one of the few chapters that mentions armed hostilities as a major cause of human suffering and environmental degradation, it does not elaborate. And, while it suggests that the UN Secretary-General should review the adequacy of all UN agencies in terms of integrating women, it leaves out the World Bank and regional banks that have major impacts on environment and women's lives.

### THE NATURE OF THE UNCED DEBATE

The UNCED process "provided an opportunity for broad-based participation of women's groups which succeeded ... in integrating women's concerns in all UNCED documents." Widespread support for this Chapter came from both developed and developing countries, and the changes proposed helped to strengthen the text. Throughout the preparatory process, Canada, with support from the Scandinavian countries, New Zealand, and Australia, played a leading role in forging partnerships with the various major groups and the NGOs to ensure support for the inclusion of women and the other major groups in Agenda 21. Through its Interdepartmental Working Group, which drew upon the expertise of government, women's organizations, business, and NGOs, Canada prepared a number of suggestions that were included in the final text. The

Women's Caucus, an informal group that emerged during the conference, circulated suggested changes to other delegations, which resulted in a stronger chapter. Although the Chapter recommended changes within the UN system in all policies, programs, and activities, concern remained that the follow-up recommended in Agenda 21 will be slow to come because of entrenched attitudes, biases, and infrastructure.

### SOME CANADIAN INITIATIVES

After Canada convened the Royal Commission on the Status of Women in 1967, which issued its all-encompassing report in 1970, numerous policies, procedures, legal instruments, and mechanisms were put in place by all levels of government to improve the status and position of Canadian women and to eradicate or minimize sex-role stereotyping and discrimination against women. It is recognized that more still can be done, especially with respect to employment, pay equity, domestic violence, and the more vulnerable women (e.g., the disabled, ethnic, or native). To this end, for example, Ontario is attempting to address workplace problems and the Federal government recently passed an amendment to the Criminal Code of Canada to give women more protection against sexual assault. Both Status of Women Canada (SWC) and the Canadian Advisory Council on the Status of Women (CACSW) have been at the forefront of promoting women's interests and concerns in Canada. SWC also very active prior to UNCED in helping to develop Canada's position paper on women for the PrepComs and UNCED itself.

Both IDRC and CIDA have had in place, for the past decade, policies, procedures, projects, and programs for the integration of women into development (WID) and the enhancement of women's roles. More recently, both institutions have moved to broaden their approaches to "gender and development" (GAD), whereby the interrelationships, roles, rights, and responsibilities of both women and men are addressed together rather than in isolation. IDRC is undertaking interdisciplinary research into the specific needs and contributions of women and men in the management of natural resources and the development of food crops. CIDA implemented a Women in Development Joint Equity policy in 1992, in an effort to ensure greater participation of women in its policy-setting and decision-making.

GLOBAL ACTION FOR WOMEN TOWARD SUSTAINABLE AND EQUITABLE  
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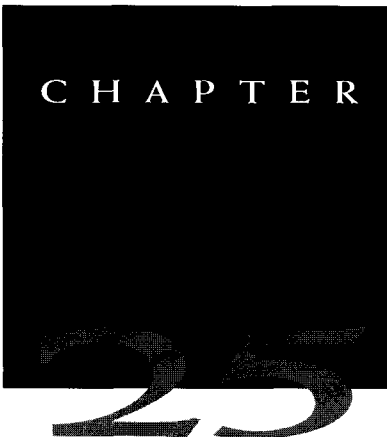
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CHAPTER  
25

**CHILDREN AND  
YOUTH IN  
SUSTAINABLE  
DEVELOPMENT**

**THE NATURE OF THE PROBLEM**

Children, defined by the UN as those between 0–13 years, and youth (between the ages of 14 and 30) comprise nearly 30% of the world's population. Over 1.2 billion youth live in developing countries, and the majority, having faced a childhood lacking in basic needs, face bleak futures. While 23% of the world's youth finish secondary education, in developing countries, just 9% do. The employment situation for youth is becoming increasingly hopeless. In industrialized countries, youth unemployment averages between 15 and 25%; in developing countries, it is averaging between 25 and 50%. What jobs do exist are often menial, exploitative, and ill-paying. Compounding these problems for young women is the constant presence of sexual harassment and the possibility of assault and rape on worksites.

**SUMMARY OF CHAPTER 25**

The key objective of the Chapter is "the involvement of today's youth in environment and development decision-making and in the implementation of programs critical to the long-term success of Agenda 21." Two main program areas are outlined.

- (a) *Advancing the Role of Youth and Actively Involving Them in the Protection of the Environment and the Promotion of Economic and Social Development.* In this context, governments are urged to open dialogue with youth and involve them in their own and UN decision-making.

- (b) *Children in Sustainable Development.* This program mainly calls on governments to enact their responsibilities for children's education, health and nutrition, etc. under various international agreements, such as ratification of the Convention on the Rights of the Child (1989) or adoption of the goals of the 1990 World

Summit for Children.

The Chapter noted the need to combat human-rights abuses, particularly against young women and girls, to expand educational opportunities for children and youth, "with overriding attention to the education of the girl child." However, the Chapter does not address such issues as street and working children; international trafficking in children as cheap labour, prostitution, and even organ-transplants for rich buyers; children as the victims of war, armed conflict, drug abuse, and even rapid urbanization; and child labour. Nor does it show the linkage between the status of children and youth and the status of women, their mothers, or the connection with the wider problems of society generally.

**THE NATURE OF THE UNCED DEBATE**

During the PrepCom IV negotiations, this Chapter was improved and strengthened. Canada took a lead in promoting the role of youth in the implementation of economic, social, and environmental sustainability. Its decision to involve its own youth representatives directly in the negotiations led credibility to its advocacy of youth's role.

The Canadian Youth Working Group during the Youth '92 process by itself and in collaboration with youth from other countries at the International Youth Forum (Costa Rica, 1992) was instrumental in promoting a stronger chapter on youth and gaining the support of the Canadian government.

### **SOME CANADIAN INITIATIVES**

The policies and actions proposed in the Chapter, such as access to secondary education, protection of the rights of youth, vocation training programs, etc., are generally already met or exceeded by Canada. Canada has supported and contributed substantially to international organizations, e.g., UNICEF and Unesco, that are concerned with the needs and rights of children and youth. It has ratified the Convention on the Rights of the Child (1989) and



has contributed to the UN Trust Fund for the International Youth Year. Although Canada has not set up a Youth Advisory Council as some other OECD countries have done, under the Federal government's Green Plan it is proposed to set up a youth council on environment and development.

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CHAPTER  
20

**RECOGNIZING AND  
STRENGTHENING  
THE ROLE OF  
INDIGENOUS PEOPLE  
AND THEIR  
COMMUNITIES**

Indigenous people and their communities at present comprise about 4% (200 million) of the world's population, but their numbers are fast decreasing — whole cultures are disappearing; languages and local knowledge are becoming extinct or extinguished. Incursions of population growth by non-indigenous people, whether logging, ranching, agriculture, tourism, industry, or urbanization, have destroyed or conflicted with the traditional way of indigenous life. Their habitats have been reduced; their livelihoods threatened; and their peoples subjugated and oppressed. And their traditional knowledge has been either ignored or denigrated. Yet over time, they "have developed an historical relationship with their lands" and "over many generations a holistic traditional scientific knowledge of their lands, natural resources, and environment." The destruction or degradation of the environment has shown a need for alternative approaches to using it, but it has been only relatively recently that research demonstrated the validity of aboriginal experience and knowledge, and that indigenous approaches have grown in application and credibility.

**SUMMARY OF CHAPTER 26**

The three main objectives of this program area are:

- (a) *The empowerment of indigenous people and their communities;*
- (b) *The strengthening of the active participation of indigenous people and their communities in national policies, laws, and programs for resource management; and*

- (c) *The involvement of those people and communities in resource management and conservation strategies.*

Governments are urged to undertake a number of activities, including ratifying and applying existing international conventions relevant to indigenous people, such as the ILO Indigenous and Tribal Peoples Convention (No.169); adopting laws to protect indigenous intellectual and cultural property; helping to protect indigenous lands from activities that are environmentally unsound; and developing national dispute-resolution systems. UN and international organizations are also urged to provide special focal points within each agency; and provide technical and financial assistance for capacity-building (including through the Global Environmental Facility and the Tropical Forestry Action Plan). Thus, it is hoped to involve indigenous populations in consultations and decision-making, and to better support their sustainable self-development.

The Chapter assumes a greater degree of social and cultural homogeneity or uniformity than actually exists in reality. It also downplays the traditional state of conflict and opposition to indigenous people and their communities by the majority of nations and their populations or the fast pace of the loss of indigenous groups and their cultural diversity.

**THE NATURE OF THE UNCED DEBATE**

Considerable debate arose over terminology, whether to use "aboriginals," "aboriginal people," "tribal peoples," "indigenous people," or "indigenous peoples," where the last

## RECOGNIZING AND STRENGTHENING THE ROLE OF INDIGENOUS PEOPLE AND THEIR COMMUNITIES

term is associated with the concept of self-determination and its rights, or even sovereignty. As Canada did with respect to the incorporation of the other "major groups" into the UNCED process and Agenda 21, Canada managed to introduce the concerns of indigenous people into the negotiations early in the process. It strongly supported the role that the indigenous people, their traditional knowledge, and their resource management practices can play in sustainable development efforts. And it promoted and supported particular reference to the need to "strengthen the role of indigenous women."

### SOME CANADIAN INITIATIVES

Canada is a signatory to the ILO Indigenous and Tribal Peoples Convention. This Convention (No.169) entered into force on 5 September 1991 but has so far been ratified by only four countries, excluding Canada. Canadian indigenous groups are involved in the draft Universal Declaration on Indigenous Rights being prepared by the UN Working Group on Indigenous Populations, in preparation for the International Year for the World's Indigenous People, 1993. Within Canada, the Federal government's national Wildlife Policy calls for effective cooperation between governments and aboriginal people in wildlife conservation, research, education, and enforcement. The Green Plan focuses on native peoples and environmental contamination in its CA\$25 million Drinking Water Safety Program for Native People. This program, a component of the Health and Environment Action Plan provides water testing, monitoring, and training for band staff on Indian reserves. The Indian Water and Health Program has promised CA\$250 million to accelerate the establishment and improvement of water and sewage services on reserves, and pledges assistance to native communities for the development of their own environmental action plans.

Native land claims, especially in the Northern territories, are in the process of being negotiated between the Federal government and native representatives. Increasingly, these are recognizing the traditional link between native cultures and their local environment as well as the need for some degree of native participation and control over the management of the environment and natural resources within their domains. Recognition of the invaluable contribution that can be made by "traditional knowledge" has been strengthened by the acceptance by the scientific community of the worth of such knowledge for improving and conserving the natural environment.

IDRC has, over the years, supported a variety of research into indigenous people, their communities, their practices, and traditional knowledge. Most recently, it published *Lore*, which portrays how, in the future, traditional knowledge may be documented and applied to the sustainable management of our natural resources.


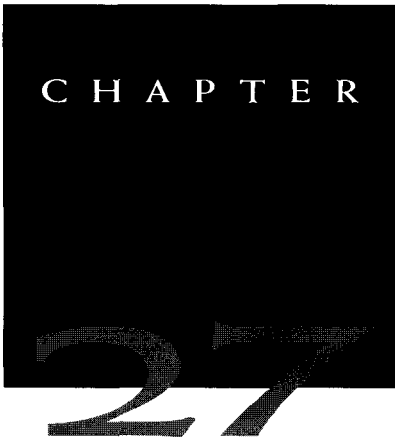

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**STRENGTHENING  
THE ROLE OF NON-  
GOVERNMENTAL  
ORGANIZATIONS:  
PARTNERS FOR  
SUSTAINABLE  
DEVELOPMENT**

**THE NATURE OF THE PROBLEM**

The implementation of environmentally and equitable sustainable development requires the full participation of all sectors of society. Government can no longer solve complex, interrelated problems just by itself, nor can it alone achieve participatory democracy. "One of the major challenges facing the world community as it seeks to replace unsustainable development is the need to activate a sense of common purpose on behalf of all sectors of society." Increasingly, governments and international bodies are accepting that they need the unique talents, skills, and experience of a variety of "grass-roots" groups (variously called nongovernmental organizations (NGOs), women's organizations, business associations, civil society groups, environmental organizations (ENGOs) and not-for-profit groups). NGOs "possess well-established and diverse experience, expertise and capacity in fields which will be of particular importance to the implementation ... of environmentally sound and socially responsible sustainable development" as set out in Agenda 21.

Because NGOs have global networks, which are constantly expanding while becoming more sophisticated and professional, the more forward-thinking governments and international organizations see NGOs as useful allies in mobilizing support for sustainability efforts. However, a number of governments still remain suspicious of NGOs and their activities. Apart from ignoring NGOs or not involving them in any substantial way in their programing

and decision-making, some governments have imposed severe constraints or restrictions on their local NGOs. This tends to negate their effectiveness, and contradicts their hyperbole about the need to involve grass-roots movements more. Nevertheless, often against considerable odds, NGOs worldwide have formed effective coalitions to move forward a civil society and environmental agenda. In Canada, there are at least 150 development NGOs formally registered with CIDA, and numerous ENGOs across Canada. Many of these have developed links with NGOs in developing countries, such as with the Third World Network based in Penang, Malaysia. A number of regional networks (e.g., the South Asia Partnership) have been established to handle regional or transboundary issues and to share information. The scope and strength of the NGO movement was demonstrated at the Global Forum, the NGO event that was held in parallel with UNCED at Rio in June 1992.

**SUMMARY OF CHAPTER 27**

This program area specified four main objectives:

- (a) *The development of mechanisms by governments and international bodies that would let NGOs be effective and responsible partners in sustainable development,*
- (b) *The strengthening of NGOs by including NGOs in policy-making, decision-making, and implementation,*

## STRENGTHENING THE ROLE OF NONGOVERNMENTAL ORGANIZATIONS: PARTNERS FOR SUSTAINABLE DEVELOPMENT

- (c) *The establishment of dialogue between governments and NGOs on their roles in implementing sustainable development; and*
- (d) *The participation of NGOs in the review of the implementation of Agenda 21.*

In order to achieve the above, the United Nations system was called upon to enhance NGO participation in inter-agency meetings and UN conferences, especially with respect to Agenda 21 follow-up. Governments were urged to involve NGOs in national measures to implement and monitor Agenda 21; expand NGOs' involvement in formal and informal education, and public awareness; and to provide NGOs with all necessary data and information for their effective contribution. The Chapter is rather weak and appears not to fully comprehend the existing and potential capacities and capabilities of the NGO network. It does not distinguish between North and South NGOs, and their respective needs or constraints, and tends to assume that NGOs are monolithic. Although the subtitle is "Partners for Sustainable Development," the Chapter does not define or address partnership, or what it could mean for NGOs, governments, and international organizations.

### THE NATURE OF THE UNCED DEBATE

Canada actively promoted the concept of NGOs as "social partners" and the substantive involvement of NGOs in all aspects, and at all levels, of UN and governmental policy- and decision-making and the implementation of their programs and Agenda 21.

### SOME CANADIAN INITIATIVES

Canada's support for — and funding of — NGOs is not new. Among industrialized nations, Canada has been one of the most supportive. Both CIDA and IDRC have long recognized the importance of involving NGOs in a fully participatory way in their programing. Both have established extensive policies for ensuring NGO consultation and participation, and over the last two decades allocated considerable financial resources to NGO support and development. For example, IDRC supported the Third World Network and its initiatives, including the production of research papers on Agenda 21 topics from a Southern perspective.

In 1989–90, NGOs raised close to CA\$200 million from the Canadian public and CIDA contributed CA\$90 million in matching contributions. But government support has gone beyond money. It has allowed NGOs the opportunity to participate actively in policy and programing, with relatively little constraint. During the UNCED process, it reaffirmed its commitment to these concepts by involving

NGOs in its National Roundtable on Environment and the Economy (NRTEE) and the provincial roundtables; in its numerous interdepartmental working groups on the Agenda 21 sectors during the PrepCom process; in the consultations leading to the establishment of the Green Plan and subsequent follow-up programs; and by its inclusion of NGOs on its official government delegation to UNCED. The Green Plan commits the Federal government to consult actively with representatives of the public on environmental issues and to provide funding to NGOs and ENGOs to enable them to expand their public participation activities. As a consequence, the level of participation in government decision-making by and partnership with NGOs and ENGOs has risen dramatically and is among the most participatory in the world. This has been aided by such umbrella groups as the Canadian Council for International Cooperation, various provincial councils, and the Canadian Environmental Network.

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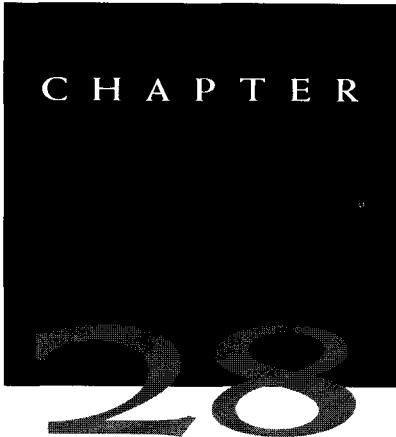
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**LOCAL AUTHORITIES'  
INITIATIVES IN  
SUPPORT OF  
AGENDA 21**

**THE NATURE OF THE PROBLEM**

Many of the problems addressed by Agenda 21 are local and thus require local involvement and intervention to arrive at sustainable solutions for the local environment and populace. This places an onus on local authorities, to "construct, operate, and maintain economic, social, and environmental infrastructure; oversee planning processes; establish local environmental policies and regulations; and assist in implementing national and subnational environmental policies." Local authorities in the Third World, which will have to deal with cities and urban populations that double in the next 15–25 years, will face escalating human and infrastructure needs with decreasing capital and financial resources.

**SUMMARY OF CHAPTER 28**

The program area outlined in this Chapter notes that local authorities, being closest to the people they govern or look after, "play a vital role in educating, mobilizing, and responding to the public to promote sustainable development." Thus, it advocates four main objectives, with some target dates:

- (a) *Local authorities' consultations with their local populations so as to come to a consensus on "a local Agenda 21" by 1996;*
- (b) *Through the international community, a consultative process between local authorities so as to increase cooperation;*

- (c) *Increased cooperation and coordination between local authorities and cities' associations; and*
- (d) *Implementation and monitoring of programs aimed at women's and youth's representation in decision-making and planning.*

The Chapter emphasizes the need to "foster partnerships" among a range of UN and international organizations, such as UNDP, Habitat, UNEP, the World Bank and regional banks, the International Union of Local Authorities (IULA), the World Association of the Major Metropolises, the Summit of Great Cities of the World, and the United Towns Organization (UTO).

The Chapter does not give a definition of local authorities, and thus treats them as homogeneous, irrespective of size, scale, relative power, situation, and condition. This leads to the assumption that local authorities can function as equal partners between themselves and with national or state entities. The Chapter barely touches on the needs of people; how they are to be integrated into the strategies for sustainable development; and what type of capacity-building is needed for local governments.

Nor does the Chapter show linkages with such chapters as Human Settlements, Freshwater Resources, Waste, etc.

**THE NATURE OF THE UNCED DEBATE**

Overall, countries agreed that there was a need to strengthen the role of local authorities and programs that support capacity-building at the local level. Accordingly,

they agreed that there should be strengthening of the programs and activities in this Chapter and in other chapters where references to local authorities were made. The CANZ group made a number of recommendations to improve references to partnerships, and to the role of women and youth in decision-making, planning, and implementation.

### SOME CANADIAN INITIATIVES

As the public has evinced more concern over environmental matters and because of pressure from local community associations and the NGOs and ENGOs, Canadian municipalities are increasingly establishing environmental offices or departments to undertake local action on the environment and to integrate environmental policies, procedures, and programming into their regular municipal planning. However, their level of political commitment to bringing about substantial change can often be measured by the financial, technical, and human resources that city councils are prepared to allocate to preserving local environmental quality. A number of cities have set up community or citizens' advisory committees on the environment, waste recycling, the urban forest, water quality and sewage issues, and wildlife. Many have been involved in the implementation of the Healthy Cities and Healthy Communities Project (see Chapter 7). Recently, the City of Toronto hosted the

International Council of Local Environmental Initiatives (ICLEI), which links local governments worldwide in order to find joint solutions to common environmental problems. ICLEI, based in Toronto, was started in 1990, and will be helping to set the agenda for the IULA Congress that is to be held in June 1993 in Toronto.

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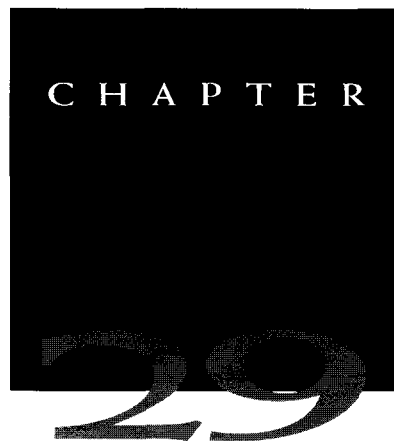
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**STRENGTHENING  
THE ROLE OF  
WORKERS AND  
THEIR TRADE  
UNIONS**

**THE NATURE OF THE PROBLEM**

As Chapter 29 notes "trade unions are vital actors in facilitating the achievement of sustainable development ... addressing industrial change, ... protection of the working environment and the related natural environment, and their promotion of socially responsible and economic development." As efforts proceed with implementing sustainable development, adjustments (or dislocations) and opportunities are likely to occur, with varying effects — some good and some bad — on workers. The degree to which workers are hurt will depend in part on how well workers and their trade unions, governments, and employers are able to collaborate effectively, maximize opportunities, and minimize disruptions and detrimental impacts. However, the majority of workers in developing countries are not unionized or in trade associations. Hence, whatever labour legislation exists or whatever unionization pertains, that large group is outside organized labour's protection and subject to a range of work-occupational health, and environmental related problems.

**SUMMARY OF CHAPTER 29**

The main objective of this program area is "*poverty alleviation and full and sustainable employment, which contribute to safe, clean and healthy environments — the working environment, the community, and the physical environment.*" In order to achieve this, workers are seen as needing to be fully involved in Agenda 21's implementation. Governments are urged to promote the rights of workers to associate freely and to organize as laid

down in the ILO conventions. Furthermore, governments are urged to ratify those conventions. The Chapter recommends that governments, employers, trade unions, and international organizations, in different combinations, strengthen participation and consultation between each other; provide training on environmental awareness, safety and health, and other skills; and participate in environmental audits and impact assessments.

The Chapter deals almost exclusively with organized or organizable workers, and ignores the millions that work in small businesses or factories and who cannot be organized. It ignores the real situation in the majority of countries, that is, the lack of workers' rights in law or otherwise and the fact that macroadjustments tend to fall mainly on the poor and the workers. Many of the proposed activities deal with occupational health and safety. An assumption appears to be made that workers and trade unions already know about sustainable development, environmental problems, and environmental audits.

**THE NATURE OF THE UNCED DEBATE**

The text of the Chapter was drafted in close consultation with labour organizations. Canada's amendments, which were submitted on behalf of the CANZ group, were adopted.

### **SOME CANADIAN INITIATIVES**

Canadian workers and trade unions have long been active in economic and environmental issues, especially occupational health and safety, waste management, and the management of toxic chemicals. They have introduced workplace environmental committees, through union-management committees, into business, industry, and education institutions. Both the Federal and provincial governments have worked with the labour unions in developing workplace environmental education programs. The Canadian Labour Congress has developed a Union Environmental Action Course for Canada, parts of which have been used to develop programs internationally and have been incorporated into ILO environmental education initiatives. As well, governments and labour unions have developed a consultative process on such matters as environmental protection, pollution prevention, and waste management.


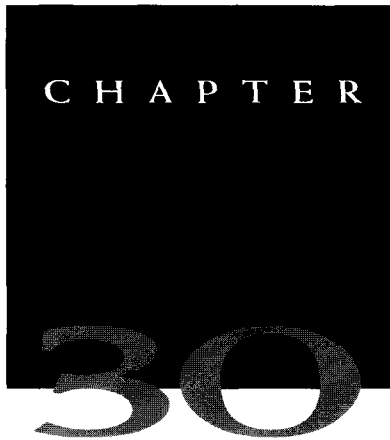
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CHAPTER  
30

**STRENGTHENING  
THE ROLE OF  
BUSINESS AND  
INDUSTRY**

**THE NATURE OF THE PROBLEM**

"In the 20th century, economic growth has been both exponential and asymmetrical. Most of that growth (80%) has occurred in the last 40 years, and largely in the industrial nations." Such growth has been both positive and negative. It has moved much of the world's economy from "original sustainability" to "open" or "frontier" economies of apparently limitless land and resources and then to "closed" or "spaceship" economies where accelerating uses of raw materials and industrial emissions are affecting global ecological systems. For example, the 350 largest transnational corporations (TNCs) produce 40% of the world's goods and cause the principal impact of technology on the environment. Over the past 20 years, starting from the forecasts of the Club of Rome and running through the Stockholm Conference (1972) to the Brundtland Commission (1987), and most recently to UNCED, business and industry in the industrialized countries have increasingly addressed the effects or symptoms of environmental deterioration. As with governments and institutions, they gradually realized that tackling environmental effects necessitated taking hard economic decisions and actions. Initially, they addressed issues reactively or from an "end-of-pipe" perspective by responding to legislation and regulation problems brought by accidents, such as Bhopal and *Exxon Valdez*.

The Brundtland Commission's insistence upon "forging a coalition of reason" helped to encourage business and industry to "sign on" to its sustainable development blueprint. This has led to a "groundswell of change," reflected

in such initiatives as new international guidelines and industry codes of practice that go beyond regulatory compliance; World Industry Conferences on Environmental Management (WICEM); the International Chamber of Commerce's (ICC) "Business Charter for Sustainable Development," signed by over 700 businesses from 30 countries; and industry's Global Environmental Management Initiatives (GEMI). UNIDO organized a ministerial-level conference on Ecologically Sustainable Industrial Development in Copenhagen in 1991. As a result, a new culture of "corporate environmentalism is slowly emerging," resulting in the establishment of cradle-to-grave schemes, such as "Life Cycle Stewardship," "Responsible Care," and "Total Environmental Quality Management." Forward-thinking business and industry leaders realize much needs to be done to achieve sustainable development, including developing a precautionary strategy and a long-term commitment to harness the market to environmental service. Gradually, they are moving away from command and control strategies that are seen as inefficient and ineffective, and, moreover, not affordable, implementable, or enforceable by developing countries.

**SUMMARY OF CHAPTER 30**

The Chapter recognizes that "business and industry, including transnational corporations (TNCs), play a crucial role in the social and economic development of a country." But it also recognizes that entrepreneurship is an important driving force in the social and economic development of countries. It specifically notes that "business opportunities available to women are contributing toward their

professional development (and livelihoods), strengthening their economic role, and transforming social systems." It emphasizes that business, industry, and TNCs need to recognize that environmental management is one of the highest corporate priorities and key to sustainable development. To these ends the Chapter sets out two main program areas.

- (a) *Promoting Cleaner Production.* This would entail production systems and technologies being more efficient and minimizing waste throughout the product life cycle. Governments are asked to implement a mix of economic and legal incentives (including voluntary initiatives) to promote the use of cleaner production. Business, industry, and the TNCs are asked to give annual environmental reports; adopt and implement codes of conduct; undertake environmental awareness training; internalize environmental costs into accounting and pricing; and promote cooperation on research, development, and application of cleaner production technologies.
- (b) *Promoting Responsible Entrepreneurship.* This envisages efforts being made by government and the larger businesses to help small- and medium-sized entrepreneurs or enterprises (SMEs) develop sustainably managed initiatives, with venture capital funds, training, partnerships, technologies, and management.

The Chapter appears to use "sustainable" synonymously with "more efficient" and "cleaner," and as a consequence lessens its impact. Implementation measures are weak, including the use of monitoring and impact evaluations. It does not address existing or emerging consumption patterns, and the resultant scale or scope of production, that are contributing to the environmental crisis both globally and locally.

### NATURE OF THE UNCED DEBATE

Some debate occurred over the relationship or linkage between protectionism and sustainable development. India did not want references to market-based economies inserted. The G77 advocated that technologies belonging to the TNCs be transferred to their developing countries' affiliates at no extra cost. This was reflected in the Chapter. The business and industry contact group advocated that the Chapter present a more balanced portrayal of industry and business than was originally written. Canadian members of the contact group, supported by New Zealand and Australia, prepared a brief that helped to emphasize the positive contributions business and industry could make to sustainable development if included as partners in the process.

### SOME CANADIAN INITIATIVES

Since the release of the Brundtland Commission's Report, Canadian business and industry have taken a strong leadership position on sustainable development. The former Canadian Council of Resource and Environment Ministers (CCREM) (now the Canadian Council of Ministers of the Environment (CCME)) set up the National Task Force on Environment and the Economy in 1987. The goal was to involve leaders in government, industry, business, and environmental groups in a dialogue on environment–economy integration and to "remove barriers to environmentally sound economic development." One of the Task Force's recommendations was that the 10 provinces and 2 territories should establish multisectoral Roundtables on Environment and the Economy. These have over the years involved thousands of Canadian in this important nationwide dialogue. This uniquely Canadian model resulted in the National Round Table on the Environment and the Economy (NRTEE), which is composed of senior leaders from all sectors of society. It evaluates and reports on the effects of policies and decision-making on the environment; promotes sustainable development practices in the field of waste management; supports sustainable development internationally; and develops ways of communicating principles of sustainable development.

Forward-looking Canadian businesses and industries are increasingly recognizing that making production more efficient, sustainable, and less wasteful is "good for their bottom line as well as for the public's bottom line." Accordingly, industry is investing more heavily in pollution abatement or pollution prevention technologies. Business and industry associations (including the Business Council of National Initiatives and the Mining Association of Canada) are following environmental issues more closely; developing awareness training and environmental policies for their members; and establishing or adopting codes of conduct and standards, such as the International Chamber of Commerce's Business Charter on Sustainable Development and the chemical industry's Responsible Care initiative. While the Federal and provincial governments still use legislation and regulation to enforce protection of the environment — and therefore the health and safety of its citizens — they are moving to more collaborative partnerships with business, industry, and NGOs. For example, the Justice Department supported a study on positive compliance mechanisms in the United States, Australia, and Britain and their applicability to Canada. The Federal government, with British Columbia, launched the successful GLOBE '90 and '92 Trade Fairs and Conferences, which brought together 13,000 participants from 74 countries in Vancouver, BC, to focus on business, environment, and practical long-term solutions. And numerous other

initiatives are under way, through such organizations as the Business Council on Sustainable Development, which was started up by a Canadian but is based in Geneva, and the International Institute for Sustainable Development in Winnipeg.

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CHAPTER  
31

**SCIENTIFIC AND  
TECHNOLOGICAL  
COMMUNITY**

**THE NATURE OF THE PROBLEM**

Closer communication and understanding between the scientific and technological community are called for in both the Montreal ozone-layer convention and in the climate-change convention signed at Rio. Members of the scientific and technological community are increasingly being held accountable by and to the public. They are expected increasingly to live up to a code of ethical practice and to become involved in the consequences of their scientific and technological discoveries and applications. This community, defined to include also engineers, architects, industrial designers, urban planners, and other professionals and policymakers, has the ability to generate solutions to many of the world's most serious problems but it also has the ability to exacerbate those problems. More than ever, they are expected not to retreat behind a facade of professional objectivity in a "hands off" way, but to be fully responsible and accountable participants in society and sustainable development.

**SUMMARY OF CHAPTER 31**

This Chapter addresses how the scientific and technological community might contribute more effectively and openly to environment and development decision-making. It sets out two key program areas.

- (a) *Improving Communication and Cooperation among the Scientific and Technological Community, Decision-Makers and the Public.* This includes ways of linking research results with decision-making and strategic policy development, promoting regional cooperation to meet regional

needs for sustainable development, disseminating research results, linking research into the industrial sector, and fully involving women in the disciplines.

- (b) *Promoting Codes of Practice and Guidelines Related to Science and Technology.* The emphasis of this program is to develop internationally acceptable codes of practice that will help to maintain and enhance the integrity of life-support systems "for their own sake" and for present and future sustainable development.

The lack of a clear definition of who really comprises the "scientific and technological community" makes it difficult to develop ethical codes and responsibilities targetted at specific groups. Insufficient emphasis is given to how the codes would be implemented, monitored, and then enforced, or how professional associations might be instrumental in developing these codes for their specific constituencies compliance.

**NATURE OF THE UNCED DEBATE**

During the PrepCom discussions, it became apparent that there was a need to broaden the definition of "scientific and technological community." This was done in part, as is shown in the Chapter, but was not as inclusive as some delegations might have liked. Debate also centered around the need for internationally accepted ethical principles and codes of practice. These were agreed to and incorporated into the Chapter.

### SOME CANADIAN INITIATIVES

Canada's Green Plan includes a 5-year environmental science and technology action plan that will provide funds for research into global and domestic environmental issues; scholarships to encourage academic research in the environmental sciences; revitalization of Federal government research facilities and additions to their scientific staff; and assistance with technology transfer and government–industry partnerships necessary to bring new technologies to market.

Not only are institutions or government departments such as IDRC, CIDA, Environment Canada, and the Canada Mortgage and Housing Corporation (CMHC) ensuring that their projects meet ethical and environmental standards and that their professionals are trained and made aware of environmental concern, but financial institutions, such as the Bank of Montreal, and retailers, such as Loblaws, are increasingly drawing upon the resources of the scientific and technological communities to bolster their environmental awareness, readiness, and applications.

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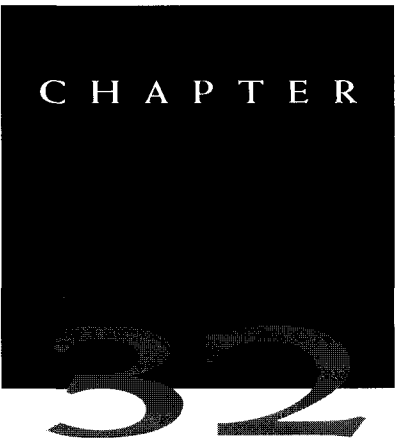
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CHAPTER  
32

**STRENGTHENING  
THE ROLE OF  
FARMERS**

**THE NATURE OF THE PROBLEM**

As Agenda 21 says: "Agriculture occupies one-third of the land surface of the Earth, and is the central activity for much of the world's population." But, the bottom line is that "food production increases are falling behind population increases by 13 million tonnes per year," despite the fact that technology has helped to increase overall production in the world since the 1950s. For example, cereal production rose about 50%, from about 1.2 billion metric tons in 1970 to 1.8 billion metric tons in 1989; fruits and vegetables have made gains, as have meat, milk, and fish; production of roots crops has remained stable. Although 15 million tonnes of grain are now produced every year, 28 million tonnes are needed to feed everyone adequately. Global food production in absolute terms appears to be sufficient to meet the needs of the growing world population, but in some regions, this increase has been outstripped by population growth, and then undermined by international debt or falling commodity prices. Some Asian economies did increase production sufficiently to stay ahead of their population growth, but in Latin America and the Near East, production barely stayed even with population, whilst overexploitation of much of the agricultural land is causing severe degradation. In Africa, population growth outstripped production increases. Overall, Africa's "foodgrain production relative to Europe's has dropped by 20% in some nations to an alarming 50% in others." This represents an average 1% drop in per-capita food production since the early 1970s. The insufficiency of food production today is compounded by poor distribution of food supplies, but it is predicted to worsen due to the need to double world food production to meet growing needs in the next 10–20 years.

Large-scale "agroindustry" and the "green revolution" in the industrialized countries and in many developing nations contributed strongly to increased food outputs. But subsistence farming by men and women farmers in many Third World countries or regions is still the norm. They are on the frontline to produce enough food for themselves and their communities in a sustainable way. However, their task is becoming increasingly difficult due to impoverishment of the soil and soil erosion; heavily subsidized food exports (e.g., grain, rice, sugar beets, etc.) from developed countries that depress world prices and force down the income of subsistence farmers; structural adjustment; costly agricultural inputs, such as fertilizers and pesticides; the lack of irrigation and accessible water supplies; and the lack of money to buy even small, hand-held equipment. These problems impact doubly on women, who are often "invisible" to their own communities, to extension agents, government officials, and donors. Despite being major producers, harvesters, and processors of food — in Africa, Asia, Latin America, and even North America — women rarely have land tenure or title, and they rarely receive agricultural support, training, or inputs. As a consequence, a key resource for sustainable agriculture and development is neglected and not adequately developed.

**SUMMARY OF CHAPTER 32**

The Chapter stresses that "a farmer-centered approach is the key to the attainment of sustainability." Thus, the sole program area states that farmers, particularly women, must have increased access to resources, technology, alternative livelihoods, and means of production, and they must be involved in decentralized decision-making through

strengthened local and village organizations. The Chapter suggests that other objectives should include support for women's legal capacity to access and have tenure to land; promotion of sustainable farming incentives, practices, and technologies; policies that encourage self-sufficiency in low-input and low-energy technologies; and more participation of farmers and their organizations in policy-making. Governments are accordingly urged to put these into action, as well as to promote pricing mechanisms and trade policies that encourage farmers to use resources sustainably; to implement a variety of programs, such as managing fragile ecosystems, water use in agriculture, and integrated management of natural resources. International organizations, such as the World Bank, FAO, International Fund for Agricultural Development (IFAD), and the World Food Program (WFP), etc. are urged to involve farmers in their deliberations.

The Chapter has not specifically outlined policies that governments can follow to promote sustainable agriculture. It tends to assume that they know what to do. It also tends to assume that farmers will automatically practice sustainable agriculture when, in fact, in both developed and developing countries they "follow and lobby for nonsustainable production methods for economic reasons." Little or no connection is made between the macropolicy level and the microagent or farmer, and the consequences for both. And, although it recognizes the role of women as farmers, it does not recognize the constraints that women farmers are up against or their needs, which sometimes differ from those of male farmers.

### NATURE OF THE UNCED DEBATE

Debate on this Chapter largely centered around the broadening of the definitions of "farmers" and "farming." The end result was that the definitions were expanded to include "all rural people who derive their livelihood from activities such as farming, fishing and forest harvesting." The Chapter also mentions "the rural household, indigenous people and their communities, and the family farmer, a substantial number of whom are women." Canada especially, with support of the other CANZ members, worked to ensure that women's farming role was properly recognized and that women were integrated throughout the chapter, including in the policy-making and implementation areas, as, all too often in the past, women have been treated by policymakers and extension agents as recipients or beneficiaries of the latter than players in food production, innovation, storage, and distribution.

### SOME CANADIAN INITIATIVES

In Canada, the Federal and provincial governments, on a cost-shared basis, have long cooperated and worked with Canadian farmers to help them conserve and protect their

agricultural resource base, through such initiatives as the National Soil Conservation Program, the Soil and Water Environmental Enhancement Program, and the Great Lakes Water Quality Initiatives Program. The Federal government has spent about CA\$100 million annually on soil and water conservation and development, including research into new techniques, such as conservation tillage methods and terracing, to address resource management challenges. It has allocated CA\$75 million to the National Soil Conservation Program, on a matching basis by the provinces, for a total of CA\$150 million over 3 years. The Federal-Provincial Agricultural Committee on Environmental Sustainability, set up in 1987-88, stated in its June 1990 Report to the Federal and Provincial Ministers of Agriculture that the survival of agriculture in Canada — and its competitiveness as an industry — was dependent upon the greater use of environmentally sustainable practices. Accordingly, the Federal government developed a sustainable agriculture policy with three main objectives:

- To conserve and enhance the natural resources that agriculture uses and shares;
- To be compatible with other environmental resources that are affected by agriculture; and
- To be proactive in protecting the food production sector from the environmental impacts caused by other sectors and factors external to agriculture.

During the past decade, IDRC has been actively promoting and strengthening the role of farmers in a number of Third World countries, by supporting research into farming systems, extension methods, and appropriate technologies that are usable by men and women.

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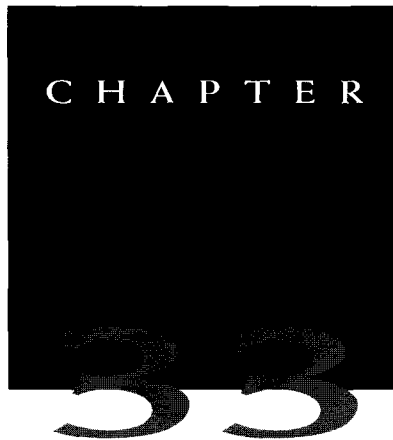


SECTION

IV

MEANS OF  
IMPLEMENTATION



CHAPTER  
33

**FINANCIAL  
RESOURCES AND  
MECHANISMS**

**THE NATURE OF THE PROBLEM**

The consensus of the 172 nations that attended the Earth Summit was that "the eradication of poverty is essential to meeting national and global sustainability objectives"; "the cost of inaction could outweigh the financial costs of implementing Agenda 21"; "the huge sustainable development programs of Agenda 21 will require ... substantial new and additional financial resources"; and that the "initial phase will (need) early commitments of concessional funding." The UNCED Secretariat estimated that all of the listed Agenda 21 programs needed US\$600 billion per year from 1993 to 2000 if they were to be properly implemented. That included US\$125 billion per year in technical and economic assistance on grant or concessional terms from developed countries. Overall, such figures only indicated the magnitude of the financing needed. They circumvent the issue that much of the outlay will need to come from the developing countries themselves and will amount to about 10% of their US\$6 trillion 1992 GDP. The catalytic US\$125 billion, by contrast, amounts to only about 0.7% of the combined US\$16 trillion 1992 GDP of developed countries.

At Rio, the industrialized nations recommitted themselves, in theory, to achieving the UN target of 0.7% of GNP for Overseas Development Assistance (ODA) as soon as possible. Although the world — developed and developing — currently spends at least US\$1 trillion per year on military expenditures, Agenda 21 barely alluded to the need to reallocate a percentage of that US\$1 trillion to environmental, economic, social, and development programs. The

combined total annual costs (in billion US\$) for only the following programs amount first to 25% of those expenditures — For example, shelter (\$21), retiring Third World debt (\$300), health care (\$15), deforestation control (\$7), clean water (\$50), population stabilization (\$10.5), soil erosion control (\$24), and the elimination of starvation and malnutrition (\$19). Only US\$300 million — or under 3% of the world's total military costs in 1 year — was needed to eradicate smallpox completely from the world. In this context, the financing needs of Agenda 21 are neither unreasonable nor unachievable, but they are at the heart of its implementation and they do necessitate political will and commitment to move the world from a war footing to a sustainable path that provides a decent quality of life and basic needs to people everywhere.

**SUMMARY OF CHAPTER 33**

The main objectives of the Chapter are *establishing measures of financial resources and mechanisms; providing new and additional financial resources, and improving funding mechanisms for implementing Agenda 21*. A number of new and existing funding initiatives are outlined: increased funding from the multilateral development banks and funds, e.g., the World Bank and IDA, regional and subregional banks, the Global Environmental Facility (GEF); the United Nations organizations and other international bodies; multilateral institutions, like UNDP, for capacity-building and technical cooperation; bilateral assistance programs, debt relief, especially from the Paris Club creditors; private funding through NGOs; investment through technology transfers and joint ventures; and

innovative financing. This last activity includes various types of debt relief, e.g., debt swaps; tradeable emissions permits; the use of economic and fiscal incentives and mechanisms; new fund-raising schemes through private channels; and, finally, "the reallocation of resources presently committed to military purposes."

The Chapter does not discuss the prioritization of program areas, given the huge sums needed to implement Agenda 21; the feasibility or practicality of rising funds from the mentioned sources; or the tremendous sums of money spent on war and the military, and the need for — and the feasibility of — the reallocation of military expenditures by both developed and developing countries to sustainable development. For obvious reasons, it does not discuss the large percentage of GNP allocated by developing nations' governments to their defence and military expenditures and away from education, health, and social programs.

### THE NATURE OF THE UNCED DEBATE

Negotiations and discussions surrounding this Chapter reflected a profound North–South divide, with a number of areas of contention being "square-bracketed [-]" for further negotiation and resolution at Rio. Like the Chapter on Forests, this Chapter could not be resolved by the various delegations' negotiators but had to be negotiated at the highest ministerial level.

The G77 bloc identified "finance" as a key issue on which they concentrated their negotiating efforts, especially in the following four areas.

- (a) *Official Development Assistance (ODA)*. Developing countries wanted developed countries to reaffirm their commitment to the goal of 0.7% of their GNP by the year 2000.
- (b) *Replenishment of IDA*. The G77 wanted additional funds — "an Earth Increment" — injected into IDA over and above the regular replenishment amounts by developed countries, in light of the world economic situation, the growing needs of the poorest of the developing countries, and the extra costs likely to be generated by Agenda 21.
- (c) *Global Environmental Facility (GEF)*. Developing countries wanted a number of changes made to the GEF, including giving developing countries a more expanded role in its decision-making and governance; funds replenishment; and the provision of programing funds for deforestation and desertification, as well as for biodiversity and climate change.

- (d) *Debt Relief*. The Third World nations wanted the establishment of debt swaps and other creative approaches to achieve sustainable development objectives. Already burdened by a debt of US\$1,341 billion or 50% of its collective debt, over 40 countries are now paying interest on their debts that are almost three times their foreign exchange earnings. This debt burden prevents such countries bearing the extra costs of Agenda 21 without debt relief of some kind.

The South pressed for new forms of financial assistance. Donor countries, including Canada, preferred to continue with existing channels rather than to set up new, costly, and duplicating channels. Canada supported the GEF as the coordinating mechanism for all funding directed to global environmental issues, and indicated a preparedness to provide new and additional funding for it. Overall, Canada, through its Head of Delegation, who chaired the discussions on financial resources, played a central role in bringing about compromises. Ultimately, all delegations agreed to the concept of building a global partnership for sustainable development, for which funds would be provided, and that a package approach of combining existing resource flows with new and additional funds would be fundamental to the agreement. Developing countries agreed to undertake the preparation of national plans for sustainable development or sustainability (sometimes referred to as National Environmental Action Plans or NEAPs) and to report on their plans and commitments to the 47th Session of the UN General Assembly. Finally, it was also decided that the (proposed) Commission on Sustainable Development (CSD), to be housed within the United Nations' ECOSOC, would "regularly review and monitor progress (on the 0.7% target)."

### SOME CANADIAN INITIATIVES

For some years, Canada has committed itself to providing 0.7% of its annual GNP to overseas development aid (ODA). At Rio, the Prime Minister reaffirmed Canada's commitment to achieving that target. In 1990–91, for economic reasons, Canada's ODA commitment amounted to 0.449% of its GNP, or CA\$3.02 billion, but this increased to CA\$3.19 billion in 1991–92, or 0.49% of its GNP. However, recent economic exigencies have again affected ODA detrimentally.

Canada (through IDRC and CIDA) provides support to both international and national NGOs for environmental and developmental activities, for a variety of programs, including increasing the capacity of NGOs and ENGOs in developing countries to promote and implement environmentally sustainable development.

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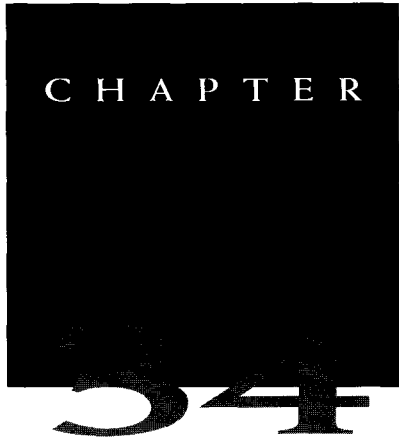
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CHAPTER  
34

**TRANSFER OF  
ENVIRONMENTALLY  
SOUND  
TECHNOLOGY,  
COOPERATION,  
AND CAPACITY-  
BUILDING**

**THE NATURE OF THE PROBLEM**

Agenda 21 basically encapsulates the problem "International technology transfer represents a potentially important instrument for assisting developing countries in meeting their environmental and developmental goals. On its own, it is not a sufficient response. It must be balanced by the development of the skills, knowledge, and institutional capabilities necessary to effectively select, assimilate, and improve upon imported technology, and, ultimately, to develop indigenous solutions." There has sometimes been the misperception that only new technology is good or useful, or that it should be given "for free" by developed countries to developing. In fact, much "useful technological knowledge lies in the public domain" and is available to developing nations, but they often lack access to the know-how and expertise necessary for the effective use and maintenance of those technologies. That being said, developing countries have been constrained in accessing environmentally sound technology developed by industrialized countries due to patent protection and intellectual property rights (IPRs), and due to the lack of local resources and foreign investments to develop their own local technological research, development, production, and dissemination.

**SUMMARY OF CHAPTER 34**

The Chapter gives a definition of "environmentally sound technologies" as those that "protect the environment, are less polluting, use all resources in a more sustainable man-

ner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies" they replace. Such technologies include both "process" and "product" technologies that prevent pollution, as well as "end of pipe" technologies for the treatment of pollution after it occurs. Finally such technologies are viewed as "not just individual technologies" but ones that cover total systems, know-how, equipment, procedures, and capacity-building for men and women.

The five key objectives of Chapter 32 are to:

- (a) *Ensure access to scientific and technological information,*
- (b) *Promote, facilitate, and finance access to and the transfer of technologies,*
- (c) *Facilitate the maintenance and promotion of indigenous technologies, while taking into account the roles of men and women,*
- (d) *Strengthen endogenous capacity-building to assess, adopt, manage, and apply such technologies, and*
- (e) *Promote long-term technological partnerships between holders of environmentally sound technologies and potential users.*

Seven specific activities are outlined for achieving the above objectives: the development of international information systems and clearing-houses; the support and promotion of access to technology transfer by governments, international

## TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY, COOPERATION, AND CAPACITY-BUILDING

organizations, and the private sector; improvement of the capacity to develop and manage the technologies; the establishment of a network of research centres; support for programs of cooperation and assistance by a range of UN, international, and national bodies; the development of technology assessment capacity; and collaborative arrangements and partnerships between North and South enterprises.

The Chapter mentions, but does not go into much detail about, indigenous technology and know-how and its possible application; about the effects of environmentally sound technology on employment, poverty, income distribution, and women; or about how to identify environmentally safe and sound technologies. It provides relatively few suggestions as to capacity-building and the need for maintenance and maintenance-training; and it contains almost no references to the specific types of technology that might be used to focus international efforts in this area.

### THE NATURE OF THE UNCED DEBATE

This Chapter was a source of considerable tension between the North and South. The developing countries argued that the control of intellectual property rights (IPR) by the North disadvantages the South. The South argued for preferential access to environmentally sound technologies and special concessions, while the industrialized nations stated they wanted to retain control over and protect intellectual property rights. Saudi Arabia wanted "safe and" inserted before any mention of "sound technology." The Eastern European and former USSR countries wanted to be included as "economies in transition" requiring assistance, technological and otherwise. The issue of concessionality was sensitive, with developed and developing countries debating whether the Third World should have to pay on commercial terms for needed technology. Canada supported the OECD stance concerning IPRs, but, at PrepCom IV, Canada helped to separate the two key issues at the heart of the debate — IPRs and the commercial transfer of technology — so that movement on other issues could occur. Eventually, compromises and a consensus were reached: the establishment of information networks would let developing countries have open access to technological information in the public domain; the North retained protection of its IPRs; the South was given access to technology transfer "on favourable terms, including on concessional and preferential terms"; and agreement was reached that technology transfer needs would be backed up by efforts to build domestic capabilities and capacity.

### SOME CANADIAN INITIATIVES

IDRC has sponsored research into alternative forms of technology transfer and how those can contribute to the development of local or indigenous technological capabilities. As part of a global study, IDRC researchers examined the experiences of Canadian small- and medium-sized enterprises with international technology transfer. It supported the International Service for the Acquisition of Agri-Biotechnology Applications (ISAAA), which is a "broker" for matching developing country technology needs with Northern country suppliers. CIDA has funded various projects involved in environmental protection technologies, such as remote-sensing, mapping, geographical information systems (GIS), and resource management software and hardware.

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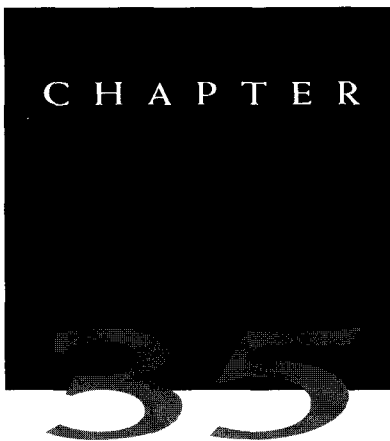
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**SCIENCE FOR  
SUSTAINABLE  
DEVELOPMENT**

**THE NATURE OF THE PROBLEM**

Modern societies have developed in such a way as to be quite dependent on scientific research and understanding. In fact, scientific research and understanding have substantially contributed to the worldwide realization and acceptance that the Earth is seriously stressed and cannot continue to withstand the relentless pressures of human population and consumption growth. Scientific research and understanding are seen as crucial to the identification, analysis, and even remediation or rectification of many key problems, whether medical, defence, environmental, energy, transportation, or food production.

The role of science, pure or applied, also extends far beyond its physical results and reappears in many consumption patterns and technological forms. It has dominated human life and the environment for many decades and its impact is likely to become even more pervasive whether in the North or South. Because of science's many innovations and successes, there has tended to be an assumption among many in the scientific and public area that the "general public" largely is scientifically illiterate but embracing of science as the panacea of environmental problems and the solution for sustainable development. The problem is that considerable ambivalence and scepticism about what science can do to solve problems exist among the public. Why should this be so?

Ambivalence and scepticism have emerged because the dominant role of science and technology has made them both *positive and negative* forces in society. Scientists were judged to be experts and powerful forces, but often they

abdicated their moral leadership and humanistic values and thus became "dangerous" to the public. An important range of human, social, cultural, and environmental variables, of concern to the public, were marginalized and dismissed by the scientific élite until challenged by the public (including NGOs). Most scientists are employed and funded by specific commercial or political institutions with particular ends in mind or bottom-lines. Few work in independent research institutions. Hence their objectivity has become suspect. Finally, scientific inquiry has often been used by governments or strong sectoral interests to give reassurance about polluting or controversial incidents. Overall, this has meant that, at the very time when public consensus and trust in the capacity of science to effect positive change is needed, public confidence in the ability of science to move toward sustainable development is wary at best.

The scientific community, in the North and in the South, will need to explore the tensions that have emerged between the itself and the public; engage in more dialogue and collaboration; and work more closely with the non-scientific community.

**SUMMARY OF CHAPTER 35**

The Chapter outlines four main program areas, which coincidentally correspond with the recommendations of the International Conference on an Agenda of Science for Environment and Development into the 21st Century (ASCEND/21):

- (a) *Strengthening the Scientific Basis for Sustainable Management,*

- (b) *Enhancing Scientific Understanding*,
- (c) *Improving Long-term Scientific Assessment*, and
- (d) *Building up Scientific Capacity and Capability*.

The Chapter emphasized that improved knowledge of the Earth's systems is crucial for furthering sustainable development. As well, it noted the need to improve the state of scientific knowledge and increase its application in decision-making. The Chapter strongly endorsed the "precautionary principle."

### THE NATURE OF THE UNCED DEBATE

This seemed to be one of the least contentious of the Agenda 21 chapters. All negotiations were completed at PrepCom IV in New York, so further discussions were unnecessary at Rio. Although initially scientists were largely deemed to be mainly physical scientists, a realization emerged that all the sciences — the physical, the natural, social, and engineering sciences — needed to be better integrated, and that academia should be more involved in the sustainability issues and Agenda 21 follow-up.

### SOME CANADIAN INITIATIVES

Through the Green Plan, financial support to the tune of CA\$4.5 million was pledged in 1991 to the Royal Society of Canada for its Global Change Program over a 6-year period. This Program was set up in 1985 and was designed to develop, coordinate, and promote awareness of on-going nation-wide research into all aspects of global change, including through both the natural sciences and physical sciences. Recently, Green Plan funding for global warming initiatives has been earmarked for research into more sophisticated climate modeling and monitoring, the development of a network of private-sector and university laboratories, and for active participation in international research programs.

Canada has established an Arctic observatory for research and monitoring of the Arctic stratosphere as a contribution to a series of such observatories being set up by and in the Arctic nations. This fits in with Canada's role of not only being an Arctic nation but also a world leader in research and modeling on global warming and ozone depletion. For example, the Canadian global circulation computer model, used for predicting future global and regional climate conditions, is considered one of the world's best. Data produced by this model were instrumental in helping to achieve international consensus at the Bergen Conference on the need to stabilize greenhouse gas emissions (GHGE) at 1990 levels by the year 2000.

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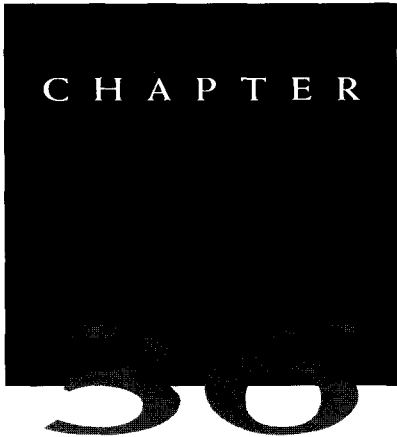
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C H A P T E R

36

**PROMOTING  
EDUCATION, PUBLIC  
AWARENESS, AND  
TRAINING**

**THE NATURE OF THE PROBLEM**

Basic education is deemed to be a right of all. But for millions in the Third World, the most basic of education is nonexistent or minimal. In low income economies (excluding China and India), only 77% of children of primary school age (generally, 7–11 years) are enrolled. For females, 70% or less of this age group are enrolled. For secondary education, the numbers drop considerably, with only 28% of children of secondary school age (generally 11–17 years) being enrolled, and 23% or less of females of the age group being enrolled. Tertiary enrollment, which includes universities, vocational schools, and adult education programs etc., accounts for only 4% of the 20–24 year-old age group. Meanwhile, of the total global population in 1990, 35% of men and 45% of women were considered illiterate. At the World Conference on Education for All: Meeting Basic Learning Needs held in Thailand (March 1990), it was strongly recommended that there should be universal access to basic education; that 80% of both girls and boys should receive primary schooling; and that the adult literacy rate should be reduced to half of the 1990 level. It particularly noted the lack of basic education for and the high illiteracy rates of women.

Education and learning (in its broadest sense) are increasingly recognized as being not only critical to sustainable development but also to helping people make the connection between environment and development. Education is crucial to bringing about changed attitudes, values, and awareness. But, a major problem is finding the US\$5 billion a year, as estimated by UNDP and Unesco, to give

every child access to primary school by the year 2000. And another major difficulty faced is the reconciling of basic education needs — and often entrenched conservative educational approaches or values — with the need for new views, approaches, and skills in integrating a sustainable development dimension into existing or nonexistent school curricula.

Alternative teaching methods, strengthening community involvement and educational partnerships, and recognizing and using the knowledge and resources of women and indigenous peoples are all critical to the success of sustainable development education. However, a combination of a lack of resources, indifference, and/or resistance to new ideas continue to be difficult barriers to overcome.

**SUMMARY OF CHAPTER 36**

As with the other topics dealt with in Section IV, education is a crucial cross-cutting issue that touches all the Agenda 21 issues. The Chapter reiterates the principles set out in the Tbilisi Intergovernmental Conference on Environmental Education, organized in 1977 by Unesco and UNEP and the recommendations of the Education for All Conference held in 1990. It urges all governments to endorse and implement these, and then sets out three program areas on which immediate action could be taken.

- (a) *Reorienting Education toward Sustainable Development.* This would use both formal and nonformal education to bring about changes in awareness, skills, and attitudes and would encompass a mix of socioeconomic, human development, and physical or biological and demographic elements.



- (b) *Increasing Public Awareness.* This recognizes the "lack of awareness of the interrelated nature of all human activities and the environment, due to inaccurate and insufficient information" and communications.
- (c) *Promoting Training.* While recognizing the need to address workforce training needs, this program advocates establishing programs that help to develop a more flexible, adaptable workforce that can make the transition to sustainable development work.

The Chapter does not distinguish between the needs, capabilities, and capacities of the North and South to implement the programs and activities. Everything is treated as generic. The Chapter tends not to recognize that considerable innovative work has been undertaken on sustainable development and environmental education, and that this is not a new trend. Nor does the Chapter distinguish clearly between education, public awareness, and training. Finally, it treats NGOs and educational institutions superficially and does not integrate them thoroughly into the whole process. As it is, NGOs have developed a comprehensive Treaty on Environmental Education and Sustainable Development. The Chapter also pays inadequate attention to the environmental education and training of politicians, leaders, decision-makers, and media.

#### THE NATURE OF THE UNCED DEBATE

Negotiation of this Chapter was completed at PrepCom IV. Overall, there was agreement that access to education for all children must be hastened in line with other international conferences on education and children, including the World Summit for Children. The CANZ Group prepared a joint position paper that emphasized the need for all sectors of society to have equitable access to education, particularly girls and women, who in both percentage terms and absolute numbers are falling behind in literacy and education. The CANZ paper also emphasized the need to encourage individuals and communities to play a greater role in designing, implementing, and evaluating local educational activities. PrepCom IV negotiations concluded that formal education policy and curricula must incorporate environmental and developmental learning as fundamental to the achievement of sustainability. But it was not actually indicated how this might be achieved. Although both health and education were stated to be fundamental to sustainability, neither issue was a priority during the UNCED negotiations and both might have been seriously neglected if the CANZ group in particular had not persisted in keeping those issues on the agenda.

#### SOME CANADIAN INITIATIVES

During the past decade there has been a burgeoning environmental interest and awareness among the Canadian public. However, the concept of sustainable development is less well-known or understood. Government, business, and NGOs have increasingly been responsible for raising that level of awareness through better information dissemination and communications. For example, Canada's Green Plan contains funding for a variety of initiatives designed to inform and educate Canadians on environmental issues. A National Environmental Information Network (NEIN) is expected to be established by 1994, to provide the public with "one-window" shopping for environmental information. At the moment, a number of government departments or agencies contain public information and education components. For example, the Health and Environment Action Plan (Ministry of National Health and Welfare); the National Waste Reduction Plan (Energy, Mines and Resources Canada); the Sustainable Forest Initiatives, (Forestry Canada); the Pollution Prevention Initiatives, which involves the provincial and Federal governments (Agriculture Canada — pesticides and fertilizers; Fisheries and Oceans Canada — protection of fish habitat; Health and Welfare Canada — health effects of pollutants; Indian and Northern Affairs Canada — waste clean-up and management in the Arctic), the National Soil Conservation Program (Agriculture Canada), and the National Action Strategy on Global Warming (Canadian Council of Ministers for the Environment).

Internationally, IDRC has supported over 600 development information projects in 95 countries during the last two decades. Much of this work, which focused on environmental and developmental issues, actually predated Agenda 21. Not only did such projects improve access to information and promote more effective information sharing, but they built up the local capacity of local community leaders, women, and indigenous peoples. CIDA, likewise, undertook a number of projects that supported educational institutions involved in teaching environmental awareness and management, disseminated environmental information, particularly through NGO channels, and launched seminars on various environmental topics. Canadian environmental and development NGOs, Learners' Centres, and Women's Organizations have been especially active in this cross-cutting sector.

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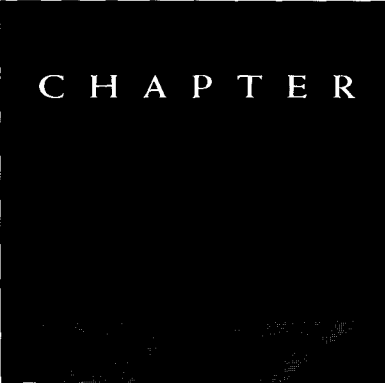

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**NATIONAL  
MECHANISMS AND  
INTERNATIONAL  
COOPERATION FOR  
CAPACITY-BUILDING**

**THE NATURE OF THE PROBLEM**

In a sense, capacity-building is not new. It is education in its broadest sense, trying to use and enhance both latent and existing human potential. "Capacity-building encompasses a country's human, scientific, technological, organization, institutional, and resource capabilities." If a country is to follow the sustainable development path, it will need to draw upon all its resources or capabilities, so that it can critically evaluate its problems and options, and make the right environmental and developmental choices. All countries share the need to strengthen national capacities, but the developing countries especially will need to build endogenous capacity to implement Agenda 21 in cooperation with UN organizations, developed countries, and with each other. As well, both the North and the South will need to involve and mobilize all sectors of society — NGOs, communities, women, indigenous people, business, municipalities, etc. — at all levels, and not just national governments and international agencies. Without their full participation, they will be hard-pressed to identify and implement sustainable development needs, priorities, and workable strategies.

**SUMMARY OF CHAPTER 37**

Chapter 37 has only one program area, that of *endogenous capacity-building*. Its objective is to "develop and improve national and related subregional and regional capacities and capabilities for sustainable development," including with NGOs. Governments are urged to use a participatory process and to complete a review of capacity- and

capacity-building needs for their national sustainable development strategies, including their own Agenda 21 action programs. A target date of 1994 is set, followed by another date of 1997 when the UN Secretary-General is to submit to the General Assembly a report on the achievement of improved policies for sustainable development. To this end, governments are asked to undertake the following activities:

- (a) *Build a national consensus and formulate capacity-building strategies for implementing Agenda 21;*
- (b) *Identify national sources and present requests for technical cooperation (including technology transfer and know-how for sector strategies);*
- (c) *Establish a review mechanism of technical cooperation regarding technology transfer and know-how;*
- (d) *Enhance the expertise and collective contribution of the United Nations system for capacity- and capability-building initiatives, and*
- (e) *Harmonize the delivery of assistance at the regional level.*

**THE NATURE OF THE UNCED DEBATE**

Early in the negotiating process, the Chapter's text was very focused on UNDP's role in implementing Agenda 21. All countries but especially the G77, worked to reduce that emphasis and to clarify the respective roles of UNDP and

## NATIONAL MECHANISMS AND INTERNATIONAL COOPERATION FOR CAPACITY-BUILDING

UNEP regarding countries' national planning mechanisms. Canada's delegation worked to ensure that Agenda 21 gave primary responsibility to national governments for capacity-building, and that actions at all levels — whether national, regional, local, or global — flowed from those national sustainability or "green" plans rather than from an international bureaucracy. These issues were relatively easily resolved at the PrepCom IV in New York, and the text was finalized before Rio. In order to gain essential political commitment to sustainability, Canada had also suggested that countries establish a steering committee, with UNDP and UNEP assistance, to develop "a country-driven participatory and sustainable development strategy."

### SOME CANADIAN INITIATIVES

Because of the expertise that Canada has gained from the development and implementation of its "Green Plan," it has committed itself to making this expertise available to developing countries, including for the development of NEAPs. Canada will undertake a number of demonstration projects to transfer Canadian expertise to other countries, particularly in areas related to climate change, forest management, and biodiversity. For example, the Canadian government, in partnership with the provinces and industry in the major Canadian regions, will encourage the creation of up to eight demonstration projects as working models of sustainable development.

CIDA, over the years, has supported a number of institutional capacity-building programs and projects at the national, regional/subregional, and local levels through NGOs or women's organizations. It has provided funding

to multilateral organizations to enhance their institution-building programs, and supported technology or know-how transfer. IDRC has concentrated much of its efforts on support for its traditional partners: research institutions, universities, and some NGOs. It has been especially successful in setting up research networks in various parts of the world. Canada will increase funding to such key environmental institutions as UNEP, the World Meteorological Organization, the International Union for Conservation of Nature and Natural Resources, the Unesco World Heritage Committee, and the International Maritime Organization.


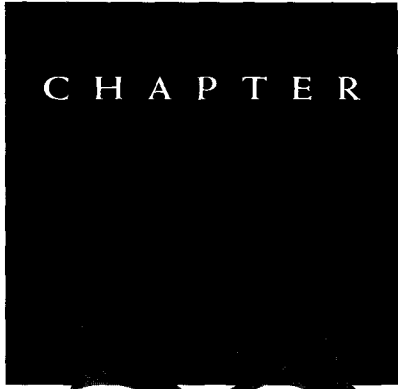

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**INTERNATIONAL  
INSTITUTIONAL  
ARRANGEMENTS**

**THE NATURE OF THE PROBLEM**

In order for the effects of environmental degradation to be halted and reversed and for sustainable and environmentally sound development to occur in all countries, it was recognized that the follow-up to UNCED would require both international and national efforts that were mutually beneficial and reinforcing. However, there was concern that perhaps the United Nations system would have difficulty "in delivering," given past tendencies among some UN agencies for bureaucratic inaction or lack of innovation under changing conditions. UNCED and its follow-up were seen as an opportunity to try and bring about some restructuring and revitalizing of the UN in its economic, social, environmental, and related fields. Accordingly, Chapter 38 was drafted to address some of those concerns.

**SUMMARY OF CHAPTER 38**

The main objective of the Chapter is "the integration of environment and development issues at national, subregional, regional, and international levels, including in the United Nations system," so as to implement and review Agenda 21 and thus achieve sustainable development in all countries. This necessitates strengthened cooperation and coordination in the UN system and with national, intergovernmental, and nongovernment organizations, as well as an effective exchange of information. Chapter 38 outlines the follow-up roles of the United Nations General Assembly (UNGA), the UN Economic and Social Council (ECOSOC), the Secretary General and the Administrative Committee on Coordination (ACC), the proposed Commission on Sustainable Develop-

ment (CSD), the UN Environment Program (UNEP), the United Nations Development Program (UNDP), the UN Conference on Trade and Development (UNCTAD), other UN bodies, multilateral financial institutions, and NGOs (including the proposed Earth Council).

A major new step was proposed — the establishment of a Commission on Sustainable Development that would ensure high-level follow-up of Agenda 21 and would report directly to ECOSOC and thus indirectly to the UN General Assembly. The Commission would monitor and evaluate the progress of governments and UN agencies in implementing Agenda 21. A key provision in the Chapter calls for governments and UN bodies to report periodically and publicly on their implementation of Agenda 21.

The Chapter deals with institutions as "organizations" in the narrow sense, and only alludes to the possibility that institutions can comprise a broader reach. If institutions were treated more broadly, then they would include "informal and formal arrangements between contracting parties, socially determined conventions or accustomed rules of procedures, and (even) attitudes of mind amongst those responsible for conducting public affairs." The Chapter has largely focused on political organizations, and mainly ignored social, scientific, and regulatory organizations or institutions, all of which are needed to achieve sustainable development.

The Chapter should be read in conjunction with Chapter 39 (International Legal Instruments and Mechanisms).

**THE NATURE OF THE UNCED DEBATE**

Negotiations on this Chapter were relatively noncontentious, although the final text reflected some weakening of key provisions, especially with respect to the establishment, mandate, and operation of the new Commission on Sustainable Development. It was finally agreed that the Commission would report directly to ECOSOC instead of to the UN General Assembly; and that its membership would be limited to no more than 52 members who would be elected on an equitable geographic basis. Weaker language was also adopted in describing two of the Commission's more important functions — consideration of the information in national reports or periodic communications; and the review of information regarding the progress made in implementing the environmental conventions, as opposed to reviewing and/or monitoring progress.

The role of NGOs, both in the context of the Commission specifically and the whole chapter generally, is rather vague and general. Canada had supported an enhanced position for NGO involvement in the Commission and overall UNCED follow-up. To that end, Canadian NGOs had tabled specific proposals with Canada, namely, NGO participation at an equivalent status to member states; promotion of gender, geographic, and sector expertise on the Commission; promotion of alternative dispute resolution, and the integration of environment and development concerns at the highest national and international levels politically; and, finally, promotion of reform to the United Nations system. There was concern that the UN, the World Bank, IMF, and GATT, which manage and control much of the world's economic system, should introduce a more effective, democratic, and participatory process in their decision-making.

**SOME CANADIAN INITIATIVES**

Many international environmental institutions were created before it was possible to anticipate the scope and scale of demands that would be placed upon such organizations. Today, those organizations are generally suffering from an overload of work, burgeoning demands, and inadequate resources. Accordingly, they need considerably more support from all countries to be effective agents of environmental change. To answer this challenge and need, through its Green Plan, Canada has decided to increase its funding to key international institutions involved in promoting multi-lateral solutions to environmental problems for the next 5 years. Among these organizations are: the United Nations Environmental Program (UNEP), the World Meteorological Organization (WMO), the International Union for the Conservation of Nature and Natural Resources (IUCN), the International Maritime Organization (IMO), and Unesco's World Heritage Committee,

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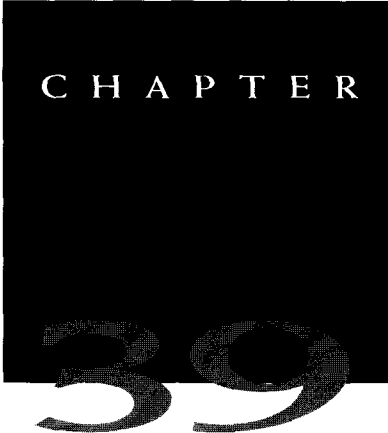
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**INTERNATIONAL  
LEGAL  
INSTRUMENTS  
AND MECHANISMS**

**THE NATURE OF THE PROBLEM**

Over 100 international agreements dealing with environmental matters exist. World-wide compliance with international laws and regulations and participation in the legal process is crucial to achieving sustainable development and environmental security. But, governments increasingly find it difficult to keep up with the proliferation of international legal obligations and regulatory processes. Also, international law on sustainable development, which attempts to reconcile environmental and developmental concerns, is still a relatively embryonic field without clear-cut precedents and processes. It is thus especially difficult for Third World governments, which often either lack persons trained in international law or lack access to such experts due to inadequate financial and technical resources. Not only are they not in a position to implement and enforce international obligations, they frequently are put at a disadvantage during negotiations requiring international law expertise and experience.

**SUMMARY OF CHAPTER 39**

The main objective of Chapter 39 is "to evaluate and promote the efficacy of international environmental law." It is also "to promote the integration of environment and development policies through effective international agreements and instruments," which are based on universal principles and which take into account the varying needs of different countries. The Chapter emphasizes the need to develop further international law on sustainable development; to develop linkages between environmental and socio-

economic legal instruments or agreements; to ensure the full participation of developing countries and to provide them with technical assistance. It especially noted the need for four activities:

- (a) *Review, assessment, and fields of action in international law for sustainable development — the past, present, and future,*
- (b) *Implementation mechanisms, including through reporting systems and the assistance of international bodies (e.g., UNEP);*
- (c) *Effective participation in international law-making, especially by developing countries, through the provision of financial and/or technical assistance, and*
- (d) *Disputes in the field of sustainable development, whereby nations would consider alternative methods for avoiding and settling disputes.*

The text specifically draws attention to large-scale destruction of the environment in times of armed conflict; trade-policy measures for environmental purposes; and the need for safe and environmentally sound nuclear power, including the need to conclude negotiations for a nuclear safety convention.

**THE NATURE OF THE UNCED DEBATE**

At both PrepCom IV and UNCED, the United States and many G77 countries insisted that the provision concerning environmental crimes be limited to times of war. The

European Community wanted a broader definition, to include environmental crimes during peace as well. After difficult negotiations, the United States–G77 position prevailed, and the provision was restricted to war. Debate arose over the need for a nuclear safety convention — it was finally agreed that there should be on-going negotiations but with the framework of the International Atomic Energy Agency (IAEA). Considerable concern was expressed that environmental law or policies could unduly restrict trade. That issue was resolved by stipulating that environmental policies should deal with the root causes of environmental degradation. In this it was anticipated that environmental measures would not result in unnecessary restrictions to trade. Overall, the North–South split occurred over language, with the G77 countries seeking weaker language — for instance, replacing “compliance” with the weaker “effective, full, and prompt implementation”; and with “prevention” being replaced by “avoidance.”

Canada participated in the general discussions and provided its comments through CANZ, but did not actually participate in drafting the text. Canada proposed exploring the possibilities of providing technical and scientific assistance to developing countries so that they might participate more effectively in the negotiation of new agreements and the revision of existing. Canada agreed with the establishment of a group of legal experts who would explore ways to improve the efficiency and effectiveness of existing environmental law and to identify legal needs and gaps.

### SOME CANADIAN INITIATIVES

Over the years, Canada has played a substantial role in negotiating a wide range of international conventions and protocols and in promoting the need for implementable international law. Some of these include oceans, ozone

layer, air pollution, international movements of hazardous wastes, trafficking in endangered species, etc. (for example, the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987; Drinking Water Safety Act, 1991; Fisheries Act, 1973; Arctic Water Pollution Prevention Act; Canadian Environmental Protection Act, 1988). Canada has also been involved in negotiations on regional agreements within the framework of the UN Economic Commission for Europe (ECE), for example, the 1979 Convention on Long-range Transboundary Air Pollution, and the North America Free Trade Agreement (NAFTA), which is addressing some environmental concerns.

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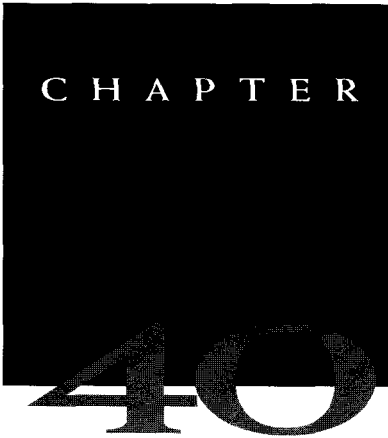
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**INFORMATION  
FOR  
DECISION-MAKING**

**THE NATURE OF THE PROBLEM**

For sustainable development to be achieved, decisions in any country and at any level must be based on sound information. But a serious gap between developed and developing countries exists in the availability, quality, and accessibility of data and information. Many Third World nations "have a general lack of capacity in many areas for the collection and assessment of data; for their transformation into useful information; and for their dissemination" and communication. Not only does a need exist for increased collection of relevant data, but also for improved coordination among information activities; better methods for data assessment and analysis; the application of traditional, indigenous, and women's knowledge; and for the development of indicators of sustainable development. There is a great need for good management of information; for an awareness of the value and availability of information; technology for effective access to information and maintenance of that technology in good, working condition; and for financial resources and trained people. Without all these elements of information in place, sound environmental and developmental decision-making will be severely hampered.

**SUMMARY OF CHAPTER 40**

That information for decision-making is a crucial, cross-cutting sector is evidenced by the number of references to information itself and information technologies throughout Agenda 21 — a minimum of 414. These ranged from remote-sensing, image analysis, and geographic information

systems (GIS) to electronic networking, expert systems, and modeling tools. As Chapter 40 states "In sustainable development, everyone is a user and provider of information" (in the broader sense). "The need for information arises at all levels," from senior national and international levels to grass-roots communities. To that end Chapter 40 sets out two large program areas.

- (a) *Bridging the Data Gap*. This program urges the development and use of indicators of sustainable development; improvement of data collection and use, and methods; the establishment of a comprehensive information framework; and the strengthening of the capacity for traditional information.
- (b) *Improving Information Availability*. This program outlines the need for the production of information that is usable in decision-making; the establishment of information standards and handling, and electronic networking; the development of documentation about information; and the use of commercial information sources.

The Chapter omits a number of key issues. It does not address the major problem of the sustainability (or maintenance) of information systems, or the specific problems, needs, and priorities of environmental information. The lack of reference to progress monitoring of information systems is also a major omission. It does not cross-reference to the major information-related programs in the other Agenda 21 chapters, or indicate how to identify the gaps

and problems related to the information needs of the various sectors. It places emphasis on UN target institutions (e.g., UNEP, EarthWatch) but is not clear about their role in this context. However, Chapter 40 is "ground-breaking in international proceedings," because it is unusual to single out information as sufficiently significant to warrant a separate chapter.

### THE NATURE OF THE UNCED DEBATE

This chapter was prepared by an International Working Group led by the Secretariat over a period of several months and after several drafts. However, the final draft was submitted virtually at the last minute by the UNCED Secretariat in Geneva, just before PrepCom IV commenced. Consequently delegations had little time to respond to it, although the Canadian Interdepartmental Working Group put together a briefing paper that identified some key gaps that were subsequently integrated into the chapter. Canada's objectives were to ensure that the Chapter included consistent approaches to data collection; training in collection, dissemination, and maintenance of data; information research and institution-building; and the inclusion of environmental indicators in national accounting. The CANZ group insisted that traditional and indigenous knowledge should be considered when compiling data bases. A couple of minor disagreements arose when some developing countries were reluctant to acknowledge the private sector as a source of useful information, while some other countries showed a reluctance to share information. Those apart, no major contentious issues hampered the adoption of the Chapter by the PrepCom.

### SOME CANADIAN INITIATIVES

Canada has undertaken a number of initiatives for developing indicators of environmental quality and the state of the environment and natural resources. It has released two State of the Environment Reports and is planning on establishing long-term state-of-the-environment monitoring and assessment capabilities. Canada has released a preliminary set of environmental indicators, and has begun to work on broadening traditional national accounting to incorporate environmental values, environmental impacts, and changes in natural resource flows. It intends to share this information and the experience or expertise it has built up with international partners through global information databases set up by UNEP.

Canada has worked with its international partners to develop indicators of environmental quality and the state of natural resources. For example, as a result of a Canadian initiative at the G7 Summit in 1989, the OECD developed environmental indicators for use by decision-makers around

the world. At a meeting of OECD Environment Ministers in early 1991, a commitment was made to continue the development and systematic use of those indicators.

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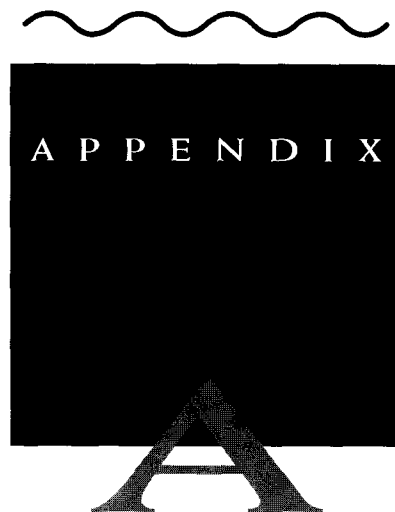
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## ACRONYMS

ACC	UN Administrative Committee on Coordination	CEAA	Canadian Environmental Assessment Agency
ACCC	Association of Canadian Community Colleges	CEPA	Canadian Environmental Protection Act
ACNU	Association canadienne pour les Nations Unies	CFCs	Chlorofluorocarbons
AECB	Atomic Energy Control Board	CHP	Common Heritage Programme
ARET	Accelerated Reduction or Elimination of Toxics	CIDA	Canadian International Development Agency
ASCEND	International Conference on an Agenda of Science for Environment and Development	CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
BCNI	Business Council on National Initiatives (Canada)	CMHC	Canada Mortgage and Housing Corporation
BCSD	Business Council on Sustainable Development (Geneva)	CNUEH	Centre des Nations Unies pour les établissements humains
CACSW	Canadian Advisory Council on the Status of Women	CPCU	Canadian Participatory Committee for UNCED
CANZ	Canada, Australia, and New Zealand	CPDRO	Commission on Planning and Development Reform in Ontario
CCC	Canadian Chamber of Commerce	CPHA	Canadian Public Health Association
CCF	Centre for Our Common Future	CRDI	Centre de recherches pour le développement international
CCFM	Canadian Council of Forestry Ministers	CSD	Commission on Sustainable Development
CCIC	Canadian Council on International Co-operation	CZM	Coastal Zone Management
CCME	Canadian Council of Ministers of the Environment	EA	Environmental Assessment
CCREM	Canadian Council of Resource and Environment Ministers	Earth Summit	UN Conference on Environment and Development (also known as UNCED)
		EC	European Council of Ministers

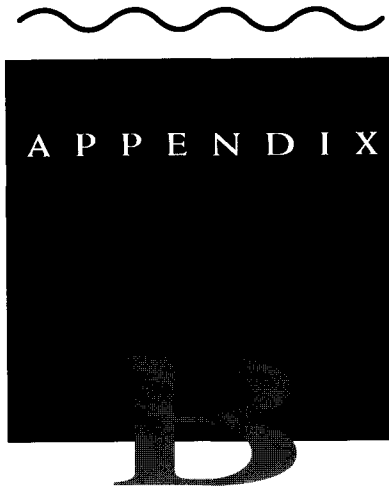
## ACRONYMS

EC	European Communities	ILO	International Labour Organisation
ECE	UN Economic Commission for Europe	IMF	International Monetary Fund
ECOSOC	UN Economic and Social Council	IMO	International Maritime Organization
EDIT	Environment and Development Issues and Trends	INC	Intergovernmental Negotiating Committee
EEZ	Exclusive Economic Zones	INSTRAW	UN International Research and Training Institute for the Advancement of Women
ENGOs	Environmental Organizations	IOCU	International Organization of Consumers Unions
FAO	Food and Agricultural Organization	IPCC	Intergovernmental Panel on Climate Change
FCM	Federation of Canadian Municipalities	IPCS	International Programme on Chemical Safety
FEARO	Federal Environmental Assessment Review Office	IPR	Intellectual Property Rights
GAD	Gender and Development	IRCWD	International Reference Centre for Wastes Disposal
GATT	General Agreement on Tariffs and Trade	IRPP	Institute for Research on Public Policy
GCC	Green Print for Canada Committee	ISAAA	International Service for the Acquisition of Agri-Biotech Applications
GEF	Global Environmental Facility	IUCN	International Union for the Conservation of Nature and Natural Resources
GEMI	Global Environmental Management Initiatives	IULA	International Union of Local Authorities
GHGE	Greenhouse Gas Emissions	IWTC	International Women's Tribune Centre
GIS	Geographic Information Systems	MAC	Mining Association of Canada
Global Forum	International Nongovernmental Organization Forum	MSY	Maximum Sustainable Yield
GLWQA	Great Lakes Water Quality Agreement	NAEE	North American Association for Environmental Education
GNP	Gross National Product	NAFTA	North American Free Trade Agreement
Habitat	UN Centre for Human Settlements	NBS	National Biotechnology Strategy
IAEA	International Atomic Energy Agency	NEAPs	National Environmental Action Plans
ICC	International Chamber of Commerce	NEIN	National Environmental Information Network
ICLEI	International Council of Local Environmental Initiatives	NGOs	Nongovernment Organizations
ICOD	International Centre for Ocean Development	NIMBY	Not In My Back Yard
IDA	International Development Association	NRTEE	National Roundtable on the Environment and the Economy
IDRC	International Development Research Centre	NSCP	National Soil Conservation Program
IEEA	Integrated Environmental and Economic Accounting	NWRP	National Waste Reduction Plan
IFAD	International Fund for Agricultural Development	ODA	Official Development Assistance
IIASA	International Institute for Applied Systems Analysis	ODA	Overseas Development Administration (UK)
IIED	International Institute for Environment and Development	OECD	Organisation for Economic Cooperation and Development
IISD	International Institute for Sustainable Development	OIC	Ontario International Corporation

## ACRONYMS

PCEQ	President's Council on Environmental Quality	UNICEF	UN Children's Fund
PIC	Prior Informed Consent	UNIDO	UN Industrial Development Organization
PrepComs	Preparatory Committee Conferences	UNIFEM	UN Development Fund for Women
RAPs	Remedial Action Plans	UNNGLS	UN Nongovernmental Liaison Service
SACDEL	Regional Training System for Local Urban Development and Improvement of Municipal Administration in Latin America	UTO	United Towns Organisation
SEI	Stockholm Environment Institute	WCED	World Commission on Environment and Development
SMEs	Small- and Medium-sized Enterprises	WCEFA	Inter-Agency Commission for the World Conference on Education for All
SWC	Status of Women Canada	WCIP	World Council of Indigenous Peoples
TERI	Tata Energy Research Institute	WCWC	Western Canada Wilderness Committee
TNCs	Transnational Corporations	WEDO	Women's Environment and Development Organization
UNAC	UN Association of Canada	WEED	Women and Environment Education and Development
UNCED	UN Conference on Environment and Development	WFP	World Food Programme
UNCHS	UN Centre for Human Settlements	WGI	World Game Institute
UNCLOS	UN Conference on the Law of the Sea	WHO	World Health Organization
UNCTAD	UN Conference on Trade and Development	WICEM	World Industry Conferences on Environmental Management
UNDP	UN Development Programme	WID	Women in Development
UNEP	UN Environment Programme	WMO	World Meteorological Organization
Unesco	UN Educational, Scientific and Cultural Organization	WRI	World Resources Institute
UNFPA	UN Fund for Population Activities		
UNGA	UN General Assembly		





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