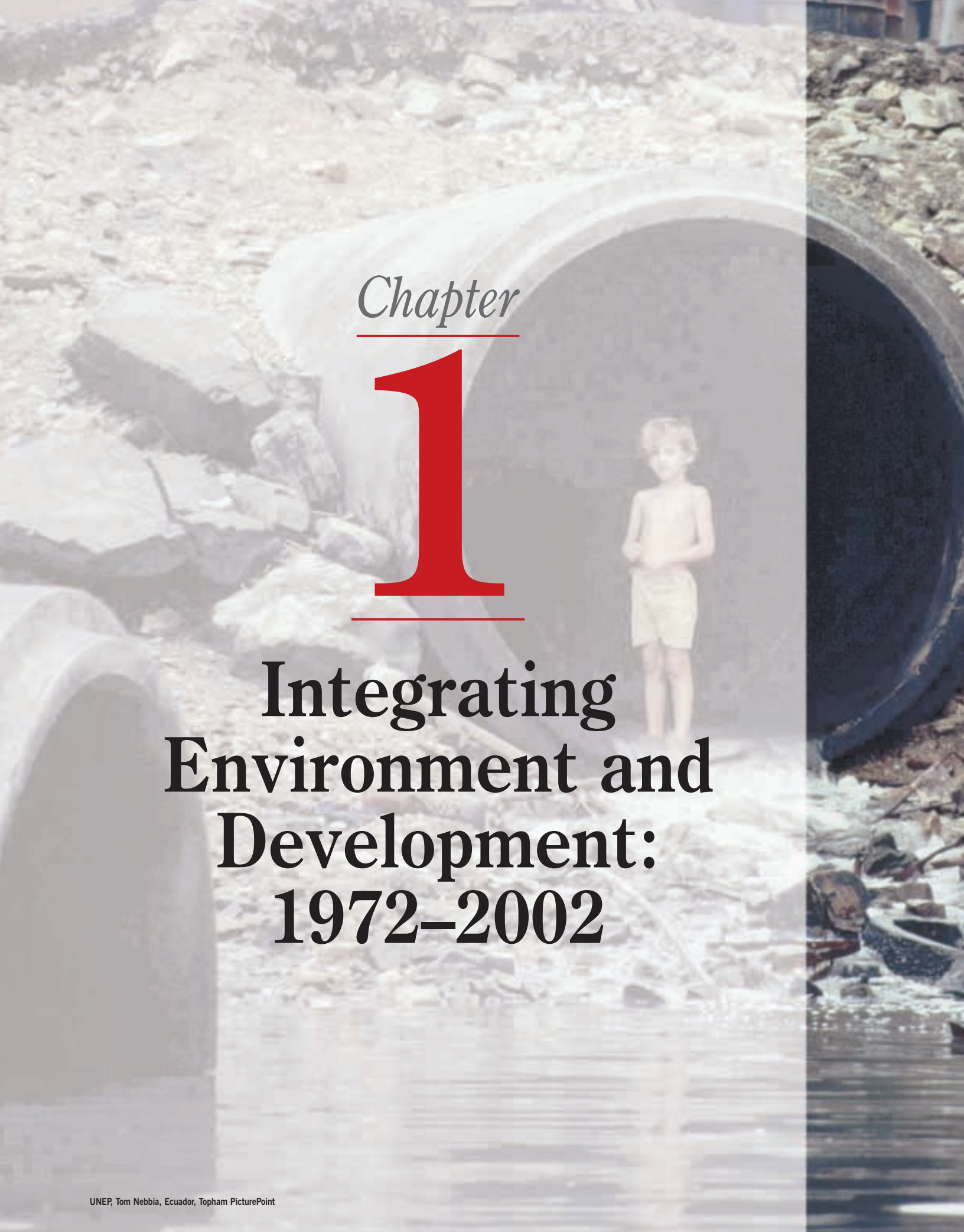


Chapter

1

Integrating Environment and Development: 1972–2002

UNEP, Tom Nebbia, Ecuador, Topham PicturePoint

Time line symbols

meeting

convention

disaster

publication

discovery

legal action

international event

new departure

new institution

The environment has always been critical to life but concerns over the balance between human life and the environment assumed international dimensions only during the 1950s. In the years that followed, supposedly unconnected pieces of a global jigsaw puzzle began to fit together to reveal a picture of a world with an uncertain future.

Paradigm-breaking books and articles such as Rachel Carson's *Silent Spring* (Carson 1962) and Garrett Hardin's 'The Tragedy of the Commons' (Hardin 1968) galvanized individual countries and the international community into action. A series of catastrophes added fuel to the environmental fire: thalidomide caused congenital deformations in babies, the *Torrey Canyon* spilled oil along France's picturesque northern coast, and Swedish scientists charged that the death of fish and other organisms in thousands of the country's lakes resulted from the long-range transport of air pollution from Western Europe.

At the end of the 1960s, the voice of environmental concern was heard almost uniquely in the West. In the communist world, the relentless destruction of the environment in the name of industrialization continued unabated. In developing countries, environmental concerns were regarded as Western luxuries. 'Poverty is the worst form of pollution,' held India's Prime Minister, Indira Ghandi, who played a key role in orienting the agenda of the UN Conference on the Human Environment, held in Stockholm in 1972, towards the concerns of the developing countries (Strong 1999). 'We hold that of all things in the world, people are the most precious,' said Tang Ke, leader of the Chinese delegation to the Stockholm conference (Clarke and Timberlake 1982).

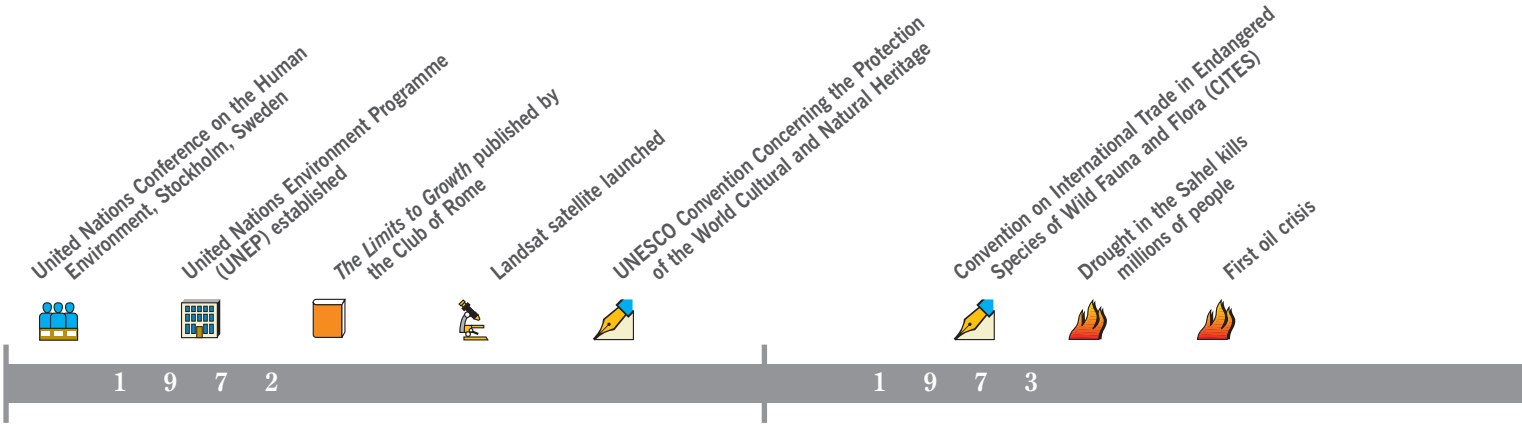
The tragedy of the commons

'The tragedy of the commons as a food basket is averted by private property, or something formally like it. But the air and waters surrounding us cannot readily be fenced, and so the tragedy of the commons as a cesspool must be prevented by different means, by coercive laws or taxing devices that make it cheaper for the polluter to treat his pollutants than to discharge them untreated.'

Source: Hardin 1968

In the early 1970s, attention was focused first on the biophysical environment, for example, on issues of wildlife management, soil conservation, water pollution, land degradation and desertification — and people were considered as the root cause of such problems. In the West, there were (and, to some extent, still are) two principal schools of thought about the causes of environmental degradation: one school blamed greed and the relentless pursuit of economic growth; the other blamed population growth. As one commentator put it, 'Unabated pollution and unstabilized population are real threats to our way of life and to life itself' (Stanley Foundation 1971).

These views were encapsulated in the most famous study of the time, the Club of Rome's computer model of the global future which attracted worldwide attention. The Club of Rome was a group of some 50 self-appointed 'wise men' (and women) who met regularly to try to put the world to rights, much as did the Pugwash group of scientists in relation to the Cold War. Published as *The Limits to Growth*, the Club of Rome model analysed five variables — technology, population, nutrition, natural resources and environment. Its main conclusion was that, if current trends continued, the global system would



'overshoot' and collapse by the year 2000. If that were not to happen, both population and economic growth would have to cease (Meadows and Meadows 1972). Although *The Limits to Growth* has been heavily criticized, it publicized for the first time the concept of outer limits — the idea that development could be limited by the finite size of the Earth's resources.

The 1970s: the foundation of modern environmentalism

The world of 1972 was very different from that of today. The Cold War still divided many of the world's most industrialized nations, the period of colonization had not yet ended and, although e-mail had just been invented (Campbell 1998), it was to be more than two decades before its use became widespread. The personal computer did not exist, global warming had only just been mentioned for the first time (SCEP 1970), and the threat to the ozone layer was seen as coming mainly from a large fleet of supersonic airliners that was never to materialize. Although transnational corporations existed and were becoming increasingly powerful, the concept of globalization was still 20 years away. In South Africa, apartheid still held sway and in Europe the Berlin Wall stood firm.

The world of the early 1970s was thus fiercely polarized, and in many different ways. Against this backdrop, it was surprising that the idea of an international conference on the environment should even be broached (by Sweden, in 1968); it was even more surprising that one should actually take place (in Stockholm, in 1972); and it was astonishing that such a conference could give rise to what later became known as the 'Stockholm spirit of compromise' in which

Principles of the Stockholm Declaration

1. Human rights must be asserted, apartheid and colonialism condemned
2. Natural resources must be safeguarded
3. The Earth's capacity to produce renewable resources must be maintained
4. Wildlife must be safeguarded
5. Non-renewable resources must be shared and not exhausted
6. Pollution must not exceed the environment's capacity to clean itself
7. Damaging oceanic pollution must be prevented
8. Development is needed to improve the environment
9. Developing countries therefore need assistance
10. Developing countries need reasonable prices for exports to carry out environmental management
11. Environment policy must not hamper development
12. Developing countries need money to develop environmental safeguards
13. Integrated development planning is needed
14. Rational planning should resolve conflicts between environment and development
15. Human settlements must be planned to eliminate environmental problems
16. Governments should plan their own appropriate population policies
17. National institutions must plan development of states' natural resources
18. Science and technology must be used to improve the environment
19. Environmental education is essential
20. Environmental research must be promoted, particularly in developing countries
21. States may exploit their resources as they wish but must not endanger others
22. Compensation is due to states thus endangered
23. Each nation must establish its own standards
24. There must be cooperation on international issues
25. International organizations should help to improve the environment
26. Weapons of mass destruction must be eliminated

Source: Clarke and Timberlake 1982

'One of our prominent responsibilities in this conference is to issue an international declaration on the human environment; a document with no binding legislative imperatives, but — we hope — with moral authority, that will inspire in the hearts of men the desire to live in harmony with each other, and with their environment.' — *Professor Mostafa K. Tolba, Head of the Egyptian delegation to the Stockholm Conference, UNEP Executive Director 1975–93*

representatives of developed and developing countries found ways of accommodating each other's strongly divergent views. The conference was hosted by Sweden following severe damage to thousands of Sweden's lakes from acid rain falling as a result of severe air pollution in Western Europe.

The United Nations Conference on the Human Environment

The United Nations Conference on the Human Environment, held in June 1972, was the event that turned the environment into a major issue at the international level. The conference drew together both developed and developing countries, but the former Soviet Union and most of its allies did not attend.

The Stockholm Conference produced a Declaration of 26 Principles and an Action Plan of 109 recommendations. A few specific targets were set — a 10-year moratorium on commercial whaling, prevention of deliberate oil discharges at sea by 1975 and a report by 1975 on energy uses. The Stockholm Declaration on the Human Environment and Principles constituted the first body of 'soft law' in international environmental affairs (Long 2000). The principles are loosely paraphrased in the box on page 3.

The conference also established the United Nations Environment Programme (UNEP, see box left) as 'the environmental conscience of the UN system'.

It is easy to claim that many of the major environmental milestones of the 1970s followed directly from Stockholm. It is important to remember, however, that Stockholm was itself a reflection of the mood of the times, or at least of the views of many in the West. That said, it is still instructive to itemize some of the major changes that followed Stockholm.

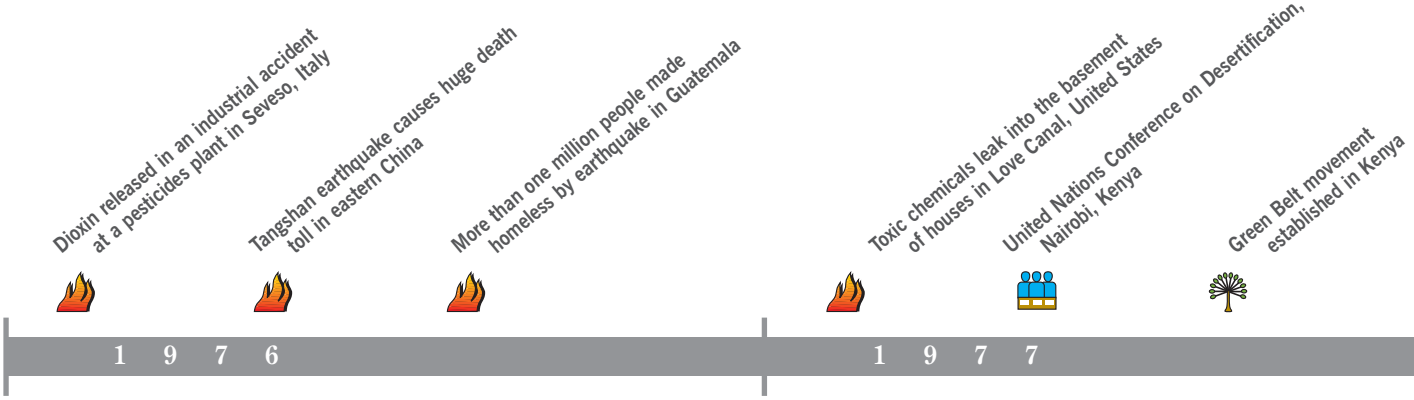
- Stockholm articulated the right of people to live 'in an environment of a quality that permits a life of dignity and well-being'. Since then, a number of organizations, including the Organization of African Unity (OAU), and about 50 governments worldwide, have adopted instruments or national constitutions that recognize the environment as a fundamental human right (Chenje, Mohamed-Katerere and Ncube 1996).
- Much national legislation on the environment followed Stockholm. During 1971-75, 31 major national environmental laws were passed in countries of the Organization for Economic Cooperation and Development (OECD), compared

The birth of the United Nations Environment Programme

The Stockholm Conference recommended the creation of a small secretariat in the United Nations as a focal point for environmental action and coordination within the UN system. This was established later in 1972 under the name of the United Nations Environment Programme (UNEP), and was headed by an executive director whose responsibilities included:

- providing support to UNEP's Governing Council;
- coordinating environmental programmes within the United Nations system;
- advising on the formulation and implementation of environmental programmes;
- securing the cooperation of scientific and other professional communities from all parts of the world;
- advising on international cooperation in the field of the environment; and
- submitting proposals on medium and long-range planning for United Nations programmes in the environment field.

UNEP's mission today is to 'Provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations'.



to just 4 during 1956-60, 10 during 1960-65 and 18 during 1966-70 (Long 2000).

- The environment entered or was brought much nearer the top of many regional and national agendas. For example, before Stockholm there were only about 10 ministries of environment; by 1982 some 110 countries had such ministries or departments (Clarke and Timberlake 1982).

Multilateral environmental agreements

One area in which governments and other stakeholders recorded qualified successes in the 1970s was wildlife conservation. This was achieved through a combination of legal actions at the global level which were (and still are) enforced at the national level with variable effectiveness. The foundation for some of these successes was laid by multilateral environmental agreements such as the:

- 1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar);
- 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage);
- 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and
- 1979 Convention on the Conservation of Migratory Species of Wild Animals (CMS).

The Ramsar Convention

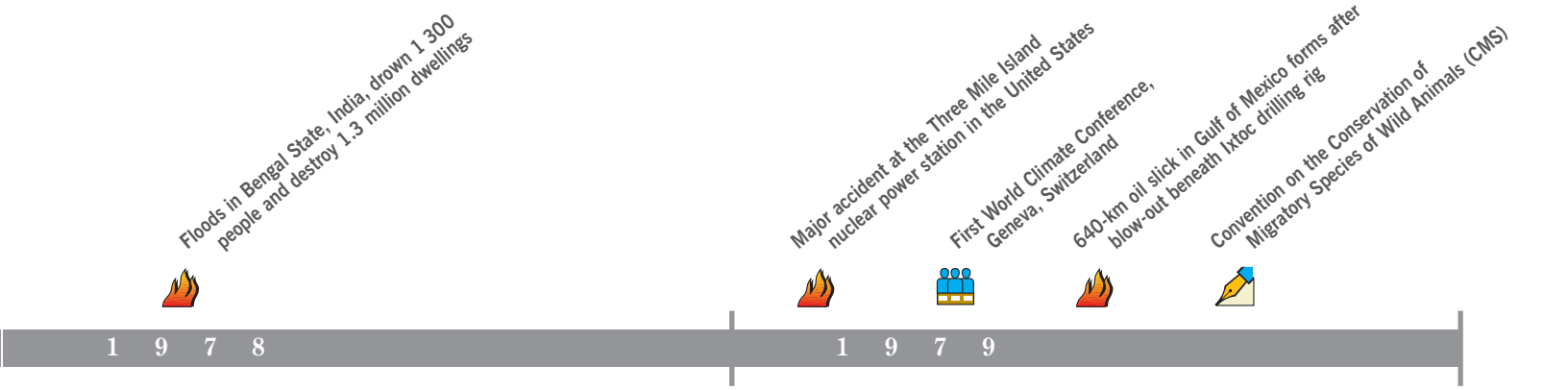
The Ramsar Convention predates the Stockholm Conference, having been opened for signature in 1971. The convention, which became effective two years after Stockholm, had 130 parties as of December 2001. It was developed largely out of NGO-led activities in the 1960s concerned with bird life and habitat. While its main focus was initially the conservation of waterfowl and their habitats, it now also deals with water quality, food production, general biodiversity and all wetland areas, including saltwater coasts.

Parties are obliged to list at least one wetlands site of importance, establish nature reserves, make wise use of those sites, encourage the increase of waterfowl populations on appropriate wetlands, and supply information on implementation of policies related to the sites. More than 1 100 areas, covering 87.7 million ha, are currently designated Ramsar sites, enhancing wildlife conservation in different regions (Ramsar Convention Bureau 2001).

'All peoples shall have the right to a general satisfactory environment favourable to their development.' — *African Charter on Human and People's Rights, 27 June 1981*

The World Heritage Convention

The World Heritage Convention, negotiated in 1972, is administered by the United Nations Educational, Scientific and Cultural Organization (UNESCO). It had 161 parties in mid-2001. Since 1972 when the Galapagos Islands were put under the aegis of UNESCO as 'a natural university of unique species', a total of 144 sites in different regions were designated as natural heritage sites as of December 2001. An additional 23 sites were of both natural and cultural significance (UNESCO 2001). The impact has been greater awareness of the importance of these sites for both present and future generations. However, the



early 2001 oil spill adjacent to the Galapagos Islands, which threatened species and habitats, underlines the fact that environmental management systems may never be foolproof.

'People are no longer satisfied only with declarations. They demand firm action and concrete results. They expect that the nations of the world, having identified a problem, will have the vitality to act.' — *Swedish Prime Minister Olof Palme, whose country hosted the Stockholm Conference, 1972*

CITES

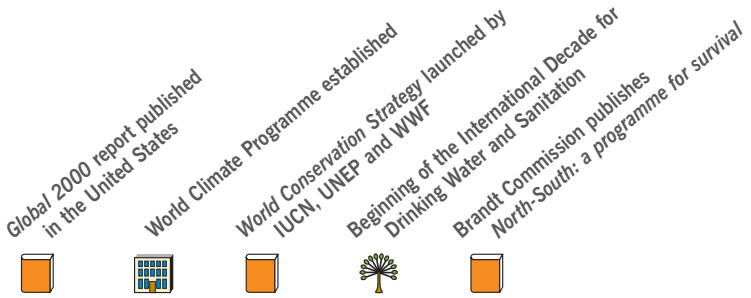
At the time of Stockholm, it was reported that 150 species of birds and animals had already been 'exterminated' and about 1 000 more were threatened with extinction (Commission to Study the Organization of Peace 1972). A UN Commission recommended the identification of endangered species without further delay, the conclusion of appropriate agreements and establishment of institutions to spearhead wildlife conservation, and the regulation of the international trade in threatened species.

The Commission's recommendation virtually endorsed a 1963 resolution by members of the World Conservation Union (IUCN) which catalysed the drafting of the CITES convention. The convention was eventually adopted in 1973 and became effective two years later. The convention controls and/or bans international trade in endangered species, including about 5 000 animal and 25 000 plant species (CITES Secretariat 2001). Controversy over charismatic species such the African elephant and the whale have often overshadowed the attention that has been placed on other species.

Other achievements

In terms of demonstrable action, Stockholm apparently achieved much. While many of its 109 recommendations remain unfulfilled, they serve — now as then — as important targets. Equally important, however, were the Conference's achievements in repairing rifts, and in narrowing the gap between the views of the developed and the developing nations. The first attempt at this had been made at a conference in Founex, Switzerland, in 1969, and the Founex Report of June 1971 identified development and environment as 'two sides of the same coin' (UNEP 1981). The Drafting and Planning Committee for the Stockholm conference noted in its report in April 1972 that 'environmental protection must not be an excuse for slowing down the economic progress of emerging countries'.

Further progress had to wait until 1974 when a symposium of experts chaired by the late Barbara Ward, was held in Cocoyoc, Mexico. Organized by UNEP and the United Nations Commission on Trade and Development (UNCTAD), the symposium identified the economic and social factors which lead to environmental deterioration (UNEP/UNCTAD 1974). The Cocoyoc Declaration — the formal statement issued by the symposium — was influential in changing the attitudes of leading environmental thinkers. What was said at Cocoyoc foreshadowed the first paragraph of the *World Conservation Strategy* published in 1980 (see page 9) and was re-stated in *GEO-2000* in 1999: 'The combined destructive impacts of a poor majority struggling to stay alive and an affluent minority consuming most of the world's resources are undermining the very means by which all people can survive and flourish' (UNEP/UNCTAD 1974).

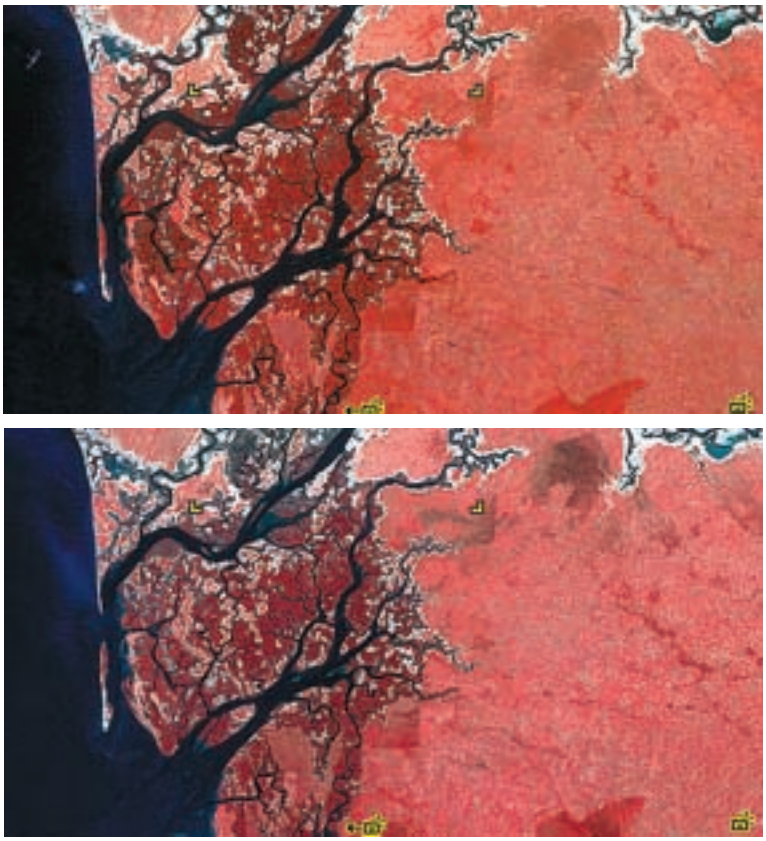


Other statements in the Cocoyoc Declaration illustrate awareness of the difficulty of meeting human needs sustainably from an environment under pressure:

- 'The problem today is not one primarily of absolute physical shortage but of economic and social maldistribution and usage.'
- 'The task of statesmanship is to guide the nations towards a new system more capable of meeting the inner limits of basic human needs for all the world's people and of doing so without violating the outer limits of the planet's resources and environment.'
- 'Human beings have basic needs: food, shelter, clothing, health, education. Any process of growth that does not lead to their fulfilment — or, even worse, disrupts them — is a travesty of the idea of development.'
- 'We are all in need of a redefinition of our goals, or new development strategies, or new lifestyles, including more modest patterns of consumption among the rich.'

The Cocoyoc Declaration ends:

'The road forward does not lie through the despair of doomwatching or through the easy optimism of successive technological fixes. It lies through a careful and dispassionate assessment of the 'outer limits', through cooperative search for ways to achieve the 'inner limits' of fundamental human rights, through the building of social structures to express those rights, and through all the patient work of devising techniques and styles of development which enhance and preserve our planetary inheritance.'



Landsat images of the Saloum River, Senegal, on 5 November 1972 (top) and 31 October 1992 show how much of the mangrove forest (dark red areas) has disappeared in 20 years, even in a protected area

Source: Landsat 2001

This vision of the way forward was reflected in the detailed new images of the planet that appeared in the 1970s as a result of the launch by the United States in

1982

United Nations Convention on the Law of the Sea (UNCLOS)

United Nations General Assembly adopts the World Charter for Nature

1983

Monsoon storms in Thailand kill 10 000 people

July 1972 of the Landsat satellite. Such images were undoubtedly instrumental in changing human attitudes to the state of the planet's environment. Sadly, the 30-year record that Landsat has provided also shows that attitudes have not yet changed enough (see photos page 7).

In terms of climate change, growing concern about global warming (the Swedish scientist Svante Arrhenius had in 1896 warned the world about the 'greenhouse effect') led to the first World Climate Conference in Geneva in February 1979 (Centre for Science and Environment 1999). It concluded that anthropogenic carbon dioxide emissions could have a long-term effect on climate. The World Climate Programme (WCP) was established the following year, providing the framework for international cooperation in research and the platform for identifying the important climate issues of the 1980s and 1990s, including ozone depletion and global warming.

The 1980s: defining sustainable development

The defining political events of the 1980s were the breakdown of the Eastern Bloc and the end of the bi-polar world built on the balance of power between Western and communist countries and their allies in the developing world. The changes that were the culmination of reform and perestroika in the Soviet Bloc came on the heels of years of apparently strong economic growth and massive military spending.

The lost decade

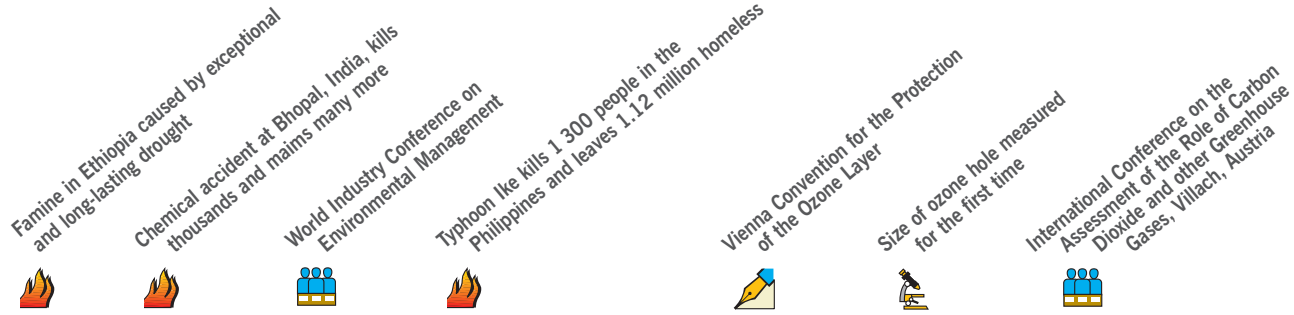
The situation was markedly different in the developing regions of Africa, West Asia, and Latin America and the Caribbean, where most countries registered little growth in income (UNCHS 1996). The sub-Saharan region fell further behind with per capita income falling 1.2 per cent a year during the 1980s (UN 2000) due to a combination of factors, including severe droughts and unfavourable terms of trade. For many developing countries the 1980s became known as the lost decade. Starting with the debt crisis in Latin America in 1982, the situation was particularly difficult in countries where wars led to the displacement of millions of people. The number of refugees doubled from about 9 million in 1980 to more than 18 million by the early 1990s (UNHCR 2000).

Dealing with the cycle of poverty became a particular challenge as population growth in the developing world not only continued but an increasing number of the poor were living in cities. As urban populations grew, cities were finding their physical infrastructure increasingly stressed and unable to cope with demand.

New issues and new accidents

Catching the scientific world as well as policy makers by surprise, measurements by British researchers of the size of the ozone hole were first reported in 1985 (Farnham, Gardiner and Shanklin 1985). The *Global 2000* report recognized for the first time that species extinction was threatening biodiversity as an essential component of the Earth's ecosystems (US Government 1980). As the interdependence of environment and development became increasingly clear, the United Nations General Assembly adopted the *World Charter for Nature*, bringing attention to the intrinsic value of species and ecosystems (UN 1982).

Besides new discoveries, the 1980s also saw a



By 1990, at least 900 million people in urban areas in Africa, Asia and Latin America were living in poverty

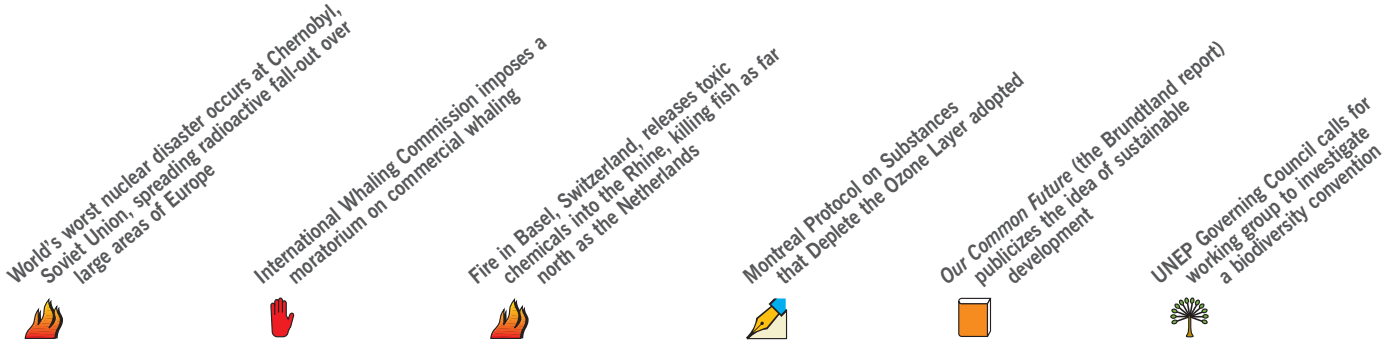
Source: UNEP, Topham Picturepoint

range of catastrophic events that left a permanent mark both on the environment and on the understanding of its connection to human health. In 1984, a leak from a Union Carbide plant left 3 000 people dead and 20 000 injured in Bhopal, India (Diamond 1985). The same year, up to 1 million people starved to death in Ethiopia. In 1986, the world's worst nuclear accident happened as a reactor at the Chernobyl nuclear power plant exploded in the Ukrainian Republic of the Soviet Union. The 1989 spill of 50 million litres of oil from the *Exxon Valdez* supertanker into Alaska's Prince William Sound demonstrated that no area, however remote and 'pristine', is safe from the impact of human activities.

The World Conservation Strategy

The events referred to above confirmed that environmental issues are systemic and addressing them requires long-term strategies, integrated action and the participation of all countries and all members of society. This was reflected in the World Conservation Strategy (WCS), one of the seminal documents which served to redefine environmentalism post-Stockholm. Launched in 1980 by IUCN, the strategy recognized that addressing environmental problems calls for long-term effort and the integration of environmental and development objectives.

The WCS envisaged governments in different parts of the world undertaking their own national



'This is a kind of development that provides real improvements in the quality of human life and at the same time conserves the vitality and diversity of the Earth. The goal is development that will be sustainable. Today it may seem visionary but it is attainable. To more and more people it also appears our only rational option.' — *World Conservation Strategy, IUCN, UNEP and WWF 1980*

conservation strategies, meeting one of the objectives of Stockholm to incorporate environment in development planning. Since 1980, more than 75 countries have initiated multi-sector strategies at national, provincial, state and local levels (Lopez Ornat 1996). These are aimed at addressing environmental problems such as land degradation, habitat conversion and loss, deforestation, water pollution and poverty.

World Charter for Nature: general principles

- The genetic viability on the earth shall not be compromised; the population levels of all life forms, wild and domesticated, must be at least sufficient for their survival, and to this end necessary habitat shall be safeguarded.
- All areas of the earth, both land and sea, shall be subject to these principles of conservation; special protection shall be given to unique areas, to representative samples of all the different types of ecosystems and to the habitat of rare or endangered species.
- Ecosystems and organisms, as well as the land, marine and atmospheric resources that are utilized by man [*sic*], shall be managed to achieve and maintain optimum sustainable productivity, but not in such a way as to endanger the integrity of those other ecosystems or species with which they co-exist.
- Nature shall be secured against degradation caused by warfare or other hostile activities.

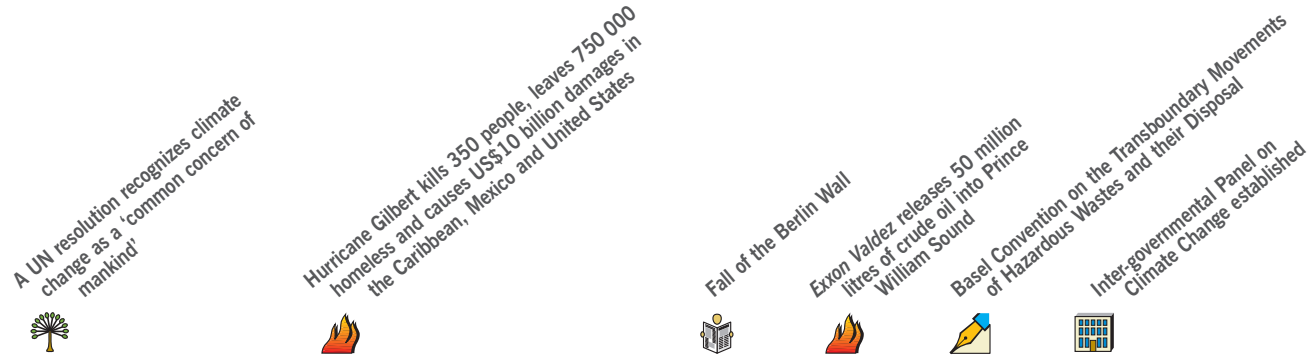
Source: UN 1982

The World Commission on Environment and Development

However, communicating the message that environment and development were interdependent required a process which carried authority and credibility to the North and South, to government and the business sector, to international organizations and civil society. In 1983, the World Commission on Environment and Development (WCED), also known as the Brundtland Commission, was formed to hold hearings across the globe and produce a formal report of its findings.

The report was issued after three years of hearings with government leaders and the public worldwide on environment and development issues. Public meetings were held in both developed and developing regions, and the process empowered different groups to articulate their views on issues such as agriculture, forestry, water, energy, technology transfer and sustainable development in general. *Our Common Future*, the Commission's final report, defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs', making it part of the environment lexicon (WCED 1987).

The Commission highlighted environmental problems such as global warming and ozone layer depletion that were new at the time. It expressed concern that the rate of 'change is outstripping the ability of scientific disciplines and our current capabilities to assess and advise'. The Commission concluded that existing decision-making structures and institutional arrangements, both national and international, simply could not cope with the demands of sustainable development (WCED 1987):



'The present decade (1980s) has been marked by a retreat from social concerns. Scientists bring to our attention urgent but complex problems bearing on our survival: a warming globe, threats to the Earth's ozone layer, deserts consuming agricultural land. We respond by demanding more details, and by assigning the problems to institutions ill equipped to cope with them' (WCED 1987).

Thus were the seeds of broader engagement in environment and development issues sown. As a sign of a strengthening non-governmental sector, many new organizations were formed. In Europe, green parties entered the political arena and the membership of grass-roots environmental organizations increased rapidly.

Involving the other actors

In the wake of the industrial accidents of the 1980s, the pressure on corporations grew. In 1984, UNEP co-organized the World Industry Conference on Environmental Management, and in 1984 Responsible Care was established by the chemical industry in Canada, one of the first attempts to provide a code of conduct to sound environmental management in the business sector. By the end of the decade, the concept of eco-efficiency was being introduced into industry as a means of simultaneously reducing environmental impact while increasing profitability. Few if any of these interests were shared by corporations based in developing countries, but there were already debates on the implications of industries migrating to 'pollution havens' in the South.

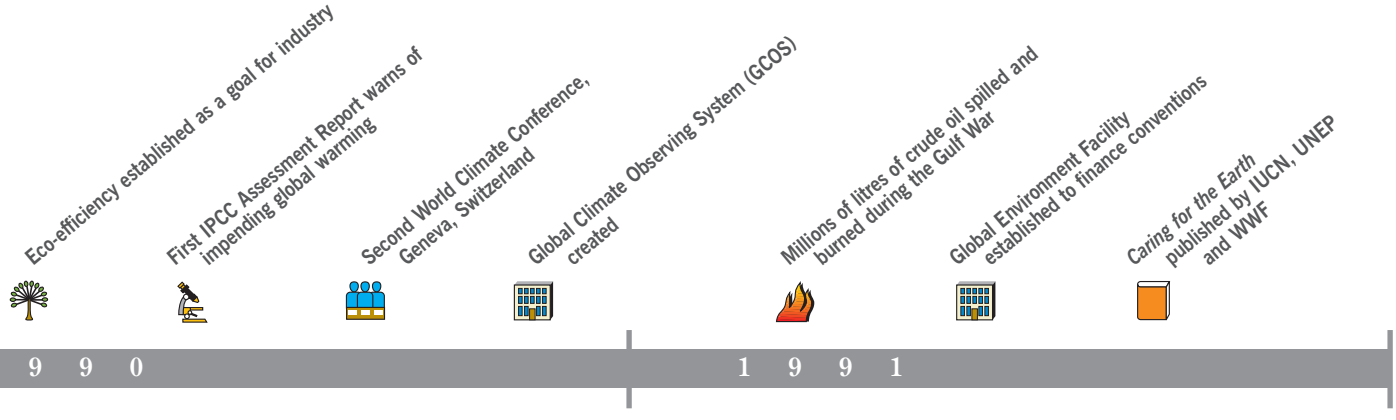
As it became clear that an increasing number of actors would need to grapple with the environmental dimensions of activities previously not recognized as having environmental implications, academic interest in the subject grew. Environment and development became legitimate subjects of study in more of the established social and natural disciplines, but also new disciplines were born to address cross-cutting areas. Environmental economics, environmental engineering and other previously fringe subjects started to become established and legitimate fields of scholarship, developing their own theories but also proving their worth in real world contexts.

The environment and sustainability still did not feature high in the principles and particularly practice of bilateral aid. As an early sign of change, in 1987 the OECD established a Development Advisory Committee charged with the establishment of guidelines for the integration of environment and development in development assistance programmes.

The successful conclusion of the Montreal Protocol in 1987 was held as a promising model for cooperation between North and South, government and business to address global environmental matters. However, dealing with ozone depletion was more straightforward than dealing with other environmental issues that entered the public agenda in the 1980s, notably climate change.

The Intergovernmental Panel on Climate Change

In 1989, the Intergovernmental Panel on Climate Change (IPCC) was established with three working groups focused on the scientific assessment of climate change, environmental and socio-economic impacts, and response strategies, foretelling the wide range of challenges that humanity would face as it entered the



'Indigenous people are the base of what I guess could be called the environmental security system. For many of us, however, the last few centuries have meant a major loss of control over our lands and waters. We are still the first to know about changes in the environment, but we are now the last to be asked or consulted.' — *Louis Bruyère, President of the Native Council of Canada, WCED public hearing, Ottawa, Canada, May 1986*

last decade of the millennium. The establishment of the IPCC by UNEP and the World Meteorological Organization (WMO) helped develop a broad consensus on the science, social impacts and best responses to human-induced global warming. The IPCC has contributed immensely to public understanding of the dangers of global warming, particularly in the industrialized countries. In many developing countries, where climate studies are rare and climate experts almost non-existent, climate change is not regarded in the same light. This has led some organizations in the developing regions to complain about 'an enormous disparity in North-South participation. … Southern countries have no coordinated national climate programmes, few climate researchers, and hardly any data to compute long-term climate projections' (Centre for Science and Environment 1999).

Multilateral environmental agreements

Some of the major Multilateral Environmental Agreements (MEAs) of the 1980s are:

- the 1982 United Nations Convention on the Law of the Sea (UNCLOS);
- the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (implementing the 1985 Vienna Convention for the Protection of the Ozone Layer); and
- the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention).

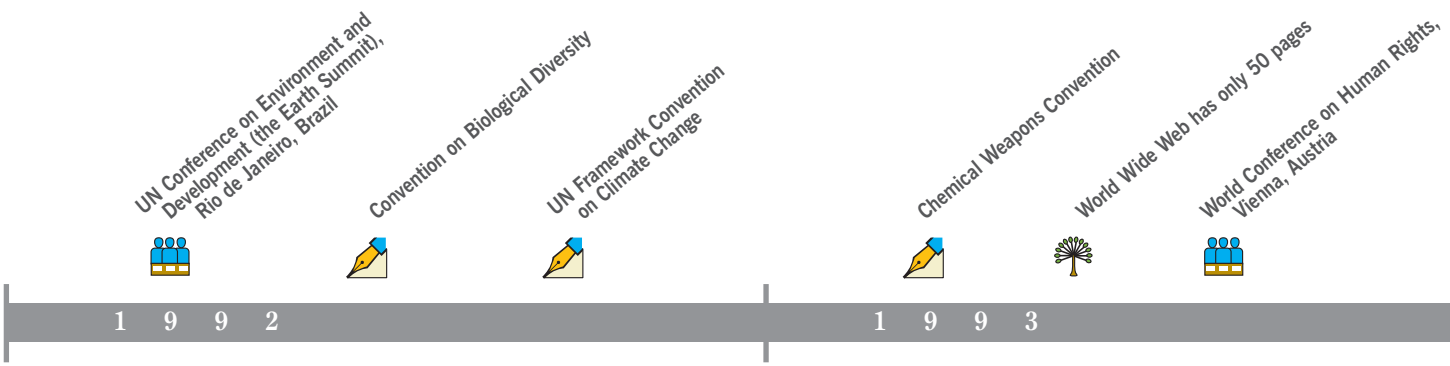
Law of the Sea

Although UNCLOS was signed in 1982, it did not come into force until 12 years later, an indication perhaps of the complexity of negotiating MEAs. The convention, which has 136 parties, is a landmark legal undertaking that encompasses a wide range of maritime issues, including environmental protection. Its environmental provisions include:

- the extension of sovereign rights over marine resources, such as fish, within the 200-mile exclusive economic zones (EEZs);
- obligations to adopt measures to manage and conserve natural resources;
- a duty to cooperate regionally and globally with regard to environmental protection and research related to this protection;
- a duty to minimize marine pollution, including land-based pollution; and
- restrictions on marine dumping by ships.

The Montreal Protocol

The Montreal Protocol to the Vienna Convention on Substances that Deplete the Ozone Layer, which entered into force in 1989 and had 182 parties as of December 2001, is one of the most successful examples of international environmental cooperation. The success of the protocol in part has hinged upon



the Multilateral Fund as an inducement to participation by developing countries (UNEP 2001a).

Parties to the Montreal Protocol must annually provide statistical data on the production, import and export of those ozone-depleting substances (ODS) that are controlled by the protocol to the secretariat, through national reports. Reporting rates are high, with more than 85 per cent of the parties reporting their data. The implementation of the protocol has been tightened and expanded significantly over the years, through the 1990 London, 1992 Copenhagen, 1997 Montreal and 1999 Beijing Amendments (UNEP 2000).

The Basel Convention

The Basel Convention, which entered into force in 1992 and had 149 parties as of December 2001, has three key objectives:

- to reduce transboundary movements of hazardous wastes;
- to minimize the creation of such wastes; and
- to prohibit their shipment to countries lacking the capacity to dispose of hazardous wastes in an environmentally sound manner.

The convention arose out of growing concerns over shipments of waste from industrialized to developing states. Concerned about shipments to Africa, member states of the Organization of African Unity (OAU) responded with the 1991 Bamako Convention on the Ban of the Import into Africa and the Control of the Transboundary Movement and Management of Hazardous Waste within Africa. It came into force in April 1998.

The 1990s: implementing sustainable development

The 1990s were characterized by the search for increased understanding of the concept and significance of sustainable development. This was accompanied by accelerating trends towards globalization, particularly with regard to trade and technology. The conviction grew that there were an increasing number of global environmental problems that required international solutions. The profile of environmental issues was also increasing in the South as new organizations began demanding diagnoses and solutions for developing countries. The Regional Environmental Centre was established in Hungary in 1990 to address environmental issues in post-Soviet Central Europe. There was significant action by private industry to put its house into better environmental shape and explosive growth in the use of the Internet and electronic communications.

'The solution cannot be that which bans the development of those who need it the most; the fact is that everything that contributes to underdevelopment and poverty is an open violation of ecology.'
— Cuban President Fidel Castro, UNCED 1992

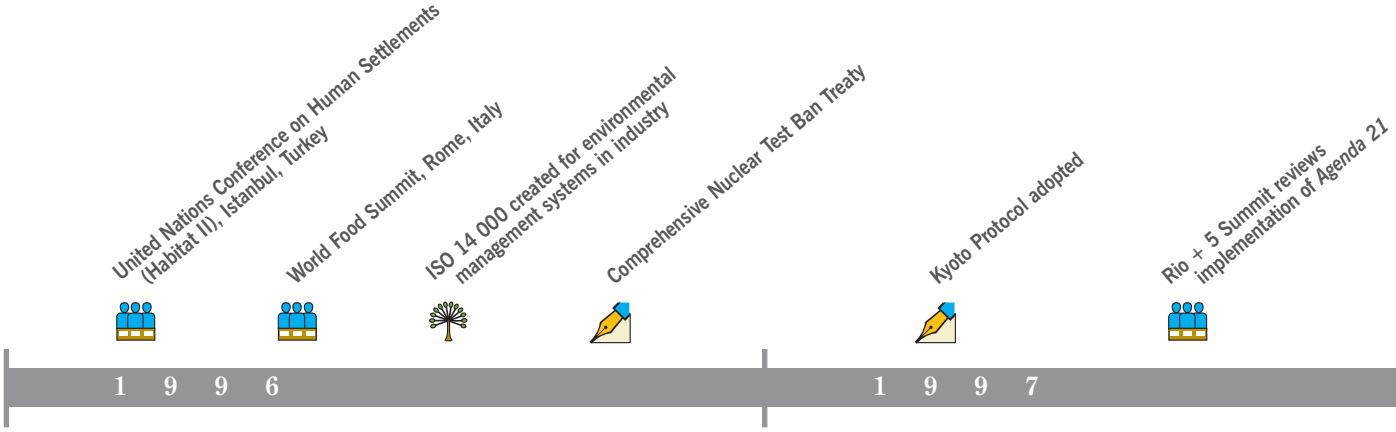
The decade started badly for the environment with the loss of thousands of lives in the 1991 Persian Gulf conflict and a partial black-out over some of the area as millions of barrels of oil were wilfully ignited (Bennett 1995). For West Asia, this was a major environmental catastrophe. An oil slick — caused by the release of between 0.5 million to 11 million barrels

Firemen trying to extinguish a burning oil rig in Kuwait in 1991

Source: UNEP, Abdel Saurad-Mali, Kuwait, Topham PicturePoint

of crude oil — is reported to have killed 15 000-30 000 sea birds. In addition, about 20 per cent of mangroves in the Persian Gulf were contaminated and 50 per cent of coral reefs affected (Island Press 1999). The atmosphere was not spared either: about 67 million tonnes of oil were burnt, producing about 2.1 million tonnes of soot and 2 million tonnes of sulphur dioxide (Bennett 1995).

Elsewhere, while technical progress was transforming industrialized society, few in the developing world were benefiting. The death toll from infectious diseases (such as AIDS, malaria, respiratory diseases and diarrhoea) was 160 times greater than the number killed in 1999 from natural disasters, including earthquakes in Turkey, floods in Venezuela and cyclones in India (IFRC 2000). The International Federation of Red Cross and Red Crescent Societies reported that a 1995 survey of 53 countries showed a 15 per cent decline in health spending per person following economic structural adjustment.



By 1997, near the end of the 20th century, some 800 million people (nearly 14 per cent of the world population) not only went hungry every day but also lacked the basic skills of reading and writing essential to sustainable development (UNESCO 1997).

In terms of governance, events of the late 1980s continued to influence political developments across the globe. No region was immune as dictatorships and military regimes in Africa and Latin America were voted out of power, and the single party governments in some European countries were relegated to opposition benches by a restless electorate. The people had begun to exercise their right to elect their leaders and demand accountability. Despite this radical change in terms of governance, there was little immediate impact on the environment in most countries. In the countries of the former Soviet Union, however, economic recession helped reduce waste emissions and energy consumption. Whether such effects will prove only temporary remains to be seen.

At the institutional level, ideas that had taken shape during the late 1980s, such as multistakeholder participation and increased accountability on environmental and social matters, were given a higher profile by a number of international events. The first of these was a ministerial conference on the environment held in Bergen, Norway, in May 1990, where such ideas were first formally endorsed. This conference was convened to prepare for the UN Conference on Environment and Development (UNCED or the Earth Summit) that was held in June 1992 in Rio de Janeiro, Brazil.

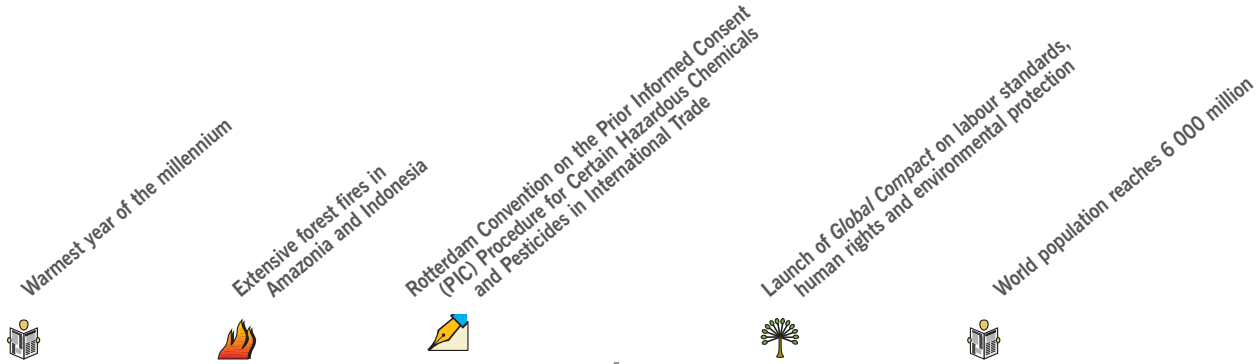
The Earth Summit

UNCED was attended by an unprecedented number of representatives of state, civil and economic society — 176 governments (UN 1993), more than 100 heads of state compared to the two who attended the 1972 Stockholm Conference (Haas, Levy and Parson 1992), and an estimated 10 000 delegates, 1 400 non-governmental organizations (NGOs) and about 9 000 journalists (Demkine 2000). It is still the largest such gathering ever held. Prior to the Summit itself, the preparatory events from national and sub-regional to regional and global also involved the participation of hundreds of thousands of people across the world, ensuring that their voices were heard. Sub-regional and regional organizations such the Association of Southeast Asian Nations (ASEAN), the Organization of African Unity, the European Union and many others played a role before and during the Earth Summit. They continue to do so in trying to implement *Agenda 21*, the action programme that resulted from the conference.

'No matter what resolutions are made or not made at a forum such as this, no genuine and lasting environmental improvement can take place without grass-roots involvement on a global scale.' — *Iceland President Vigdís Finnbogadóttir, UNCED 1992*

The Summit produced at least seven major achievements:

- the Rio Declaration on Environment and Development (containing 27 principles);
- *Agenda 21* — a blueprint for environment and development into the 21st century;
- two major international conventions — the United



Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD);
- the Commission on Sustainable Development (CSD);
- agreement to negotiate a world desertification convention; and
- the statement of Principles for the Sustainable Management of Forests.

The Rio Principles reaffirmed the issues that had been articulated in Stockholm 20 years earlier, placing human beings at the centre of sustainable development concerns by stating that humans are 'entitled to a healthy and productive life in harmony with nature'.

The Earth Summit provided a forum to address issues of both environment and development, and to highlight differences in perspective between the North and South. After the Summit, sustainable development took on a life of its own, forcing its way into the deliberations of bodies ranging from city councils to international organizations. More than 150 countries have established national-level institutions to develop an integrated approach to sustainable development — although, in some countries, the national councils of sustainable development have been more political than substantive in nature (Myers and Brown 1997). A wide range of civil society sectors is now involved in agenda setting and strategy building. More than 90 per cent of them have been established in response to Rio, the majority in developing countries.

The emphasis given to sustainable development also had considerable impact on both legal instruments and the institutions that administer them. For example CITES, which was already evolving away from a classic conservation approach, moved further towards an approach that balances conservation with sustainable use. The practical application of sustainable use within CITES provoked substantial and heated debate throughout the decade.

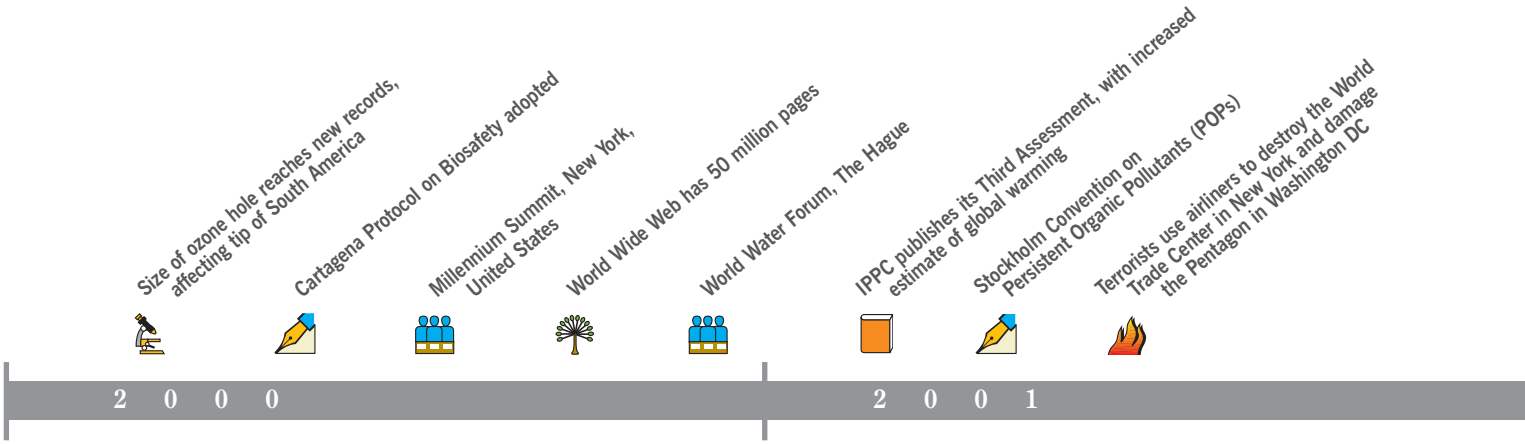
Agenda 21

Agenda 21 lays a solid foundation for the promotion of sustainable development in terms of social, economic and environmental progress. *Agenda 21* has 40 chapters, and its recommendations are divided into four main areas:

- Social and economic issues such as international cooperation to accelerate sustainable development, combating poverty, changing consumption patterns, demographic dynamics and sustainability, and protecting and promoting human health.
- Conservation and management of resources for development, such as protection of the atmosphere, combating deforestation, combating desertification and drought, promoting sustainable agriculture and rural development, conservation of biological diversity, protection of freshwater resources and the oceans, and the sound management of toxic chemicals and hazardous wastes.
- Strengthening the role of major groups, including women, children and youth, indigenous people and their communities, NGOs, local authorities' initiatives in support of *Agenda 21*, workers and their trade unions, business and industry, the scientific and technological community, and farmers.
- Means of implementation, including financial resources and mechanisms, transfer of environmentally sound technology, promoting education, public awareness and training, international institutional arrangements, international legal instruments and mechanisms, and information for decision-making.

Agenda 21

Agenda 21 is an action programme. It was partially based on a series of specialized contributions from governments and international bodies, including *Caring for the Earth: a Strategy for Sustainable Living* (IUCN, UNEP and WWF 1991). *Agenda 21* is now the



most significant and influential non-binding instrument in the environmental field, serving as the blueprint for environmental management in most regions of the world (see box left).

The cost of implementing *Agenda 21* in developing countries was estimated by the Earth Summit secretariat to be about US$625 billion a year, with the developing countries meeting 80 per cent, or US$500 billion, of it. Developed countries were expected to foot the remaining 20 per cent, or about US$125 billion annually, by meeting their long-established official development assistance (ODA) target of 0.7 per cent of gross national product (GNP).

Although UNCED was concerned with global approaches, an important outcome was the adoption of many national and regional *Agenda 21* programmes for sustainable development. In the Southern African Development Community (SADC) region, for example, the member states adopted the SADC Policy and Strategy for Environment and Sustainable Development in 1996. The European Union adopted the 5th Environmental Action Plan *Towards Sustainability* (EU 1993).

The Global Environment Facility

The Global Environment Facility (GEF) was created in 1991 as an experimental partnership involving UNEP, UNDP and the World Bank to generate ecological dividends from local and regional development by providing grants and low-interest loans to developing nations and economies in transition. Following the Summit, it was intended to be the financing mechanism for *Agenda 21*, and was expected to mobilize the necessary resources. It helps fund national, regional and global development projects which benefit the world's environment in four focal areas — climate change, biodiversity, ozone and international waters — as well as local economies and societies.

Following its successful restructuring in March 1994, GEF membership has grown from 34 to more than 155 countries, whose representatives meet in the GEF Assembly of participating states, the GEF's overall supervisory body, every three years.

GEF chief executive officer and chairman Mohamed T. El-Ashry acknowledges that it is too early to assess the impact of the more than 220 GEF-supported projects in terms of sustainable development. A gap between donor pledges and actual contributions to the GEF has raised concerns, particularly among developing countries. Despite the commitment to meet an ODA target of 0.7 per cent of GNP annually, ODA in 1995 stood at 0.29 per cent, its lowest level since 1973 (GEF 1997).

However, foundations, individuals, corporations and bequests committed to sustainable development have brought a new meaning to the word 'charity', contributing a total of US$129 billion in 1994 (Myers and Brown 1997). This figure was estimated to increase by 9 per cent in 1995 to US$143.85 billion.

Multilateral environmental agreements

UN Framework Convention on Climate Change

The ability of IPCC to provide evidence that climate change posed a real threat encouraged governments at the Summit to sign the UN Framework Convention on Climate Change (UNFCCC). This became the centrepiece of the Summit and entered into force in 1994; it had 186 parties as of December 2001. The development of the convention can be traced back to

the 1990 Second World Climate Conference in which the ministerial declaration was the vehicle for pushing ahead with policy development and the establishment of the Global Climate Observing System (GCOS).

The primary goal of the UNFCCC is to stabilize greenhouse gas emissions at levels that will prevent dangerous anthropogenic interference with the global climate. The principle of 'common but differentiated responsibilities' that was embraced by this convention has guided the adoption of a regulatory structure. This principle reflected the reality that most emissions of greenhouse gases are from industrialized states.

The Kyoto Protocol, which set actual targets for emissions reductions, was opened for signature in 1997. As of December 2001, 84 Parties had signed and 46 Parties had ratified or acceded to the Protocol (UNFCCC 2001). A notable exception was the United States which announced its decision not to ratify the Protocol in early 2001.

The Convention on Biological Diversity

The CBD came into force in 1993. It was the first global agreement on the conservation and sustainable use of biodiversity and serves as a blueprint for national action. The Convention establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. Many biodiversity issues are addressed, including habitat preservation, intellectual property rights, biosafety and indigenous peoples' rights.

The Convention stands as a landmark in international law, noted for its comprehensive, ecosystems approach to biodiversity protection. The treaty has gained rapid and widespread acceptance. By December 2001, a total of 182 governments had ratified the agreement. A supplementary agreement to the Convention, the Cartagena Protocol on Biosafety, was adopted in January 2000 to address the potential risks posed by cross-border trade and accidental releases of living genetically modified organisms. The adoption of the biosafety protocol is a success for developing countries which called for it. The protocol had been signed by 103 parties and ratified by 9 as of December 2001. The CBD has also influenced the enactment of a law which seeks to regulate genetic resources within the Andean Pact nations of Bolivia, Colombia, Ecuador, Peru and Venezuela. The law became effective in July 1996 (Centre for Science and Environment 1999). Despite the success of the convention, negotiations before its adoption were often acrimonious (see box).

The role of developing countries in the CBD negotiations

Unhappy with the early draft of the CBD in November 1991, the Geneva-based South Centre urged developing countries to reject the draft and … 'insist that any negotiation on biodiversity should be linked to a negotiation on biotechnology, and more generally to IPR (intellectual property rights). This combined trend towards the privatization of knowledge and gene resources is a serious threat to the South's development and should be countered.'

During negotiations, the South:

- stressed national sovereignty over natural resources;
- called for technology transfer to developing countries on a preferential basis;
- pushed for supremacy of CBD over other institutions such as the World Intellectual Property Organization (WIPO) and the General Agreement on Tariffs and Trade (GATT); and
- called for a protocol on biosafety.

Source: Centre for Science and Environment 1999

The Convention to Combat Desertification

Though negotiations were not completed until 1994, the UN Convention to Combat Desertification (CCD) developed out of the process associated with the 1992 UNCED. However, its history extends back to the 1970s. It became effective in 1996 and had 177 parties as of December 2001. The CCD has been described as a 'Rio stepchild' (Centre for Science and Environment 1999) because it did not get as much attention as the UNFCCC and CBD. The industrialized countries opposed it because 'they were not willing to undertake any financial responsibility for arresting the process of desertification' which is not perceived as a global problem (Centre for Science and Environment 1999). While it has been projected that a 20-year global effort to combat desertification would cost US$10-22 billion annually, funding countries provided a meagre US$1 billion in 1991 for desertification control worldwide (Centre for Science and Environment 1999).

Although the CCD has modest financial support compared to the UNFCCC and the CBD, the convention is distinctive for two reasons:

- It endorses and employs a 'bottom-up' approach to

international environmental cooperation. Under the terms of the CCD, activities related to the control and alleviation of desertification and its effects are to be closely linked to the needs and participation of local land users and non-governmental organizations.

- It employs detailed regional annexes, sometimes more detailed than the core treaty itself, that address the particularities of the desertification problem in specific regions such as Africa, Latin America and the Caribbean, and the Northern Mediterranean (Raustiala 2001).

The central substantive commitment in the CCD is the obligation to develop 'national action programmes', in conjunction with local stakeholders. These programmes delineate the tasks that the parties will undertake to implement the CCD. For example, parties must make the prevention of desertification a priority in national policies and must promote awareness of desertification among their citizens.

The Commission on Sustainable Development

The establishment of the CSD in December 1992 was a direct outcome of the Summit. Although the goal of sustainable development was established in the 1980s, it was not until Rio that an international body was assigned the mandate to oversee and help the international community achieve this goal (see box). Although this was a major step, the Commission has been criticized for being a weak response to problems of institutional capacity, and has encountered apathy from high-level government ministers (Long 2000). The integration of economic, social and environmental policies — a requirement of sustainable development spelled out by the Brundtland Commission — continues to challenge institutions at all levels.

Rio + 5

Five years after UNCED, the international community convened a review summit, known as Rio + 5, in New York where concerns were expressed about the slow implementation of *Agenda 21*. The general conclusion was that while some progress had been made in terms of sustainable development, 'many of the targets of *Agenda 21* are a long way from being met' (UN 1997).

Mandate of the Commission on Sustainable Development

The CSD, which was established in December 1992 under the UN Economic and Social Council, is composed of 53 members elected for terms of office of three years. The Commission meets annually for a period of two to three weeks, meeting first in June 1993. Broadly, the role of the Commission is to:

- review progress at the international, regional and national levels in the implementation of recommendations and commitments contained in the final documents of UNCED — *Agenda 21*, the Rio Declaration on Environment and Development, and the Forest Principles;
- elaborate policy guidance and options for future activities as a follow-up to UNCED and to achieve sustainable development; and
- promote dialogue and build partnerships for sustainable development with governments, the international community and the major groups identified in *Agenda 21* as key actors outside central government which have a major role to play in the transition towards sustainable development.

Source: UN 2001

'Here in the United States, we must do better. With 4 per cent of the world's population, we produce 20 per cent of its greenhouse gases. So we must do better, and we will.' — *Bill Clinton, President of the United States, Rio + 5, 1997*

'It is a matter of deep concern to India that five years after Rio, there is a discernible effort to erode the framework for partnership built at Rio — notably the principle of common but differentiated responsibilities — with efforts to prescribe equal obligations and liabilities on unequal players.' — *Professor Saifuddin Soz, Indian Minister of Environment and Forests, Rio + 5, 1997*

Other important international conferences

The principles of sustainable development were reaffirmed throughout the 1990s at numerous international conferences such as the:

- 1993 World Conference on Human Rights in Vienna;
- 1994 International Conference on Population and Development in Cairo;
- 1994 Global Conference on the Sustainable Development of Small Island Developing States in Bridgetown, Barbados;
- 1995 World Summit for Social Development in Copenhagen;
- 1995 Fourth World Conference on Women in Beijing;

'The five years that elapsed since the Rio Conference have clearly shown that changes in the global political and economic structure have not been followed through by commensurate progress in the fight against poverty and the predatory use of natural resources.' — *President Fernando Henrique Cardoso of Brazil, whose country hosted the 1992 Earth Summit, Rio + 5, 1997*

- 1996 United Nations Conference on Human Settlements (Habitat II) in Istanbul; and
- 1996 World Food Summit in Rome.

Stakeholder participation in sustainable development

Much of this international activity was mirrored by attempts by the private sector to improve its environmental performance. Action was encouraged by the creation of the World Business Council for Sustainable Development (WBCSD) in 1995 which has done much to encourage industry to look for improvements in profitability by reducing waste of both resources and energy and by reducing emissions. The WBCSD now has hundreds of members, of whom many have managed to effect remarkable savings for both themselves and the environment (Rabobank International 1998). In 1996, the International Organization for Standardization created a new voluntary standard for environmental management systems in industry, the ISO 14 000 (International Organization for Standardization 2001).

By the end of the decade, transnational corporations had greatly improved their environmental image; indeed, their environmental performance was often better than that of many small and medium-sized enterprises (Kuhndt and Van der Lugt 2000). Corporate environmental reporting also became more common during the 1990s and the Global Reporting Initiative was created to establish a common framework for voluntary reporting of the environmental, economic and social performance of an organization (GRI 2001). The GRI seeks to elevate enterprise-level sustainable development reporting to the same level of credibility, comparability and consistency as financial reporting.

Civil society was also active, notably in its attempts to create an Earth Charter which articulates the 'fundamental ethical principles for a sustainable way of life'. Hundreds of groups and thousands of individuals have been involved. The Charter, which was originally meant to have been adopted at the Earth Summit, has been refined in a process spearheaded by the Earth Council and Green Cross International. The Charter is available in 18 languages on the Secretariat's website (Earth Charter 2001).

Civil society has not, however, limited itself to campaigns such as the Earth Charter but has also organized massive demonstrations in different parts of the world, many of them against the perceived threat of globalization. Such attempts are themselves reflections of the globalization process, and of the now extraordinary power of the Internet which has undergone explosive growth. While in 1993, there were only 50 pages on the World Wide Web, these had multiplied by a million by the end of the decade (UN 2000), making radical changes to the way many people live and work — mainly in the rich industrialized countries. Even though 'electrons are cheap', at the end of the 1990s 88 per cent of Internet users lived in industrialized countries, which collectively represented just 17 per cent of the world's population (UNDP 1999). This was a sobering conclusion to the end of the 1990s: in at least one important sense, the voices and concerns of the poor majority — for all the decade's rhetoric — were still being left out of the global conversation.

The Comprehensive Nuclear Test Ban Treaty

An important milestone in international cooperation with a bearing on the environment came in 1996 with the adoption of the Comprehensive Nuclear Test Ban Treaty (CTBT) by the United Nations General Assembly in New York. The CTBT, which prohibits all nuclear test explosions in all environments, was opened for signature in New York on 24 September 1996, when it was signed by 71 States, including the five nuclear weapon states. As of August 2001, 161 States had signed the Treaty and 79 had ratified it. An elaborate global verification scheme is being developed by the Preparatory Commission of the CTBT for when the Treaty enters into force, which will be 80 days after the 44 States listed in Annex 2 to the Treaty have all ratified; 31 had done so by August 2001 (CTBTO 2001).

2000 and beyond: reviewing the agenda

Despite many setbacks, the past 30 years have provided a strong foundation on which to build sustainable development over the coming decades. The prevailing mood in environmental circles is cautiously optimistic about future progress in general — though this is tempered by several important unknowns, including notably the threat of climate change.

Environmental interest and awareness rekindled

Environmental interest and awareness in 2002 have been stimulated by preparations for the World Summit on Sustainable Development. There have also been a number of other interesting developments which may have far-reaching impacts. One of these is the greater willingness among disparate groups to work together on a common cause. The United Nations Secretary-General Kofi Annan has supported the establishment of the Global Compact (see box), which aims to build synergy between the private sector and three United Nations organizations — UNEP, the International Labour Organization (ILO) and the UN Office of the High Commissioner for Human Rights (UN 1999). For the first time, principles that embrace protection of human rights, sound labour laws and environmental responsibility are addressed by these offices in a single international agreement.

Chemicals

Thirty years ago, many toxic and persistent chemicals were considered to be not only resources but also pollutants adversely affecting human health and the environment, particularly where they could be accumulated up the food chain or transported long distances over the globe. Today, chemicals are seen as even more essential to development, and as a resource that needs to be managed to protect or even enhance human health and the environment. This sound management of chemicals applies to both those anthropogenically produced and those of natural origin, including those generated through biological processes.

The international community has recently concluded a landmark convention to control the use of a group of persistent toxic organic compounds (see box). In December, 2000 representatives of 122 governments finalized the text of a legally binding treaty for implementing international action on certain persistent organic pollutants (POPs). The Stockholm Convention on Persistent Organic Pollutants, signed in May 2001 and which had 111 signatories and 2 Parties as of December 2001, sets out control measures

Principles of the Global Compact

Human Rights

- Principle 1: support and respect the protection of international human rights; and
- Principle 2: ensure that corporations are not complicit in human rights abuses.

Labour

- Principle 3: freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.

Environment

- Principle 7: support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Source: UN 1999

Stockholm Convention on Persistent Organic Pollutants

The POPs treaty covers an initial list of 12 chemicals, the so-called 'dirty dozen':

- eight pesticides — aldrin, chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, endrin, heptachlor, mirex and toxaphene;
- two industrial chemicals — polychlorinated biphenyls (PCBs) and hexachlorobenzene (which is also a pesticide); and
- two unwanted by-products of combustion and industrial processes (dioxins and furans).

A health-related exemption has been granted for DDT, which is still needed in many countries to control malarial mosquitoes until 2025. Governments may also maintain existing equipment that contains PCBs in a way that prevents leaks to give them time to arrange for PCB-free replacements. PCBs have been widely used in electrical transformers and other equipment.

The Convention also designates GEF as its primary financial mechanism, on an interim basis, through which developed countries will channel new and additional resources to help countries with economies in transition and developing countries to implement their obligations. It also provides for a science-based process, incorporating precaution, to review other chemicals for possible addition by the Conference of the Parties.

Source: UNEP 2001

covering 12 chemicals. The control provisions call for eliminating production and use of intentionally produced POPs and eliminating unintentionally produced POPs where this is feasible (UNEP 2001).

Since the Stockholm Conference, the global chemicals industry has grown almost ninefold and an annual growth rate of about 3 per cent is expected to continue over the next three decades, with a considerable increase in trade (OECD 2001). This will increase the risk of exposing an increasing number of people and the environment to new chemicals and the potential for the emergence of new diseases of chemical origin.

Information about the release of chemicals into the environment is now much more widely available than used to be the case. North America has led action in this area, in particular with the US Toxics Release Inventory (TRI 2001) enacted through the Emergency Planning and Community Right-to-Know Act (EPCRA) in the United States in 1986. EPCRA's purpose is to inform communities and citizens of chemical hazards in their areas. The Act requires businesses to report the locations and quantities of chemicals stored on-site to state and local governments. Through EPCRA, the US Congress mandated that a Toxics Release Inventory (TRI) be made public. TRI provides citizens with information about potentially hazardous chemicals and their use so that communities have more power to hold companies accountable and make informed decisions about how toxic chemicals are to be managed.

The Millennium Summit

Environmental issues featured prominently during the United Nations Millennium Summit hosted by Secretary-General Kofi Annan in New York in 2000 (see box below). While recognition of the importance of environmental issues at this summit was encouraging, the actual progress report was not. The Secretary-General was blunt in his comments regarding environmental management, stating that the international community was failing to provide future generations the freedom to 'sustain their lives on this planet. On the contrary', he said, 'we have been plundering our children's future heritage to pay for environmentally unsustainable practices in the present' (UN 2000).

Climate and energy consumption

In early 2001, IPCC announced that the evidence for anthropogenic climate change was getting stronger, that warming was happening faster, and that the consequences looked more severe than first predicted. The expert panel, made up of thousands of scientists

UN Secretary-General's key proposals presented to the Millennium Summit

Freedom from want: the Development Agenda

Heads of State or Government are urged to take action in the following areas:

- *Poverty:* to halve, by 2015, the proportion of the world's people (currently 22 per cent) whose income is less than one dollar a day.
- *Water:* to halve, by 2015, the proportion of people who do not have access to safe drinking water (currently 20 per cent).
- *Education:* to narrow the gender gap in primary and secondary education by 2005; and to ensure that, by 2015, all children complete a full course of primary education.
- *HIV/AIDS*: to halt, and begin to reverse, the spread of HIV/AIDS by 2015 by:
  — adopting as an explicit goal the reduction of HIV infection rates in persons 15 to 24 years of age, by 25 per cent within the most affected countries before the year 2005, and by 25 per cent globally before 2010;
  — setting explicit prevention targets: by 2005 at least 90 per cent, and by 2010 at least 95 per cent, of young men and women must have access to HIV-preventive information and services; and
  — urging every seriously affected country to have a national plan of action in place within one year of the Summit.
- *Clearing the Slums:* to endorse and act upon the *Cities Without Slums* plan launched by the World Bank and United Nations to improve the lives of 100 million slum dwellers by 2020.

A sustainable future: the Environmental Agenda

Heads of State or Government are urged to adopt a new ethic of conservation and stewardship; and, as first steps:

- *Climate Change:* to adopt and ratify the Kyoto Protocol, so that it can enter into force by 2002, and to ensure that its goals are met, as a step towards reducing emissions of greenhouse gases.
- *Green Accounting:* to consider incorporating the United Nations system of 'green accounting' into their own national accounts, in order to integrate environmental issues into mainstream economic policy.
- *Ecosystem Assessment:* to provide financial support for, and become actively engaged in, the Millennium Ecosystem Assessment, a major international collaborative effort to map the health of the planet.
- *Earth Summit +10:* to prepare the ground for the adoption of concrete and meaningful actions by the world's leaders at the 10-year follow-up to the Earth Summit in 2002.

Source: UN 2000

from around the world, predicted that average temperatures would rise between 1.4 and 5.8°C over the 21st century. IPCC states that: 'There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities … Furthermore, it is very likely that the 20th century warming has contributed significantly to the observed sea level rise, through thermal expansion of sea water and widespread loss of land ice' (IPCC 2001).

The implications of this faster rise in global temperatures cut across broad areas of economic, social and environmental concern and add urgency to the need for controls on factors contributing to global warming. The first and most important of these is energy consumption. Only in Europe is the per capita consumption of fossil fuels falling, and there only slowly.

El Niño

Increasing attention is also being paid to El Niño as a result of a particularly severe episode during 1997–98 which caused millions of dollars worth of damage. It also gave rise to a major study by several institutions of the lessons learned from that episode and of what could be done to mitigate the effects of future El Niños (see box right).

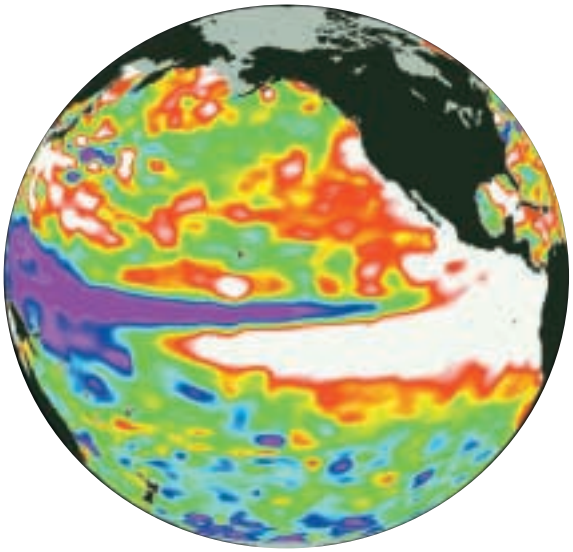
Scientific developments

In the early years of the 3rd millennium, scientific advances continue to provide ethical and environmental challenges. A scientific breakthrough whose impact on humankind and ultimately the environment is still uncertain is the mapping of the human genome. The benefits of such mapping include learning the underlying causes of thousands of genetic diseases and predicting the likelihood of their occurrence in any individual. Genetic information might also be used to predict sensitivities to various industrial and environmental agents. While concerns about misuse and loss of personal privacy exist, many of the ramifications of mapping the human genome will be recognized only as science and technology merge in the future applications of this new tool (Human Genome Project 1996).

Also controversial is the increasing use of genetically modified organisms (GMOs).

As described in *GEO-2000* (UNEP 1999), the rapid evolutionary character of microbes and viruses,

Sea levels during the 1997–98 El Niño



Satellite image records sea levels in the Pacific on 10 November 1997. El Niños are characterized by higher sea levels (red and white areas) on the South American side of the southern Pacific, lower levels (blue areas) on the other side

Source: Topex/Poseidon NASA

Once burned, twice shy: the 1997–98 El Niño

Thousands of human casualties and tens of billions of dollars in economic damage will continue to befall the world's developing countries every two to seven years until an investment is made to improve forecasting and preparedness against El Niño, according to a new international study. The study was developed by teams of researchers working in 16 countries in Latin America, Asia and Africa. Four United Nations organizations collaborated in the preparation of the study – UNEP, the UN University, WMO and the International Strategy for Disaster Reduction – together with the US-based National Center for Atmospheric Research.

More reliable El Niño forecasts and the ability of governments to react quickly to them are critical. In the absence of such capabilities, vulnerable people, infrastructure and economies in many parts of the world will continue to suffer periodically from El Niño events through floods, fires, drought, cyclones and outbreaks of infectious disease.

Few forecasters came close to forecasting El Niño's onset in mid-1997 and none was able to grasp the magnitude of the 'El Niño of the Century' until it was well under way. National and regional forecasters typically provided predictions of El Niño impacts that in many cases were too general to be used with confidence by national and local decision-makers. Losses from the El Niño in 1997-98 included thousands of deaths and injuries from severe storms, heat waves, fires, floods, frosts and drought. Estimates of El Niño-related damage ranged from US$32 to US$96 billion.

Source: UNU 2001

coupled with increased transport, presents potential surprises in this millennium. The reality behind this statement was revealed by the discovery of bovine spongiform encephalopathy (mad cow disease) in the United Kingdom and other parts of Europe, and then more dramatically with the spread of foot-and-mouth disease in the United Kingdom.

The effects of increased transport of livestock and feed material across political boundaries intensified the spread of these diseases, leading to the destruction of many farm animals and concern for transmission to and from wild populations. Although foot-and-mouth is commonly found in many developing countries, it is the industrialized nations that feel its effects most acutely. Although the disease is rarely lethal, it is debilitating and reduces productivity. In intensive industrial agricultural systems, where profit margins are low because of overproductivity, the economic impact of the disease cannot be tolerated.

The costs of global warming

A report by Munich Re, a member of UNEP's financial services initiative, has estimated the potential financial consequences of the IPCC predictions:

- Losses due to more frequent tropical cyclones, loss of land as a result of rising sea levels and damage to fishing stocks, agriculture and water supplies, could cost more than US$300 000 million annually.
- Globally some of the biggest losses would be in the area of energy. The water industry worldwide faces US$47 000 million of extra cost annually by 2050. Agriculture and forestry could lose up to US$42 000 million worldwide as a result of droughts, floods and fires if carbon dioxide levels reach twice their pre-industrial concentrations.
- Flood defence schemes to protect homes, factories and power stations from rising sea levels and storm surges may cost US$1000 million annually.
- Ecosystem losses, including mangrove swamps, coral reefs and coastal lagoons, could amount to more than US$70 000 million by 2050.

Source: Berz 2001

Globalization

Globalization has been described by some as the new Industrial Revolution. There are fears that it could result in a dangerous polarization between people and countries benefiting from the system and those that are merely passive recipients of its effects.

In its *Human Development Report 1999*, UNDP states that the one-fifth of the world's people living in the highest income countries have 86 per cent of world GDP, 82 per cent of world export markets, 68 per cent of foreign direct investment, and 74 per cent of telephone lines (UNDP 1999). The bottom one-fifth, in the poorest countries, have about 1 per cent in each category. In the 1990s, more than 80 per cent of foreign direct investment in developing countries and those of Central and Eastern Europe went to just 20 countries, notably China.

The main engines of globalization are the transnational corporations, transnational media organizations, intergovernmental organizations and NGOs (Riggs 2000).

Globalization is more than the flow of money and commodities — it is the growing interdependence of the world's people through 'shrinking space, shrinking time and disappearing borders' (UNDP 1999). This offers great opportunities for enriching people's lives and creating a global community based on shared values. But markets, the UNDP report argues, have been allowed to dominate the process, and the benefits and opportunities have not been shared equitably.

One response to the rapid growth of economic globalization has been massive civil society demonstrations in many parts of the world. The November 1999 demonstration at the World Trade Organization (WTO) meeting in Seattle in which thousands of people campaigned against globalization was a major event. Increased public awareness was also apparent at the World Bank and International Monetary Fund meetings in Prague in September 2000, and at other meetings since.

These demonstrations show that citizens across the globe are insisting on being heard, and are demanding the implementation and enforcement of acceptable trade, labour and environmental standards worldwide. Many international organizations involved in regulating the global economy are now having to adjust their policies to include the participation of civil society in their activities. The irony of globalization and increased public awareness is that consumption by people in industrialized countries continues to grow, and poverty in developing regions continues to worsen.

Water

Water will play a leading role in the agenda of the new millennium. The World Water Forum held in The Hague in March 2000 led to the adoption of 'water visions' for different regions of the world, helping to define the water agenda for the 21st century. About 6 000 people participated in the global forum but

One of the world's largest dams — the Itaipu hydroelectric plant in Brazil. The future of such projects is called in question by a new report

Source: Julio Etchart, Still Pictures

thousands more had been involved in regional preparatory meetings. It is hoped that mass participation in these events will keep issues of water quality and quantity at the forefront of the environment agenda so that the new regional visions can be successfully implemented.

Over the previous decades, large dams had emerged as one of the most significant and visible tools for the management of water resources. In November 2000, the World Commission on Dams released its report *Dams and Development: A New Framework for Decision-Making* which stated that over the past 50 years, dams have fragmented and transformed the world's rivers, displacing 40-80 million people in different parts of the world (WCD 2000). The report questions the value of many dams in meeting water and energy development needs when compared with alternatives. It thus represents a significant change of view of the value of dams, and may pave the way for different approaches to water development in the future.

Assessments and early warning

The Millennium Ecosystem Assessment (MA), launched on World Environment Day 2001, will examine the processes that support life such as the world's grasslands, forests, rivers and lakes, farmlands and oceans. The US$21 million, four-year effort will involve 1 500 of the world's leading scientists (MA 2001).

'The Millennium Ecosystem Assessment will map the health of our planet, and so fill important gaps in the knowledge that we need to preserve it,' said UN Secretary-General Kofi Annan in announcing the study. 'All of us have to share the Earth's fragile ecosystems and precious resources, and each of us has to play a role in preserving them. If we are to go on living together on this earth, we must all be responsible for it.'

The study was launched to provide decision-makers with authoritative scientific knowledge concerning the impact of changes to the world's ecosystems on human livelihoods and the environment. It will provide governments, the private sector and local organizations with better information about steps that can be taken to restore the productivity of the world's ecosystems.

The MA has been recognized by governments as a mechanism to meet the assessment needs of three international environmental treaties — the UN

Convention on Biological Diversity, the Ramsar Convention on Wetlands and the UN Convention to Combat Desertification.

Moving forward, making progress

A new spirit of collaboration and participation is apparent in the early years of the 21st century — likened by some to the 'Stockholm spirit of compromise'. With the World Summit on Sustainable Development scheduled for 2002 in Johannesburg, there is renewed hope for adoption of meaningful and effective actions by the world's major decision makers. The following four chapters, presenting global and regional environmental assessments, insights into environmental change and human vulnerability, scenarios for the future and implications for policy making, are intended as a substantive contribution to this debate.

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