

defining characteristics of environmental politics is the awareness of such interconnections and of the need to 'think globally—act locally'. NGOs have been very active in this respect, as shown in Chapter 19 of this book.

Despite the global dimensions of environmental change, an effective response still has to depend upon a fragmented international political system of over 190 sovereign states. Global environmental governance consequently involves bringing to bear inter-state relations, international law, and international organizations in addressing shared environmental problems. Using the term 'governance'—as distinct from government—implies that regulation and control have to be exercised in the absence of central government, delivering the kinds of service that a world government would provide if it were

to exist. You should refer to Chapter 17 for the essential concepts employed in regime analysis, which is commonly applied in the study of international governance.

### Key Points

- The diverse use and degradation of the Earth's resources is unbalanced and costly compared to resources available for use by the poorest of populations.
- There are vast initiatives between rich and poor to deal with the Earth's resources and the ecological challenges they pose on it.
- The response at the international level is to attempt to provide global environmental governance in a system of sovereign states that involves international cooperation.

## Environmental issues on the international agenda: a brief history

Before the era of globalization there were two traditional environmental concerns: conservation of natural resources and the damage caused by pollution. Pollution, like wildlife, does not respect international boundaries and action to mitigate or conserve them sometimes had to involve more than one state. There were also numerous, mostly unsuccessful, attempts to regulate exploitation of maritime resources lying beyond national jurisdiction, including several multi-lateral fisheries commissions. The 1946 International Convention for the Regulation of Whaling and its International Whaling Commission (IWC) offer an interesting move away from the original goal of conserving the whaling industry by regulating catches, towards the preservation of the Great Whales *per se* through declaring an international moratorium on whaling. This shift still generates bitter confrontation between NGOs, most IWC members, and the small number of nations—Japan, Norway, and Iceland—that wish to resume commercial whaling.

Post-Second World War global economic recovery brought with it evidence of damaging pollution of the atmosphere, of watercourses, and of the sea, notably the Mediterranean, leading to international agreements in the 1950s and 1960s covering such matters as discharges

from oil tankers. This worthy activity was, though, hardly the stuff of great power politics. Such 'apolitical' matters were the domain of new United Nations Specialized Agencies, like the Food and Agriculture Organization, but were hardly central to diplomacy at the UN General Assembly (UNGA) in New York. This neglect was reflected in academic writing at the time, as exemplified by Hans J. Morgenthau's famous text, *Politics among Nations* (1955), which mentions the natural environment only as a fixed contextual factor or a constituent of national power.

However, the salience of environmental issues grew in the 1960s, and in 1968 the UNGA accepted a Swedish proposal for what became the 1972 UN Conference on the Human Environment (UNCHE) 'to focus governments' attention and public opinion on the importance and urgency of the question'. This Conference led to the creation of the United Nations Environment Programme (UNEP) and the establishment of environment departments by many governments. Yet it was already clear that for the countries of the South, constituting the majority in the UNGA, environmental questions could not be separated from their demands for development, aid, and the restructuring of international economic relations. This was the political context surrounding the emergence

## Box 20.1 Chronology

1846	International Convention for the Regulation of Whaling	1988	Establishment of the Intergovernmental Panel on Climate Change (IPCC)
1855	UK Clean Air Act to combat 'smog' in British cities	1989	Basel Convention on the Transboundary Movement of Hazardous Waste
1958	International Convention for the Prevention of Pollution of the Sea by Oil	1991	Madrid Protocol (to The Antarctic Treaty) on Environmental Protection
1959	Antarctic Treaty	1992	United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro. Publication of the Rio Declaration and Agenda 21. United Nations Conventions on Climate Change (UNFCCC) and Biological Diversity (CBD) both signed. Establishment of the Commission on Sustainable Development (CSD)
1962	Rachel Carson publishes <i>Silent Spring</i>	1995	World Trade Organisation (WTO) founded
1967	Torrey Canyon oil tanker disaster	1997	Kyoto Protocol to the UNFCCC
1968	Greenpeace founded	1998	Rotterdam Convention on Hazardous Chemicals and Pesticides
1971	At the Loureaux Meeting in Switzerland, Southern experts formulated a link between environment and development		Aarhus Convention on Access to information, Public Participation in Decision-making and Access to justice in Environmental Matters
1972	United Nations Conference on the Human Environment (UNCHE) in Stockholm. Establishment of the United Nations Environment Programme (UNEP)	2000	Cartagena Protocol on Biosafety
1973	MARPOL Convention on oil pollution from ships		Millennium Development Goals set out
	Convention on International Trade in Endangered Species (CITES)	2001	US President Bush revokes signature of the Kyoto Protocol
1979	Long Range Transboundary Air Pollution Convention (LRTAP)	2002	World Summit on Sustainable Development (WSSD), Johannesburg. Johannesburg Plan of Implementation
1980	Convention on the Conservation of Antarctic Marine Living Resources	2005	Entry into force of the Kyoto Protocol and introduction of the first international emissions trading system by the European Union
1982	UN Law of the Sea Convention (enters into force in 1984)	2006	International discussions commenced on the climate change regime after 2012
1984	Bhopal chemical plant disaster	2007	Fourth Assessment Report of the IPCC
1985	Vienna Convention for the Protection of the Ozone Layer. The Antarctic 'ozone hole' confirmed	2008	First Commitment Period of Kyoto begins
1986	Chernobyl nuclear disaster		
1987	Brundtland Commission Report. Montreal Protocol on Substances that Deplete the Ozone Layer		

of the concept of **sustainable development** (also see Ch.27) but before this was formulated by the Brundtland Commission in 1987, the environment had been pushed to the periphery of the international agenda by the global economic downturn of the 1970s and then the onset of the second cold war (see Ch.3).

Environmental degradation continued nonetheless. Awareness of new forms of transnational pollution, such as 'acid rain', joined existing concerns over point-source pollution (when the pollutant comes from a definite source), followed by a dawning scientific realization that some environmental problems—the thinning of the stratospheric ozone layer and the possibility of climate change—were truly global in scale. The attendant popular

concern over such issues and the relaxation of East-West tension created the opportunity for a second great conference, for which the connection between environment and development had been explicitly drawn through the Brundtland Commission's notion of sustainable development. Though subject to many subsequent interpretations, its political essence is an accommodation between the environmental concerns of developed states and the development demands of the South, without which there could have been no Earth Summit and no Rio process.

The 1992 UN Conference on Environment and Development (UNCED) or 'Earth Summit' was the largest international conference so far held, raising the profile of the environment as an international issue.

### Key Points

- In the late nineteenth and early twentieth century international environmental politics was strictly limited, but from around 1960 its scope expanded as environmental problems acquired a transnational and then a global dimension.
- The process was reflected in and stimulated by the three great UN conferences of 1972, 1992, and 2002, whose most important role

was to make the connection between the international environmental and development agendas, as expressed in the concept of sustainable development.

- International environmental politics reflected the economic cycle in developed countries and relied heavily on scientific knowledge.

## The functions of international environmental cooperation

International cooperation establishes governance regimes to regulate transboundary environmental problems and sustain the global commons. Regimes encompass more than formal agreements between states, although these are very important (see Ch. 17). Moreover, there are other functions and consequences of international cooperation beyond regime formation.

The pursuit of power, status, and wealth are rarely absent from international deliberations. This is often neglected in discussions of international environmental cooperation, even though many of the great international gatherings and even some of the more mundane ones clearly reflect struggles for national and organizational advantage. Organizations seek to maintain their financial and staff resources as well as their place within the UN system. UNEP, for example, despite extensive debates over granting it the higher and more autonomous status of a UN Specialized Agency, remains a mere programme. Some suspect that much of the activity at international environmental meetings is simply to issue declarations convincing domestic publics that something is being done, even if environmental conditions continue to deteriorate.

### Transboundary trade and pollution control

When animals, fish, water, or pollution cross national frontiers the need for international cooperation arises and the regulation of transboundary environmental problems is the most long-established function of international cooperation, reflected in hundreds of multilateral, regional, and bilateral agreements providing for joint efforts to manage resources and control pollution.

An important example is provided by the Convention on Long-Range Transboundary Air Pollution (LRTAP) and its various protocols. They responded to the growing problem of acidification and so-called 'acid rain' by providing mechanisms to study atmospheric pollution problems in Europe and North America and secure commitments by the states involved to control and reduce their emissions. Another set of multilateral environmental agreements (MEAs) regulates the transboundary movement of hazardous wastes and chemicals in the name of protecting human health and the environment. It requires that when hazardous chemicals and pesticides are traded, the government from whose territory the exports originate shall obtain the 'prior informed consent' of the importing country.

Controlling, taxing, and even promoting trade has always been one of the more important functions of the state, and trade restrictions can also be used as an instrument for nature conservation. The 1973 Convention on International Trade in Endangered Species (CITES) does this by attempting to monitor, control, or prohibit international trade in species (or products derived from them whose continued survival might be put at risk by the effects of such trade). Species at risk are 'listed' in three appendices to the Convention; some 600 animal and 300 plant species currently enjoy the highest level of protection (a total ban) through listing on Appendix I, though decisions on the 'up-listing' and 'downlisting' of species are sometimes controversial, as in the case of the African Elephant.

The use of trade penalties and restrictions by MEAs has been a vexed issue when the objective of environmental protection has come into conflict with the rules of the GATT/World Trade Organization (WTO) trade regime.

## Introduction

Although humankind as a whole now appears to be living well above Earth's carrying capacity, the ecological footprints of individual states vary to an extraordinary extent. See, for example, the unusual map of the world (Fig. 20.1), where the size of countries is proportionate to their carbon emissions. Indeed, if everyone were to enjoy the current lifestyle of the developed countries, more than three additional planets would be required.

This situation is rendered all the more unsustainable by the process of globalization, even though the precise relationship between environmental degradation and the over-use of resources, on the one hand, and globalization, on the other, is complex and sometimes contradictory. Globalization has stimulated the relocation of industry, population movement away from the land, and ever-rising levels of consumption, along with associated emissions of effluents and waste gases. While often generating greater income for poorer countries exporting basic goods to developed country markets, ever freer trade can also have adverse environmental consequences, by disrupting local ecologies and livelihoods.

On the other hand, there is little doubt that globalization has stimulated a rise in the human carrying capacity standards, and it has even been argued that the high levels of affluence have brought about environmental improvements, just as North America and other rich nations became wealthier. Economists claim that globalization, opening up of markets, and market efficiency can reduce pollution, provided that the environmental damage associated with production is properly factored into its market price. Similarly, globalization has promoted the sharing of knowledge and the influence of non-governmental organizations (NGOs) on global environmental politics. Whatever the balance sheet of globalization, the resources upon which human beings depend for survival, such as food, water, a clean atmosphere, and a stable climate, are now under serious threat.

Global problems may need global solutions, and this is a fundamental requirement for global environmental governance, yet local or regional action remains a vital aspect of responses to many problems. In this



such a problem arose when the international community attempted to address the controversial question of the new biotechnology and genetically modified organisms (GMOs). There was much resistance to the claims of biotechnology corporations that had made huge investments in developing GMO seed, pharmaceutical, and food products, and argued that these innovations had positive environmental and development potential (through reduced pesticide use and increasing crop yields). European public supermarkets, and some developing countries were very wary of GMO technologies on safety and other grounds, leading to pressure for controls on their transboundary movement and the negotiation of the Biosafety Protocol to the Convention on Biological Diversity (CBD) that had been agreed at Rio in 1992. The resulting Cartagena Protocol was signed in 2000 and establishes an advanced informed agreement procedure between governments to be applied when GMOs are transferred across frontiers for ultimate release into the environment. The criteria to guide decisions on blocking imports reflected a precautionary approach rather than insistence on conclusive scientific evidence of harmfulness. Much of the argument in negotiating the Cartagena Protocol concerned the relationship of these new environmental rules to the requirements of the trade regime and arose from the concern of the USA and other potential GMO exporters that the Protocol would permit a disguised form of trade protectionism. Whether the WTO trade rules should take precedence over the emerging biosafety rules was debated at length until the parties agreed to avoid the issue by providing that the two sets of rules should be 'mutually supportive'.

### Norm creation

The development of international environmental law and associated norms of acceptable behaviour has been both rapid and innovative over the last thirty years. Some of the norms mentioned above are in the form of quite technical policy concepts that have been widely documented and adopted as a result of international discussion. The precautionary principle has gained increasing but not universal currency. Originally coined by German policy-makers, it states that where there is a likelihood of environmental damage, banning an activity should not require full and definitive scientific proof. As we saw in the example of GMOs, the latter has tended to be the requirement in trade law (and indeed in UK environmental policy before European Community directives on precaution took hold). The notion of 'prior informed consent' has also been promoted alongside that of the 'polluter pays'. In the longer term, one of the key effects of the climate change regime (dealt with in detail below) may well be the dissemination of new approaches to pollution control such as emissions trading and joint implementation.

The UN Earth Summits were important in establishing environmental norms. The 1972 Stockholm Conference produced its 'Principle 21', which combines sovereignty over national resources with state responsibility for external pollution. This should not be confused with Agenda 21, issued by the 1992 Rio Earth Summit, a complex 40-chapter document of some 400 pages that took two years to negotiate in UNCED's Preparatory Committee. Agenda 21 was frequently derided, not least because of its non-binding

### Box 20.3 Trade and the environment

The issue of the relationship between trade and environmental degradation is much broader than disputes over the relationship between the World Trade Organization (WTO) and particular multilateral environmental agreements (MEAs). Globalization is partly fueled by the efforts of the GATT/WTO to open up protected markets and expand world trade. Many green activists argue that globalization damages the environment by destroying local sustainable agriculture and by encouraging the environmentally damaging long-range transport of goods. The rearrangement of patterns of production and consumption has indeed been one of the hallmarks of globalization. Liberal economists and apologists for the WTO claim that if the 'externalities', such as the pollution caused, can be factored into the price of a product, then trade can be beneficial to

the environment through allowing the most efficient allocation of resources. In this view, using trade restrictions as a weapon to promote good environmental behaviour would be undesirable and, indeed, the rules of the WTO allow only very limited restrictions on trade on environmental grounds (GATT XXIV) and certainly not on the basis of 'process and production methods'. A number of trade dispute cases have largely confirmed that import controls cannot be used to promote more sustainable or ethical production abroad, including the famous 1991 GATT Tuna-Dolphin case which upheld Mexican and EC complaints against US measures blocking imports of tuna caught with the methods that kill dolphins as by-catch. Developing country governments remain resistant to green trade restrictions which are disguised form of protection for developed world industries.

### Box 20.4 The tragedy of the commons—local and global

Hardin (1968) who coined the term 'tragedy of the commons' based on his observation of an inherent conflict between individual and collective interest and **rationality** in the use of resources that is held in common. Hardin argued that individual users of a resource, such as 'open access' resource will often bring rationality to the pasture, fish stock (common pool), or river. However, if the resource suffers ecological collapse through over-exploitation, no problem will be perceived if the 'carrying capacity' of the resource is sufficient for all to take as much as

they require, but this is rarely true. The case that is the reality of modern exploitation and production practices, and recent scientific advances have sharpened Hardin's appreciation of the full extent of the damage imposed on the Earth's ecosystems. Hardin's solution to the dilemma—enclosure of the commons through privatization or nationalization—has only limited applicability in the case of the global commons. For two main reasons, it is physically or politically impossible to enclose them and there is no central world government to regulate their use.

Within the jurisdiction of governments it may be possible to solve the problem by turning the common into private property or nationalizing it, but for the global commons such a solution is, by definition, unavailable. Therefore the function of international cooperation in this context is the very necessary one of providing a substitute for **world government**, to ensure that global commons are not misused and subject to tragic collapse. This has been done through creating regimes for the governance of the global commons, which have enjoyed varying degrees of effectiveness. Many of the functions discussed above can be found in the global commons regimes, but their central contribution is a framework of rules to ensure mutual agreement between users about acceptable standards of behaviour and levels of exploitation, consistent with sustaining the ecology of the commons.

Enforcement poses difficult challenges due to the incentives for users to 'free ride' on these arrangements by taking more than a fair share, or refusing to be bound by the collective arrangements. This can potentially destroy regimes because other parties will then see no reason to restrain themselves either. In local commons regimes, acquisitive neighbours might deter rule-breaking and a similar role at the international level can be performed by NGOs. However, it is very difficult to enforce compliance with an agreement on the part of sovereign states, even when they have undertaken to comply—a fundamental difficulty for international law and hardly unique to environmental regimes (see Ch.16). Mechanisms have been developed to cope with this problem but how effective they, and the environmental regimes to which they apply, can be is hard to judge, as this involves determining the extent to which governments are in legal and technical **compliance** with their international obligations. Moreover, it also involves estimating the extent to which

state behaviour has actually been changed as a result of the international regime concerned. Naturally, the ultimate and most demanding test of the effectiveness of global commons regimes is whether or not the resources or ecologies concerned are sustained or even improved.

Some of the first and least successful global commons regimes were the various fisheries commissions for the Atlantic and elsewhere, which sought agreement on limiting catches in order to preserve stocks. Pollution from ships has been controlled by MARPOL (an international marine environmental convention—short for marine pollution) and there is a patchwork of other treaties to manage such issues as the dumping of radioactive waste at sea. For the Antarctic, a remarkably well developed set of rules designed to preserve the ecological integrity of this last great wilderness has been devised within the framework of the 1959 Treaty. The Antarctic regime is a rather exclusive club: the Treaty's 'Consultative Parties' include the states that had originally claimed sovereignty over parts of the area while new members of the club have to demonstrate their involvement in scientific research on the frozen continent. There is a comprehensive agreement on conserving the marine ecosystem around the continent and in the late 1980s preparations for regulated minerals mining were defeated and replaced by a new Protocol on Environmental Protection including a 50-year mining ban. The success of a restricted group of countries in governing this crucial oratory for understanding global environmental change with only a minimal level of formal organization, demonstrates what can be achieved by international action.

Antarctic science was crucial to the discovery of a problem which resulted in what is perhaps the best example of effective international action to govern global commons. In 1985, a British Antarctic Survey expedition provided definitive evidence of serious thinning of the stratospheric ozone layer. A diminishing ozone

## Box 20.2 Sustainable development

The 50 separate definitions of sustainable development have been reduced to classic statement was provided by the 1987 Brundtland Commission Report.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (Brundtland et al. 1987: 43)

Behind it lay an implicit recognition of limitations. In future growth which was social, technological, and environmental, its underlying emphasis was placed upon needs, and the highest priority was given to those needs experienced by the world's poor. Central to the concept was the idea of fairness between generations, as well as

between the rich and poor currently enjoying the planet.

By the time of the 1992 World Summit the subject had become widely agreed.

To ensure a balance between sustainable development, social development and environmental protection, as well as progress and mutually reinforcing components of sustainable development. (UNGA, A/47/32/Annex, 11 December 1992)

Ensuring environmental sustainability by integrating sustainable development principles into national decision-making, was the seventh of eight UN Millennium Development Goals agreed in 2000.

including several significant documents and agreements, such as Agenda 21 and international conventions on climate change and the preservation of biodiversity. The event's underlying politics were captured in its title—'conference on environment and development'—where the most serious arguments concerned aid pledges to finance the environmental improvements under discussion. A process was created at the UN to review the implementation of the Rio agreements, including meetings of the new Commission on Sustainable Development (CSD) and a Special Session of the UNGA in 1997.

On UNCED's tenth anniversary in 2002, the World Summit on Sustainable Development (WSSD) was held in Johannesburg. The change of wording indicated how conceptions of environment and development had shifted since the 1970s. Now discussion was embedded in recognition of the importance of globalization and of the dire state of the African continent. Poverty eradication was clearly emphasized, along with practical progress in providing clean water, sanitation, and agricultural improvements. One controversial element was the role to be played in such provision by private-public sector partnerships.

While the UN conferences marked the stages by which the environment entered the international political mainstream, they also reflected underlying changes in the scope and perception of environmental problems. As scientific understanding expanded, it was becoming a commonplace, by the 1980s, to speak in terms of global environmental change, as most graphically represented in the discovery of the 'ozone hole' and the creeping realization that human activities might be dangerously altering the global climate itself.

Alongside actual environmental degradation and advances in scientific knowledge, the international

politics of the environment has responded to the issue-attention cycle in developed countries, peaking at certain moments and then declining. The causes are complex and during the 1960s reflected the counter-cultural and radical movements of the time along with wider public reactions to a series of trends and events. The most totemic of these was Rachel Carson's hugely influential book *Silent Spring* (1962), which powerfully conjoined the conservationist and anti-pollution agendas by highlighting the damage inflicted upon bird-life by industrial pesticides like DDT. Well-publicized environmental disasters, such as the 1959 mercury poisoning at Minimata in Japan and the 1967 wreck of the *Torrey Canyon* oil tanker close to Cornish beaches, fed public concern. The failure of established political parties to embrace these issues effectively encouraged the birth of several new high-profile NGOs—Friends of the Earth, Greenpeace, and the World Wildlife Fund for Nature—alongside more established pressure groups such as the US Sierra Club and the British Royal Society for the Protection of Birds. The interest in environmental action at the international level and, indeed, most of the NGOs exerting pressure to this end were an almost exclusively developed world phenomenon. Public attention then receded until the ending of the second cold war coincided with a new concern over global environmental problems, providing the political impetus for the 1992 Earth Summit. Interest waned again during the ensuing decade, although by 2005–6 public alarm over the impact of climate change again propelled environmental issues up the political agenda. The demand was, of course, for international action and governance, but what exactly did this mean? The next section attempts to answer this question by reviewing the functions of international environmental cooperation.

threatens huge changes in living conditions and challenges existing patterns of energy use and security. There is almost no dimension of international relations that it does not actually or potentially affect and it has already become the subject of 'high politics', discussed at G8 summits and in high-level meetings between political leaders. Indeed, the UK Foreign Secretary stated in 2006 that climate change and climate security must now be a priority for foreign policy.

One way of examining the dimensions of the problem and the steps taken at the international level to respond to the threat is to make a comparison to the stratospheric ozone problem discussed in the previous section. There are, of course, some similarities. CFCs are in themselves greenhouse gases and the international legal texts on climate change make it clear that controlling them is the responsibility of the Montreal Protocol. The experience with stratospheric ozone and other recent conventions has clearly influenced efforts to build a climate change regime, as shown at the very start of climate discussions, when the same approach of a framework convention followed by protocols was adopted.

The UN Framework Convention on Climate Change (UNFCCC) was signed at the Rio Earth Summit in 1992. It envisaged the reduction of greenhouse gas emissions and their removal by sinks, hoping that a start could be made by including a commitment from the developed nations to cut their emissions back to 1990 levels by 2000. In a US election year this proved to be impossible and the parties had to be content with a non-binding declaration that an

attempt would be made. There was a broad agreement, however, for parties to draw up national inventories of sources and sinks. As this included the developed countries, many of whom were ill-equipped to fulfil this task, there was also funding for capacity building. Subsequently, the convention looked the parties agree to a continuing series of annual conferences—regularly considering possible actions and review the adequacy of existing commitments, supported by regular meetings of subsidiary scientific and implementation bodies. At the second CoP in Kyoto in 1997, the parties agreed a 'control' measure—the Kyoto Protocol involving emission reductions by developed countries facilitated by various mechanisms.

The problem faced by the framers of the Kyoto Protocol was vastly more complex and demanding than that which their counterparts at Montreal had confronted so successfully in 1987. Instead of controlling a set of industrial gases for which substitutes were available, reducing greenhouse gas emissions would affect energy, transport, and agriculture—the fundamental life in modern societies. Whether this must involve sacrifices in living standards and 'impossible' policy choices is a tough question for governments. However, there are potential economic benefits from cutting emissions through the development of alternative technologies.

A second key difference from the ozone problem experience was that, despite a quite unprecedented international scientific effort in support of the IPCC

### Box 20.7 The Kyoto Protocol

The 1997 Kyoto Protocol to the UN Framework Convention on Climate Change commits the developed countries to make an average of a 5.2 per cent cut in their greenhouse gas emissions from a 1990 baseline. Within this, different national targets were negotiated: for example, 7 per cent for the United States and 8 per cent for the European Union (EU). These were to be achieved by the first commitment period—2008–12.

#### The Kyoto mechanisms

In order to provide flexible ways of achieving these targets, three mechanisms were also agreed:

- 1 **Emissions Trading** This envisages a system where a market in rights to pollute is created. For example, efficient power plants can sell their permits to emit carbon dioxide to others and a long-term reduction in the number of permits available means that the price of carbon rises, alternative power sources become more competitive, and the overall amount of carbon dioxide emitted is reduced.
- 2 **Joint Implementation (JI)** Under this mechanism a developed country can receive credits against its own emissions reduction target by financing projects in another developed country. The argument is that a given amount of money is best spent where it can achieve the greatest reduction in world emissions of greenhouse gases. Countries with very efficient power plants will have an incentive to use this scheme.
- 3 **The Clean Development Mechanism (CDM)** Applies the same principle to relations between developed and developing countries. This has already stimulated a good deal of interest in China and elsewhere because it is a source of new funds and technology transfer.

## Climate change

Like the ozone layer problem, climate change and the enhanced greenhouse effect had long been debated among scientists, but only in the late 1980s did sufficient international consensus emerge to stimulate action. There were still serious disagreements over the likelihood that human-induced changes in mean temperatures were altering the global climate system. The greenhouse effect is essential to life on Earth. Greenhouse gases (ghgs) in the atmosphere (see Fig. 20.2) insulate the Earth's surface by trapping solar radiation. Before the industrial revolution, carbon dioxide concentrations in the atmosphere were around 280 parts per million, and have since grown exponentially (to a 2005 figure of 379 ppm) due to burning of fossil fuels and reductions in some of the 'sinks' for carbon dioxide—notably forests. Methane emissions have also risen with the growth of agriculture (IPCC 2007: 11). The best predictions of the IPCC are that, if

nothing is done to curb intensive fossil fuel emissions, there will be a likely rise in mean temperatures of the order of 2.4–6.4°C by 2099. The exact consequences of this are difficult to predict on the basis of current climate modelling but sea level rises and turbulent weather are generally expected. According to the EU, to avoid climate catastrophe, it would be necessary to hold temperature increases below 2°C by keeping atmospheric CO<sub>2</sub> concentrations below 550 ppm. In the first decade of the twenty-first century unusual weather patterns, storm events, and the melting of polar ice sheets have added a dimension of public concern to the fears expressed by the scientific community.

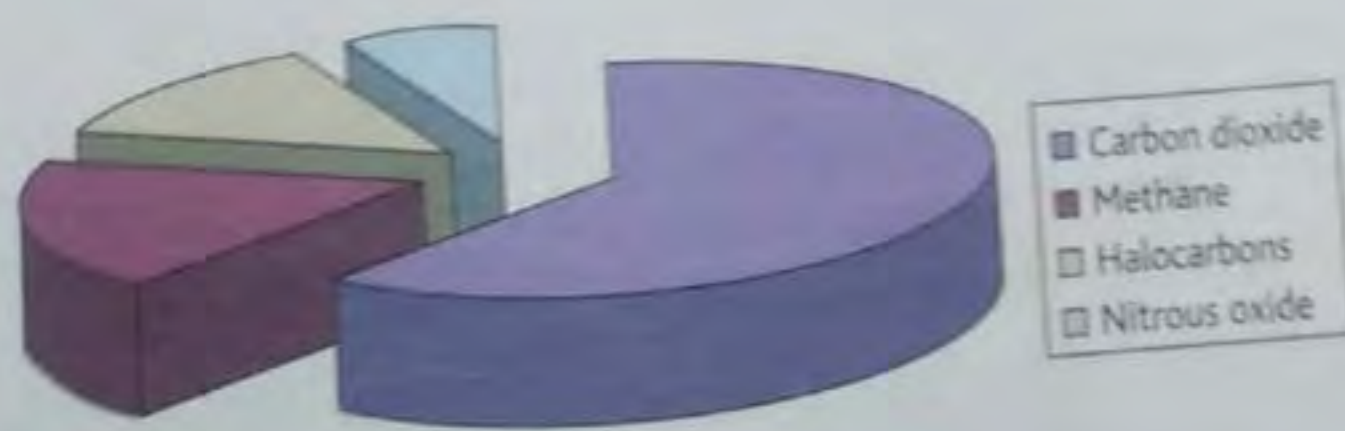
As a common problem, climate change is on a quite different scale from anything that the international system has previously encountered. Climate change is really not a 'normal' international environmental problem—it

### Box 20.6 The Intergovernmental Panel on Climate Change

Set up in 1988 under the auspices of the World Meteorological Organization (WMO) and UNEP, the Intergovernmental Panel on Climate Change (IPCC) brings together the majority of the world's climate change scientists in three working groups: on climate science, impacts, and economic and social dimensions. They have produced assessment reports in 1990, 1995, and 2001, which are regarded as the authoritative scientific statements on climate change. The reports are carefully and cautiously drafted with the involvement of government representatives and represent a consensus view.

The Fourth Assessment Report, published in February 2007, concluded that 'warming of the climate system is unequivocal, as is

now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global sea levels' (IPCC 2007: 4). Most of the temperature increase is very likely due to the observed increase in anthropogenic greenhouse gas concentrations' (*ibid.*: 8, original italics). The use of words is significant here for the IPCC defines 'very likely' as being more than 90 per cent certain. This represents a change from the previous report which had only estimated that human activity was 'likely' or more than 66 per cent certain to be responsible for temperature increases.



character, but this internationally agreed compendium of environmental 'best practice' subsequently had a wide impact and remains a point of reference. For example, many local authorities have produced their own 'local Agenda 21s'. Under the Aarhus Convention (1998), North American and European governments agreed to guarantee to their publics a number of environmental rights, including the right to obtain environmental information held by governments, to participate in policy decisions, and to have access to judicial processes.

#### Capacity building

Although not a specific norm of the type dealt with above, **sustainable development** provides a normative framework reflecting an underlying deal between developed and developing worlds. Frequent North-South arguments since Rio about the levels of aid and technology transfer that would allow developing countries to achieve sustainable development have seen many disappointments and unfulfilled pledges. In 1991, UNEP, UNDP, and the World Bank created the **Global Environmental Facility (GEF)** as an international mechanism specifically for funding environmental projects in developing countries. In 2003-6 it attracted donations of around US\$3 billion. Most environmental conventions now aim at **capacity building** through arrangements for the transfer of funds, technology, and expertise, because most of their member states simply lack the resources to participate fully in international agreements. The stratospheric ozone and climate change regimes aim to build capacity and could not exist in their current form without providing for this function.

#### Scientific understanding

International environmental cooperation relies upon shared scientific understanding, as reflected in the form of some important contemporary environmental regimes. An initial **framework convention** will signal concern and establish mechanisms for developing and sharing new scientific data, thereby providing the basis for taking action in a **control protocol**. Generating and sharing scientific information has long been a function of international cooperation in such public bodies as the World Meteorological Organization (WMO) and myriad academic organizations such as the International Council for the Exploration of the Seas (ICES) and the International Union for the Conservation of Nature

(IUCN). Disseminating scientific information on an international basis makes sense but it needs funding from governments because, except in areas like pharmaceutical research, the private sector has no incentive to do the work. International environmental regimes usually have standing scientific committees and subsidiary bodies to support their work. Perhaps the greatest international effort to generate new and authoritative scientific knowledge has been in the area of climate change, through the Intergovernmental Panel on Climate Change (IPCC, see Box 20.6 below).

#### Governing the commons

The global commons are usually understood as accessible resources that are not under sovereign jurisdiction, that they are not owned by anybody. The high seas and the deep ocean floor come within this category (beyond the 200-mile exclusive economic zone), as does Antarctica (based upon the 1959 Antarctic Treaty.) Outer space is another highly important common, its use being vital to modern telecommunications, broadcasting, navigation, and surveillance. Finally, there is the global atmosphere. The commons all have an environmental dimension, not only as resources but also as 'sinks' for waste products that have been increasingly degraded. The fish and whale stocks in the high seas have been relentlessly over-exploited to the point where some species have been wiped out and long-term protein sources for human beings are imperilled. The ocean environment has been polluted by land-based effluent and oil and other discharges from ships. It has been a struggle to maintain the unique wilderness of the Antarctic in the face of increasing pressure from human beings, and even outer space now faces an environmental problem in the form of increasing amounts of orbital debris left by decades of satellite launches. Similarly, the global atmosphere has been degraded in a number of highly threatening ways, through damage to the stratospheric ozone layer and, most importantly, by the enhanced greenhouse effect now firmly associated with changes to the Earth's climate. This is often characterized as a 'tragedy of the commons'. Where there is unrestricted access to a resource owned by no one, there will be an incentive for individuals to exploit it as much as they can and, if the resource is finite, there will come a time when it is ruined by over-exploitation as the short-term interests of individual users overwhelm the longer-run collective interest in sustaining the resource.

## The environment and International Relations theory

The academic study of the international relations of the environment has naturally tried to understand the circumstances under which potentially effective international cooperation can occur. The preceding discussion of climate change shows that this question remains important. Most scholars have used the concept of regime to explain characteristics of regimes—principles, norms, and **decision-making procedures**—can be applied to the environmental cases mentioned in this chapter (also see Ch.9). Those who try to explain the record of environmental regimes tend to adopt a liberal institutionalist stance, stressing as a key motivating factor the joint gains arising from cooperative solutions to the problem of providing public goods such as a clean atmosphere (see Ch.6 and Ch.7). One important addition to the regime literature, made by scholars of environmental politics, reflects the importance of **scientific knowledge** and the **roles of NGOs in this area**. Whereas orthodox regime approaches assume that behaviour is based upon the pursuit of power or interest, students of international environmental cooperation have noted the independent role played by changes in knowledge (particularly scientific understanding). This cognitive approach is reflected in studies of the ways in which transnationally organized groups of scientists and policy-makers—often referred to as **epistemic communities**—have influenced the development of environmental regimes (see Ch.9).

Liberal Institutionalist analysis of regime creation may still be the predominant IR approach to global environmental change, but it is not the only one. It makes the important, but often unspoken, assumption that the problem to be solved is how to obtain global governance in a fragmented system of sovereign states. Marxist and Gramscian writers would reject this formulation (see Ch.8). For them, the **state system** is part of the problem rather than the solution, and the proper object of study is the way in which global **capitalism** reproduces relationships that are profoundly damaging to the environment. The global spread of neo-liberal policies accelerates those features of globalization—consumerism, the relocation

of production in the South, and the transnational hoarding of resources—driving the global ecological crisis (see Ch.27). Proponents of this view also highlight the incapacity of the state to do anything other than assist such processes. It follows that the international cooperation efforts described here, at worst legitimize this state of affairs and at best provide some marginal improvements to the devastation wrought by global capitalism. For example, they would point to how free market concepts are now routinely embedded in documents of sustainable development and how the WTO rules tend to subordinate attempts to provide environmental regulation of GMOs. This argument is part of a broader debate among political theorists concerning whether the state can ever be 'greened'. The opposing view would be that within any time frame that is relevant to coping with a threat of the immediacy and magnitude of climate change, the state and international cooperation remain the only plausible mechanisms for providing the necessary global governance and we shall simply have to make the best we can with existing state and international organizational structures.

The other theoretical connection that must be made is to the pre-eminent concern of orthodox IR—security (see Ch.13). This link can be thought of in two ways. First, it is argued that environmental change contributes to the incidence of both internal conflict and even inter-state war, even though the causal connections are complex and involve many factors. It is already evident that desertification and the degradation of other vital resources are intimately bound up with cycles of poverty, destitution, and war in Africa. However, if we consider such predicted consequences of climate change as mass migrations of populations across international boundaries and acute scarcity of water and other resources, the outlines of potential future conflicts come into sharper focus (see Ch.26 and Ch.27).

The link between environmental change and armed conflict is essentially an extension of traditional thinking about security, defined in terms of collective violence and attacks upon the state. A more intriguing question is whether we should now redefine the idea of security to

(continued)

### The future of the climate change regime

In 2004 the International Energy Agency published projections that indicated how globalisation was radically changing the pattern of energy-related carbon dioxide emissions. It estimated that emissions would rise by 62 per cent by 2040 but, most significantly, that at some point in the 2020s developing world emissions would overtake those of the developed OECD countries.

It therefore became clear that to have any chance of success the future climate change regime would have to include emissions reductions by countries such as China and India, but that they in

The achievement at Kyoto was to bind most of the developed nations to a set of emissions cuts that varied (see Box 20.7). This achieved at least part of the objectives of the European Union, but it was soon seen to be wholly inadequate in terms of the projected scale of the global warming problem. In return, the European Union accepted the US proposal for the Kyoto mechanisms and has since become their enthusiastic champion. However, none of the detail of what was to become a highly complex and innovative agreement had been worked out. It was to take a series of difficult CoPs to achieve this, to write the rules for the operation of the Protocol, and, above all, to meet the demanding requirements for its ratification and entry into force. These were that 55 parties had to ratify the agreement and that these parties must also produce over 55 per cent of global emissions. It was very evident that the United States would not ratify Kyoto and the administration of George W. Bush actually denounced US signature of the Protocol, claiming it to be 'fatally flawed' and that the emissions cuts required would be impossibly damaging to the US economy. Australia also refused to ratify, thus making it essential that Russia and Japan should ratify alongside the European Union. Much of the burden of ensuring that Kyoto eventually entered into force fell upon the EU and tested the diplomatic capabilities of this new type of international actor and its component member states in what became a direct contest with the US government. The EU also pioneered the world's first international emissions trading system which commenced operation at the beginning of 2005. This was in the hope that it would not only help to achieve the EU's Kyoto target of an 8 per cent reduction in emissions by 2012, but that it would also encourage other countries to join the scheme.

turn would not even consider this if the United States was outside the Kyoto system. The fundamental question is: on what basis should countries be asked to reduce their emissions? Most radical and equitable answer would be to require a fixed carbon allowance, primarily allowing developed countries something of their share of the global allowance. A more likely alternative was to have a global carbon price that would allow the market to determine the level of emissions. This would mean that fuel becomes an economically sensitive commodity.

The climate regime has been affected by the problem. If some countries join together and make cuts which are costly, then others who do not enjoy the environmental benefits of such cuts will not pay. Thus, proceeding without the USA is very difficult, not only because it produces a quarter of global carbon dioxide emissions, but because its failure to be involved affects the willingness of others to participate and particularly the developing economies of the South. There is some hope that the Kyoto targets may be achieved by 2012, but that is uncertain. The Bush administration has absolutely opposed Kyoto and from its entry into force in 2005, discussions have been proceeding as to how the regime might be constructed that involves all industrialized and industrializing countries in a cooperative scheme to make significant cuts in their greenhouse gas emissions, but also to work together to address the effects of climate change that are already becoming evident. There is probably no more urgent or important issue for international cooperation.

### Key Points

- Climate change, because of its all-embracing nature and its roots in essential human activities, poses an enormous challenge for international cooperation.
- A limited start has been made with the Kyoto regime, but this is undermined by the absence of the United States. Much more radical arrangements will be required in the period after 2012 and these will have to involve the major developing world economies.

### Box 20.5 The Montreal Protocol and stratospheric ozone regime

The consequences of the thinning of stratospheric ozone layer include excessive exposure to UV/B radiation resulting in increased rates of skin cancer for human beings and damage to immune systems. Stratospheric ozone depletion arose from a previously unsuspected source—artificial chemicals containing fluorine, chlorine, and bromine which were involved in chemical reaction with ozone molecules at high altitudes. Most significant were the CFCs (chlorofluorocarbons), which had been developed in the 1920s as 'safe' inert industrial gases and which had been blithely produced and used over the next fifty years for a whole variety of purposes from refrigeration to air-conditioning and as propellants for hair spray. There was no universal agreement on the dangers posed by these chemicals and production and use continued—except, significantly, where the US Congress decided to ban some non-essential uses. This meant that the US chemical industry found itself under a costly obligation to find alternatives. As evidence on the problem began to mount, UNEP acted to convene an international conference in Vienna. It produced a 'framework convention'—the 1985 Vienna Convention on substances that deplete the stratospheric ozone layer—agreeing that international action might be required and that the parties should continue to communicate and develop and exchange scientific findings. These proved to be very persuasive, particularly with the added public impetus provided by the dramatic discovery of the Antarctic 'ozone hole'.

Within two years the Montreal Protocol was negotiated. In it the parties agreed to a regime under which the production and trading of CFCs and other ozone depleting substances would be progressively

phased out. The developed countries achieved this for CFCs through the annual Meetings of the Parties (MoP) have continued to work on the elimination of other substances since that time. There was considerable resistance from European chemical producers, but the industry had a real incentive to ensure international agreement because otherwise its chemical industry would remain at a commercial disadvantage. The other problem faced by the negotiators involved the developing countries, which themselves were manufacturing CFC products. The Indian delegate put it, it was the developed countries who had their responsibility to clear it up! Why should developing countries be forced to change over to higher cost CFC alternatives? There were two responses to this. The first was an article in the Protocol which gave the developing countries a period of grace. The second was a fund set up in 1990, to finance the provision of alternative non-CFC technologies for the developing world.

Illegal production and smuggling of CFCs was evident in the 1990s. This tested the monitoring and compliance systems of the Protocol (which included a possible use of trade sanctions against offenders). Nonetheless, the regime has generally proved to be effective and has continually widened the scope of its activities to deal with further classes of ozone-depleting chemicals. The damage to the ozone layer will not be repaired until the latter part of the twenty-first century, given the long atmospheric lifetimes of the chemicals involved. However, human behaviour has been significantly altered to the extent that the scientific subsidiary body of the Montreal Protocol has been able to report a measurable reduction in the atmospheric concentration of CFCs.

a global problem *par excellence*, because it protects the Earth and its inhabitants from the damaging effects of the sun's UV/B radiation. A framework convention was signed about the issue in 1985, followed in 1987 by its Montreal Protocol, imposing international controls over ozone-depleting chemicals. The further evolution of the ozone layer regime offers the paramount example of how international cooperation can achieve an effective solu-

tion to a global environmental problem. The problem was isolated, international support was mobilized, compensatory action was taken to ensure that developing countries participated, and a set of rules and procedures were developed which proved to be effective at least in reducing the concentration of the offending chemicals in the atmosphere, if not yet fully restoring the stratospheric ozone layer.

#### Key Points

- International environmental meetings serve several political objectives alongside environmental aims.
- A key function of international cooperation is transboundary regulation but attempts at environmental action may conflict with the rules of the world trade regime.
- International action is needed to promote environmental norms, develop scientific understanding, and assist the participation of developing countries.
- International cooperation is necessary to provide governance regimes for the global commons.

encompass environmental threats as well as those stemming from terrorism and war (see Ch.12). As the public becomes more sharply aware of the full magnitude of the climate problem, political discourse begins to 'securitize' the environment, that is, to characterize the environment

as a security problem. Because governments securitize security matters, people wishing to mobilize political attention and resources, and encourage painful societal adaptation, will be tempted to use additional definitions of security.

### Key Points

- The environment has been a growth area for IR scholars interested in identifying the conditions under which effective international cooperation can emerge.
- Scholars differ in the importance that they attach to various kinds of explanatory factors in their analyses of international environmental regime-building activities—crude calculations of the power and interests of key actors such as states, cognitive factors such as shared scientific knowledge, the impact of non-governmental

actors, and even the extent to which the system of states is part of the problem.

- IR scholars are also interested in the extent to which the environment in general and particular environmental problems are being seen as security issues in academic, political, and popular discourse, and whether this securitization of the environment is something to be welcomed.

## Conclusion

This chapter has shown, briefly, how environmental issues have moved from the margins to an increasingly central place on the international agenda. Climate change is now widely perceived to be at least the equal of any other issue and arguably the most important faced by humankind. The rise to prominence of environmental issues is intimately associated with globalization due to the strain that this places on the Earth's carrying capacity in terms of consumption levels, resource depletion, and rising greenhouse gas emissions. Globalization has also facilitated the growth of transnational green politics and interventions by NGOs to raise public awareness, influence international conferences, and even monitor the implementation of agreements by states.

At every stage, two distinctive aspects of international environmental politics have played a central role. The first is the complex relationship between scientific understanding of the biosphere, politics, and policy, as exemplified by the interplay between the IPCC and the actions of governments building the climate regime. The second is the connection between environment and development, which has been expressed in the shifting meanings given

to the concept of sustainable development and whose acknowledgement has been a precondition for international action on a whole range of environmental issues. Nowhere is this more evident than in debates about the future direction of the climate regime.

The international response to environmental change has been in the form of attempts to arrange global environmental governance through extensive cooperation between governments. This chapter has attempted to provide some insight into the range and functions of such regime-creating activities, which provide a basis upon which the international community is attempting to grapple with the climate problem. The academic community has generally followed this enterprise by concentrating upon the question of how regimes may be formed and sustained. More critical theorists will take a different view of the meaning of international cooperation (see Ch.9 and Ch.10). Furthermore, the challenges posed to international theory by the global environmental predicament will undoubtedly involve the need to think through the connections between security, climate change, and globalization.

through the causes and consequences of warming, there was a scientific consensus of the kind that had preceded agreement on CFCs. There was scientific disagreement over the significance of human activities and projections of future change (which has since narrowed dramatically). There were those who had an economic interest in denying or misrepresenting the science, including fossil fuel interests and producers such as Saudi Arabia. At the other end of the spectrum, the Alliance of Small Island States, some of whose members' territory would simply disappear under projected sea level rises, were desperately concerned that these projections be taken seriously.

There is a further problem in that, even though the effects of climate change are not fully understood, there is enough evidence for some nations to calculate that there might be benefits to them from climatic alterations. Regions of Russia, for example, might become more temperate with rises in mean temperature and more suitable for agricultural production (although one could equally well argue the extremely damaging effects of melting permafrost in Siberia). One generalization that could be made with certainty is that it is the developing nations,

with limited infrastructure and more populations, located at sea level, which are most vulnerable. In recognition of this and on the understanding that a certain level of warming is now inevitable, international attention has begun to shift towards the problem of adaptation to the inevitable effects of climate change as well as mitigation of its causes. Once again, the comparative simplicity of the stratospheric ozone problem is evident—the effects of ozone depletion were spread across the globe and affected North Europeans as well as those living in the southern hemisphere.

At the heart of the international politics of climate change as a global environmental problem is the structural divide between North and South (see Ch. 8 and Ch. 26). For the Montreal Protocol there was a solution available at an acceptable price, delivered through the Multilateral Ozone Fund. Once again, climate change is different. One of the most significant principles set out in the UNFCCC was that of **common but differentiated responsibilities**. That is to say that while climate change was the 'common concern' of all, it had been produced as a consequence of the development of the old industrialized nations and it was their responsibility to take the lead in cutting emissions.

### Case Study Common but differentiated responsibilities?



A key principle of the climate change regime, written into the 1992 UNFCCC, was the notion of 'common but differentiated responsibilities'. This, in effect, meant that although all nations had to accept responsibility for the world's changing climate, it was developed nations that were immediately responsible because they had benefited from the industrialization which was generally regarded as the source of the excess carbon dioxide emissions that had caused mean temperature increases (refer back to Fig. 20.1).

Consider the relationship between national carbon dioxide emissions and share of global population. The USA emits around 25 per cent of the global total but has only 4.5 per cent of global population. The Chinese figures are 14 per cent and over 20 per cent of the world's population while the 35 least developed nations emit under 1 per cent and account for over 10 per cent of the world's population.

Accordingly, the developed countries were listed in Annex 1 of the Convention and it was agreed that they, rather than developing countries, would have to lead the way in making emissions reductions.

This approach was followed in the Kyoto Protocol, where developed country parties are committed to make reductions. Even before the Protocol was agreed, the US Senate passed the Byrd–Hagel Resolution making it clear that it would not ratify an agreement where developing nations, who were now economic competitors of the United States, did not also have to make emissions reductions.

(continues)