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Protecting the Environment

Case Study: Climate Change

"Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" (IPCC 2013). Thus opens the 2013 report on the physical basis of climate change by Working Group I of the Intergovernmental Panel on Climate Change (IPCC). Other parts of this Fifth Assessment Report issued in early 2014 underscore that the human influence on climate change is clear and the rate of change is accelerating, but mitigation is still possible and averting catastrophe is still affordable (IPCC 2014). Although other recent studies have found that there may be a pause in the upward trend in temperature, the long-term effects of the trend are widespread: glaciers and sea ice are melting, the oceans are becoming acidified, hurricanes are strengthening, deserts are expanding, and weather patterns are becoming more extreme, affecting land use, most notably in Africa, coastal zones, island states, the Arctic, and Antarctica. The two greenhouse gases blamed for atmospheric heat retention, carbon dioxide (CO_2) and methane, have experienced sharp spikes after 12,000 years of relative consistency. Consensus among scientists on the extent of the problem and its link to human activity has taken almost two decades to achieve, yet debates among citizens and policymakers still continue. How much is Earth heating up? The estimates vary between 1.9 and 3 degrees centigrade. What policies need to be instituted? The burning of fossil fuel for energy, the major culprit, has long been viewed as essential for maintaining high rates of economic growth, and only slowly are sufficient supplies of alternative energy sources at affordable cost being developed.

Recognition of the problem of climate change dates back to 1988 when the IPCC was formed at the urging of bureaucrats in the World Meteorolog-

ical Organization (WMO) and the United Nations Environment Programme (UNEP). Its purpose was to synthesize the state of knowledge about climate change and recommend possible responses. Over time, the IPCC has helped to generate attention by the scientific community and create an epistemic community around the issue. Participants in the IPCC process include experts in the physical and natural sciences, engineering, social sciences, public policy, and management. Some 1,250 individuals participated in the fifth review process, completed in 2014, along with representatives of 194 governments, organized into three working groups. The 2013 scientific report, for example, synthesized some 9,200 scientific works from around the world. The IPCC process, therefore, forms a core part of climate change governance, a role that was recognized by the awarding of the 2007 Nobel Peace Prize to the IPCC and former US vice president Al Gore.

At the 1992 UN Conference on the Environment and Development, held in Rio de Janeiro, more than a hundred countries signed the UN Framework Convention on Climate Change (UNFCC)—the first step toward creating a regime to govern climate change. Framework conventions are used in situations where negotiators can agree that a problem exists and on some principles, but not on any legally binding obligations. In 1997, the UNFCC was supplemented by the Kyoto Protocol, which aimed to stabilize the concentration of greenhouse gases and required developed countries to reduce their overall greenhouse-gas emissions according to a timetable. While developing countries, including China and India, were not included in the emission limitation requirement, the norm of "common but differentiated responsibility"—that states take appropriate actions within their means—was accepted. States have several ways to meet the international targets besides just reducing emissions, for example by earning credits for carbon sinks such as forests. A Joint Implementation Mechanism was designed to enable developed countries to work with developing states to reduce emissions or enhance sinks and obtain credit for emission reductions. A market-based emissions trading system permits states, local jurisdictions, and private companies to reduce greenhouse-gas emissions below what is required or to trade the excess reductions in order to offset other types of emissions. The protocol also created the Clean Development Mechanism, which developed states and private companies can use to meet domestic emission targets by financing greenhouse-gas abatement projects in developing countries.

The Kyoto Protocol came into force in 2005, ratified by 156 states representing 55 percent of greenhouse-gas emissions, including the EU member states, Russia, Canada, China, India, and Japan. The protocol itself created very little institutional structure to aid in implementation. Authority was given to the Global Environmental Facility (GEF, discussed later) to finance projects for increasing energy efficiency and energy conservation.

From the outset, the United States raised serious objections to the Kyoto Protocol and is not a party. US concerns centered particularly on the two-tier system that excuses developing countries from obligations to reduce emissions and on the economic costs that the United States would incur in implementation. As an energy-intensive economy, the United States, which emits more than two times the average per capita CO_2 emissions of European states, proposed using its vast carbon sinks to offset the preponderance of its emission reductions, a position rejected by the Europeans. US private industry, too, initially opposed the regulatory approach of the protocol and formed the Global Climate Coalition, which opposed all mandatory limitations on greenhouse-gas emissions and sponsored publicity campaigns in support of that position. By 2001, however, views began to change, as some companies realized that climate change was affecting their operations and that the move to more energy-saving technologies could itself be profitable. Many US businesses, once opposed to Kyoto, now assert the need to go beyond Kyoto and support a successor agreement. US military analysts in 2014 acknowledged increased scientific certainty about climate change and growing evidence of the link between it and security threats such as conflicts over food and water in Africa and vulnerability of people and food supplies to rising sea levels (C. Davenport 2014).

In contrast to the United States, support for the Kyoto Protocol and steps to address climate change have been much greater within the European Union, whose then fifteen members ratified the protocol in 2002. They have created their own regulatory systems with legally binding targets and timetables. In 2005, they launched the EU Emissions Trading System, the cornerstone of EU policy and the key tool for reducing industrial greenhouse-gas emissions. States that use less than their allowance may sell credits to others that are having difficulty meeting their obligations, with fines assessed for states that fail to meet those obligations. As of 2014, the system covers more than 11,000 power stations and industrial plants, but has encountered difficulties. Economic recession in the eurozone has decreased demand for the permits and there is major overcapacity in the carbon market. EU member states utilize Kyoto mechanisms for reductions and have been strong proponents of developing renewable energy sources. For example, the Carbon Fund for Europe is a trust fund administered by the World Bank and the European Investment Bank, established to pool money for climate-friendly projects in other countries and hence earn emission credits under Kyoto's Joint Implementation Mechanism.

Still, the fifteen EU member states that originally ratified the protocol more than met their targets for emission reductions by 2012, and the EU accounts for only 10 percent of greenhouse-gas emissions worldwide. In late 2014, EU leaders agreed on a new climate and energy framework that

commits members to reducing greenhouse-gas emissions by at least 40 percent by 2030, which will increase the share of renewables in the energy mix, increase energy savings, and enhance the EU's energy infrastructure. This commitment, however, may be reviewed after the 2015 negotiations described later.

The Kyoto Protocol was intended as a relatively short-term step in the process of addressing climate change and scheduled to expire in 2012. Consequently, the UN has convened a series of annual conferences since 2007 with the initial goal of renegotiating and extending Kyoto. As negotiations dragged on, the goal became a new agreement under the UNFCC-based regime by the end of 2015. The process has been marked by the continuing North-South divide, with developing countries arguing as they have since 1997 that they should not bear the costs to their economic growth of adapting to climate change and that the developed countries who are responsible for much of the problem must demonstrate their commitment to reductions first, as well as provide financing for developing countries.

One of the major challenges is bringing the top three emitters—China (number one since 2008), the United States, and India—on board with any agreement. In 2014, China accounted for one-quarter of global greenhouse-gas emissions, and over the next twenty years those emissions are expected to grow by an amount equivalent to total US emissions (Porter 2014). China has continued to argue that as a developing country it should not have to take steps to cut its carbon emissions, although, in fact, it is doing so on its own. India's emissions are also projected at least to double over coming decades, and it has refused to offer a plan to cut them, since its priority is poverty alleviation and economic growth. In late 2014 the United States and China signed a "landmark agreement" whereby China agreed for the first time to stop its emissions from growing by 2030 and the United States announced new targets for reducing carbon emissions. As one journalist claimed, "A climate deal between China and the United States, the world's No. 1 and No. 2 carbon polluters, is viewed as essential to concluding a new global accord" (Lander 2014: A1). Another important step in the negotiations was the agreement in Lima, Peru, in late 2014 that every country—rich and poor—must take steps to reduce the burning of oil, gas, and coal by some amount, and announce how much it will cut by mid-2015. The agreement relies heavily on global peer pressure to get countries to act.

One group of states that are among the strongest advocates of urgent action on climate change is the Alliance of Small Island States. This coalition of forty-four island and low-lying coastal states and observers ranging from Antigua to Vanuatu has come together around their shared development challenges given the adverse effects of rising sea levels. They have no formal charter or institutions, and function primarily through their New York–based UN missions, with major policy decisions being taken by their ambassadors. They have, however, been a forceful lobbying group pushing for concrete action, since many of them are already experiencing effects of climate change.

The annual conferences of UNFCC parties have produced only modest steps so far. For example, at the 2007 conference in Bali, agreement was secured that China and India should be included in any follow-on agreement, but what that meant was unclear. It was agreed in 2008 meetings that states should be given credit for saving forests and expand a fund to help poorer countries adapt. In Copenhagen, the following year, the parties agreed to provide both technology and financing ($30 billion annually) to mitigate the effects of climate change. But the gap between projected need and pledges for mitigation for the developing countries remained wide. With the Kyoto Protocol already extended, the target date for concluding a new agreement is the conference in Paris in 2015. Given this history, a consensus has emerged on the dysfunctionality of the process of trying to accomplish all the goals simultaneously. One scholar describes the negotiations as having led to "sub-optimal diplomatic and environmental outcomes" in which "procedural issues frequently take precedence over substantive ones" (Elliott 2013: 848).

As one would expect, environmental NGOs have been active throughout this process. Greenpeace and the World Wildlife Fund have provided leadership on the issue, and the Climate Action Network is now a worldwide network of over 900 NGOs in 100 countries supporting the transition to a low- or zero-carbon economy, with the goal of phasing out net greenhouse-gas emissions by 2050, while promoting adaptation in the most vulnerable communities. Seeing climate change as a crosscutting issue, the network has worked to link the negotiations for a Kyoto successor agreement with the process of developing new the Sustainable Development Goals (SDGs), discussed in Chapter 9, pushing to mainstream climate action across these goals.

Since the treaty-based regulatory approach of Kyoto has not worked as anticipated, what other actions have been taken to address climate change? The reality is that quite a lot has happened at different levels of governance. To see that, however, it helps to apply the concept of a regime complex, described in Chapters 1 and 9.

Robert Keohane and David Victor (2011: 9) describe the climate change regime complex as "a loosely coupled system of institutions; it has no clear hierarchy or core. . . . [Its] elements are loosely linked to one another." The UNFCC and Kyoto Protocol form one constituent part; other parts include climate change initiatives taken by the G-8, G-20, EU, and World Bank; the Nuclear Suppliers Group; regional pollution control institutions; the US Climate Action Partnership (an alliance of firms and

NGOs); the Montreal Protocol on Substances that Deplete the Ozone Layer; and a wide array of national and subnational activities.

In Europe and the United States, subnational entities have emerged as important actors in global-warming initiatives. In Europe, for example, four transnational municipal networks have steered member cities toward adoption of climate strategies. Lacking coercive power, the networks use communications, project funding, and certification to push for change (Hakelberg 2014). The EU also channels funding to municipalities. Similar networks exist in the United States. The International Council for Local Environmental Initiatives coordinates the Cities for Climate Protection, a network of over a thousand cities in more than thirty countries, including the United States. These transnational networks represent a new form of environmental governance, taking action in cities, where most greenhouse gases are emitted (Betsill and Bulkeley 2006). In the United States, individual states have taken initiatives, often working with other states in a region or with neighboring Canadian provinces. Examples include the New England Governors–Eastern Canadian Premiers Climate Change Action Plan and the Western Regional Climate Action Initiative (Arizona, California, New Mexico, Oregon, and Washington), both of which call for regional targets for reduction and mechanisms for monitoring and managing emissions. In 2008, under the Regional Greenhouse Gas Initiative, ten states participated in the first-ever auction of pollution rights, establishing caps on CO_2 emissions and calling for utilities to buy allowances to pollute.

Various other transnational groups are experimenting with climate change initiatives, many only loosely connected to official UN negotiations. Matthew Hoffmann (2011) analyzes these various experiments, including the Climate Group, Climate Wise, and the Carbon Disclosure Project. Since 2004, the Climate Group, for example, has brought together both government authorities (Germany, California, Connecticut, state of Victoria, Australia, London) and corporate leaders (British Petroleum, HSBC, Shell). It is seen as a way to learn best practices, exercise corporate social responsibility, and deploy climate-friendly technologies.

There are now a plethora of such transnational governance initiatives—private as well as public-private in various combinations of business, government, and civil society groups. An empirical study of over sixty of such initiatives (Bulkeley et al. 2012) shows that most begin at the local level and are joined by NGOs and then states and IGOs. Most are devoted to capacity-building and information-sharing; the overwhelming number lack formal organizational structure.

These developments are all compatible with what Keohane and Victor and others have argued: the need to focus on parts of the climate change problem rather than the whole, to recognize the existence of a regime complex rather than just a single climate change regime centered on the UNFCC and Kyoto Protocol. "Both political reality and the need for flexibility and diversity suggest that it is preferable to work for a loosely linked but effective regime complex for climate change" (Keohane and Victor 2011: 20).

The long debate over whether climate change is real and human-caused illustrates the distinct challenge for governance created by scientific uncertainty surrounding many environmental issues. The IPCC's role illustrates the importance of scientific expertise to environmental governance, and also the importance of a variety of actors other than states. The climate change issues illustrate the evolution of many different types of governance mechanisms. Changing behaviors over the long term is difficult and costly, yet the threat to human security is severe and the need for multilevel global governance has never been greater.

Relating Environmental Problems to Security, Economics, and Human Rights

A contemporary ecosystem perspective confirms that various environmental issues are integrally related to each other and have critical economic repercussions. The case of climate change illustrates these connections, as economic downturns may make it more difficult to pay the costs of reducing emissions. Development issues, discussed in Chapter 9, also illustrate the connections, as higher levels of economic development mean increased demands for natural resources and energy. Economic growth at any cost may also lead to unsound decisions or negative externalities, costly unintended consequences that adversely affect the quality of the environment.

Environmental issues have a connection not only to economics, but also to human rights. Leading environmentalists have met stiff opposition, harassment, and violent ends. The leader of the Greenbelt movement in Kenya, female activist and 2004 Nobel Peace Prize winner Wangari Maathai, was imprisoned for her activities in seeking to protect open spaces in Nairobi. Ken Saro-Wiwa, environmental activist of the Movement for the Survival of Ogoni People, the leader of the fight against exploitation by the Nigerian government and Royal Dutch Shell, was killed for that cause. It is Saro-Wiwa who claimed that the environment is humanity's first right.

Finally, lack of critical resources poses a threat to states' security, and unsustainable environmental practices pose a threat to human security, potentially leading to resource-motivated violence and intrastate and interstate wars. The search to guarantee supply of nonrenewable natural resources such as petroleum motivated Japan's aggression in China and Southeast Asia and Germany's invasion of southern Russia's oil fields during World War II. The same search today fuels conflicts in the Caspian Sea basin and the South and East China Seas. The need for usable water for

agricultural productivity and human needs has led to major disputes in the Middle East over access to the water of the Jordan, Tigris-Euphrates, Nile, and Indus Rivers. Mass migrations, deforestation, desertification, flooding, loss of water supplies, collapse of agricultural production, and hunger burden neighboring states with refugees and in some cases threaten regional peace and stability, as conditions in Mali, Indonesia, and the Philippines confirm. As Jared Diamond (2005) warns in *Collapse*, the struggle for scarce resources can and has led to the collapse of states and empires.

In short, issues once perceived as "merely environmental" have far-reaching economic, human rights, and security implications. As the destructive Superstorm Sandy (2013) in the United States, extreme heat in Australia, and typhoons in Myanmar (2008), Japan (2014), and the Philippines (2013) remind us, we live in a fragile and vulnerable environment.

Emergence of the Environment as an Issue Area

International environmental issues have become part of the public agenda only in the past five decades, in large part as a result of two major long-term trends (Meyer et al. 1997). The first is the gradual expansion of scientific knowledge that has enabled people to collect data that monitors environmental trends. The second is the rise of environment-oriented civil society associations, first national NGOs such as the Society for the Protection of Birds (1889) and the Sierra Club (1892), then international NGOs such as the Society for the Preservation of the Wild Fauna of the Empire (1903) and the Commission for the International Protection of Nature (1913, subsequently renamed the International Union for the Conservation of Nature [IUCN] in 1956).

During the 1960s, increased interest in the environment resulted in broader public responses. Rachel Carson's book *Silent Spring* (1962) and Jacques-Yves Cousteau's book *The Living Sea* (1963) galvanized environmental activists and helped to cement in the public consciousness the notion of the interdependence of all living things. Individual events, such as the Torrey Canyon oil spill in 1967 and the photographs of Earth from space taken by astronauts in 1969, also proved to be catalysts for a view of the planet as a single ecosystem. Over the following decades, interest in environmental issues broadened in scope to include both protection of the natural environment and curbing of the destructive effects of industrialization.

Biologist Garrett Hardin's article "The Tragedy of the Commons," published in 1968, set the stage for the theoretical and practical collective goods dilemmas posed by many environmental issues, as discussed in Chapter 2. Hardin suggested some simplistic strategies to overcome this tragedy of the commons. Yet almost five decades after Hardin's article was published, the effort to create multilevel environmental governance for a wide range of problems continues.

The Evolution of Global Environmental Governance

International conferences sponsored by the UN have played a major role in the evolution of global environmental governance, as have NGOs and epistemic communities. They have put environmental issues on the international agenda and provided frameworks for negotiations and subsequent institutionalization. Although the UN Charter itself contains no mention of environmental protection, UN-sponsored conferences filled a critical gap in the evolution of environmental governance.

UN Global Conferences and the Articulation of Norms: From Stockholm to Johannesburg

The Stockholm Conference. In the late 1960s, Sweden and other Nordic states proposed an international environmental conference on the environment, resulting in the 1972 UN Conference on the Human Environment (UNCHE), in Stockholm. The conference effectively put environmental issues on the agenda of the UN and many governments, initiating the piecemeal construction of international environmental institutions, expansion of the environmental agenda, increasing acceptance of international environmental standards, and extensive involvement of NGOs and scientific and technical groups in policymaking efforts. Thrust into the popular consciousness was the notion of "Spaceship Earth" and the slogan "Think Globally, Act Locally."

During the preparatory meetings for the 1972 conference, UNCHE secretary-general Maurice Strong, a Canadian businessman, provided the leadership to bridge the divergent interests of North and South by forging the conceptual links between development and environment. The North emphasized issues such as preservation of species and the need to curb environmental and transborder pollution. The South, however, feared that environmental regulation could hamper economic growth and divert resources from economic development. While many developing countries were reluctant to attend the conference, those that did had to be persuaded that environmental problems were a concern for everyone, not a plot to keep them underdeveloped.

The Stockholm Declaration, a soft-law statement of twenty-six principles, called on states and international organizations to coordinate activities. It endorsed states' obligation to protect the environment and not to damage the environment of others. It also recognized the principle that

environmental policies should enhance developing countries' economic potential and not hamper the attainment of better living conditions. The Stockholm participants agreed not to use environmental concerns as justification for discriminatory trade practices or as a way to decrease access to markets. Conferees called for creation of a new UN body to coordinate environmental activities and promote governmental cooperation—the United Nations Environment Programme. The Stockholm Conference also inaugurated the practice of a parallel NGO forum, run simultaneously with the official conference, as discussed in Chapter 6. Almost 250 NGOs participated, setting an important precedent. At the state level, environmental ministries began to be formed to improve national capacity and signal commitment to addressing the issues. That trend toward state institutionalization has continued, accelerating even more over the subsequent two decades (Aklin and Urpelainen 2014).

Moving to sustainable development. The consensus forged at Stockholm on integrating the environment and development was met with some skepticism by the less developed countries, who argued that environmental concerns diverted attention from the need to pursue economic growth. That tension led the UN General Assembly in 1983 to establish the World Commission on Environment and Development (or Brundtland Commission), discussed in Chapter 9, to develop the concept of sustainable development. Its report, *Our Common Future,* called for "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 8). It sought to balance ecological concerns with the economic growth necessary to reduce poverty. The report underscored that the South could not develop in the same way the industrialized countries did, because humanity could not survive a similarly radical transformation in the environment.

The Brundtland Commission's approach was adopted in 1987 by UNEP and later by the World Bank, NGOs, and many national development agencies. It became the rallying cry of the environmental movement and a concept articulated by academics, state officials, and leading scientists. It acknowledged that poverty is a critical source of environmental degradation; it encouraged people to begin to think about critical links among agriculture, trade, transportation, energy, and the environment; and it called attention to the long-term view (Esty 2001).

The Rio Conference. Twenty years after Stockholm, the 1992 UN Conference on the Environment and Development (UNCED), or Earth Summit, held in Rio de Janeiro, convened in the aftermath of a series of key scientific findings during the 1980s: the discovery of the ozone hole over Antarctica, the growing evidence of global warming, and the accumulating

data on loss of biodiversity and depletion of fisheries. These developments shaped the Rio Conference agenda.

The Earth Summit was the largest of the UN-sponsored global conferences at that time, both in the number of participants and in the scope of the agenda. Preparatory meetings were used to articulate positions, resolve basic issues, and negotiate the text for all conference documents. NGOs played key roles in the preparatory process and the conference. The 1,400 accredited environmental organizations included not only traditional, large, well-financed NGOs, such as the World Wide Fund for Nature and the IUCN, but also many new grassroots groups that typically were poorly financed and had few previous transnational linkages.

The final outcomes of the Earth Summit were the 800-page Agenda 21, the UN Convention on Biological Diversity, and the UN Framework Convention on Climate Change. The South succeeded in integrating issues of economic reform into Agenda 21 and reaffirming the principle of sovereignty over natural resources. Yet it also accepted the propositions that degradation of those resources was a threat to global security and that states must be responsible stewards. Second, the linkage between development and the environment was expanded to the issue of trade in GATT and to the gradual "greening" of World Bank programs. UNCED's third outcome was the acceptance of direct NGO participation in dealing with environmental issues. NGOs were given the capability of participating at all levels, from policy- and decisionmaking to implementation. What began as a parallel informal process of participation within the UN system evolved into a more formal role. Indeed, NGOs' participation at the Earth Summit stimulated a review of their relationship with the UN overall, as discussed in Chapter 6.

Finally, just as Stockholm led to the establishment of UNEP, Rio led to the creation in 1993 of the Commission on Sustainable Development to encourage and monitor the implementation of Agenda 21. It also led to the restructuring of the Global Environmental Facility, both of which are discussed later.

The two framework conventions concluded at the Earth Summit illustrate critical dilemmas that environmental issues pose. For example, the Convention on Biological Diversity includes both the principles of national sovereignty over domestic resources and the obligation of states to conserve biological diversity. States commit themselves to developing national preservation plans, and wealthy states pledge to provide funding for states unable to pay. Follow-up, however, was voluntary, and many states were unwilling to take action. The same was true of the UNFCC, as discussed in the opening case study of this chapter.

Several UN conferences that followed the Earth Summit, including the 1995 Social Summit, the 1995 Fourth Women's Conference, and the 1996

Habitat II Conference, reinforced the discourse of sustainable development. For example, the 1994 International Conference on Population and Development built on Rio's foundations to emphasize the need to slow population growth rates as part of sustainable development. Likewise, the seventh Millennium Development Goal dealt with ensuring environmental sustainability, although specific operational indicators were not established.

Rio Plus 10: The Johannesburg Summit. The purpose of the 2002 UN World Summit on Sustainable Development, also known as Rio Plus 10, was to build on the ambitious yet poorly executed agenda of Rio. The change of name to "summit" reflected the opposition from some states to continuing the pattern of UN global conferences, as discussed in Chapter 4. Participants hoped to stem the rising toll of poverty and curb pollution and deforestation, which had only accelerated during the 1990s. The South wanted more aid for economic growth. The Europeans wanted targets and timetables, while the United States found targets unnecessary. The divisions were profound. Few states did the necessary preparatory groundwork. By the time the summit convened, there was also increasing disillusionment with the notion of sustainable development, seeing it as a "buzzword largely devoid of content" (Esty 2001: 74).

The major outcome of the summit, its implementation plan, included some targets in the areas of access to clean water and proper sanitation, reduction of biodiversity loss, better use of chemicals, and more renewable energy. These goals were to be achieved through partnerships among governments, citizen groups, and business (called action coalitions)—the governance approach for human development as discussed in Chapter 9. Overall, Rio Plus 10 was generally seen as disappointing compared to previous gatherings, yet that disappointment led to a ten-year social science–based research program, the Earth System Governance Project, to provide a roadmap for major institutional changes, proposals that would be made in a follow-up conference a decade later (Biermann 2012).

Back to Rio: Rio Plus 20. In 2012, The UN Conference on Sustainable Development reconvened. Its final document, *The Future We Want*, reaffirmed past commitments, but as Maria Ivanova (2013: 4) describes, "offers no targets, timelines, or specific objectives. Inclusive of every possible topic within sustainable development, it does not prioritize any areas or express a particular sense of urgency. Its most important achievement, some observers lamented, was simply that it did not regress." But in keeping with the recommendations of Frank Biermann (2012), it confirmed institutional changes, including strengthening the structure and financing of UNEP, abolishing the Commission on Sustainable Development, and pledging to set the global Sustainable Development Goals to replace the MDGs.

Thus, while the mega-conference approach may have outlived its usefulness, Rio Plus 20, like the other summits before it, forced states to adopt national agendas, socialized them to accept new norms of behavior, and brought together the scientific community and environmental NGOs to learn from each other. As constructivists argue, this process over time has led to significant shifts in perceptions and behavior that created the foundations of global environmental governance (Haas 2002).

NGO Roles in Environmental Governance

NGOs have played important roles in environmental affairs since the nineteenth century. Since the 1960s, however, with the emergence of a global environmental movement and especially following the 1972 Stockholm Conference, the number and scope of both internationally based NGOs and small, locally based environmental NGOs in less developed countries have expanded. Environmental organizations now number in the tens of thousands. The European Environmental Bureau, the liaison office between the EU organs and NGOs, lists 140 European environmental citizen organizations, for example. The bureau has offices in Brussels, receives funding from the European Commission, operates through a set of well-organized working groups on major issues, and enjoys consultative status in EU institutions and routine contacts with the European Environmental Agency. It has mounted recent campaigns focusing on banning mercury and adopting energy-saving "Coolproducts." Most NGOs have neither the same levels of funding nor the same access to decisionmakers.

Environmental NGOs are rarely united in either approach or ideological orientation; some prefer to work within the status quo, others oppose any change, while others seek radical change. They have given individual citizens a voice in environmental governance and many names are well-known, including Earthwatch, the Environmental Defense Fund, the Nature Conservancy, Greenpeace, the Sierra Club, the World Wide Fund for Nature, the Rainforest Action Network, and the Earth Island Institute.

Environmental NGOs, among other roles, serve as generalized international critics. Because they are not attached to nation-states and do not depend on states for funds, they are able to take critical positions. For example, Greenpeace publishes the "Waste Trade Update," the authoritative source for information relating to the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. Some NGOs offer even more targeted criticism. The Rainforest Action Network, for example, launched an initiative against Amazon deforestation precipitated by cattle ranching by targeting Burger King for buying Brazilian beef. It also targeted Home Depot for selling old-growth wood. Groups use a variety of means ranging from boycotts to media campaigns, but their impact is often limited. Some groups engage in direct, confrontational

actions—"direct enforcement" or, to some, ecoterrorism—to stop purportedly illegal practices by states and private actors (Eilstrup-Sangiovanni and Bondaroff 2014). Greenpeace and Friends of the Earth initiated environmental direct action in the 1970s in efforts to halt nuclear testing in the South Pacific and Japanese and Soviet whaling, including sinking or disabling ships. Such actions are examples of "*direct* pressure on perpetrators as opposed to indirectly pressuring states to change their policy through an appeal to public opinion" (Eilstrup-Sangiovanni and Bondaroff 2014: 351).

Second, NGOs are sometimes linked to epistemic communities. Individual experts from NGOs, along with their counterparts in IGOs and government agencies, may well form part of an epistemic community. Sometimes the epistemic communities try to change the way people think about issues in the interest of environmental preservation. The World Wide Fund for Nature, for example, uses its expertise to try to convince consumers and medical practitioners in Asia to try to end the use of endangered species like bears and rhinos for medicinal purposes. The International Water Resources Association and several NGOs have worked to get policymakers to adopt a more integrated resource management perspective in their thinking about water and rivers (Conca 2006: 123–140).

Third, NGOs often work through environmental IGOs, particularly UNEP, to which 174 NGOs are accredited, because that is where they get access to states. They participate along with other nonstate stakeholders (business and industry, farmers, indigenous peoples, scientific/technical groups) in virtually every area of UNEP activity. In cooperation with state parties to the Convention to Regulate International Trade in Endangered Species of Wild Fauna and Flora (CITES), the WWF and IUCN formed a network called TRAFFIC to monitor trade in endangered species and wildlife. It performs on-site inspections and trains state officials and legal professionals, as discussed below. NGOs use their access to states through IGOs as a lever or boomerang to influence states' domestic policies, as US-based NGOs have tried to do to change attitudes on climate change.

Finally, and perhaps most important, NGOs attempt to influence states' environmental policies directly. Some NGOs, like the World Resource Institute, have extensive research staffs and provide valuable information for policymakers. The US–based World Wildlife Fund (a branch of the WWF) has worked directly with the Chinese Ministry of Forestry to manage the endangered panda bear, for example. Together with the US Agency for International Development (USAID), NGOs have helped fund Zambia's national game preserves, including training locals in anti-poaching strategies and using funds earned from the tourist trade for local development projects. Some NGOs may initiate formal legal proceedings against states for noncompliance. The Earth Island Institute used this approach in the tuna/dolphin controversy, appealing to US courts to enforce the 1972 Marine Mammal Protection Act. They may work through states' legislative or bureaucratic processes to pressure authorities to impose sanctions against other parties. NGOs may also work with local-level organizations. The WWF, for example, trains local villagers as wildlife conservationists and helps fund nurseries for restoration and reintroduction of indigenous crops. NGO-provided training is a particularly important function, as many governments may not have the technical capacity and resources to provide it without external assistance.

NGOs may work directly with states to package issues in ways that enhance the possibility of compliance with sets of obligations stemming from treaties or other commitments, including providing financial resources. Debt-for-nature swaps—the acquisition of debt, usually by a conservation NGO, followed by redemption of that debt in local currency to be used for conservation purposes—are one such example. Beginning in 1987, NGOs such as Conservation International and the Nature Conservancy arranged such swaps in Bolivia, Costa Rica, Ecuador, Zambia, Madagascar, and the Philippines, with local NGOs obtaining title to the preserved land. Another example is the use of conservation trust funds created with money from grants, donations, and earmarked fees to fund projects such as the WWF has undertaken in Central Africa, Brazil, Peru, and elsewhere to provide technical support for carbon finance mechanisms to reduce greenhouse-gas emissions. Projects in states are widely recognized as NGO funding opportunities, for it is in states that environmental policy is made and implemented.

Still, the overall impact of NGOs on environmental governance is a matter of dispute and not easily evaluated. They have had particular impact on treaty-negotiating processes, by working behind the scenes to reframe issues and influence the positions of state negotiators, and sometimes their proposals have found their way into treaty texts (Betsill and Corell 2008). They have had major impacts on monitoring environmental quality and national compliance, with Greenpeace keeping track of national compliance for many treaties, for example, and the World Conservation Union tracking compliance with species conservation treaties. NGOs have also played a key role in "greening" the international financial institutions, including most notably the World Bank, as discussed below, and in activating environmental constituencies around the world, using social media and the Internet to provide information and mobilize action groups.

The Role of Epistemic Communities

Epistemic communities also perform a vital role in global environmental governance processes. In the 1970s, the dominant epistemic community concerned with the international environment comprised resource managers and liberal economists. Gradually, as environmental issues gained attention,

ecologists and other environmental scientists in various specialized fields formed issue-specific epistemic communities. Scientists are the linchpins of these epistemic communities, serving as networks of professionals who can provide the vital data and analysis needed to expose problems and consult with governments and international agencies about policy options.

The Intergovernmental Panel on Climate Change is one such epistemic community, as discussed earlier. When scientific information is unclear or when members of the epistemic community disagree, as they did for many years on the climate change issue, then they too become a key part of the political process. When there is agreement among scientific experts, as there now is in the IPCC, then international action is more likely to be forthcoming, as uncertainty is reduced.

UNEP's Mediterranean Action Plan, for example, was developed with the help of an epistemic community of ecological experts from around the Mediterranean basin. Beginning in 1972, the experts participated in meetings in a professional but unofficial capacity; UNEP administrators relied on the epistemic community for obtaining the data needed to establish the monitoring program and modify it accordingly. These experts were also active in the domestic bargaining processes within Mediterranean littoral states, fostering learning among governmental officials and elites. As Peter Haas (1990: 188) concludes, "The transnational alliance between the ecological epistemic community and national marine scientists led governments to define their interests, so that they accepted a collective program that was increasingly comprehensive and complied with such arrangements domestically."

To be successful, epistemic communities have to be continually nurtured, new research opportunities presented, and new networks developed. For a global epistemic community to be legitimate, members have to come from both developing and developed countries, a difficult task given the more limited number of scientific specialists from the South.

Global Environmental Regimes and Institutions

UN-sponsored global conferences have resulted not only in the formation of epistemic communities and the proliferation of NGOs, but also in the establishment of key principles, new norms, and programs of action. In many cases, those principles have been translated into specific standards and incorporated into environmental treaties and specific global institutions.

Principles of Environmental Governance

The core principles and norms governing the environment have evolved over more than a century and certain ones are generally recognized as customary law. The first is the principle of "no significant harm." This came

from the 1941 *Trail Smelter Arbitration* between the United States and Canada and from Principle 21 of the Stockholm Declaration. States have the responsibility to ensure that activities within their jurisdiction do not cause environmental damage to others. The second is the principle of "good neighbor" cooperation. According to Stockholm's Principle 27, states agree to cooperate should environmental problems arise. There are also emerging principles that are not yet recognized as binding international law. Many of these were incorporated in the Rio Declaration on Environment and Development, including the "polluter pays" principle, the precautionary principle (take action on the basis of scientific warning), and the preventive action principle (take action within one's own state). The nondiscrimination principle obligates states to treat domestic and international environmental concerns in the same way. Finally, the principles of sustainable development and intergenerational equity suggest that no policies should obligate future generations or incur costs that are then transferred to subsequent generations.

Because most of these are emerging principles, environmental law is mostly soft law. Although nonbinding, it is useful because it offers a starting point for getting agreement on more ambitious norms. Furthermore, soft law often foreshadows hard law of the future, describing acceptable norms of behavior and codifying developing rules of customary practice.

Law-creating conventions, embodying principles, norms, and where possible rules, form the foundations for environmental governance.

Global Environmental Agreements

There were almost 1,200 multilateral environmental agreements and 1,500 bilateral agreements as of 2013. In the fifteen years after Stockholm, for example, more agreements were concluded than ever before. In general, these agreements articulate the normative content of a specific issue, initiate information-gathering activities, and call for voluntary restrictions on domestic activities that result in transnational harm. Much less attention is given to spelling out means of implementation and compliance. With the growing number of such treaties, there have been changes in subject and scope. Prior to the 1970s, most agreements were very specific, applying to one species or a particular local or regional problem. Since the 1970s, the agreements have broadened to deal with activities negatively affecting the global or regional commons. In recent years, many agreements are amendments to existing conventions.

Table 11.1 provides a selective list of both global and regional agreements. Some of these are linked to specific organizations while others are freestanding, autonomous arrangements. Most call for a conference or meeting of the parties that has decisionmaking powers, a small secretariat, and one or more specialized subsidiary bodies, often convened on an ad hoc

Table 11.1 Selected Global and Regional Environmental Agreements

Treaty	Year Opened for Ratification	Year Entered into Force	Number of Ratifications, Accessions (2014)
Global environmental agreements			
International Convention for the Regulation of Whaling	1946	1948	38
Convention for the Protection of the World Cultural and Natural Heritage	1972	1975	189
Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter	1972	1975	80
Convention on the International Trade in Endangered Species of Wild Fauna and Flora	1973	1975	175
Convention on Long-Range Transboundary Air Pollution	1979	1983	51
Convention on the Conservation of Antarctic Marine Living Resources	1980	1982	34
Vienna Convention for the Protection of the Ozone Layer	1985	1988	197
Montreal Protocol on Substances That Deplete the Ozone Layer	1987	1989	197
Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1989	1992	172
UN Convention on Biological Diversity	1992	1993	193
UN Framework Convention on Climate Change	1992	1994	195
UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	1994	1996	198
Kyoto Protocol to UN Framework Convention on Climate Change	1997	2005	192
Convention on the Conservation and Management of the Highly Migratory Fish Stocks of the Western and Central Pacific	2000	2004	25
Convention on Persistent Organic Pollutants	2001	2004	176
International Tropical Timber Agreement	2006	2011	63
Minamata Convention on Mercury	2013	pending	11
Regional environmental agreements			
Convention for the Protection of the Mediterranean Sea Against Pollution	1976	1978	22
Convention on Long-Range Transboundary Air Pollution in Europe	1979	1983	51
North American Agreement on Environmental Cooperation (Canada, Mexico, United States)	1993	1994	3
Convention for the Protection of the Black Sea Against Pollution	1992	1994	6
Convention on Cooperation for Protection and Sustainable Use of the Danube River	1994	1998	15
ASEAN Agreement on Transboundary Haze Pollution	2002	2003	9
Treaty on the Conservation and Sustainable Development of the Forest Ecosystems of Central Africa	2005	2006	8
Agreement on the Conservation of Gorillas and Their Habitats	2007	2008	5
Agreement on the Nile River Basin Cooperative Framework	2010	pending	10
Agreement on Cooperation on Marine Oil Pollution, Preparedness, and Response in the Arctic	2013	pending	4

Note: For additional information, see International Environmental Agreements Database Project, http://iea.uoregon.edu.

basis. While few include provisions for dispute settlement, there is evidence that states are more likely to participate in environmental treaties when there are provisions for dispute settlement and when assistance is provided for building state capacity (Bernauer et al. 2013).

The Convention on International Trade in Endangered Species, covering about 34,000 specific species, provides an example of a flexible agreement. Species that are threatened with extinction receive the greatest degree of protection, and trade is prohibited, as it was for the African elephant (and ivory) in 1989. For species needing intermediate levels of protection including polar bears and grizzly bears, trade is permitted but highly regulated. For still another group, regulation is domestic. Parties meet every two years to determine whether to add, delete, or transfer species from one list to another. State and regional variations in levels of protection enhance that flexibility. CITES proved especially effective in the early years, but the highly publicized cases of the African elephant and the rhino are particularly vexing, as high demand in Asia has fueled extensive poaching in Africa.

CITES implementation mechanisms are unique. As discussed earlier, TRAFFIC verifies compliance with CITES rulings, working directly with governments to provide information, monitoring, training, and education programs for wildlife-trade enforcement officers. It also works on the demand side, organizing campaigns to reduce demand for the products in East Asian countries. The flexible arrangements and cooperation with NGOs engendered by CITES are more the exception than the rule among environmental regimes. WildAid, another NGO, is trying to do the same specifically in China, enlisting celebrities such as basketball player Yao Ming to endorse the campaign to reduce demand for ivory and rhino horn. On the supply side, states like Kenya and South Africa have expanded anti-