

Environment and Globalization

Table of Contents

<u>Introduction</u>	2
<u>Globalization and the Environment</u>	3
<u>Are International Trade and Protection of the Environment Enemies?</u>	5
<u>The Tuna-Dolphin Case</u>	6
<u>The Shrimp-Turtle Case in the New WTO Context</u>	10
<u>The Doha Mandate on the Environment</u>	11
<u>International Environmental Problems and Efforts to Solve Them</u>	11
<u>Wildlife</u>	12
<u>Trade in Wildlife</u>	12
<u>Spread of Invasive Species</u>	15
<u>Loss of Biodiversity</u>	17
<u>Ecosystems</u>	20
<u>Oceans</u>	20
<u>Desertification</u>	22
<u>Global Warming</u>	23
<u>Ozone Depletion</u>	26
<u>Pollution</u>	29
<u>Conclusion</u>	30
<u>Is Sustainable Development the Way Forward?</u>	31
<u>Glossary</u>	33

Trade	Environment	Media	Development	Women
Investment	Technology	Culture	Migration	Human Rights
IMF+World Bank	Energy	Education	Health	International Law

Introduction

Tens of thousands of people descended on Seattle, Washington, in December 1999 to protest a **World Trade Organization (WTO)** meeting of trade ministers from 130 countries around the world that was intended to launch a new, multi-year set of trade liberalization negotiations. At what became known as the "[Battle in Seattle](#)," some protestors challenged, in street demonstrations that eventually shut down the entire city and Millennium Round talks along with it,¹ the underlying premise of free trade—namely that the benefits of free trade can be shared by all participants. Many protestors dressed as sea turtles and suggested that the strengthening of open trade through the WTO, and by extension the broadening of globalization, limited the prospects of environmental treaties.²

A 1998 WTO decision overturning a U.S. law intended to protect sea turtles had become a flash point for concerns voiced by these protestors about the effect that open trade and globalization have on the environment. The decision, known as the "shrimp-turtle case," declared a U.S. import ban on shrimp caught without "turtle excluder devices" was in violation of international trade law.³

Although the shrimp import ban was intended to protect the environment, most of the affected imports were from Southeast Asian countries that could not afford the turtle excluder devices. Those countries claimed that the United States ban was therefore protecting the environment by harming their development, since their economies depended on shrimp exports.

The case thus highlighted important and interrelated questions about the place of environmental protection in a globalized economy.

- First, what is the proper balance between environmental protection and economic development?
- Second, how can nations cooperate to protect the environment when their interests diverge?
- Third, what is the role of international organizations deciding the balance between environmental measures and free trade?
- Fourth, should international agreements on trade and other issues contain explicit measures to protect the environment?
- Finally, what are the responsibilities of richer nations to help poorer nations develop environment-friendly policies?

¹ Postman

² For more information on the WTO protests of 1999 see also the feature film, "Battle In Seattle" from Fall 2008. Although it is not a documentary, it does offer some actual footage from protests and an accurate depiction of the deterioration of the WTO talks and the protests in Seattle.

³ "WTO Case File: The shrimp-turtle case."

Trade	Environment	Media	Development	Women
Investment	Technology	Culture	Migration	Human Rights
IMF+World Bank	Energy	Education	Health	International Law

Globalization and the Environment

These questions have arisen mainly as a result of increased economic integration, but globalization has also meant an important conceptual change in the way we think about the environment. Many of us now see environmental problems as being of international concern, not just national interest—such as protection of the oceans and the atmosphere from pollution. The environment is now considered the "common heritage of mankind," and environmental problems are increasingly the subject of international efforts because of their cross-border effects and the impossibility that just one or a few nations can solve these problems on their own.⁴

Legions of public international and private non-governmental organizations therefore seek solutions for environmental issues, such as the [United Nations Environmental Program](#), [Greenpeace](#), and the [Worldwatch Institute](#). A [multitude of treaties](#) have been concluded to harmonize governmental policy on environmental protection. Some environmentalists have even proposed the creation of a "world environmental organization" to coordinate international environmental policies.

There is a growing body of literature from environmentalists and NGOs about the importance of such global environmental governance.⁵ A 2007 proposal by former French president Jacques Chirac for the creation of such a body within the UN garnered the support of over forty other countries.⁶ A dialogue about such an establishment has also reached the top levels of the WTO where it has been suggested numerous times by directors and is debated in annual public forums and conferences. The UN environment body has not been created mainly because of the unwillingness of the United States and China.⁷

Others have questioned the need for rigorous environmental protection, however, on scientific, economic, and **sovereignty** grounds. Critics of environmental protection argue that alleged dangers, such as **global warming**, have been exaggerated and the economic harm from regulation of natural resources has been minimized, in pursuit of a radical, anti-capitalist agenda. They argue that too much regulation is both unnecessary and ultimately harmful because it keeps people poor by preventing the competitive use of their resources.⁸

In contrast, advocates of environmental protection say that unregulated economic activity has led to environmental destruction and must be slowed, and they say that their critics are [uniformed and pursuing their own agenda](#) of unfettered capitalist expansion.⁹

Environmental protection can entail a drag on economic growth in the short-term. Industries that have to adjust to environmental regulations face disruption and higher costs, harming their competitive position. The question is what to make of this. Some argue that it may be worth slower economic growth in order to protect the environment. Others say that the free market and technological advances are the best tools to solve environmental problems and lift people out of poverty, rather than greater regulation.

⁴ Baslar, 106.

⁵ Esty and Ivanova; see also John Whalley and Ben Zissimos, "What Could a World Environmental Organization Do?" *Global Environmental Politics* v1, no.1: 29-34.

⁶ "World summit delegates call."

⁷ Cone.

⁸ Murray.

⁹ To hear more on this debate go to the *Intelligence Squared U.S. debate* on NPR.org. David Malakoff, "Global Warming is Not a Crisis." *NPR.org* 27 March 2007. <http://www.npr.org/templates/story/story.php?storyId=9082151>.

The link between the environment and economic development may be more complex than that, however. In fact, in many ways, protecting the environment and promoting economic growth are complementary goals. Poverty in developing countries is a leading cause of environmental degradation. For instance, "slash-and-burn" land-clearing by **subsistence farmers** has been a major cause of depletion of the Amazon rainforest.¹⁰ Boosting economic growth may then be an effective tool to promote protection of the environment. This is the idea behind the **sustainable development** movement, which seeks to advance economic opportunities for poorer nations in environmentally friendly ways.

Year	Deforestation (sq mi)	Deforestation (sq km)	Deforestation change (%)
2004	10,588	27,423	9%
2005	7,276	18,846	-31%
2006	5,447	14,109	-49%
2007	4,453	11,523	-47%
2008	4,621	11,968	-47%
2009	2,881	7,464	-73%

Credit: National Institute of Space Research.

This Issue Brief examines the critical environmental challenges facing the earth within this framework that environmental problems are now recognized as global issues requiring solutions coordinated among many nations. However, disagreements about how to proceed, particularly over the trade-off between environmental protection and economic development, have hampered these efforts.

First, we will look at some specific disputes involving the environment and free trade as a means to illustrate the difficulty of balancing these concerns and to see how the international trading system has approached the problem. Second, we will examine environmental problems in the larger context of international politics and discuss **multilateral** efforts to solve environmental problems. In conclusion, we will look at the idea of sustainable development to see if it can produce the balance between economic growth and environmental health that its supporters hope to achieve.

¹⁰ Butler

Are International Trade and Protection of the Environment Enemies?

As demonstrated by the protestors in Seattle, the effect of international trade on the environment has been one of the most contentious elements in the world-wide debate about globalization. Opponents of globalization fear that uncontrolled economic growth, fueled by free trade, harms the environment by causing more pollution and exhaustion of natural resources. Furthermore, they suspect that environmental protection laws are weakened under the guise of promoting free trade by corporations and governments unconcerned about the negative environmental effects of commerce.

In contrast, many corporations, governments, and citizens in developing countries (and some in developed countries as well) are willing to accept a certain level of environmental damage in exchange for economic well-being. They fear that environmental protection laws are really ways for developed countries to prevent their goods from competing fairly.

These concerns, however, are relatively recent. When the first **General Agreement on Tariffs and Trade (GATT)** came into force in 1947, there was no such explicit acknowledgement of any broad linkages between trade and the environment. The only mention of the environment came in Article XX, which contained exceptions to the basic rules of the treaty. Those exceptions allowed countries to impose measures "necessary to protect human, animal or plant life or health" or "relating to the conservation of exhaustible natural resources" so long as those measures did not amount to unfair discrimination against foreign products or operate as disguised restrictions on trade. For decades, no further exploration of the trade-environment linkages was made within the GATT framework.

In the early 1970s, however, when the environmental movement was gaining strength internationally, the members of the GATT were invited to submit comments for consideration at the UN (United Nations) Convention on the Human Environment, held in Stockholm, Sweden in 1972. The secretariat of the GATT prepared a study on the impact on international trade of various measures proposed to deal with pollution, but the study did not address the larger issue of the balance between economic development and environmental protection.¹¹

The GATT also set up the Group on Environmental Measures and International Trade (EMIT) to provide advice to GATT members on trade policy and pollution issues. EMIT, however, was never called upon for advice until 1991, when governments began preparing for the UN Conference on Environment and Development, to be held in Rio de Janeiro, Brazil, in 1992.

EMIT held two years of meetings on the relationship between trade and the environment, eventually producing a report that said there was no inherent contradiction between environmental protection by individual countries or through **multilateral** treaties and the GATT trading system. Nevertheless, the report also said that the GATT was not the forum to review national environmental laws or develop international environmental standards. The role of environmental concerns in international trade was thus not spelled out, the importance of the GATT's orientation toward free trade was emphasized, and the issue was not addressed.

Meanwhile, trade disputes involving environmental protection that would demonstrate the conflicting positions were rare until the 1990s. With minor exceptions, the GATT dispute resolution system never addressed the conflict between the free trade principles of the treaty and environmental protection under the Article XX provisions. That changed in 1990 when Mexico and Venezuela challenged a U.S. law intended to prevent dolphins from being killed in the tuna-fishing process. The case was the first in a series of disputes in the 1990s whose outcome in GATT dispute resolution panel reports seemed to prioritize free trade over the environment and galvanized opposition to free trade among environmentalists.

¹¹ "The 1971 GATT Study."

The Tuna-Dolphin Case

The origin of what became known as the "tuna-dolphin" case was the United States' **Marine Mammal Protection Act (MMPA)**, which imposed a ban on imports of tuna from countries that did not have a conservation program designed to protect dolphins in the tuna-fishing process. Tuna, it turns out, are often found swimming in schools underneath dolphins. In order to catch the tuna, fishermen used to drag large nets through the water and then pull them up under the tuna.

Dolphins swimming above the tuna would be caught at the same time and die in the nets along with the tuna. The MMPA therefore required American tuna fishermen to adjust their fishing practices to avoid such deaths, and banned tuna from countries in which dolphin deaths from tuna fishing exceeded deaths from U.S. tuna fishing by more than 25 percent. As a result, tuna from Mexico, Venezuela, Panama, Ecuador, and the Pacific island of Vanuatu were banned in 1990.



Credit: PicApp

What do you think?

- Should governments prioritize trade in relation to the environment?
- Does one need to trump the other?
- What would you recommend in the Tuna-Dolphin Case?

Mexico and Venezuela challenged the U.S. action in the dispute resolution system of the **GATT** and won their cases in 1991 and 1992. The decision in the Mexico case is considered a key turning point in jurisprudence of the world trade system, even though it was not officially adopted as a binding decision by the members of the GATT. (Mexico and the United States later settled the dispute through negotiations.)

Prior to reforms of the Dispute Settlement Process in the **Uruguay Round** of trade negotiations (1986-1994), adoption of a dispute panel report by the GATT could be blocked by the country found to be in violation of GATT rules. Thus, many findings, including the tuna-dolphin panel decision, never took effect. The Uruguay Round reforms reversed this—now, all panel reports are binding unless a consensus of all **WTO** members blocks adoption.

The dispute resolution panel decided that the United States could not justify the MMPA's ban on Mexican tuna imports for several reasons.

- First, the panel said that Article XX's exceptions must be interpreted narrowly so that any one country cannot undermine the **multilateral** trade rules.
- Second, the panel said that the United States had not proved that the tuna ban was "necessary," i.e., that it was the least-trade restrictive way to protect dolphins, in contrast to, for example, negotiating dolphin-protection agreements with other countries.
- Third, the panel said that the percentage link to U.S. dolphin deaths made it difficult for Mexican authorities to predict in advance the acceptable level of Mexican dolphin deaths.
- Finally, the panel said that the United States could not use the Article XX exceptions to regulate natural resources outside of its borders.

The case thus laid out some of the issues that have continued to frame the debate over the environment and trade. The panel approached the dispute with a distinct pro-trade bias, analyzing each of the contested points from the perspective of the effect of the MMPA on free trade. Furthermore, the panel viewed preserving the multilateral free trade system as more important than any one country's evaluation of the need to protect the environment. These results should not be too surprising, however. After all, the GATT panel's mandate was to interpret the GATT—a trade treaty. The panel evidently could not find any authority for placing environmental concerns on par with the thrust of the GATT to promote free trade.

In addition, the decision explicitly limited the right of a country to protect environmental resources extra-territorially. The panel could not find authority within the language of the agreement to allow one country to affect the environmental resources in another. This should not be surprising, since the prospect of one country taking actions to interfere with the resources of another country could be abused and lead to innumerable disputes.

Even now, 19 years later, the idea that one country can impose its view of the need for environmental protection on another country's resources is highly controversial. In fact, a second dispute arose out of the tuna-dolphin case because the MMPA also banned tuna and tuna products from third world countries that imported tuna from other countries that did not comply with the MMPA. The GATT overturned this ban, as well.

Finally, another key issue from this case that continues to affect the debate over environmental protection in a globalized economy is the contrast between the wealthy United States and its ability to have sophisticated fishing techniques with the limited resources of the developing countries and related constraints on the affordability of environmental protection tools.

After the GATT decision, the tuna-dolphin dispute was resolved by agreements negotiated between the United States and the affected countries that called for dolphin protection measures and through a multilateral declaration on the importance of dolphin conservation. The U.S. Congress later called for a binding agreement to implement the declaration, and the International Dolphin Conservation Program was established. Some environmentalists, nevertheless, are skeptical that anything practically beneficial will come of the program.

Was the tuna-dolphin case a victory or a defeat, then, for the environmental movement? On the one hand, the GATT dispute resolution panel gave priority to free trade over environmental protection (on sound grounds when viewed in the context of Article XX). On the other hand, the U.S. loss before the panel gave impetus to an internationally agreed-upon action program. In fact, the International Dolphin Conservation Program could be more effective than a unilateral U.S. law. Yet we still do not know how effective that program may turn out to be.

In any event, the tuna-dolphin case dramatically raised the stakes in the debate over the relationship between international trade and the environment because it came at the same time that two major sets of trade negotiations were in high gear-those to create the **North American Free Trade Area (NAFTA)** and to finish the Uruguay Round in the GATT and create the WTO. The tuna-dolphin case therefore became ammunition for both environmentalists and strict believers in American **sovereignty**.

The Environment and NAFTA

Environmental issues (as well as protection of labor rights), therefore, became a focal point for opposition to the United States' plan to join **NAFTA**. Although NAFTA had been negotiated primarily during the administration of President George H.W. Bush, his successor, Bill Clinton, and the Clinton administration strongly supported integration of the U.S., Canadian, and Mexican economies as a means to promote economic development in all three countries.

Some members of Congress, however, were wary of approving the agreement and pressure from them and environmental interest groups resulted in the Clinton administration negotiating a special "side agreement" on the environment (as well as one on labor issues).

The side agreement, called the [North American Agreement on Environmental Cooperation \(NAAEC\)](#) committed the three governments to studying environment problems, developing scientific research and technology to improve environmental protection, and educating their publics about the environment. The governments also pledged to enforce strictly their own environmental laws and to ensure that private citizens had access to their national court systems to promote

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Human Rights
		Education	Health
			International Law

environmental protection. It also said that the governments should "consider" implementing environmental protections measures suggested by a new trilateral group called the [Commission for Environmental Cooperation \(CEC\)](#).

The agreement was criticized, therefore, for not actually making the governments responsible for new obligations. Instead, environmental activists pointed out, the agreement only requires that the governments live up to commitments already made under domestic law. If those laws are not effective, the CEC cannot impose new obligations.

The CEC also is supposed to rule on disputes if one country believes that another is not enforcing its environmental laws effectively. The procedures for doing so, however, are complex, and the consequences of a negative decision by an arbitral panel are minimal, with development of an "action plan" to resolve the non-enforcement and only symbolically significant fines against the offending government.

So far, all disputes brought to the attention of the CEC have been submitted through the Citizen Submission on Enforcement Matters branch. There have been 77 citizen submissions exposing dangerous environmental practices in all three member countries. The availability of this course of action to citizens is a boon to those trying to keep the environment safe in this open trade system. The lack of real accessibility and widespread knowledge about the CEC legal happenings and laws in truth constrain the possibility of much tangible change among the companies involved.

Again, some of the key issues in the debate over international environmental protection repeated themselves in the NAFTA side agreement negotiations—the sensitivity to international review of national laws, barriers to enforcement of environmental standards, the differences in environmental protection between rich and poor countries, and the priority given to trade over environmental concerns.

What was the practical effect of the side agreement, then? It probably did not sway many votes in favor of the NAFTA in the U.S. Congress, which was approved by only 18 votes in the U.S. House of Representatives. U.S. Senators were more in favor of the agreement with, 61 votes in favor and 38 opposed. (In a controversial move, NAFTA was approved not as a treaty, which would have required a two-thirds majority of the Senate alone to become law, but as an "executive-congressional agreement," requiring only a majority of each chamber in favor.) The side agreement did, however, provide political cover to some Congressmen and Senators who wanted to vote for NAFTA but also wanted to assure their constituents that they supported environmental protection.

On a less pessimistic note, however, it is worth pointing to the extensive activities of the CEC to support scientific research and promote public education about environmental issues. The CEC, through the [North American Fund for Environmental Cooperation](#), created in 1995, also provides grants for local, community-based non-governmental organizations to solve environmental problems. The side agreement and CEC are not simply window-dressing, then, but nevertheless they did not satisfy environmental groups.

The environmentalists had more success in the **GATT multilateral** trade negotiations of the **Uruguay Round** that were being conducted at the same time. The negotiators were working on a major revision of the GATT that would create an enhanced system for dispute resolution and enforcement, as well as changes in the text and scope of the GATT. Adopted in April 1994 at a summit in Marrakesh, Morocco, the new GATT, which created the World Trade Organization, stated in its preamble that the parties to the agreement recognized that

their relations in the field of trade and economic endeavor should be conducted with a view to raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of **sustainable development**, seeking both to protect and preserve

Trade	Environment	Media	Development	Women
Investment	Technology	Culture	Migration	Human Rights
IMF+World Bank	Energy	Education	Health	International Law

the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development...[emphasis added].¹²

The trade ministers at the summit also adopted a special resolution called the [Decision on Trade and Environment](#), creating a Committee on Trade and the Environment (CTE), as part of the permanent **WTO** structure to study the relationship between trade and the environment. Later that year, they adopted the [Decision on Trade in Services and the Environment](#), authorizing the CTE to examine environmental issues related to trade in services. Nevertheless, the mandate of the CTE was limited by the recognition that the WTO is not an environmental agency and that the committee always had to work to uphold the trade-liberalizing principles of the WTO.

¹² "Marrakesh Agreements."

The Shrimp-Turtle Case in the New WTO Context

With that in mind, the first major test of how the newly created **WTO** would deal with environmental issues came in the 1998 shrimp-turtle case mentioned in the introduction to this Issue Brief. The United States had implemented a ban on shrimp from countries whose fishing fleets did not have special "turtle excluder devices," to prevent endangered sea turtles from being killed in the shrimping process. India, Malaysia, Thailand, and Pakistan claimed that the law was a disguised restriction on free trade and challenged the measure in the WTO's dispute resolution process.



Credit: NOAA

The United States argued, as it had in the tuna-dolphin case, that the exceptions in Article XX of the GATT allowed for the ban. And, as in the tuna-dolphin case, the United States lost, for virtually the same reasons. The dispute resolution panel deciding the case said that the shrimp ban was not justified under the Article XX exceptions because environmental protection measures could not be used to undermine the overall **multilateral** trading system.

The United States appealed the decision, however, under the new appeal procedure that had been created by the revision of the **GATT** in the **Uruguay Round**. The **WTO appellate** body again ruled against the United States, but with a significant difference from the rationale of the initial dispute resolution panel. The appellate body said that the panel had read Article XX too narrowly within the context of the overall goal of maintaining free trade. Article XX, the appellate body said, was meant only to prevent abuse of environmental protection laws to undermine the multilateral trading system.

Furthermore, the appellate body said, the new language in the preamble of the GATT, quoted above, established that the WTO members agreed that **sustainable economic development** was a goal of the trading system and should be taken into account as "color, texture, and shading" in interpreting the agreement. The appellate body went on to say that the way the United States implemented its shrimp ban, however, was discriminatory, and ordered the United States to end the ban. Still, it emphasized that:

In reaching these conclusions, we wish to underscore what we have *not* decided in this appeal. We have *not* decided that the protection and preservation of the environment is of no significance to the WTO. Clearly, it is. We have *not* decided that sovereign nations that are members of the WTO cannot adopt effective measures to protect endangered species, such as sea turtles. Clearly, they can and should. And we have *not* decided that sovereign states should *not* act together bilaterally, plurilaterally or multilaterally, either within the WTO or in other international forums, to protect endangered species or to otherwise protect the environment. Clearly, they should and do [Emphasis in the original].¹³

¹³ Appellate Body sect. 185.

Trade	Environment	Media	Development	Women
Investment	Technology	Culture	Migration	Human Rights
IMF+World Bank	Energy	Education	Health	International Law

Despite these reassuring words from the WTO, environmentalists and other members of the American and international public focused on the result of the case and what it seemed to mean. That is, an international tribunal had overturned a democratically enacted law for the protection of an endangered species. Like the tuna-dolphin case, therefore, the shrimp-turtle case galvanized opposition to globalization that appeared to be running roughshod over the environment for the benefit of free trade.

The Doha Mandate on the Environment

Aware of the public outcry over the shrimp-turtle case and growing opposition to free trade in many countries—indeed, the summit of trade officials in Seattle in 1999 failed to launch a new round of global trade negotiations—world governments recognized that they had to acknowledge the importance of the environment. When an agreement was reached among all **WTO** trade ministers to start a new round of global trade negotiations at a summit in Doha, Qatar, in November 2001, therefore, it included a limited mandate to open negotiations on the relationship between trade and environment in the context of the **GATT** and the 20 **multilateral environmental agreements (MEAs)** governing environmental protection that have provisions affecting international trade.

This was a significant step because it raised the level of concern for the environment from that of merely studies by the CTE to the level of the full negotiations among the members of the WTO, with the results to be included in the final, legally binding, decision to come at the end of the Doha Round.

Nevertheless, the results remain to be seen, and skeptics as to the value of the negotiations exist on both sides. Developing world countries are concerned that the negotiations may be a means to discriminate against their goods. To try to forestall this problem, the CTE was also given a further mandate to study the impact of environmental protection measures on access to markets for products from the developing world.

At the same time, environmentalists are concerned that the WTO will still be too focused on free trade. The WTO reaffirmed in the Doha Declaration that its competency is in trade and that the proper forum for solving environmental problems is through MEAs, not the GATT.

Environmentalists hope, perhaps too optimistically, that the new round of negotiations will enable them to insert more concern for the environment in the international trading system, what has been called "greening the GATT." This is particularly important for the environmental movement since there is, as of yet, no international organization to coordinate global environmental policy.

The negotiating process will, at the least, open up these issues to wider and more public airing. All of the themes that have wended their way through the development of concerns in the international trade system will be vigorously debated—**sovereignty** over natural resources versus international control, the role of environmental concerns in trade treaties, and, most importantly, the balance between development and environmental protection.

After ten years, WTO members working on the Doha Round have still not reached a consensus. The direction in which agricultural tariffs, advancement of new energy and biofuel technology, and other trade concerns for developing countries (like those addressed in cases like the shrimp-turtle decision) are still unclear, even under the conditions of the preamble that promote sustainable development and environmental protections.

International Environmental Problems and Efforts to Solve Them

The trade disputes described in the previous section of this Issue Brief dramatize the trade-offs inherent in thinking about the relationship between globalization and the environment. These trade-offs are also apparent in the larger context of international economic and political relations, as the environment has become a key area of international concern and has been addressed in many **multilateral** forums and treaties.

Below, we examine six specific environmental issues—threats to wildlife, loss of **biodiversity**, **ecosystem** degradation, **global warming**, **ozone depletion**, and pollution—that display the same themes as those disputes, as well as others. These include international cooperation versus sovereign control, differing cultural evaluations of the need for environmental protection, the role of scientific evidence in policymaking, and, of course, environmental concerns versus economic development.

Wildlife

As exemplified in the tuna-dolphin and shrimp-turtle cases described above, the most visible—and sympathetic—victims of environmental problems caused by globalization are animals.

Animals are faced with a host of threats from human economic activities, including the degradation of their **ecosystems** as a whole and the direct extinction of tens of thousands of species. In this section, we describe two threats related most closely to international trade, while other threats are covered in detail in following sections.



Trade in Wildlife

VIDEO: <http://www.youtube.com/watch?v=jjtEJHQluCQ>

Trade in animals is a worldwide industry that is large and lucrative industry worldwide. According to **TRAFFIC**, an international monitor of wildlife trade created by the World Wildlife Fund (WWF) and World Conservation Union in 1976, the legitimate, international wildlife industry has an estimated worth of US \$300 billion and involves hundreds of millions of individual animal specimens.¹⁴

However, a significant portion of trade in wildlife is illegal. Rare and endangered animals and plants are often transferred from wild habitats in poor countries to buyers in rich countries by well-organized smuggling rings for use as medicines, furs, food, pets, ornaments, and collectors' items.

Annually, illegal international wildlife trafficking is estimated to bring in billions of dollars. The nature of the wildlife trade makes it difficult to estimate the exact annual revenue, but it is considered second-largest cross-border criminal activity next to illegal drug trafficking. Annual illegal trade in caviar is estimated at US \$244 million, bringing in many times more than legal caviar commerce.¹⁵ Illegal trafficking and commercialization of wildlife is considered by agents of USFWS as “[o]ne of the fastest ways to cause a species to go extinct.”¹⁶

A report by Brazil's National Network Against the Trafficking of Wild Animals (RENCTAS) found that 38 million animals are stolen from Brazilian forests every year. Even though an overwhelming 90 percent die in the process of being caught or during transportation, Brazil still maintains a five to 15 percent share of the illegal wildlife trade market. In the United States, for example, animal traders can fetch \$20,000 for a Brazilian jaguar skin and \$60,000 for a rare Lear's Macaw parrot.¹⁷

¹⁴ Maylynn Engler and Rob Parry-Jones “The economy of legal wildlife trade.”

¹⁵ ibid.

¹⁶ Traxler.

¹⁷ RENCTAS 6, 17.

There are signs that the business is only growing. In 2009, Kenya reported its worst year on record for animal poaching—249 elephants were killed, compared to 147 in 2008 and 47 in 2007. In April 2011, the Thai Customs Office seized 247 tusks, worth an estimated \$3.1 million, which arrived from the Mombasa region in Kenya.¹⁸ This surge in illegal activity has been echoed throughout Africa.

According to a Newsweek article, militia members and organized crime groups in Chad and Sudan are funding their operations by poaching endangered species to trade for weapons or money.¹⁹ The RENCTAS report, mentioned above, also linked illegal wildlife trafficking to crime syndicates and other illegal activities.²⁰ The increased ease of transporting and selling these animals is just another way that globalization is consequential in the environment. Crime syndicates have become more dispersed, so they can easily move merchandise in a clandestine manner. These groups have connections with other global crime rings, which facilitates the linking of wildlife trafficking to drug and arms trafficking.

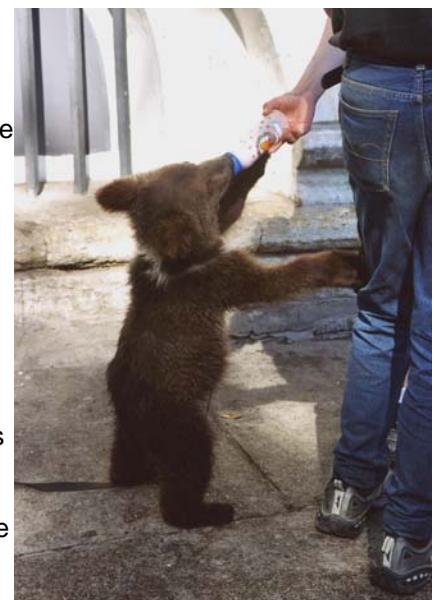
The international community responded to the need to regulate trade in wildlife by establishing the [Convention on International Trade in Endangered Species \(CITES\)](#) in 1973. Over 5,000 species of animals and 28,000 species of plants are currently protected by CITES so that international trade in wildlife does not imperil their survival. More than 175 countries are now parties to CITES. Species covered by CITES are safeguarded under an international system of trade controls based on their placement in one of two protected categories.

Appendix I of CITES contains a list of the world's most endangered species—apes, leopards, tigers, sea turtles, and others—which are near extinction and are not likely to survive if used in trade. For this Appendix I group, no trade permits are issued by CITES countries, barring exceptional circumstances.

Appendix II lists species at serious risk of becoming endangered if involved in international trade. This group includes three-toed sloths, crocodiles, frogs, cobras, and many others. International trade of an Appendix II species requires a permit issued by the government of the exporting country. In addition, countries are allowed to exceed the levels of protection required by CITES, to the point of banning wildlife trade completely for Appendix II species.

Appendix III takes account of species that are protected in at least one country, which has requested other CITE parties for assistance in controlling the trade of said species. Changes to Appendix III follow a separate procedure from changes to Appendix I and Appendix II, as each individual party is at liberty to make unilateral adjustments to it.

CITES and TRAFFIC encompass only international trade in wildlife, however. Domestic trade must be regulated at the national level. In the United States, such regulation takes the form of the robust [Endangered Species Act](#), but other countries such as Thailand, Indonesia, and India are faulted by environmental groups for weak internal regulation. For instance, according to the [International Primate Protection League](#), in Indonesia, the law states that trade or possession of endangered species is punishable by up to five years in prison or a \$10,000 fine, yet many government officials, military leaders, and celebrities own endangered animals as pets.



¹⁸ McConnell

¹⁹ Begley

²⁰ RENCTAS 52-53

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Health
		Education	Human Rights International Law

Some environmentalists advocate going further than CITES, therefore, and establishing international controls for protection of animals within countries. Nations have resisted such an idea, however, because of the perceived invasion of their **sovereignty** such controls would represent.

CITES may actually be doing more damage than protection. In fall 2008, CITES members held an auction for ivory seized in four African countries. The money from the auction, around \$1.3 million, was distributed to elephant conservation projects in these countries.²¹ Conservationists argued that the sale of this ivory actually drove up the demand for ivory in several Asian countries.²² Many fear the auction directly correlates with increased illegal poaching occurring in the last several months.

It seems clear from the facts and reports, especially those given from the Amboseli Trust for Elephants, that the increased demand from the auction raised the supply of illegal ivory. Amboseli documented 98 elephant killings in 2008, compared to 48 in 2007.²³ This number has only increased since 2008. The new demand comes mostly from Asian markets in China, Taiwan, and Japan where ivory is still used in many traditional medicines.

Trade in wildlife has caused a counter-reaction by animal rights groups that itself displays some interesting features of environmental consciousness in a globalized international society. Environmental activists have mounted prominent public efforts to protect various species from commercial exploitation, such as the "fur is murder," "save the dolphins," and "save the whales" campaigns in order to change demand for goods derived from wildlife.

The "fur is murder" movement incites public outrage against the killing of animals for their skins by boycotting department stores and luxury goods retailers that sell fur. Activists spray-paint fur products, place stickers on car bumpers and stop signs, stage public rallies, and promote alternative clothing fashions.²⁴ The "[save the dolphins](#)" campaign urges consumers to purchase only tuna cans that are labeled as "dolphin-safe," because some methods of tuna fishing have the side effect of killing dolphins (discussed in more detail below). Greenpeace has led the "[save the whales](#)" campaign since 1975, raising public awareness about threats to whales, pushing for international whaling restrictions, and actively obstructing whaling ships.

In recent years, it has become a trend for Hollywood celebrities to endorse animal rights groups, such as the wildly popular PETA (People for the Ethical Treatment of Animals). Celebrity supporters include Sir Paul McCartney, Dennis Rodman, and Paris Hilton. While often criticized as a publicity stunt, celebrity endorsement has undeniably put the spotlight on animal rights protection, while reaching a vast audience across the globe. The 2010 Academy Award Winner for best documentary, *The Cove*, also served as a means to increase awareness on animal rights, by shedding the light on the slaughter of dolphins and porpoises in Japan.

These campaigns are perhaps most notable not because they are effective responses to a major problem, but because of their statements about political pressures and attitudes in a globalized society. The ability of environmentalists to organize activists across the world—particularly using the Internet to spread their message—and to influence policy on a national and international level is, in itself, a feature of globalization.

This ability has affected policy in important ways, with, for example, the implementation of "dolphin-friendly" labels on cans of processed tuna in the United States. Illustrative of these effects, the protection of sea turtles mobilized thousands of

²¹ Mukumbira.

²² Leakey.

²³ Kilner.

²⁴ "Get Active."

protesters at the WTO negotiations in Seattle in 1999, and the "save the whales" movement drew widespread international support and helped lead to a ban on commercial whaling.

Because such campaigns address sensitive lifestyle issues, however, they have run into opposition. For instance, as described in the "Wildlife Protection and Cultural Right" section in our [Issue Brief on Culture](#), whaling is a tradition in places such as Japan and Norway and among some Eskimos tribes in the United States, leading to struggle in opposition to restrictions on such practices.

Spread of Invasive Species

VIDEO: <http://www.youtube.com/watch?v=-V5513w1XSk>

Invasive species (also referred to as exotic, alien, or non-native species) are defined by the [U.S. Fish and Wildlife Service](#) as "infiltrators that invade **ecosystems** beyond their historic range."²⁵ When introduced to a new habitat where they happen to be particularly fit for survival, invasive species quickly dominate the naturally occurring wildlife and throw the ecosystem out of balance.

For instance, [zebra mussels](#) have invaded waterways around the United States and clogged up pipes that deliver water to municipalities, farms, and factories, costing billions of dollars in economic disruption. Trout populations in the Great Lakes have declined precipitously after sea lamprey arrived and began feeding heavily on them.²⁶ Since its discovery in a Washington, DC pond, in 1942, an aquatic plant called Eurasian water milfoil has spread all over the country and pushed out native vegetation, thus impeding water flow and depriving many waterfowl of a proper diet.

July 2002 witnessed the discovery of snakehead fish in Maryland. Snakehead fish are a voracious family of fish species that can survive out of water for three days, reproduce quickly, and eat nearly any small animal they come across.²⁷ These findings have sparked great environmental concern and an effort to eradicate snakefish. More recently, according to the *New York Times* (October 7, 2006), "Asian carp have infested the rivers flowing into the Mississippi" to such an extent that fishermen can no longer leave their fishing nets in the river overnight. The carps have proven to be a nuisance, as they tend to leap near passing boats to such an extent that "being hit by fish [is] a normal occupational hazard now."²⁸

The U.S. Forestry Service reports that in the United States invasive plant species already cover over 100 million acres and are spreading at a rate of 14 percent per year.²⁹ One agriculture monitoring organization noted that a new invasive species moves into the San Francisco Bay area every 12 weeks.³⁰ In order to mitigate the effects of invasive species in the United States, the National Invasive Species Council (NISC) released a national invasive species management plan in 2008, which will be effective until 2012.³¹

Of the 1,200 domestic plant species recognized as weeds by the Weed Science Society of America, 65 percent are non-native to the United States.³² The U.S. Department of Agriculture (USDA) says that invasive plants force farmers to

²⁵ National Wildlife Refuge System.

²⁶ Greg, et al.

²⁷ Nonindigenous Aquatic Species.

²⁸ Tom Vaughn and Deborah Weisberg.

²⁹ Bodner.

³⁰ AIMS

³¹ National Invasive Species Management Plan

³² Weed Science Society of America

spend billions on pesticides and, according to the *Weed Science Society of America* cause an annual \$34.7 billion dollar (est. 2007) loss in American agricultural productivity and wildlife.³³

According to [United Nations Environmental Program](#) the total annual cost of invasive species (plant and animal) to the world economy is \$1.4 trillion dollars, which constrains UN Millennium Development goals on poverty.³⁴ Because invasive species reproduce quickly, take resources from native plants, and are hard to eliminate there are huge losses in biodiversity related to the increased introduction of nonnative species into societies. Increased travel, immigration, and international trade have made it more difficult to manage these alien species and have inflated the number of species entering societies.

Farmers and fisherman in developing countries, dependent on the survival of their crops, accrue costs for the damage wrought by invasive insects or plants that clog lakes and waterways. The introduction of the water hyacinth into Lake Victoria in 1990 has caused major difficulties in Uganda. The way the plant grows is “affecting shipping, reducing fish catches, hampering electricity generation and human health.”¹⁰

Questions for Discussion:

The Burmese python were brought to households in Florida as pets. Once they got too big and hard to feed, many households let them go into the wetlands. Now the native wildlife in the Everglades is threatened because the pythons are multiplying and have no natural predator.

How do you solve this problem? What can you do to prevent similar problems in the future?

The spread of invasive species has occurred for hundreds of years as a consequence of human activity, both intentional and unintentional. As noted above, however, this spread is emerging as a pressing problem now because in a globalized world where more people and goods travel all over the planet, it is common for wildlife species to be transported with them.

Another example of an invasive species is the corn rootworm, the major pest to corn in the United States. This pest was accidentally introduced to the Balkans through American military transport during the Bosnia conflict.³⁵ Likewise, insects, rodents, and fish get trapped in cargo containers and are carried to new ecosystems. Sometimes, owners of aquariums dump non-native fish in a local pond or owners of exotic pets release them into the wild.

A program does not yet exist to combat the invasive species problem, but the World Conservation Union and parties to the [Convention on Biological Diversity](#) have recently begun working on a global initiative for that purpose. To date, the invasive species phenomenon has been addressed most attentively at the national level. In the United States, the [Lacey Act](#) restricts the importation, acquisition, transportation, and possession of wildlife deemed injurious to human activity and wildlife resources. The [National Invasive Species Act](#), passed in 1996, established a comprehensive framework to research, regulate, and combat the spread of aquatic nuisance species, in particular the zebra mussel.

In 1999, President Clinton signed an executive order creating the [Invasive Species Council](#) to oversee all efforts nationally. Invasive species are likely to be a persistent and escalating problem in the future all over the world, with UNEP describing this issue as the second-most important threat facing wildlife, after loss of habitats.

³³ Garhan.

³⁴ Steiner.

³⁵ Smith “US Pushes its Agenda, and Its Pest, on Europe.”

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Health
	Education		Human Rights International Law

The problems faced by animals in a globalized economy exemplify themes that arise repeatedly throughout this Issue Brief. In the case of international trade in animals, governments have agreed on an international treaty to cover legal trade in animals, but the illegal trade remains lucrative, and domestic protection of animals within countries' borders has so far escaped international concern. Meanwhile, international non-governmental organizations have rallied private citizens to oppose trade in wildlife.

In the case of invasive species, governmental efforts to protect animals have so far proceeded only domestically, with, for example, U.S. laws to prevent their spread, but have not yet produced any international strategy. As with other environmental problems, the balance between international concern and domestic **sovereignty**, coordinated government action versus inter-government disputes, environmental concern and economic interest on the one hand and cultural values on the other, has yet to be clearly drawn.

Loss of Biodiversity

VIDEO: <http://www.youtube.com/watch?v=L3QgCLyxvn4&feature=related>

The concept of "biodiversity" is the "big picture" view of the flora and fauna of the earth. Biodiversity is defined by International Convention on Biological Diversity as "the variability among living organisms for all sources, including terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part."³⁶ In other words, biodiversity covers plants and animals themselves, the way they interact with each other, and the way they interact with the natural environment in which they live.

Thinking Question: Create a list of political and economic incentives that can be offered by organizations or by the government to stop the decrease in biodiversity.

Biodiversity loss is occurring on two levels. First, plant and animal species are becoming extinct at an unprecedented rate that far exceeds the natural historical rate (although there is some uncertainty because only 1.75 million out of an estimated 14 million species have been scientifically described).

Second, entire ecosystems in coastal and marine areas, inland watersheds, forests, and dry lands (i.e. deserts, grasslands, and savannahs) are being destroyed by pollution, land conversion, and climate change. In total, the [Living Planet Index \(LPI\)](#), developed by the [World Wildlife Fund](#) based on population trends for hundreds of species, has found that biodiversity declined by about 30 percent from 1970 to 2005.³⁷ (Ecosystem loss is described in more detail in the following section of this Issue Brief.)

In a report titled "2010 and Beyond: Rising to the Biodiversity Challenge," the WWF illustrates how the world's biodiversity is still continuously declining, despite an agreement made in 2002, which was set by Parties of the Convention on Biological Diversity (CBD), and covered clear targets on how to achieve a significant reduction of the current rate of biodiversity loss at global, regional and national levels. The scientists behind the report have come to the conclusion that countries will not be able to meet the modest goals set by the CBD, let alone halt biodiversity loss, as some European countries agreed to, by 2010.³⁸

This loss is important for numerous reasons.

³⁶ Baumgartner 3.

³⁷ Hails 2.

³⁸ Loh 1.

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Human Rights
		Education	International Law

- First, living organisms provide irreplaceable environmental services upon which humanity is critically dependent, such as keeping soil fertile, absorbing pollution, breaking down waste, and pollinating crops. One study estimates that the value of 17 such natural services is between \$16 and 54 trillion per year.³⁹ Comparatively, world **GDP** in 2008 was \$69.5 trillion.⁴⁰
- Second, biodiversity supports human health through facilitating the development of medicines. According to UNEP, 10 of the world's 25 top-selling drugs in 1997 had natural origins, and such nature-based pharmaceuticals are estimated to have a global market value between \$50 and \$75 billion annually.⁴¹ According to the National Cancer Institute, 70 percent (est. 2007) of all new drugs introduced in the U.S. within the past 25 years have been derived from natural products.⁴² It is estimated that plants provide the basis for 56 percent of the 150 most popularly prescribed drugs.⁴³
- Third, biodiversity offers genetic resources for food and agriculture. The unique and lucrative human ability to domesticate and breed more productive animals and crops—for instance, hens that lay more eggs and corn that resists drought—depends upon the genetic diversity within these species. The Convention on Biological Diversity's [Global Biodiversity Outlook \(2001\)](#) states, "Biological diversity provides the goods and services that make life on earth possible and satisfy the needs of human societies."⁴⁴
- Furthermore, many people support biodiversity for ethical and spiritual reasons. John Muir, founder of the Sierra Club, wrote in 1912, "Everybody needs beauty as well as bread, places to play in and pray in, where nature may heal and give strength to body and soul alike." The WWF argues that it works to protect endangered animals and plants in part simply because they are "beautiful and rare" and that this mission is performed both "for people and for nature."⁴⁵ Thus, for many people, preservation of nature is a worthy end in and of itself.

The primary international instrument to protect biodiversity is the [Convention on Biodiversity \(CBD\)](#), one of many that developed out of the heightened environmental consciousness that led up to the [Rio Earth Summit](#) in June 1992. Signed in Rio and now boasting 193 parties (June 2010) the CBD has three objectives: "the conservation of biological diversity, the sustainable use of its components, and fair and equitable sharing of the benefits arising out of the utilization of genetic resources."⁴⁶ The CBD has three mechanisms for promoting biodiversity: an information clearinghouse for technical and scientific cooperation, a process of national reporting on measures taken for biodiversity, and a financial provision that offers assistance to developing countries in this effort.

Nevertheless, the CBD is not an action plan but rather a commitment device; indeed, it lays out little in the way of specific procedures. "The Convention does not set any concrete targets, there are no lists, no annexes relating to sites or protected species, thus the responsibility of determining how most of its provisions are to be implemented at the national level falls to the individual Parties themselves," says the Global Biodiversity Outlook.

Instead, the CBD advocates several guiding principles for countries to consider: the use of a holistic, multi-sectoral approach that involves cooperation among government, civil society, and business; the recognition of the value of local knowledge in promoting sustainable use of biological diversity; and an understanding that economic and institutional factors often underlie the loss of biodiversity.

³⁹ Costanza 253.

⁴⁰ CIA World Fact Book.

⁴¹ TUNZA 124.

⁴² Roberson 3.

⁴³ ibid.

⁴⁴ GBO 248.

⁴⁵ WWF International.

⁴⁶ Convention on Biological Diversity Article 1.

Trade	Environment	Media	Development	Women
Investment	Technology	Culture	Migration	Human Rights
IMF+World Bank	Energy	Education	Health	International Law

The secretariat of the CBD reports in the Global Biodiversity Outlook that despite being parties to the CBD, too many countries lag behind in creating, implementing, and managing their own coordinated national action plans so that real change happens. According to the secretariat, many countries have failed to fully develop national biodiversity strategies or even to submit the national reports required under the CBD rules. In fact, the secretariat itself admits that the CBD has failed in "conveying the message of the economic importance of biodiversity" and "engaging the private sector at the national and global levels."⁴⁷

Finally, a global effort is complicated by the lack of any rigorous scientific standard for benchmarking biodiversity. Without such an indicator, it is too conceptually vague to assess the status of biodiversity and measure progress in supporting it. Germany's Minister of the Environment, Sigmar Gabriel, asserts, "We are currently in the process of wiping nature's harddrive—at a tremendous rate and without any hope of restoring it once it is lost....In order to curb the ongoing destruction of biodiversity and thus reverse the trend, we must finally adopt effective measures at an international level."⁴⁸

The need to protect biodiversity is a political question as well as an economic one, because assessment of the benefits of protection depends heavily on the intrinsic and indefinable value one places on nature.

The United States, for example, has not become a party to the CBD. When the treaty was presented at the Rio Earth Summit in 1992, the elder President George H.W. Bush refused to sign it, citing concerns over protection of intellectual property rights, such as the right to patent certain plant and animal life, and terms of financial assistance to developing countries. The Clinton administration signed the treaty in 1993, but the Senate never ratified it because of protests [from the property rights, farm, and timber lobbies](#). They objected to the idea that their economic interests, dependent on control over land, should be subjected to interference from outside the U.S. political system in which environmental concerns might override American determinations of economic development needs.

Loss of biodiversity, then, is an international problem that is being fought through international cooperation. But, there are disagreements among nations about how best to deal with the problem. Citizens of different countries have different philosophical beliefs about how much to value the environment versus economic development and personal freedom, and such differences must be respected for a cooperative response to work.

Potential solutions must take into account the **sovereignty** and input of local people to gain political support. International agreements, like the CBD, are ineffective unless they create the necessary real-world political and economic incentives for people, organizations, and governments to take appropriate action.

⁴⁷ GBO 248.

⁴⁸ "Biodiversity Loss—It Will Make You Sick."

Ecosystems

Ecosystems are the whole web of relationships among a particular environmental habitat and the plants, animals, and human beings who depend on it. Some of these ecosystems, such as the oceans, are not under the control of any one or number of nations, however. Who, then, should be responsible for protecting those areas? At the same time, some ecosystems are under the control of one nation, but that one nation may have neither the resources nor the inclination to protect them. Should other countries care about environmental damage in another country that has no clear cross-border affects? If so, how can those other nations reverse that damage without impinging on the first country's **sovereignty**?

Oceans

The oceans are a prime example of these problems. They are used for economic activity, recreation, and sustenance by people in many nations of the world. At the same time, they are also damaged by people in those nations. Belonging to no one nation, however, oceans can be considered the "common heritage of mankind."⁴⁹



Yet, if no one nation owns them and is responsible for taking care of the oceans as a coherent **ecosystem**, how can they be protected? This is referred to as the "tragedy of the commons," that is, a resource that is owned by no one but used by everyone will eventually become hopelessly damaged because no one will take responsibility for protecting it.⁵⁰ Each user will assume that someone else will be responsible, and, thus, no one becomes responsible.



This is a tragedy, too, because of the reliance of all human beings on the oceans. Covering about 70 percent of the earth's surface, oceans play a vital role in the environment and economic activity throughout the world. According to the United Nations Atlas of the Oceans, "Oceans are a highly productive system which continuously recycles chemicals, nutrients and water through the '**hydrological cycle**,' which powers climate and weather, and which regulates global temperature by acting as a giant heat reservoir from the sun."⁵¹

Additionally, oceans are the basis for a wide variety of industrial, commercial, and recreational activities, such as fisheries, shipping, and sailing. Finally, livable coastal marine areas are important—as of 2009, 44 percent of the world's population resides within 62 miles (100km) of an ocean coast. This is more people than even inhabited the planet in 1950. This number is continually increasing; since 1970, an average of 2000 homes has been built daily in coastal areas.⁵²

Various kinds of pollution make their way into oceans from many sources, including sewage, agricultural runoff, oil spills, chemical emissions, and non-biodegradable litter (that is, litter that will not degrade naturally). Unsustainable consumption

⁴⁹ Basler.

⁵⁰ Hardin.

⁵¹ UN Atlas of the Oceans

⁵² "Human Settlements on the Coast."

Trade	Environment	Media	Development	Women
Investment	Technology	Culture	Migration	Human Rights
IMF+World Bank	Energy	Education	Health	International Law

of living marine resources (fishing) is another pressing problem. UNEP reports "an almost inexorable global trend towards increasingly intense exploitation and depletion of fisheries stocks, three-quarters of which are maximally exploited...."⁵³

Also, through dredging to create ports, waste dumps, construction, and recreation, coastal areas have been significantly disturbed and reshaped for human purposes. Scientists estimate that nearly 10-30 percent of the world's coral reefs have been permanently lost; while an astounding 70 percent are threatened with damage often attributable simply to direct physical destruction.⁵⁴ Coral reefs are lost at a rate currently higher than rainforest depletion, and studies suggest that up the Indo-Pacific Ocean loses 3168 square kilometers (1223 square miles) of coral cover annually. This loss is the equivalent to the size of 450 fields.⁵⁵

Recently, one of the largest environmental disasters took place, the 2010 BP Oil Spill in the Gulf of Mexico. This was the largest oil spill in the history of the U.S., with numerous negative impacts on marine ecosystems and coastal economies. The extent of the long term effects is still unknown. However, this disaster was largely publicized, making the public more aware of the vulnerability of ecosystems, the negative effects of oil dependency, and the necessity of making a transition to clean energy.

The tragedy of the commons has led only to a hodgepodge of ocean protection treaties. The primary treaties are the UN Convention on the Law of the Sea and fisheries agreements, including the UN Fish Stocks Agreement and Code of Conduct for Responsible Fisheries, as well as some anti-pollution measures such as the London Dumping Convention, Basel Convention, and the Global Programme of Action, that have provision on maritime issues.

In 1999, however, the international community undertook a four-year fact-finding mission called the Global International Waters Assessment (GIWA). The goal of this initiative is to comprehensively clarify the environmental state of oceans, the sources of damage to oceans, and possible future scenarios for their protection. In 2006, GIWA released its final report highlighting the following problems: freshwater shortage, pollution, overfishing and other threats to aquatic living resources, habitat and community modification, and global change. To read the report, click here:

http://www.unep.org/dewa/giwa/publications/finalreport/giwa_final_report.pdf.

⁵³ Global Environment Outlook, Ch 2.

⁵⁴ "Coral Reef Destruction and Conservation."

⁵⁵ Pareti 19.

Desertification

A slightly different problem occurs with land **ecosystems**. These tend to be within one country, but the international community is still concerned with trying to protect them, particularly because some of the world's poorest people live in areas threatened by rapid loss of productive capability through **desertification**, that is, the transformation of land areas into essentially uninhabitable deserts that cannot support human populations. This raises its own problems regarding a coordinated international strategy.

Dry land ecosystems such as grasslands and savannahs cover over one-third of the world's land area and are home to many of the world's poorest people, whose livelihoods depend critically on the land. Yet precisely because these ecosystems are not naturally lush, dry land areas are fragile and highly vulnerable to land degradation.



Desertification is caused by a combination of climactic variations and human activities. Untouched dry lands suffer during periods of drought, but are generally able to recover on their own. However, when these areas are simultaneously exploited for human economic gain, the combined stress on the ecosystem can be too much. Thus, over-cultivation, over-grazing, deforestation, and poor irrigation by humans play a large role in the desertification problem.

The results of desertification can be disastrous. The key effect is the loss of the primary resources—fertile topsoil, vegetation, and crops—that sustain economic activity. In impoverished regions, such as sub Saharan Africa, the ramifications are serious. If desertification progresses enough, the already marginalized people who depend on this land will find that the land can no longer provide enough food and water for survival. The result is famine that starves many people and animals, forces large displacements of populations, and entails massive economic disruption.

Though the effects of desertification are most alarming in poor regions, resultant loss of productivity is damaging for developed areas as well. Indeed, Kofi Annan, Former Secretary General of the United Nations, warned that, "Desertification... affects one-third of the earth's surface, putting at risk 1.2 billion people in more than 100 countries."⁵⁶ A UN Convention to Combat Desertification press release stated that approximately \$42 to 45 billion (est. 2009) in global income is lost annually, directly because of desertification. It would only cost \$2.4 billion annually to prevent land degradation.⁵⁷

Recognizing the potentially catastrophic consequences of desertification, the international community created the United Nations Convention to Combat Desertification (UNCCD). Agreed upon in 1994, the UNCCD went into force in 1996 and 193 countries had joined it as of June 2011. In 2007, the UNCCD released a 10 year strategy for the reduction of desertification, which will be effective from 2008 to 2018. Though the UNCCD addresses desertification in all parts of the world; the primary focus is on Africa, where it is a particularly pernicious problem.

Despite the UNCCD, desertification has not abated and may even be intensifying. The UNCCD seeks to prevent degradation through a combination of national action programs and participation of local communities in decision-making.

⁵⁶ Dialo.

⁵⁷ "GEF as a Financial Mechanism of UNCCD."

However, UNCCD relies on individual countries to raise funds and form partnerships with other countries as necessary and as possible in order to provide the means to carry out its stated goal.

Since, however, the problems caused by desertification are confined to individual countries, mainly poor ones to begin with; there has been no internationally coordinated effort to provide concrete financial help. Individual nations are affected within their own borders, making the problem seem to be the responsibility of each nation itself, rather than the international community as a whole. Even with the UNCCD, therefore, the nature of the problem has prevented the richer countries from committing to help the poorer countries with financial aid.

By contrast, in the case of oceans, the impediment to collective international action is the fact that no one nation feels responsible for a problem that affects many nations. In the case of desertification, many nations do not feel responsible for a problem that affects only one or several other countries within their own borders.

Global Warming

VIDEO: <http://www.youtube.com/watch?v=oJAbATJCugs>

Global warming—also called climate change—refers to the worldwide rise in temperatures that has been blamed for severe weather in many parts of the world. According to the [Intergovernmental Panel on Climate Change \(IPCC\)](#) a worldwide consortium of scientists set up in 1988 by the United Nations Environment Programme ([UNEP](#)) and the [World Meteorological Organization \(WMO\)](#), the world's average temperature has risen by 1.1° F (0.6° C) over the past century. The Earth Policy Institute reported that 2010 was the hottest year on record with an average global temperature of 14.63 degrees Celsius.⁵⁸ The IPCC also predicts an increase in average temperature between 2.5° F (1.4° C) and 10.4° F (5.8° C) over the next century, a rate of warming unprecedented in the last 10,000 years.⁵⁹

This same panel concluded in its 2007 report that it is 90 percent certain that human emissions of greenhouse gases are the main cause of the global rise in temperature.⁶⁰ This rise in temperature is blamed for a number of environmental problems, such as an increase in the worldwide sea level by 11 to 17 inches (28 to 43 centimeters) caused by melting ice glaciers that threatens to swamp coastal land areas and islands.⁶¹ Global warming may also cause higher precipitation levels and more frequent severe weather, such as [El Niño](#).

The cause of global warming is human activity, including fossil fuel combustion associated with industrial development, the burning of forests by farmers in the developing world, and even **biomass** combustion—the burning of wood, coal, and dung for cooking and heat—by the poor. These activities have produced emissions of gases, such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFC's), which contains elements such as carbon dioxide, methane, nitrous oxide, and chlorine, fluorine, and bromide (together called halogens). CFCs and HCFCs are often described as "greenhouse gases" because they warm the atmosphere by trapping heat from the sun and cause the "[greenhouse effect](#)."



Credit: PicApp

To combat these problems, in 1992 the [UN Framework Convention on Climate Change \(UNFCCC\)](#) established a commitment "to achieve...stabilization of atmospheric concentrations of greenhouse gases at levels that would prevent

⁵⁸ Earth Policy Institute.

⁵⁹ ibid.

⁶⁰ "Evidence of Human-Caused Global Warming."

⁶¹ National Geographic.

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Human Rights
		Education	International Law

dangerous anthropogenic (human-induced) interference with the climate system.⁶² Since then, 192 countries have joined the UNFCCC (and 4 countries have joined as 'observer countries'), and as of June 2011, 193 parties (192 states and one regional organization) have ratified the [Kyoto Protocol](#), a more stringent and detailed procedure for execution of the UNFCCC goals. Under the protocol, developed, signatory nations are supposed to achieve a five to seven percent reduction from 1990 levels in CO₂ emissions by 2008 to 2012. Developing nations do not have such specific targets, but are incentivized to reduce greenhouse gas emissions through voluntary targets, technology transfer, and the income generated by the cap-and-trade market designated in the protocol.

The Kyoto Protocol came into force in 2005 after Russia signed the agreement. At least 55 countries that account for a total of 55 percent or more of greenhouse gas emissions (at 1990 levels) must ratify the protocol for it to take effect. Most importantly, despite being one of the 84 drafters of the protocol in 1997, the United States has been an outspoken critic of the agreement since then, and as the producer of about one-third (est. 2008) of greenhouse gas emissions (with only about five percent of the world population),⁶³ U.S. refusal to ratify has almost single-handedly thwarted the effectiveness of the protocol, and the Obama administration has not given any signal that this is likely to change. The majority of the international community stays committed to pushing forward with this protocol and future environmental agreements in the hopes that the U.S. will feel greater pressure from its population and others to join as well.

However, as stated by the *International Herald Tribune* (June 13, 2008), China has now clearly overtaken the U.S. as the leading emitter of climate-warming gases.⁶⁴ As a developing country, China is pardoned from the Kyoto Protocol's requirements to reduce emissions of global warming gases. According to the *New York Times* (November 07, 2006), "unregulated emissions from China, India and other developing countries are likely to account for most of the global increase in carbon dioxide emissions over the next quarter-century."⁶⁵ This raises a larger issue: how can developing countries balance the obligation of becoming part of the "developed world", while simultaneously keeping global warming gases to a minimum?

The United States and other countries, such as Australia, have voiced several concerns about the Kyoto Protocol, focusing on its scientific basis, economic cost, feasibility and fairness.

First, critics of the protocol question how serious global warming is. For example, the IPCC has never offered a specific figure for an acceptable concentration of greenhouse gases, and Thomas C. Schelling, a professor at the University of Maryland, estimated in the May/June 2002 issue of *Foreign Affairs* that an acceptable concentration ranges widely between 600 and 1200 parts per million.⁶⁶ With this kind of uncertainty, say the protocol's critics, the benefits of reducing emissions cannot be adequately compared to its disadvantages. Supporters of the protocol, on the other hand, say that the prospect of better scientific knowledge in the future should not prevent action in the present.

Second, there will undoubtedly be an economic cost to reducing greenhouse emissions. For example, closing down cheap coal-fired electricity plants and replacing them with cleaner but more expensive natural-gas burning plants would increase energy prices. Likewise, forcing automobile manufacturers to produce more energy-efficient cars would be expensive. As a result, the economy as a whole would face slower growth and lost jobs, although the exact amount of such a reduction is subject to debate.

⁶² UNFCCC.

⁶³ Environmental News Service.

⁶⁴ Krugman.

⁶⁵ Bradsher.

⁶⁶ Schelling "The Uncertainty Principle."

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Human Rights
		Education	International Law

Furthermore, there is a cultural divide over how concerned we should be about environmental risk versus economic development. For instance, Europeans are generally more willing than Americans to pay high fuel taxes and drive small cars in order to protect the environment. And, as previously mentioned, developing countries tend to prioritize economic growth over reducing their emissions.

Third, critics say that the prescribed timeframe for emissions cuts is unreasonable and unrealistic. For example, carbon dioxide emissions in the United States increased by 13 percent in the 1990s, so that meeting the Kyoto targets for reduction from 1990 levels would require the United States to cut emissions by about 30 percent from the levels they would otherwise be projected to reach by 2010.⁶⁷

Instead, the United States wants reduction efforts to focus on "greenhouse gas intensity"—emissions per unit of **Gross Domestic Product (GDP)**—arguing that this measure considers emissions reductions within the context of economic growth. For example, according to the [U.S. Environmental Protection Agency \(EPA\)](#), while absolute levels of U.S. greenhouse gas emissions grew 12 percent in the 1990s, greenhouse gas intensity actually declined 17 percent. Thus, economic growth produced extra pollution, but the economy as a whole was in fact becoming cleaner and more efficient.⁶⁸

Fourth, critics decry the protocol's weaker restrictions on developing countries—particularly India and China—than on developed countries. While the UNFCCC provides a general mandate for all countries to reduce greenhouse gas emissions, the specific commitments entailed in the Kyoto Protocol apply only to a group of rich countries on the basis that rich countries are best economically positioned to adopt environmental protection measures.⁶⁹

On the other hand, it is relatively easier for poor nations to upgrade outdated, dirty industrial processes by applying modern technology already available in wealthy countries. In fact, the Kyoto Protocol calls for rich countries to provide technological and capacity-building assistance to poor countries so that these "easy" emissions reductions can be made, with the simultaneous benefit of a badly needed boost to economic efficiency.

Developing nations, however, argue that it is unfair to burden their current economic development with environmental regulations while the richer countries enjoyed unfettered development in decades past without environmental restrictions.⁷⁰

Nevertheless, the disputes over the balance between economic development and environmental protection and between the responsibilities of rich and poor countries will have to be settled before an internationally coordinated strategy on reducing greenhouses gases can gain the participation of the United States.

A new direction for U.S. environmental policy was a big draw for many voters in the 2008 election. The Obama administration's policy on climate is to invest over \$150 billion on energy research and development and green jobs in the U.S. in the next ten years. He also plans to adopt a market cap-and-trade policy similar to the Kyoto framework, but Obama will not sign the Kyoto Protocol because it expires in 2012. He has committed to negotiations for the post-Kyoto framework.

⁶⁷ Gallagher.

⁶⁸ EPA "Climate Change."

⁶⁹ Kyoto Protocol Article 10.

⁷⁰ McGregor.

Ozone Depletion

Like global warming, depletion of the ozone layer raises complex problems of cause and effect that have led to international disagreements over coordinated efforts to reverse the problem. Unlike global warming, however, ozone depletion has actually been successfully controlled by international cooperation, perhaps providing a model for other efforts at global environmental protection.

Ozone is an invisible, poisonous gas molecule (O_3) that exists in trace (minimal) amounts in the stratosphere (6-30 miles above the earth). It makes life on earth possible by shielding the planet from 95-99 percent of the sun's harmful ultra-violet (UV) rays, which can cause skin cancer, degenerative eye damage, and suppressed immune response. Rodents subjected to UV **irradiation** are more likely to die from viruses such as malaria, influenza, and herpes.

In addition, increased UV radiation upsets the balance of ecosystems and disrupts many chemical and physical processes that occur in nature's cycle. For example, elevated UV levels have been shown to compromise the aquatic food chain, alter plant-insect interactions, change the growth patterns of fungi, and slightly reduce the productivity of agricultural plants.

Basic natural cycles involving nitrogen, sulfur, carbon dioxide, and decomposition of biological matter are also affected. Also, increased UV radiation in the lower atmosphere, or troposphere, helps cause photochemical smog. Finally, solar rays augment and interact with the global warming trend.

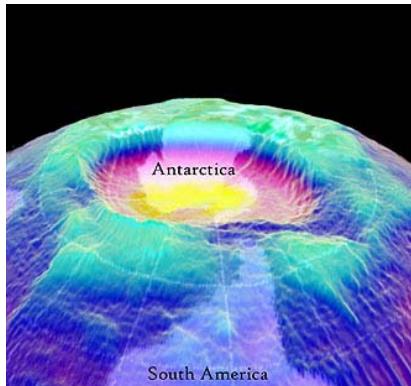
According to the [U.S. National Aeronautics & Space Administration](#) (NASA), from 1978-1991 there was a net decrease in global ozone of 3 percent per decade, and "every 1 percent decrease in the earth's ozone shield is projected to increase the amount of UV light exposure to the lower atmosphere by 2 percent."⁷¹ [UNEP has reported](#) that since measurements started in the early 1980s, the ozone layer over Antarctica—the world's most vulnerable region because of the extreme cold and presence of polar stratospheric clouds—has steadily eroded. This resulted in "**ozone holes**" over land.

The ozone hole in the South Pole grew to about five billion acres in the early 1990s and, at times, increased to seven billion acres. In 2001, the ozone layer had thinned up to 30 percent at the North Pole and 5-30 percent in Europe and other high latitudes. In 2007, the ozone loss tired at 27.7 million tons, surprisingly less than in 2006, which saw a record loss of 40 million tons. At its maximum size, in 2008, the ozone hole in the Antarctic zone reached 27 million square kilometers. This is about 2000 square kilometers larger than North America. In 2009, at its maximum size, the ozone hole reached 24 million square kilometers, decreasing from the previous year and still smaller than the 2006 record size, according to images collected by the NASA Aura satellite.⁷² In 2010, the ozone hole was further reduced, to 22 million square kilometers at its maximum size, a sign of sustained progress.⁷³

⁷¹ Stratospheric Ozone Depletion.

⁷² NASA.

⁷³ The Ozone Hole.



The main cause of ozone depletion is emissions from man-made sources of halocarbons, most notably chlorofluorocarbons (CFCs). Discovered in the early 20th century, these "wonder gases" were renowned for their industrial properties and used in a wide range of applications, including refrigerators, air conditioners, aerosol spray cans, solvents, foams, and fire extinguishers. The downside of these gases is that they linger in the atmosphere—50, 65, 100, or as long as 1,700 years—and thus cause long-lasting environmental damage. The chlorine in CFC interacts chemically with ozone and breaks it up into constituent molecules of oxygen, reducing the capability of the ozone layer to block UV rays.⁷⁴

The international response to the ozone threat has been perhaps the most successful of all global environmental efforts. In 1985, The [Convention for the Protection of the Ozone Layer](#) (known as the Vienna Convention) committed countries to take "appropriate measures...to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the Ozone Layer."⁷⁵ At that point, scientific understanding of ozone depletion was still limited, so specific measures were not put in place, but countries were willing to recognize the problem and agree in principle to combat it.

As scientists developed precise knowledge of how ozone depletion occurs and started finding definitive proof of an ozone hole, the parties to the Vienna Convention were more inclined to take specific action and thus negotiated the [Montreal Protocol on Substances that Deplete the Ozone Layer](#). Completed in 1987 and with 196 parties as of May 2011, the Montreal Protocol established tough guidelines for reducing usage of ozone-depleting substances while allowing leeway for the economic growth of developing countries and changes based on scientific advances.

Under an amendment process, the Montreal Protocol can be updated to reflect better understanding of the ozone problem without having to re-negotiate the whole agreement, so that the agreement is flexible yet steadfast. This process has resulted in four subsequent amendments: in [London](#) (1990), [Copenhagen](#) (1992), [Montreal](#) (1997), and [Beijing](#) (1999). In March 2007, the U.S. submitted an amendment to speed the elimination of ozone-depleting substances.

Like the effort to stop global warming, the drive to end ozone depletion was based on the principle that rich countries could better afford to implement environmental protection than poor countries. The Montreal Protocol therefore established separate phase-out schedules for the two groups, granting developing countries a grace period. Now, of the 96 ozone-depleting chemicals controlled by the protocol, developed countries have already phased out use of most of them and are far along in eliminating the rest. Developing countries are still in the primary process of phasing out CFCs

⁷⁴ Clark.

⁷⁵ Vienna Convention Preamble

Trade	Environment	Development	Women
Investment	Technology	Media	Migration
IMF+World Bank	Energy	Culture	Human Rights
		Education	International Law

and other gases called halons, but are expected to make substantial progress on these and other substances in the next decade.⁷⁶

Klaus Toepfer, executive director of UNEP, insists that continued leadership by the rich countries will be needed to eliminate ozone depletion permanently. Developing countries, such as India, China, and Brazil, received \$470 million from 2006-2008 to help to cut back on their production and consumption of ozone-depleting substances.⁷⁷

Since 1990, \$2.4 billion of assistance from the Montreal Protocol's Multilateral Fund has underwritten over 6,000 projects to reduce usage of ozone-depleting substances in 148 developing countries. The resulting reductions total 230,768 tons in production and 175,864 tons in consumption.⁷⁸ Toepfer has commented that, "To maintain this momentum, the donor countries must continue supporting developing countries in their transition to ozone-friendly technologies... [T]he partnership between developed and developing countries must remain strong and effective." The Fund's replenished budget for the 2009-2011 period is currently \$490 million⁷⁹.

So far, the Montreal Protocol has yielded impressive results. Between 1986 and 2006, annual worldwide consumption of CFCs declined from 1.1 million tons to 35,000 tons. UNEP projects that if not for the Montreal Protocol, by the year 2050 ozone depletion would have risen 50-70 percent, roughly ten times worse than current levels. Instead, the ozone layer is expected to reach a low point in the next few years and gradually recover to its normal state by 2050.⁸⁰ The reduced ozone loss from 2009-2011 compared to the peak loss in 2006 might be an indication of this gradual trend back to the ozone layer's normal state.

This success in turning back ozone depletion may provide a model for other efforts to combat global environmental problems. The Vienna Convention and Montreal Protocol succeeded because rich countries first took the lead and made the effort credible, and only then asked less developed countries to follow suit.

Also, governments were able to work with industry to develop alternative technologies and chemicals to replace CFCs and other ozone-depleting chemicals. Finally, countries embraced a "precautionary principle" of acting to protect the environment despite a lack of conclusive scientific evidence, and then tightened and modified their policies as further scientific research warranted.

As we have seen with global warming, however, and will see with other environmental problems, consensus on finding solutions to environmental problems is not easy to find. The split between rich and poor nations and between economic development and environmental protection often cannot be bridged. Similarly, some nations are more supportive of the precautionary principle than others.

⁷⁶ "Phase-out of Ozone Killers."

⁷⁷ Backgrounder 10.

⁷⁸ Multilateral Fund Welcome.

⁷⁹ibid.

⁸⁰ Backgrounder 4-6.

Pollution

The balance between economic development and environmental damage is also evident in the problem of pollution and waste products. Increased economic activities, especially in industrial countries, yield pollution from trash and litter, sewage, oil spills, gas and chemical emissions, and nuclear radiation.

The **Organization for Economic Cooperation and Development (OECD)**, representing the world's 30 richest countries, estimates that from 1980-2005 there was a 35 percent increase per person in waste each year, from 946 lbs. to 1,276 lbs, among its member-countries.⁸¹ OECD says that, "municipal waste generation continues to increase almost as rapidly GDP in member-countries." Overall, total waste generation in OECD countries exceeded four billion tons in the mid-1990s.⁸²

The United Nations Commission on Sustainable Development, meanwhile, predicts that by 2025 global waste generation may increase five-fold. Within developing countries, the UN commission expects that waste will double within the next ten years.⁸³

What can you do to decrease pollution in your neighborhood?

International trade made this problem particularly acute in the 1980s. "Toxic traders" in environmentally stricter industrialized countries were avoiding the increasingly high cost of disposing of hazardous waste domestically by shipping the waste to developing countries and Eastern Europe.⁸⁴ To combat what many people perceived to be a contemptible and unfair arrangement, the Basel Convention on the Transboundary Movement of Hazardous Wastes was drafted in 1989. The convention has three main objectives:

- 1) to reduce the generation of hazardous wastes,
- 2) to dispose of hazardous wastes close to their place of production, and
- 3) to reduce the movement of hazardous waste.

International shipments of hazardous waste require approval of the governments to which the waste will be imported or across which it will transit. Export to certain countries is banned altogether. The convention requires annual reporting by each party, offers legal and technical advice, and promotes financial assistance to developing countries. The Basel Convention came into force in 1992 and as of June 2010, there are 173 parties to the convention; however, the U.S., Afghanistan, and Haiti have signed, but not ratified the convention.

Similarly, the Stockholm Convention on Persistent Organic Pollutants (POPs), adopted in May 2001, places strict controls on production, trade, and disposal of 12 of the most dangerous POPs because these toxic substances—mainly industrial chemical by-products and pesticides—are highly injurious, spread easily, and become more concentrated-and thus more dangerous-as they move from organism to organism up the food chain.

⁸¹ Environmental Data Compendium 11.

⁸² OECD Environmental Outlook.

⁸³ Shaw RP Abstract.

⁸⁴ O'Neill "Problems with current U.S. Policy."

Most of the POPs regulated by the Convention have already been banned in industrialized countries under domestic law, so the primary purpose of the treaty is to provide financial and technical assistance to developing countries. Recognizing the value of international cooperation, President Bush in May 2002 advised the U.S. Senate to ratify the convention, saying, "POPs chemicals respect no boundaries and can harm Americans even when released abroad."⁸⁵ In 2004, the Convention entered into force with ratification by 128 parties and 151 signatories. Nonetheless, the U.S. has only become a signatory and has not ratified the Convention. As of 2011, there are 171 parties, and 152 countries have ratified it (and/or given their acceptance, approval, or accession).⁸⁶

Why were pollution problems dealt with more easily than **global warming** or **biodiversity** loss? Three factors account for the success of international anti-pollution measures.

First, many of the scientific doubts that exist over **global warming** and **biodiversity** did not exist for pollution. Those whose economic interests might be harmed by tighter pollution regulations could not successfully argue that the science was too uncertain to be worth imposing restrictions on the use of pollution-causing chemical.

Second, in a related development and as noted above regarding POPs, many of the most dangerous chemicals had already been banned through domestic regulations before international efforts. This made coordinating international strategy easier.

Third, technology was developed to avoid the use of hazardous chemicals, so that adapting to pollution regulations became relatively cost-efficient.

The availability of technology to control pollution holds two potentially contradictory lessons for the debate about global warming. On the one hand, supporters of strict controls on the causes of global warming can point to the development of such technology to show that corporations can adapt to be productive and environmentally friendly. On the other hand, opponents of strict controls can point to technological adaptation to show that whatever the environmental problems, the free market economy can develop fixes without being forced to do so by government regulation.

The relative balance between the push by government for environmental protection versus an advanced economy's adaptation to environmental protection out of private concern poses a difficult issue for policymakers.

Conclusion

This Issue Brief has described the effect of globalization on the environment both as a result of the increasing integration of the world's economies through international trade and in the context of **multilateral**, international efforts to combat the most pressing global environmental problems. As we have discussed, countries disagree over the nature and scope of the threats the environment faces and the way to deal with those threats, with scientific, cultural, and economic considerations all playing roles in these disagreements. The common themes running through these disagreements, though, are the trade-offs between economic development and environmental protection and between international cooperation and individual action.

⁸⁵ Schafer "Problems with Current U.S. Policy."

⁸⁶ Basel Convention Status of Ratification.



Is Sustainable Development the Way Forward?

The movement for sustainable development is one way past these divisions that has become increasingly important both in international policy-making circles and on the ground. In 1987, the **World Commission on Environment and Development** (the Brundtland Commission) summarized many ideas that had been coalescing among environmentalists into the idea of sustainable development, which the commission defined as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"⁸⁷ This definition supported a comprehensive approach to development in all its aspects-social as well as economic-in ways that did not harm the environment or deplete natural resources so that they would still be available in the future.

The first major endorsement of sustainable development came at the 1992 Rio Conference mentioned earlier, which set forth the [Rio Declaration on the Environment and Development](#) and the [Agenda 21](#). The declaration outlined the goals of sustainable development. It stated, "*Human beings...are entitled to a healthy and productive life in harmony with nature,*" and that "*environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*" States were enjoined to "*cooperate to eradicate poverty*" and to "*cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem.*"⁸⁸

But the "differing responsibilities" of nations at differing levels of development was also emphasized, with rich nations supposed to provide scientific know-how, technology, and financial resources to poorer countries to help them develop and protect the environment.

At the same time, the declaration noted that states have "*the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.*"⁸⁹ The declaration thus tries to navigate a way through the tensions in the relationship between environmental protection and development, rich and poor nations, and international cooperation and national **sovereignty**.

Agenda 21 turned the declaration's principles into a comprehensive list of programs that the international community committed itself to implementing to achieve economic development and environmental protection in tandem and without conflict. Included in the agenda were items as diverse as ending poverty, promoting human health, fighting corruption, protecting the oceans, forests, and biological diversity, and creating environmentally friendly agricultural practices. All of these were to be accomplished in the framework of local, national, and international governmental and non-governmental initiatives that respected women's rights, workers rights, and the rights of indigenous peoples.⁹⁰

Following the summit, organizations were set up to help implement both the declaration and Agenda 21, such as the [United Nations Commission on Sustainable Development](#) and the [U.S. President's Council on Sustainable Development](#). More than 150 countries set up national councils to promote Agenda 21 and 1,800 cities and towns drafted programs to implement Agenda 21 in their localities.⁹¹ Advocacy groups, such as Greenpeace and Oxfam, added sustainable development to their own agendas. Further support for sustainable development came in the **WTO's** 1994 Marrakesh

⁸⁷ World Commission on Environment and Development ch.2, IV.

⁸⁸ Rio Declaration on the Environment and Development Preamble and Principles 1, 4.

⁸⁹ Rio Declaration on Environment and Development Principle 2.

⁹⁰ Agenda 21 Programme Areas.

⁹¹ Beatley, 250.



Declaration and the 2001 Doha Declaration, which both affirmed the goal of liberalizing international trade within the context of sustainable development.

The idea of sustainable development has not, however, ended controversies over the relationship between economic growth and environmental protection. In fact, in many ways the [World Conference on Sustainable Development](#) in August 2002, intended to review progress since the Rio Summit, demonstrated the continuing divisions in the international community.

For example, former U.S. Secretary of State Colin Powell was booed and jeered by some in the audience at his speech to the summit, as he defended the record of the United States on both environmental development and environmental protection.⁹² Meanwhile, government leaders and citizen-protestors from many developing countries decried agricultural subsidies in developing countries, which, they said, prevent poor farmers from competing fairly on the international market.⁹³

In the end, the summit was criticized both by those who had high hopes for its success, such as [Greenpeace](#), and by those who had been [skeptical all along](#), for not having achieved much.⁹⁴ Although participants at the summit agreed on two key documents, a political declaration and an action plan, similar to the Rio documents, it remains to be seen whether the continuing disputes in the international community can be overcome to lead to real progress on eliminating poverty and simultaneously protecting the environment.

In the almost 40 years since the 1972 Stockholm Conference, dozens of international conferences, national laws, local initiatives, government programs and non-governmental campaigns have not resolved the fundamental tensions that underlie the relationship between globalization and the environment. Instead, all these efforts have challenged countries to manage those tensions in ways that are politically feasible within their domestic political context and their financial resources. The results of this process for the environment and for human development are still unfolding.

⁹² Doyle and Stoddard.

⁹³ Yin Shao Loong "The Battle of Bali: Last Stop."

⁹⁴ Doyle and Stoddard.



Glossary

Appellate: a court that will hear cases on appeal from lower courts

Biodiversity: "the variability among living organisms for all sources, including terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part."

Biomass: living organisms that be used for fuel or for industrial purposes

Desertification: land degradation in an arid area

Ecosystem: the whole web of relationships among a particular environmental habitat and the plants, animals, and human beings who depend on it.

General Agreement on Tariffs and Trade (GATT): At the Bretton Woods conference following World War II, representatives of the United States, Great Britain, France, Russia, and 40 other countries created GATT in order to reduce barriers to international trade. It was an agreement not an organization. The functions of GATT were taken over by the World Trade Organization when it was established in 1990.

Gross Domestic Product (GDP): A statistical measure of "the total value of the goods and services produced by the residents of a nation" less the "value of net income earned abroad." This is usually the measurement cited to describe the size of a nation's economy.

Global Warming: also called climate change—refers to the worldwide rise in temperatures that has been blamed for severe weather in many parts of the world.

Hydrological cycle: the movement of water in the atmosphere through 5 steps in a cycle: condensation, infiltration, run-off, evaporation, and precipitation.

Invasive species: infiltrators that invade ecosystems beyond their historic range.

Irradiation: process in which something is exposed to radiation.

Jurisprudence: theory and philosophy of law

Marine Mammal Protection Act (MMPA): enacted in the U.S. 1972 to protect all marine mammals. It was based on the following principles: some marine mammals and fish stock could become extinct due to human activities; these stocks should not fall below sustainable levels; measures need to be taken to replenish stock; there is inadequate knowledge of ecology and population dynamics; and, marine mammals are a resource of great significance.

Multilateral: multiple countries working together to on a specific issue

Multilateral environmental agreements (MEAs): agreements between states that set out binding or non-binding legal principles concerning that parties need to consider before doing something that might affect the environment



North American Free Trade Area (NAFTA): a treaty between the U.S., Canada and Mexico, which eliminated tariffs on many products traded between the three countries. It also protects intellectual property and outlines the removal of investment restriction amongst the three countries.

Organization for Economic Cooperation and Development (OECD): A group of the world's most advanced and wealthiest economies that is both a forum for and an active participant in debates about international economic policies. It was established in 1961 and now has 30 members, including the United States, Canada, Mexico, Japan, South Korea, and most members of the European Union.

Ozone depletion: a decline of ozone in the atmosphere

Ozone holes: decrease in ozone over the Earth's polar regions

Sovereignty: complete and exclusive control of all the people and property within a territory

Subsistence farming: a system of farming that provides just enough for the family, without a significant surplus available to be sold.

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

Uruguay Round: A World Trade Organization round of trade negotiations, which took place between September 1986 and April 1994.

Watersheds: a place where water gathers from falling rain, melting snow, and flowing water

World Commission on Environment and Development: It was convened by the United Nations in 1983 to address accelerating deterioration of the environment and natural resources and the consequences of that deterioration on economic and social development.

World Trade Organization (WTO): an international body dealing with the rules of trade between participating nations



Bibliography

Introduction

Postman, David. "'Battle in Seattle' brings back memories of WTO riots." *The Seattle Times* 18 September 2008. http://seattletimes.nwsource.com/html/localnews/2008187167_battle18m0.html.

Post Intelligencer Staff. "The WTO Case File: The shrimp-turtle case." *Seattlepi.com, Business* 23 November 1999. <http://www.seattlepi.com/business/case1.shtml>.

Globalization and the Environment

"World environmental summit delegates call for new world environmental agency." *People's Daily Online* 4 February 2007. http://english.people.com.cn/200702/04/eng20070204_347389.html.

Baslar, Kemal. *The Concept of the Common Heritage of Mankind in International Law*. The Hague: Martinus Nijhoff Publishers, 1998.

Butler, Rhett. "Deforestation in the Amazon." *Mongabay.com*. <http://www.mongabay.com/brazil.html>.

Cone, Marla. "World environmental officials weigh proposals to cut mercury emissions." *The Los Angeles Times*. Posted to the Seattle Times 24 February 2005. http://www.greatlakesdirectory.org/il/022405great_lakes.htm.

Esty, Daniel C. and Maria H. Ivanova. "Making International Environmental Efforts Work: The Case for a Global Environmental Organization." New Haven: Yale Center for Environmental Law and Policy, 2001.

Murray, Iain. "Global Warming FAQ: What every citizen needs to know about global warming." *Competitive Enterprises Institute* 16 July 2006. http://www.heartland.org/custom/semod_policybot/pdf/24311.pdf.

Simonis, Udo E. "Global Environmental Governance: Speeding up the debate on a world environment organization." Berlin: Science Center Berlin, 2002.

Are International Trade and Protection of the Environment Enemies?

World Trade Organization. "Early Years: Emerging environment debate in GATT/WTO." *World Trade Organization Environment: History*. http://www.wto.org/english/tratop_e/envir_e/hist1_e.htm.

World Trade Organization. *General Agreement on Tariffs and Trade*: Article XX. 1947. *World Trade Organization*. http://www.wto.org/english/docs_e/legal_e/gatt47_02_e.htm#articleXX.

The Tuna-Dolphin Case

105th Congress. "International Dolphin Conservation Act." Public Law 105-42. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=105_cong_public_laws&docid=f:publ42.105?dbname=105_cong_public_laws&docid=f:publ42.105.



Southwest Fisheries Science Center, NOAA Fisheries Service, Protected Resource Division. "The Tuna- Dolphin Issue," in *Encyclopedia of Marine Mammals*, ed. W.F. Perrin, B. Wursig, and J.G.M. Thewissen. <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuld=228&id=1408>.

World Trade Organization. "EU versus US: 'son of dolphin-tuna.'" *World Trade Organization Environment: Disputes Five*. http://www.wto.org/english/tratop_e/envir_e/edis05_e.htm.

World Trade Organization. "Mexico etc. versus US: 'tuna-dolphin.'" *World Trade Organization Environment: Disputes Four*. http://www.wto.org/english/tratop_e/envir_e/edis04_e.htm.

World Trade Organization. "The World Trade Organization in Brief." *World Trade Organization*. http://www.wto.org/english/res_e/dolload_e/inbr_e.pdf.

The Environment and NAFTA

Commission for Environmental Cooperation. *Citizen Submissions on Enforcement Matters*. Comission for Environmental Cooperation. <http://www.cec.org/grants/index.cfm?varlan=english>.

Commission for Environmental Cooperation. *Grants for Environmental Coopeation*. Comission for Environmental Cooperation. <http://www.cec.org/citizen/status/index.cfm?varlan=english>.

Kelly, Mary E. *NAFTA's Environmental Side Agreement: A Review and Analysis*. Austin: Texas Center for Policy Studies, 1993. <http://www.ciesin.org/docs/008-099/008-099i.html#fn1>.

The Washington Post. "The U.S. Congress Voter's Database: 103rd Congress 1st Session." *Washingtonpost.com*. <http://projects.washingtonpost.com/congress/103/senate/1/votes/395/>.

World Trade Organization. "Marrakesh Agreements Establishing the World Trade Organization." *World Trade Organization Uruguay Round Agreement*. http://www.wto.org/english/docs_e/legal_e/04_wto_e.htm.

The Shrimp-Turtle Case in the New WTO Context

Appellate Body of the World Trade Organization. *United States—Import Prohibition of Certain Shrimp and Shrimp Products: Report of the Appellate Body*. World Trade Organization WT/DS58/AB/R, 1998.

Post Intelligencer Staff. "The WTO Case File: The shrimp-turtle case." *Seattlepi.com, Business* 23 November 1999. <http://www.seattlepi.com/business/case1.shtml>.

The Doha Mandate on the Environment

"The Doha Round and Round and Round." *The Economist* 31 July 2008. http://www.economist.com/finance/displayStory.cfm?story_id=11848592.

World Trade Organization. "Trade and Environment: The Trade and Environment Committee, and Doha Preparations."

World Trade Organization Doha WTO Ministerial 2001: Briefing Notes.

Trade in Wildlife

Environment and Globalization
<http://www.globalization101.org>



Convention on International Trade in Endangered Species. <http://www.cites.org/eng/app/index.shtml>.

"Get Active: 9 ways to Make a Statement About Fur." *FurIsDead.com*. <http://www.furisdead.com/getActive.asp>.

"Report on Elephant Poaching and Ivory Trade in the Amboseli Area." *Amboseli Trust for Elephants* 14 February 2009. www.elephanttrust.org.

Begley, Sharon. "Extinction Trade: Endangered Animals are the New Blood Diamonds as militias and warlords use poaching to fund death." *Newsweek* 10 March 2008. <http://www.newsweek.com/id/117875>.

Engler, Maylynn and Rob Parry-Jones. *The Role of the European Union in Wildlife Trade*. Brussels: TRAFFIC Europe, 2007. <http://maps.grida.no/go/graphic/the-economy-of-legal-wildlife-trade>.

Kilner, Derek. "Elephant Poaching Increasing in Kenya." *VOAnews.com* 27 February 2009.

http://www.voanews.com/english/archive/2009-02/2009-02-27_voa30.cfm?CFID=218047948&CFTOKEN=74446329&jsessionid=88305ce9467192f9e961531a3_83d207cd163.

Leakey, Richard. "Ivory Auction a Disservice to Conservation." *WildlifeDirect: The Hard Conservation Questions* October 2008. <http://richardleakey.wildlifedirect.org/2008/11/>.

McConnell, Tristan. "Is China Killing Africa's Elephants." *Global Post*. April 7, 2011.

<http://www.globalpost.com/dispatch/news/regions/africa/kenya/110406/elephant-poaching-ivory>

Mukumbira, Rodrick. "1st Legal Ivory Auction in Ten Years Yields \$1,300,000." *National Geographic* 28 October 2008. <http://news.nationalgeographic.com/news/2008/10/081028-af-namibia-AP.html>.

National Geographic. "Grisly Wildlife Trade." *Youtube*. <http://www.youtube.com/watch?v=jjtEJHQluCQ>.

PETA. "Eva Menendez Reveals All." *The PETA Files* 6 December 2007.

http://blog.peta.org/archives/2007/12/eva_mendes_reve_1.php.

RENCTAS. 1st National Report on the Traffic of Wild Animals. Brasília: Dupligráfica Publishing Company, 2001. http://www.rentas.org.br/files/RELATORIO%20INGLES_final.pdf.

Traxler, Chuck. "Federal Wildlife Investigation Leads to Felony Conviction of Two Minnesota Women for Trafficking in Illegal Wildlife." *USFWS Public Affairs* 13 Jan 2009. <http://usfwsmidwest.blogspot.com/2009/01/federal-wildlife-investigation-leads-to.html>.

Spread of Invasive Species

"2008-2012 National Invasive Species Management Plan." NISC. <http://www.fs.fed.us/r6/invasiveplant-eis/Region-6-Invasive-Plant-Toolbox/2008-New/2008-2012-National-Inv-Sp-Mgt-Plan.pdf#xml=http://www.fs.fed.us/cgi-bin/texis/searchallsites/search.allsites/xml.txt?query=invasive+species&db=allsites&id=4d8bcfd60>

Agriculture Internet Monitoring System. *Brochure on Invasive Plants*. NSF Center for Integrated Pest Management. http://www.cipm.info/cipmbrochures/APHIS/AIMS_Brochure.pdf.



Garhan, Lisa. "Biofuel Crops: Panacea or Pandora's Box?" Weed Science Society of America 26 November 2007. <http://www.wssa.net/WSSA/PressRoom/WSSABiofuelPressRelease.pdf>.

Lee Greg, Christine Hucal and Doug Galante. "Zebra Mussels vs. Sea Lamprey in the Great Lakes." *University of Michigan*. http://sitemaker.umich.edu/section8group3/methods_and_analysis.

Nonindigenous Invasive Species. "Channa argus." USGS:NAS. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=2265>.

Smith, Jeffrey M. "Genetically Modified Corn Study Reveals Health Damage and Cover-up." *Spilling the Beans* 11 July 2005. <http://www.responsibletechnology.org/utility/showArticle/?objectID=221>.

Steiner, Achim. "Time to Get Tough on Alien Species." United Nations Environment Programme 22 May 2009. <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=585&ArticleID=6180&l=en>

United Nations Environment Programme "UN Celebrates International Biological Diversity Day by Highlighting Threat of Invasive Alien Species." UNEP News Release 01/55 22 May 2001. <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=201&ArticleID=2829>.

U.S. Forest Service. *Invasive Plant Pest Species of South Carolina*. The Clemson University, 2008. <http://www.se-eppc.org/southcarolina/scinvasives.pdf>.

U.S. Fish and Wildlife Service. "Invasive Plants Defined: What They Are and What They Are Not." *U.S. Fish and Wildlife Service National Wildlife Refuge System*. <http://www.fws.gov/invasives/volunteersTrainingModule/bigpicture/invasives.html>.

Vaugh, Tom and Deborah Weisberg. "Invasive Fish Species are Proving a Shock to the Ecosystem." *New York Times* 7 October 2006. http://www.nytimes.com/2006/10/07/sports/othersports/07outdoors.html?_r=1&scp=1&sq=october%202006,%20asian%20carp&st=cse.

Weed Science Society of America. <http://www.wssa.net/WSSA/SciPolicy/InvasiveWeeds.htm>.

Youtube. "Invasive Species." *Youtube.com* 2 February 2008. <http://www.youtube.com/watch?v=-V5513w1XSk>.

Loss of Biodiversity

Convention on Biological Diversity. Rio De Janeiro: United Nations, 5 June 1992. <http://www.cbd.int/convention/articles.shtml?a=cbd-01>.

Baumgartner, Johann. *Biodiversity that Mitigates Pests in Agroecosystems*. ELCI/UNEP BPSP: Managing Agricultural Resources for Biodiversity Conservation, 2001. <http://www.unep.org/bpsp/Agrobiodiversity/agrobiodiversity%20thematic/biodivmitpests.pdf>.

Central Intelligence Agency. "Country Comparisons: GDP (Purchasing Power Parity) 2008." *CIA World Fact Book*. <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2001rank.html>.



Convention on Biological Diversity. "Global Biodiversity Outlook 1." *Convention on Biological Diversity* 2001.
<http://www.cbd.int/gbo1/>.

Costanza Robert, et al. "The Value of the World's Ecosystem Services and Natural Capital." *Nature* vol. 387 15 May 1997.
http://www.uvm.edu/giee/publications/Nature_Paper.pdf.

Hails, Chris, et al eds. "Living Planet Report 2008." *World Wildlife Fund*, 2008.
http://assets.panda.org/downloads/living_planet_report_2008.pdf.

Loh, Jonathan, et al eds. "2010 and Beyond: Rising to the Biodiversity Challenge." *World Wildlife Fund*, 2008.
<http://www.wwf.org.au/publications/wwf-2010-and-beyond/>.

Roberson, Emily. "Nature's Pharmacy, Our Treasure Chest: Why We Must Conserve Our Natural Heritage." *Medicinal Plants at Risk: Native Plant Conservation Campaign* 2008.
http://www.biologicaldiversity.org/publications/papers/Medicinal_Plants_042008_lores.pdf.

UN Environment Programme. "Biodiversity Loss—It Will Make You Sick." *UNEP Press Release*, 24 April 2008.
<http://new.unep.org/Documents.Multilingual/Default.Print.asp?DocumentID=531&ArticleID=5775&l=en>.

UN Environment Programme. "TUNZA: Acting for a Better World 2003." *UNEP* 2003.
<http://www.unep.org/geo/pdfs/tunza.pdf>.

World Wildlife Fund. "WWF Mission and Guiding Principles." *WWF International*. http://www.panda.org/who_we_are/.

Youtube. "Helping the World by Preserving Biodiversity." *Youtube.com* 11 June 2007.
<http://www.youtube.com/watch?v=L3QgCLyxvn4&feature=related>.

Oceans

"Coral Reef Destruction and Conservation." *World Prout Assembly*, 5 April 2007.
http://www.worldproutassembly.org/archives/2007/04/coral_reef_dest.html.

Basler, Kernel. *The Concept of the Common Heritage of Mankind in International Law*. The Hague: Martinus Nijhoff Publishers, 1998. http://findarticles.com/p/articles/mi_qa3821/is_200210/ai_n9115940/.

Hardin, Garrett. "The Tragedy of the Commons." *Science* vol. 162, 1968 pp. 1243-1248.

Pareti, Samisoni. "Operation Save Our Coral Reefs." *Island Business* April 2008.
http://www.iyor.org/news/PDF/IB_April2008.pdf.

UN Atlas of the Oceans. "Human Settlements on the Coast: The Ever More Popular Coasts." *UN Atlas of the Oceans: Uses*. http://www.oceansatlas.org/servlet/CDSServlet?status=ND0xODc3JjY9ZW4mMzM9KiYzNz1rb3_M~.

UN Environment Programme. "GEO-3: Global Environment Outlook." *UNEP* 2000.
<http://www.unep.org/geo/geo3/english/316.htm>

Desertification



Convention to Combat Desertification: Status of Ratification and Entry into Force. Rio de Janeiro: United Nations, 1992.
<http://www.unccd.int/convention/ratif/doeif.php>.

Dialo, Hama Arba. "Desertification: A Threat to the Livelihoods of Millions of the World's Poorest People." *IPS News* June 2007. <http://ipsnews.net/columns.asp?idnews=38153>.

UN Convention to Combat Desertification. "Executive Secretary Urges the GEF Assembly to designate the GEF as a Financial Mechanism of the UNCCD." *UNCCD Press Release* 28 August 2002.
http://www.unccd.int/publicinfo/pressrel/showpressrel.php?pr=press28_08_02.

UN Educational, Scientific, and Cultural Organization. *Education Kit on Desertification: Learning About Desertification, A Teacher's Guide.* UNESCO. <http://unesdoc.unesco.org/images/0012/001258/125816e.pdf>.

Global Warming

UN Framework Convention on Climate Change: Kyoto Protocol. Kyoto: United Nations, 1997.
http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php.

Earth Policy Institute. "Eco-Economy Indicators" *Earth Policy Institute* 2008. <http://www.earth-policy.org/Indicators/Temp/2004.htm>.

Environmental News Service. "Record Increase in U.S. Greenhouse Gas Emissions Reported." *ENS* 18 April 2006.
<http://www.ens-newswire.com/ens/apr2006/2006-04-18-02.asp>.

Bradsher, Keith. "China to Pass U.S. in 2009 in Emissions." *New York Times* 7 November 2006.
http://www.nytimes.com/2006/11/07/business/worldbusiness/07pollute.html?_r=1&scp=75&sq=November%207,%202006&st=cse.

Gallagher, Kelly Sims. "Bush's Hot Air Plan." *International Relations Center: Foreign Policy in Focus* 19 February 2002.
<http://www.fpif.org/commentary/2002/0202greenhouse.html>.

Krugman, Paul. "The Conscience of a Liberal." *International Herald Tribune* 18 June 2008.
<http://krugman.blogs.nytimes.com/2008/06/18/dont-worry-be-happy/?scp=2&sq=June%2018%202008,%20china%20emissions&st=cse>.

McGregor, Richard. "China Urges Rich Nation to Lead on Climate." *Financial Times* 4 June 2007.
http://www.ft.com/cms/s/0/34ef96a2-1258-11dc-a475-000b5df10621.html?nclick_check=1.

Schelling, Thomas C. "What Makes Greenhouse Sense?" *Foreign Affairs* vol. 81 no. 3, May/June 2002.

UN Environment Programme. "Evidence of Human-Caused Global Warming 'Unequivocal,' says IPCC." *UNEP Press Release* 2 February 2007. <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=499&ArticleID=5506&l=en>.

National Geographic. "Effects of Global Warming." *National Geographic*, 2007.
<http://environment.nationalgeographic.com/environment/global-warming/gw-effects.html>.



The White House. "Issues: Energy and Environment." *The White House*, 2009.
http://www.whitehouse.gov/issues/energy_and_environment/.

UN Framework Convention on Climate Change. "Facing and Surveying the Problem." *UNFCCC: Essential Background*.
http://unfccc.int/essential_background/feeling_the_heat/items/2914.php.

US Environmental Protection Agency. "National Goal to Reduce Emissions Intensity." *EPA Climate Change—U.S. Climate Change Policy* 17 February 2009. <http://www.epa.gov/climatechange/policy/intensitygoal.html>.

Youtube. "Global Warming 101." *Youtube.com* 18 May 2007. <http://www.youtube.com/watch?v=oJAbATJCugs>.

Ozone Depletion

"Nations Ramp Up Phase-out of Ozone Killers." *MSNBC* 23 September 2007. <http://www.msnbc.msn.com/id/20925073/>.

The Montreal Protocol on Substances that Deplete the Ozone Layer. Montreal: United Nations, 1987.
http://ozone.unep.org/Ratification_status/.

Vienna Convention for the Protection of the Ozone Layer. Vienna: United Nations, 1985. <http://www.unep.org/ozone/vc-text.shtml>.

Clark, Jim. "Uses of Halogenalkanes." 2003. <http://www.chemguide.co.uk/organicprops/haloalkanes/uses.html>.

Krupa, Sagar V. and Hans-Jurg Jager. "Adverse Effects of Elevated Levels of Ultraviolet (UV)-B Radiation and Ozone (O_3) on Crop Growth and Productivity." *Natural Resources Management and Environment Department*, 1996.
<http://www.fao.org/docrep/W5183E/w5183e09.htm>.

Multilateral Fund for the Implementation of the Montreal Protocol. "Welcome." *Multilateral Fund*, 2003.
<http://www.multilateralfund.org/>.

Sparling, Brien. "Stratospheric Ozone Depletion." *US National Aeronautics and Space Administration: Educational Resources*. <http://www.nas.nasa.gov/About/Education/Ozone/ozone.html>.

The Ozone Hole. <http://www.theozonehole.com/2010ozone.htm>

UN Environment Programme. "Backgrounder: Basic Facts and Data on the Science and Politics of Ozone Depletion." *UNEP* September 2008.

US National Aeronautics and Space Administration. "Ozone Hole Watch." *NASA*, 5 June 2009.
<http://ozonewatch.gsfc.nasa.gov/>.

Pollution

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Basel: United Nations, 1992. <http://www.basel.int/text/documents.html>.



Stockholm Convention on Persistent Organic Pollutants. Stockholm: United Nations, 2001.
<http://chm.pops.int/Convention/tabid/54/language/en-US/Default.aspx>

O'Neill, Kate. "Hazardous Waste Disposal." *International Relations Center: Foreign Policy In Focus* vol. 4 no. 1, January 1999. <http://www.fpi.org/briefs/vol4/v4n01haz.html>.

Organization for Economic Cooperation and Development. "OECD Environmental Data Compendium 2006-2008." *OECD*, 2008.

Organization for Economic Cooperation and Development. "OECD Environmental Outlook." *OECD*, 2001.

Schafer, Kristin S. "Global Toxic Treaties: U.S. Leadership Opportunity Slips Away." *International Relations Center: Foreign Policy In Focus* vol. 7 no. 11, September 2002. <http://www.fpi.org/briefs/vol7/v7n11toxics.html>.

Shaw, RP. "International Policy Dimensions of Population and Environment." 1991
<http://www.popline.org/docs/0972/075387.html>.

Is Sustainable Development the Way Forward?

Agenda 21. Rio de Janeiro: United Nations, 1992. <<http://www.un.org/esa/sustdev/documents/agenda21/index.htm>>

Rio Declaration on Environment and Development. Rio de Janeiro: United Nations, 1992.
<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=78&ArticleID=1163&l=en>.

Beatley, Timothy. "Planning for Sustainability in European Cities: A Review of Practices in Leading Cities," in *The Sustainable Urban Development Reader*, ed. Stephen Maxwell Wheeler and Timothy Beatley, (Routledge: 2004), 249-258.

Doyle, Alister and Ed Stoddard. "Powell Jeered as Earth Summit Settles Pact." *Reuters* 4 September 2002.
<http://www.commondreams.org/headlines02/0904-01.htm>.

World Commission on Environment and Development. "Our Common Future: Report of the World Commission on Environment and Development." *United Nations*, 1987. <http://www.un-documents.net/wced-ocf.htm>.

Yin Shao Loong. "The Battle of Bali: The Last Stop Before the World Summit on Sustainable Development." *Third World Network* June 2002. <http://www.twinside.org.sg/title/wssd2.htm>.