Global Environmental Governance

Jean-Frédéric Morin

Introduction

Challenges of Global Environmental Governance
Ecological interdependence
From science to politics

Institutions of Global Environmental Governance
The tragedy of the commons
Institutional solutions
International regimes

Actors of Global Environmental Governance
The State and sovereignty
Inter-governmental organizations
Non-State Actors

Discourses of Global Environmental Governance
Anthropocentrism and biocentrism
Economy and ecology
From human environment to sustainable development

Conclusion

Summary

In the last thirty years, the study of international environmental politics has grown amongst a vast array of debates, and its theoretical innovations have matured. These innovations are rooted in more general international relations theories but are especially designed for the understanding and explanation of global environmental governance. This chapter presents some of them, with a special focus on collective action problems, the design of international institutions, interactions among various international actors, and the evolution of prevalent discourses. Substantial work has been conducted in global environmental politics on the concept of ecological interdependence, the analysis of regimes complexes, the effectiveness of public-private partnerships, and the hegemony of the liberal paradigm. In turn, these theoretical developments from global environmental politics can contribute to other streams of literature in international relations.

Introduction

Thirty years ago, few students of international relations were concerned about fish stocks conservation, dangerous waste management or desertification prevention. Today, whether it is because of a staggering decay of the environment, scientific progress, growing awareness, or simply because of a new trend, things have changed. Those who remain insensitive to environmental issues have become the minority. Environmental protection has even become a key component of the European identity in the making and one of the main European foreign policy principles (Manner 2008). However obvious these normative developments may seem, they come with quite a few commonplace beliefs. The study of global environmental governance strives at debunking these tenacious intellectual shortcuts.

Studying global environmental governance does not mean taking a normative political stance on environmental issues. First and foremost, it is necessary to understand and explain the political dynamics at play. A better understanding and explanation of political phenomena related to environmental protection is a necessary first step to redefine the issues at hand and identify more appropriate solutions. This chapter provides some conceptual tools to better understand global environmental politics, looking respectively at its structures, its institutions, its actors, and its discourses.

Challenges of Global Environmental Governance

Ecological interdependence

"The earth is one but the world is not," noted the Report of the World Commission on Environment and Development (1987: 28). Our planet's biosphere covers a politically fragmented world. One must recognize the international community's ecological interdependence when faced with environmental issues and the challenges this causes in the political arena.

There are at least four contributing factors that create a context of ecological interdependence among States. First of all, ecosystems do not respect manmade borders. Forests, migratory birds and rivers do not stop at border controls. Be it at a bilateral or regional level, States must cooperate to protect their own environmental resources because living plants and animals, as well as pollution, migrate beyond political borders.

Secondly, certain areas belong to the international community as a whole, such as the moon, Antarctica and the international seabed. None of these three zones are restricted to the sovereign territory of any State. They are considered to be world heritage and their management raises specific problems.

Thirdly, local emissions of pollution can have an impact worldwide. Emissions of carbon dioxide in Berlin will not necessarily cause more climate change in Europe than in Australia. By the same token, emissions of chlorofluorocarbons in Mumbai not only damage the ozone layer above the Indian peninsula, but also harm

the earth's entire stratosphere. This type of global issue requires both local intervention to control the emissions and multilateral cooperation to coordinate the solutions.

Finally, more often than not, environmental issues are linked to other international issue-areas, such as trade, migration, and security. The ecological footprints of mass production and military conflicts come to mind. As global cooperation has intensified in these domains, their link with the environment cannot be ignored.

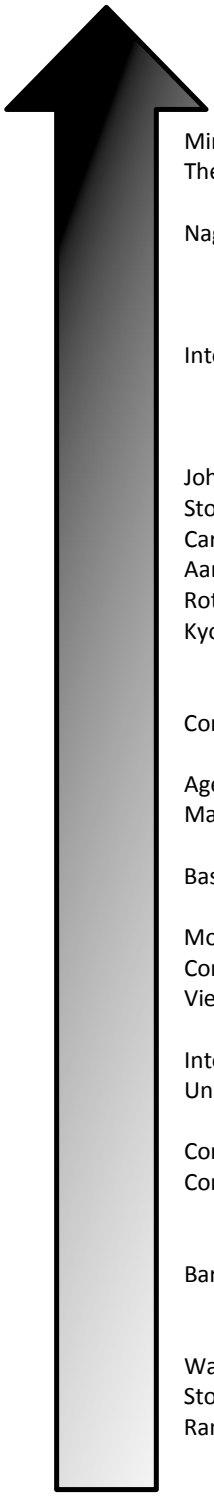
Ecological interdependence, however, does not mean that all states are equally dependent on each other. Costs of abatement and vulnerability to environmental degradation vary from one country to another. In the 1980s, for example, the United States was a global leader on the issue of ozone degradation, pushing for stricter global norms, while most European countries were uninterested and some even expressed skepticism on the ozone science. This difference was partly the result of the willingness of the American industry to develop alternative products to substances that deplete the ozone layer while the European industry was a massive exporter of chlorofluorocarbon. These positions reversed in the 1990s during the Kyoto Protocol Negotiation, partly because European economies were less dependent on fuel energy than the United States (Sprinz and Vaahtoranta 1994).

Nevertheless, thanks to the overall context of ecological interdependence, global environmental governance has a great variety of instruments at its disposal. Hundreds of international environment agreements have been concluded over the years. Some have been in force for more than a century; such as the Boundary Waters Treaty signed between the United Kingdom (acting for Canada) and the United States in 1909. Some more recent multilateral environmental agreements are located in the timeline in figure 1. It is important to bear in mind, however, that they represent only a subset of the multiplicity of international agreements currently in force.

From science to politics

Some observers have developed a pessimistic attitude and have come to believe that international cooperation is doomed to fail because international instruments have not succeeded in reducing current ecological degradation. This verdict needs to be reviewed. For instance, since adopting the *Montreal Protocol* in 1987, developed countries have substantially reduced the use and emission of substances that weaken the ozone layer, which has entered a healing phase. Likewise, significant success has been achieved in the conservation of emblematic mammals, including some populations of seals, elephants and fin whales (DeSombre and Kauffman 1996; Breitmeier, Underdal and Young 2011). There really is no need to be cynical or fatalistic. Rather, one should take a step back and examine the circumstances that would allow global environmental governance to achieve its aim.

Figure 1. Timeline of key events in global environmental politics



Minamata Convention on Mercury
The Future We Want, outcome document of the Rio+20 Conference

Nagoya Protocol on Access to Genetic Resources and Benefits Arising

International Tropical Timber Agreement

Johannesburg Declaration on Sustainable Development
Stockholm Convention on Persistent Organic Pollutants and International Treaty on Plant Genetic Resources
Cartagena Protocol on Biosafety
Aarhus Convention on Access to Information, Public Participation and Access to Justice
Rotterdam Convention on Prior Informed Consent for Certain Chemicals and Pesticides
Kyoto Protocol on Climate Change

Convention on Desertification, Tropical Timber Agreement, and Oslo Protocol on Sulphur

Agenda 21, Convention on Biological Diversity, and UN Convention on Climate Change
Madrid Protocol on Antarctica, Bamako Convention on Wastes, and Espoo Convention on Impact Assessment

Basel Convention on Hazardous Wastes

Montreal Protocol on Substances that Deplete the Ozone Layer
Convention on Early Notification of a Nuclear Accident, and Moratorium on Whaling
Vienna Convention on the Ozone Layer and Helsinki Protocol on Sulphur Emissions

International Tropical Timber Agreement
United Nations Convention on the Law of the Sea

Convention for the Conservation of Antarctic Marine Living Resources
Convention on Migratory Species and Convention on Long-Range Transboundary Air Pollution

Barcelona Convention on the Mediterranean Sea and Convention on Environmental Modification Techniques

Washington Convention on International Trade in Endangered Species (CITES)
Stockholm Declaration and Action Plan of the Stockholm Conference
Ramsar Convention on Wetlands of International Importance

Cynicism towards environmental cooperation is often fuelled by a false belief. Some are quite wrongly convinced that solutions to ecological issues are objectively outlined by science, readily available, and that their implementation depends simply on the goodwill of policy makers. This persistent myth can be broken down in three related and equally flawed assumptions. The first is ontological and opposes science and politics as two antithetical endeavours. According to this dichotomy, science is perceived as consensual, neutral, and universal, while politics is deemed conflictual, partial, and contextual. The second related assumption is normative and argues for a strict division of labour, according to which scientists should supply and policymakers consume knowledge. The third assumption is analytic and results from the tension between the previous two. It explains governance failures by the tendency of policymakers to follow their political interests rather than science-based solutions. When stakes are high, scientific proposals for environmental problems can be expected to be spoiled by dirty political games. This could not be further from the truth.

A closer look at global environmental politics reveals that scientific evidence is neither a sufficient nor a necessary condition for political action and international cooperation. On the one hand, cooperation on deforestation and desertification remain particularly weak although the causes and remedies of these environmental degradations are relatively well known. On the other hand, the 1985 *Vienna Convention on the Protection of the Ozone Layer* was adopted even though the extent of the problem was still cloudy, the 1992 Convention of Biological Diversity was adopted when the economic value of biodiversity was unknown, the 1992 Framework Convention on Climate Change when causal factors were disputed, and the 2000 Cartagena Protocol when health impact of GMOs were uncertain. As Dimitrov notes, “our intuitive expectations that knowledge should be at least necessary for policy action are repeatedly contradicted by empirical findings”(2003, p. 123).

In some cases, science can even impede cooperation. For example, the profusion of scientific indicators and measurement techniques has complicated rather than facilitated negotiation among Scandinavian countries over Baltic Sea pollution (Auer 2010). Likewise, recent studies suggest that scientific literacy in the population does not increase consensus on environment policies but rather feed polarization (Kalan et al. 2012).

Even when science accurately assesses the level of environmental degradation and its causes, the solution does not always speak for itself. Environmental regulation always generates costs, whether they are political, cultural, economic, social, or even environmental. Switching from fossil fuel to nuclear or hydroelectric energy would reduce the emission of greenhouse gases, but the former would also generate more radioactive waste and the latter artificial floods.

Because all environmental measures imply a series of costs and require a hierarchical order of priorities, political debates help define the issue and find the appropriate solution. The general interest is rarely predetermined and obvious answers to the problems we face are non-existent. Conflicts of ideas and interests are inescapable, making political debates and negotiations necessary.

In this context, epistemic communities are particularly important. According to Peter Haas' seminal definition, "an epistemic community is a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain" (1992, p. 3). As a political actor, an epistemic community should be distinguished from a discipline. Its members do not only share causal beliefs and notions of validity, but also norms, principles, and a common policy enterprise.

Thanks to their expertise, often in a scientific field, epistemic communities have the capacity to generate authoritative claims and wield significant influence over the decision making process. Several studies suggest that epistemic communities had a strong influence, including on the ozone layer, acid rain, Mediterranean Sea, and climate change. In some other cases, they were found to have little influence, such as on the international whaling commission (Peterson 1992). This variation led to an interesting debate on the conditions affecting their influence, including political opportunities (Zito 2001), alliances with environmental NGOs (Gaugh and Shckely 2001; Meijerink 2005), types of scientific knowledge communicated (Dimitrov 2006), and stages of policymaking (Campbell Keller 2009).

The epistemic community literature, however, has been criticized for neglecting the political dynamics underlying the scientific process (Litfin 1995; Toke 1999; Lidskog and Sundqvist 2002). While it adequately highlights the direct involvement of science in politics, it fails to theorize the politicization of science. The *International Panel on Climate Change* (IPCC), for example, is not a scientific initiative but the result of a political process led by the United Nations Environmental Program and the World Meteorological Organization. The IPCC nomination process, the negotiation of its policymaker summaries, the management of inconsistencies in its reports, and the capitalization on its Nobel Peace prize are political rather than scientific processes (Lemos and Morehouse 2005) This example illustrates that scientific debates do not pre-exist to political processes: they are intimately intertwined.

Box 1 : The convention on Long-Range Transboundary Air Pollution as a building block for peace in Europe

In the sixties, some European scientists started to be concerned about the fact that pollution emissions in Central Europe could cause acidification of lakes and rivers in Scandinavia. In 1972, the Swedish government took advantage of the United Nations Conference on the Human Environment, held in Stockholm, to draw attention to these disconcerting findings. The member states of the Organisation for Economic Co-operation and Development (OECD) institutionalized a certain type of international cooperation to help states exchange information on transboundary air pollution. Thanks to this system, scientists from different parts of Europe who were alarmed by this issue could communicate amongst themselves. A genuine transnational epistemic community was created.

In 1975, the secretary general of the Soviet Union, Leonid Brezhnev, took advantage of the rising environmental issues to bring about cooperation

between Eastern and Western Europe. By offering to negotiate a new convention on t**ransboundary air pollution**, Brezhnev had a double agenda. Not only did the soviet leader wanted to reduce long-range air pollution, he also hoped to foster a climate of political détente between the rivaling blocks. With this in mind, both Eastern and Western European leaders put great emphasis on the technical aspects of the convention, to ensure that the agreement remained ideologically neutral and fostered symbolic cooperation.

The Convention on long-range transboundary air pollution, concluded in 1979 and overseen by the United Nations Economic Commission for Europe, received positive feedback and encouraged the pursuit of scientific studies and technical negotiations. New data was gathered and maps that could locate the source of air pollution and regions that were most affected by it were made. This encouraged European countries to adopt protocols aiming at reducing air pollution and inspired by scientific research. Today, the constant interaction between science and international cooperation still pushes the European Union to take action and reduce transboundary air pollution. Scientific research and international cooperation can thus work hand in hand and inspire one and other.

Source: Lidskog and Sundqvist 2002; Tuinstra, Hordijk and Kroeze 2006

Institutions of Global Environmental Governance

The "tragedy of the commons"

One of the main underlying issues related to environmental politics is the tension between individual and collective interests. On the one hand, collective groups (such as the international community, composed of many different players) are better off if they participate in joint investments that would ensure the environment's sustainability. On the other hand, individuals (or individual States considered as cohesive units) seek to minimize the costs of environmental protection while benefiting from it. Everyone prefers to have a third party carry the load (Sprinz and Vaahtoranta 1994).

These tensions between individual and collective interests are frequently expressed through the "tragedy of the commons". In a seminal article on the limited carrying capacity of the earth to support a growing population, the ecologist Garret Hardin (1968) pictures a parcel of land shared by local shepherds. If each shepherd has free access to this pasture, it is in their individual interest to allow a maximum amount of sheep to graze on the common land. The more livestock a shepherd has, the more profit he will gather and the less he will have to spend on feeding his animals, thanks to the common pasture. However, none of the shepherds will benefit from sowing the land because the profits of the investment will be shared amongst them. Because no one will invest in its upkeep, overgrazing of the pasture is therefore inevitable. The sum of individual rational behavior leads to a collective irrational result. The moral behind the "tragedy of the commons" goes against the grain of

classic liberal economic theories, which profess that the pursuit of individual interests contributes to the collective good.

This metaphor can be applied to a great number of environmental issues. It is relevant as long as two characteristic conditions are united. First of all, the good must be freely accessible, i.e. no public or private entity has the ability to exclude anyone from the good. Fishing in international waters, for example, is accessible to all regardless of nationality and without restrictions on the quantity of fish that are caught. Secondly, consumption of the good must be rivalrous, i.e. each unit consumed or destroyed by one diminishes the quantity available to the others. The particulate matter emitted by a car, for example, diminishes the quantity of clean air for others citizens. Consequently, both fisherman and car-drivers are victims of the "tragedy of the commons". They have few individual incentives to reduce their consumption or their pollution, but they collectively pay a price for their otherwise rational behavior, as the fish stocks are being exhausted and air pollution causes health problems.

Box.2 Canada, Europe and the Turbot War

Fish stocks in international waters are no strangers to the tragedy of the commons. International waters do not fall under the sovereign jurisdiction of coastal states. Factory ships navigate International waters for months, catching various species of fish stocks, which they freeze and package on board. As a result of these practices, many studies show the gradual reduction of the overall fish stocks and that the number of endangered species has been rising since the seventies.

As the pressure on fish stocks started to be documented, some coastal states adopted fishing quotas in the waters under their jurisdiction, often at the price of great political and economic setbacks in fishing communities. However, if foreign trawlers continued to exploit international waters, these quotas ran the risk of being taken in vain. This caused for disputes to arise between coastal states and countries of origin of the factory vessels that were fishing in international waters. For instance, in 1995 the Canadian coastal guards boarded and seized a Spanish vessel in international waters not far from Canada. This event, also known as the "Turbot War", caused unprecedented tension in diplomatic relations between Canada and Spain.

In the long term, however, the Turbot War encouraged Canada and member states of the European Union to cooperate and regulate fishing quotas in the North Atlantic international waters. In fact, many agreements have been adopted around the world in order to monitor fishing activity of certain species or in certain regions. These agreements generally establish fishing quota and set up a supervision and inspection system. Some even provide sanctions for trawlers navigating under "flags of convenience".

References: Bailey 1996; DeSombre 2005

This "tragedy of the commons" can itself lead to other forms of tragedies. According to some analysts, the exhaustion of natural resources is a factor that can

lead to violent armed conflicts (Homer-Dixon 2001). Wars for the appropriation of precious minerals or fossil fuel illustrate this phenomenon. The relation between the exhaustion of resources and conflicts is however contested. According to other analysts, it could even have the opposite effect and provide an incentive for political actors to establish new institutions that align individual with collective interests (Conca 2001).

Institutional solutions

By better outlining the environmental issues, the "tragedy of the commons" metaphor gives scholars a means to assess possible solutions. If the problem resides in the discrepancies between individual and collective interests, then institutionalized cooperation should help us bridge the gap. The problem is that no one can agree on the best way to achieve this (Victor and Cohen 2005).

Many institutional solutions have been imagined. One of them consists of governmental regulation, coupled with surveillance mechanisms and penalties. If we go back to the pasture, we could imagine the authorities of the village limiting the amount of livestock per shepherd. Since the shepherds would be tempted to breach the rule, it would be necessary to set up inspections and fines for violators. The *Convention of the International Trade of Endangered Species* (CITES) is an example of this model. This Convention controls the exportation of a series of plants and animals and has set up border control. This international instrument has the advantage of looking fair and seems more able to reach its goals. Its administration, however, could prove to be quite heavy, especially in developing countries.

Other institutional frameworks focus on economic incentives to alter individual interests. Public authorities, for example, could allocate subsidies to induce behavior less harmful to the environment. In the tragedy of commons, we could imagine the government rewarding shepherds who voluntarily limit their livestock. In a sense, developed countries already practice this policy with developing countries by conditioning international aid to environmental conditions. This option could bring political bonuses but requires important public financing.

Another economic incentive consists of taxing environmental degradation in order to internalize environmental externalities. As opposed to subsidies, the economic burden is on polluters rather than the general public. Without restricting the amount of sheep, the village could collect taxes from each shepherd and use the money to invest in the upkeep of the pasture. This option, frequently implemented on a national level, is rarely applied internationally because few global authorities could collect taxes. The *Convention on the Law of the Sea* provides royalty obligations to an international organization for mining activities in the deep sea, but the aim of the fee is to provide developing countries with compensation and not to internalize environmental externalities.

A forth solution to the "tragedy of the commons" is establishing clear private property rights and a free market with minimal transaction costs. For instance, each shepherd could receive a percentage of the pasture that would be his own. They could choose to exploit it themselves, to rent it to another or to sell it. In each case, market mechanisms give economic incentives to ensure the preservation of the land. When a

State imposes quotas on air pollution, it basically applies this solution. The State gives each polluter a specific amount of emission credits, which can be considered as the ownership a polluter has on a virtual quantity of resources that it can exploit, rent or sell as it wishes. When the demand for emission credits grows or when the State restricts the supply, the price automatically rises. In this sense, companies are pushed to develop technologies that reduce pollution so that they don't have to buy extra credits or sell those they already own.

There is thus a wide variety of solutions to reconcile individual and collective interests. Some prefer State intervention for regulation or tax collection while others prefer the self-regulating mechanisms of the market. A part from these differences, everyone acknowledges the importance of establishing clear rules that outline expectations, modify the calculation of interests and structure the behavior of key players. For this reason, many experts of global environmental governance have developed a keen interest for institutions, especially international regimes.

International regimes

International institutions set up to solve the "tragedy of the commons" are frequently analyzed under the paradigm of 'regime theory.' International regimes are usually defined as "sets of implicit or explicit principles, norms, rules and decision making procedures around which actors' expectations converge in a given area of international relations" (Krasner 1982: 185).

Regimes are not spontaneous ad hoc arrangements, but are instead institutions that evolve with time and that have deep normative roots. Once they are set up, it is difficult to turn them away from their direction. This consistency makes them predictable, which in turn structures actors' expectations, their conception of their relations, their capacity to act, and at the end of the line, their interactions. If the result of these interactions leads to the establishment of new norms, these will most likely have strong links with established ones. Therefore, regimes develop while depending on their original foundation (Hasenclever et al. 1997).

This path dependency process is especially obvious in global environmental governance. States typically define environmental problems based on initial political declarations, which do not have any judicial obligations but shape the guidelines that will be used to build a regime. Then, on the basis of the declaration, they adopt a framework convention that defines the main legal standards. In the following years, one or more protocols complete the Convention by outlining a more precise set of rules. Simultaneously, the Conference of the Parties, meaning the governing States that ratified the Convention, elaborate the procedures that guarantee its follow-up and implementation. Though a simple political declaration may disappoint those who were hoping for more binding rules, we have to acknowledge that it is often an important first step in orientating a regime for decades to come.

Antarctica is a good illustration on how environmental regimes evolve. This regime was established at the end of the 1950s during the Cold War. Initially driven by security instead of environmental objectives, the Antarctic Treaty provides that it "is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes." (preamble) Gradually, this legal basis was

completed by new rules aiming at the protection of seals and then at the protection of maritime flora and fauna. In 1991, a protocol specifically dedicated to environmental issues was adopted. Today, Antarctica is not only considered to be a land of peace but also as a natural reserve that belongs to humankind. The environmental rules that have been established since 1970 are the continuum of the principle adopted in 1959.

Despite this insistence on institutions, an international regime should not be confused with an intergovernmental organization or with a treaty. Not a single intergovernmental organization dedicated to fresh water exists. However, there are sets of (implicit) rules that exist and that lay out actors' expectations. We can also imagine an international regime without an instrument of international public law. With regard to forestry, for example, intergovernmental initiatives remain modest and yet non-state actors have established global certification schemes (Andonova 2010).

The study of international regimes is always limited to a specific issue-area of international relations. When analyzing regimes, the researcher is restricted to the chosen issue-area. For example, it would obviously be inappropriate to assess an actor's power based on its forest resources to explain negotiations on toxic waste. Both fields are independent and have their own system. Importantly, this concept of issue-area prompts researchers to take social and cognitive constructions into account. Indeed, the scope of an issue-area depends on the actors understanding and ideas regarding it. Since regimes evolve along with our conception of their issue-area, there is a strong chance that they will overlap at some point. Regimes can collide, compete against each other, develop synergies or even merge. For example, cultural and biological diversity were considered independent issues-areas for decades, governed by distinct regimes. With the 1992 *Convention on biological diversity*, however, they became normatively connected and today it is difficult to adopt new norms in one while ignoring the other. For this reason, an increasing number of researchers investigate the interactions between different regimes (Raustiala and Victor 2004, Gehring and Oberthür 2009; Keohane and Victor 2011; Oberthür and Stokke 2011).

Box 3. The Precautionary Principle, at the crossroad between various international regimes

The precautionary principle states that the absence of scientific certainty cannot be used as an excuse to postpone taking measures that could reduce risks to the environment. Unlike the prevention principle, which is applicable when the damage caused has been scientifically proven and which calls for measures to prevent such harm, the precautionary principle is used when science is unable to determine if there is a true risk or not.

Quite a few international instruments make use of this principle, but they do not give it the same interpretation. According to the Rio Declaration on the environment and development, the precautionary principle is applicable to "threats of serious or irreversible damage" (principle 15). The Framework Convention on climate change states that precautionary measures "should be cost-effective so as to ensure global benefits at the lowest possible cost" (article 3). The Agreement on sanitary and phytosanitary measures of the World Trade Organization does not explicitly use the term "precautionary principle" but it makes room for precautionary measures as long as they are temporary and that

the authorities that take these measures "seek to obtain the additional information necessary for a more objective assessment of risk" (article 5.7). Finally, the Cartagena Protocol on Biosafety indicates that precautionary measures "shall be carried out in a scientifically sound manner" and "taking into account recognized risk assessment techniques" (article 15).

Therefore, the interpretation and scope of the precautionary principle vary from one international regime to the other. These contrasts allow for strategic behaviour on the part of states, which make use of an international agreement depending on whether they want to support an environmental measure or fight it. For instance, the European Union's Moratorium on genetically modified organisms was called out for not respecting the precautionary principle as it is defined in the Agreement on sanitary and phytosanitary measures. However, the European moratorium was most likely compatible with the more flexible version of the Cartagena Protocol.

Reference: Lieberman and Gary 2008

Another emerging avenue for research on international regimes is the study of their effectiveness. There is no consensus on the criteria to be used to assess a regime's effectiveness. Should it be based on the actors' satisfaction, compliance with the adopted rules, the achievement of goals that were set at the regime's creation, or the state of the environmental problem? For methodological reasons, most scholars focus on changes in governmental policy and behavior to assess regime effectiveness. Many argue, however, that this criterion is not sufficient as standards of environmental protection can be so low that complete compliance would not impede environmental degradation. (Haas et al. 1993; Downs et al. 1996; Brown et al. 1998; Victor et al. 1998; Miles et al. 2002; Breitmeier et al. 2011; Szulecki et al. 2011).

The regime research program is sometimes criticized for being too functionalistic. As it turns out, regimes occupy an intermediary position between governing structures and actors' behavior. They are the reflection of the structures in place, including power distribution and prevailing ideas, but they also guide and constrain the behavior of social actors. Understanding the guiding principles, norms, rules and procedures is thus only one element of the equation. It is equally essential to gain a better understanding of actors involved in global environmental governance and the overall structure in which they interact.

Actors of Global Environmental Governance

The State and sovereignty

States play a key role in global environmental governance, just as they do in many fields of international relations. They ratify treaties, establish intergovernmental organizations, control trade flow, implement legislations, and provide fiscal incentives. However, global environmental governance is a field that causes some to question State sovereignty, its nature and its necessity.

In the 1960s, during the decolonization process, developing countries insisted upon controlling their natural resources. Many were suspicious of the Western environmental intentions, fearing a form of neo-colonialism. In 1962, they strongly advocated for the adoption of the United Nations Resolution 1803 on the *Permanent sovereignty over natural resources*, recognizing "the inalienable right of all States freely to dispose of their natural wealth and resources in accordance with their national interests". Still today, developing countries frequently refer to this principle and make sure that negotiated texts explicitly recall it.

Several environmentalists, especially in the 1970s and 1980s, feared that such behavior would impede environmental protection. If all States have inalienable rights, they can ignore international cooperation efforts. The idea of a full, exclusive and supreme sovereignty seem incompatible with the "common preoccupation of mankind", equally stated in numerous international agreements.

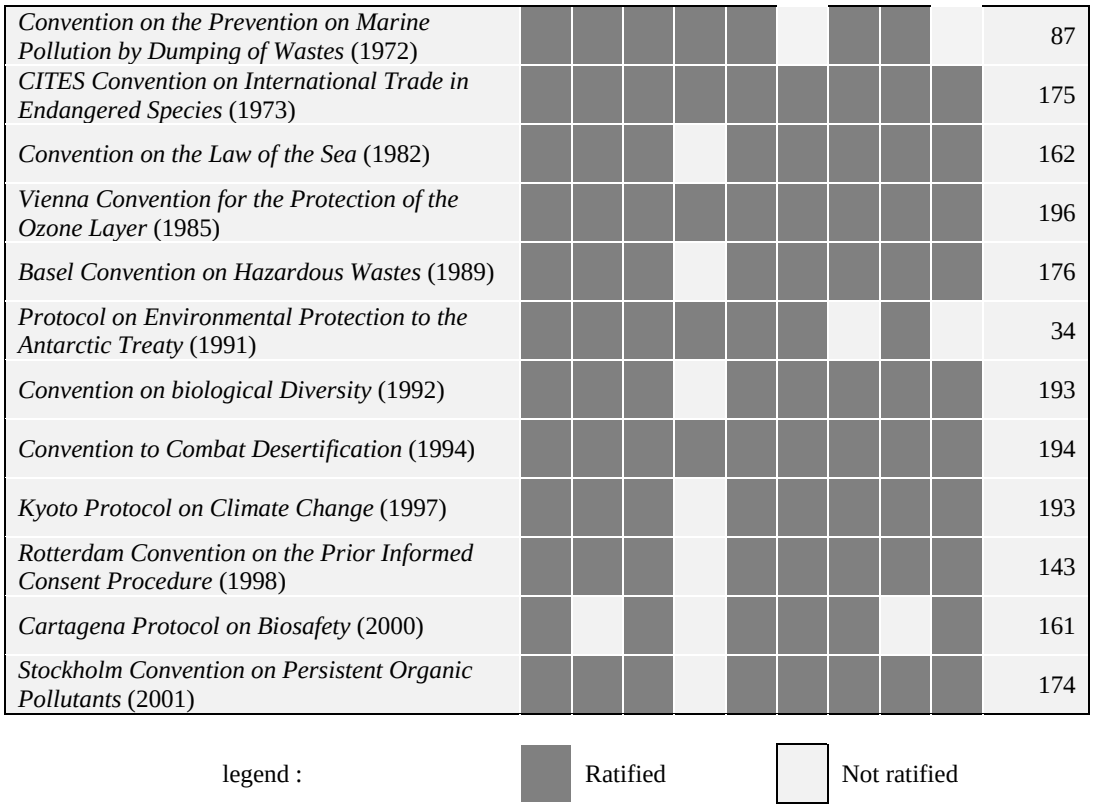
Permanent sovereignty over natural resources, however, is limited by a number of other principles. The principle of preventive action, for example, states that one State cannot use its territory in a way that damages the environment of another State. It was politically endorsed in the Stockholm and the Rio Declarations and legally recognized by the International Court of Justice (Sands 1995).

State sovereignty is additionally limited by international conventions, which often qualify sovereignty rights by assigning specific obligations to states. The Convention on the Law of the Sea, for example, extends sovereignty rights to 200 nautical miles from the coasts but provides for environmental duties. This led some legal experts to affirm "sovereign rights of nation states over certain environmental resources are not proprietary, but *fiduciary*" (Sand 2004, p. 48). Here, sovereignty is a form of public trusteeship granted to States with specific obligations and limitations.

Other requirements also create conditions that push States towards cooperation and joint-action. For instance, several environmental treaties prohibit trade with non-Parties. The Montreal Protocol bans imports, even from non-Parties, of products containing substances that are harmful to the ozone layer. The Basel Convention bans imports and exports of toxic wastes with non-Parties. Consequently, a country whose firms produce sprays or process toxic wastes has a high incentive to respect these treaties, no matter its national interest (DeSombre 2005)

Table 1 : Ratification status of main multilateral environmental agreements (as of 01/01/2012)

	Brazil	Canada	China	United States	France	India	Morocco	Russia	Senegal	Number of parties
*International Convention for the Regulation of Whaling (*1946)	■		■	■	■	■	■	■		89
*RAMSAR Convention on Wetlands of International Importance (*1972)	■	■	■	■	■	■	■	■	■	160



In some cases, the consolidation of State sovereignty can even contribute to environmental cooperation. The *Convention on Biological Diversity* of 1992, for example, placed genetic resources under national sovereignty even though they were previously considered to be part of world heritage. The aim was to make sure States could control access to these resources and therefore negotiate contracts with companies that wish to use samples for biotechnological research and development. In exchange for these genetic resources, States are entitled to ask for fair financial or technological benefits arising from their use. These benefits can then be reinvested into biodiversity conservation. Here, State sovereignty is meant to favor environmental protection instead of hinder it, although the success of the Convention on Biological Diversity is mixed.

Therefore, experts of global environmental governance disagree on the value of national State sovereignty in achieving environmental goals. Some consider that it is best to have a strong State, custodian of common property resources, while others believe States should leave more room for non-state actors more capable of applying practical solutions. This debate between sovereignty as an obstacle or as a means for environmental protection could be somewhat resolved by dividing the concept. Karen Litfin (1997) divides sovereignty into authority, control and legitimacy. She argues that States engage in “sovereignty bargains” along these dimensions. For instance, tying emission targets to domestic ownership of green technology could increase autonomy but reduce legitimacy, while delegating emission targets to an internationally recognized scientific body could increase legitimacy but decrease autonomy. Here, sovereignty is not understood as an absolute attribute but as a

multidimensional concept in constant flux, and in constant social redefinition (Conca 1994; Hochstetler, Clark and Friedman 2000)**.**

Intergovernmental organizations

International environmental governance is fragmented around a multitude of competent intergovernmental organizations (see chapter by Paul Taylor this book). The United Nations Environmental Program (UNEP) is one of them. It was created in 1972 as a subsidiary organ of the United Nations General Assembly. UNEP's mandate is to coordinate international cooperation programs on the environment by undertaking a scientific watch, by communicating gathered information, by drawing attention to up-and-coming themes and by offering environmental policy expertise. It played an important role in the negotiation of many international treaties, such as the *Vienna Convention on the Ozone Layer*, the *Basel Convention on Hazardous Waste* and the *Convention on Biological Diversity*. Nevertheless, UNEP is not one of the most powerful organizations of the United Nations family. Its budget remains modest, it has relatively few employees, its headquarters in Nairobi are far from the main decision making centers, and it has to compete with other intergovernmental organizations that are also concerned with the environment.

Instead of reinforcing UNEP, in 1992 the General Assembly of the United Nations decided to create a new parallel organization: the Commission on Sustainable Development (CSD). The CSD is composed of 53 member states, elected for a 3-year term, which meet once a year in New York. Its mandate is to review the implementation of *Agenda 21*, an action plan adopted in Rio in 1992, to provide policy guidance for another action plan adopted in Johannesburg in 2002, and to ensure the effective integration of the sustainable development objectives in the entire UN system. These missions are organized in two-year cycles, each one focusing on a specific cluster of themes. The cycle 2014/2015, for example, focuses on oceans, marine resources, small island developing states and disaster management.

A third major intergovernmental organization is the Global Environmental Facility (GEF). It was established in 1991 with the aim of bringing financial aid to developing countries for financing environmental projects and programs, especially regarding biodiversity, climate change, desertification and persistent organic pollutants.

Many other multilateral intergovernmental organizations are active in global environmental governance, such as the Food and Agriculture Organization of the United Nations (FAO), the Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO), the World Bank, the World Meteorological Organization and the Organization for Economic Co-operation and Development (OECD).

There are also several bilateral and regional organizations active in the field of environmental protection. The European Union is certainly among the most active of them, using the environment as a flagship of the European identity and as an opportunity to increase its institutional autonomy from Member states. Not only is it active at the regional level, but in some cases at the multilateral level as well. Under certain circumstances, the European Commission and the Council presidency enjoyed

a relative degree of discretion and were the main European actors, negotiating on behalf of European countries (Delreux 2011; Oberthür 2011)

In order to manage this fragmented governance, the scattered instruments and the relative weakness of the UNEP, some have suggested creating a new, strong and independent organization, one that would centralize debates and international initiatives with regards to the environment. Not all agree on the added value this decision would bring. Those that defend it believe that it would guarantee more normative coherence, that it would have the necessary authority to put pressure on States, and that its international strength could act as a counterbalance to the World Trade Organization (WTO) (see chapter by Steven Woolcock this book). On the other hand, some consider that its bureaucratic system would hinder efforts in cooperation, that it would be vulnerable to recalcitrant actors, and that decentralized governance is better suited to bring environmental issues into the field of international relations. This debate, which frequently resurfaces, is still open (Biermann and Bauer 2005).

Non-state actors

According to a prevailing norm in global environmental governance, non-state actor participation is an essential component in reaching environmental goals. The 1992 *Rio Declaration on Environment and Development*, for example, appreciates that "environmental issues are best handled with the participation of all concerned citizens, at the relevant level" (principle 10). Guided by this principle, States and intergovernmental organizations have increased the transparency and openness of international environmental governance to a level that is quite uncommon in international relations. Non-states actors have benefited from this normative environment to wield influence over the decision making process.

Non-governmental environmental organizations (NGEOs) are some of the most influential non-state actors (see chapter by Raffaele Marchetti in this book). The different means they have to achieve their goals are very diverse. Some, like *Greenpeace* and *Friends of the Earth*, use name-and-share strategies and publically condemn States or corporations that maintain policies or practices harmful to the environment. To attract the media's attention, they give out razzes and organize demonstrations. Coalitions of NGOs, for example, regularly give "fossil awards" to countries that most impede climate change negotiations, or "Captain Hook awards" to businesses that use genetic resources without obtaining the prior informed consent of local communities from which they originate. Other NGEOs make use of environmental law and public opinion to bring change. The *Center for International Environmental Law*, for instance, uses legal action to impose pressure on governments and corporations. Others, such as the *World Resources Institute*, conduct research and advance policy ideas to influence politicians. Some NGEOs go as far as drafting a treaty and giving it to the States. The *International Union for Conservation of Nature* (IUCN) played a fundamental role in negotiating the *Convention of International Trade of Endangered Species of Wild Fauna and Flora* (*CITES)* (Betsill and Corell 2007).

Businesses are also organized into networks and endeavor to influence public opinion, offering research to decisions makers and making use of the justice system. However, they do not have the same objectives. Some see environmental norms as an

obstacle to their growth and openly try to block negotiations and hinder the implementation of existing treaties. Others, especially those who are more sensitive to boycotting or regulations, adopt a more conciliatory approach and try to maintain a positive image amongst public opinion and decision makers. Some even take the initiative to adopt new codes of conduct for their industry and develop voluntary environmental certifications schemes. Finally, several businesses pressure the government to adopt stricter rules governing environmental protection. Such norms give them more predictability for long-term planning, a supply of regular natural resources, fairer competition, and/or access to a market of new goods, technologies and environmental services (Vogel 1995).

We should be aware that NGEOs and companies are not necessarily rivals. Too often NGEOs are presented as weak, selfless actors that are busy defending the common good, whereas companies are seen as powerful, selfish and only governed by material interests. The reality is that neither of the two are part of a homogenous group. There are intense divisions among the *International Centre for Environmental Liaisons*, a NGEOs network, and among the *World Business Council for Sustainable Development*, a company network. More radical NGEOs, particularly those that reject the objective of economic growth, frequently speak out against more moderate groups seeking compromise between development and environmental protection; while other NGOs, created or financed by companies, speak out against implementing strict environmental norms.

Both NGEOs and companies use a multitude of methods. Some companies do not have enough resources to get their point across, while some NGEOs have abundant assets. The *World Wildlife Fund* (WWF), for instance, has about 5 million members and an annual budget of 600 million dollars, not mentioning the priceless sympathy and trust from the public.

Finally, we cannot deny that both NGEOs and companies are motivated by material and ideological considerations. NGEOs are guided by material concerns, such as securing funding, increasing the number of members, and getting media visibility, which make them compete amongst themselves. On the other hand, company directors hold certain values and ideas that help them calculate their material interests. Consequently, it is no surprise that certain NGEOs and companies collaborate on certain projects. The *Forest Stewardship Council* and the *Marine Stewardship Council* are certified organizations that can be cited as examples of collaboration in the fields of forestry and fisheries (Andonova 2010).

Discourses of Global Environmental Governance

Anthropocentrism and biocentrism

At least since the 19th century, two opposing worldviews on the relation between man and nature have structured debates on global environmental politics. The first, called anthropocentric, conceives nature as a pool of exploitable resources. In this sense, environmental protection has a utilitarian and instrumental value: it is in humanity's interests to protect the environment. Farmers, hunters and fishermen who

traditionally share this perspective were among the first to advocate for international cooperation on environmental issues.

Many international instruments derive from this mindset. In 1881, a treaty was adopted to protect European wine fields from phylloxera, an insect from the United States. In 1902, the *Convention on the protection of birds useful for agriculture* was signed for the safety of insect-eaters, without taking into account other species of the ecosystem. In 1946, the International Whaling Commission was created for the purpose of providing the proper conservation of whale stocks, and thus protecting the whaling industry in the long-term.

The second worldview, bio-centric, ascribes an intrinsic value to nature, independently from services provided to humankind. This perspective was defended in the 19th century by hiker groups' ornithological associations. They called for the construction of national parks so that wild territories could remain intact and be preserved from human activity. At the time, a romanticized idea of nature rather than a scientific understanding of the ecosystem inspired bio-centrism.

This second worldview is also the logic behind some international instruments. The *London Convention Relative to the Preservation of Fauna and Flora* was signed in 1933 by European colonial powers to protect certain animal and plant species in Africa, even though their environmental efforts were at times harmful to the local population that lived with the species. Similar preservationist goals the conclusion in 1940 of the *Convention for the Protection of Flora, Fauna and the Natural Scenic Beauties of the Americas*.

The anthropocentric and bio-centric worldviews still coexist. Environmental protection advocates often combine them to resolve disagreements and promote political consensus. For example, the *World Charter for Nature*, adopted by the United Nations General Assembly in 1982, simultaneously recognized that humankind "depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients" and that "every form of life is unique, warranting respect regardless of its worth to man" (preamble).

However, it is important to bear in mind that these two worldviews can lead to opposite political solutions. To face climate change, the international community can either invest more in adaptation to minimize human and social costs, or in the reduction of emissions of greenhouse gases to protect the environment from human agency. Sustaining both objectives can be politically - if not economically - challenging. With the rise of global environmental governance in the seventies, decision makers had to make a difficult choice, and for the most part they favored a utilitarian vision of the environment.

Tellingly, the first major United Nations conference on the environment, held in Stockholm in 1972, had "Human Environment" for its title and its declaration starts with these words: "Man is both creature and moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social and spiritual growth." Ever since, the anthropocentric worldview has dominated over the ecocentric one in global environmental politics (Barkin 2006).

Economy and ecology

Two important events took place in 1972, each exemplifying a different perspective on the relation between economy and ecology. The first, as previously mentioned, was the *United Nations Conference on the Human Environment* was held in Stockholm, which was the biggest international conference ever organized at that time, with more than 113 States and 400 NGOs. Some developing countries were initially reluctant to participate, on the basis that poverty reduction and economic development should be recognized as a global priority. They argued that poverty was the cause of environmental degradation and should therefore be tackled first. However, the Secretary-General of the Conference, Maurice Strong, succeeded in bringing developed and developing countries together in support of a consensual declaration and action plan. The Stockholm declaration presented economic development and environmental protection as processes that could be mutually supportive. The action plan provided for several measures supposed to simultaneously promote environmental protection and economic development, such as new stabilizing mechanisms for the price of raw materials and increased technological transfers from developed to developing countries. The Stockholm Conference carried the message that economic growth does not have to be detrimental to the environment.

During the same year, an expert group called the Club of Rome published the *Limits to Growth* report, written by researchers from the *Massachusetts Institute of Technology* (MIT). The report, a true alarm call, received strong reactions, both of praise and criticism. The authors claimed that economic and demographic growth could not continue forever because the world's natural resources are limited. These worries echoed the thoughts expressed by Thomas Robert Malthus in the 18th century. The writers of *Limits to Growth*, however, had a more sophisticated model than Malthus, which allowed them to simulate the interactions between different variables, such as the quantity of food available, technological capacities, life expectancy, industrial production and pollution output. Based on past records, this computer-based model allowed for the predictions of scenarios for the future. One scenario, deemed highly probable, predicted the system's collapse by the 21st century, as a result of unsustainable economic and demographic growth. A critical shortage in raw materials and a strong degradation in the quality of life were to be expected in the years to come. Avoiding such catastrophes entailed slowing down economic and demographic growth (Meadows et al. 1972).

Despite the wide diffusion of the *Limits to Growth* report, few policy makers or NGOs advocate for mandatory birth control or for planned economic recession. Instead, the compromising and optimist discourse of the Stockholm Conference prevailed and eventually became the environmental orthodoxy with the emergence of the concept of sustainable development in the 1980s.

From human environment to sustainable development

In 1987, the *World Commission on the Environment and Development*, chaired by Gro Harlem Brundtland, published a report entitled *Our Common Future*. Taking off where the Stockholm Conference ended, the Brundtland report pursued the reconciliation of economic development and environmental protection and built on

the concept of sustainable development. The members of the commission defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (1987:16). While economic development is a necessary and justified goal, they suggested that it needs to include intra-generational equity, meaning that "overriding priority should be given to the needs of the poorest," and intergenerational equity, "taking into account the limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" (1987:16). The concept of sustainable development embraces economic, social and environmental goals. Despite its ambiguities, or perhaps thanks to it, it reconciled antagonisms, strengthened consensus, and established the conceptual foundation of the Rio Conference.

The *United Nations Conference on Environment and Development*, which took place in 1992 in Rio, was one of the most remarkable events in global environmental governance. This conference, sometimes called the *Earth Summit*, gathered 103 State leaders, 3000 NGO representatives, 8000 government delegates and 9000 journalists. Its *Declaration on the Environment and Development* continued what was started in Stockholm 20 years before. This political document laid down a series of fundamental principles, such as common but differentiated responsibility between developed and developing countries regarding environmental degradation. With this in mind, social or economic costs of environmental commitments should be adjusted to the country's revenue. The States participating at the Rio conference also adopted *Agenda 21*, which defined the problems, the objectives and the means that should be applied. This extremely detailed plan of action contains 40 very diverse chapters, covering issues such as managing hazardous chemicals, access to clean water and transport.

In 2002, the United Nations organized the World Summit on Sustainable Development in Johannesburg. The aim of the meeting was to examine the progress that had been made since the Rio Conference and to remedy deficiencies with concrete steps. During the summit, the concerns regarding public health and the fight against poverty were added to the debate on sustainable development. The Johannesburg summit did not produce an action plan such as *Agenda 21*, nor did it lead to adopting legally binding conventions. However, the summit successfully created a network between the different participants. Hundreds of public, private and NGEO partnerships were forged. This achievement has different interpretations. Some see it as a sign of the State's disengagement from environmental concerns, whereas others believe it is a necessary step in achieving sustainable development.

In 2012, States' representatives gathered once again in Rio, for the United Nations Conference on Sustainable Development. One of the key themes of this conference was the 'green economy.' According to the adopted resolution, *The Future We Want*, green economy is a strategy to "contribute to eradicating poverty as well as sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth's ecosystems" (paragraph 23).

Today, it is obvious that environmental issues are not treated independently, separated from other international issues. While the 1972 Stockholm Conference focused on environmental issues while acknowledging concerns of economic

development, environmental protection was only one of the several issues discussed at the 2002 Johannesburg Summit and the 2012 Rio Conference. It was together with gender equality, poverty reduction, public health, international trade, food security, water and sanitation, education, employment, human rights, good governance, and security. For some, this evolution denotes the watering down of environmental objectives and stands as one more demonstration that liberalism is the hegemonic paradigm. For others, it is the necessary recognition that interdependence does not simply mean that countries share a single biosphere, but also that every issue-areas of international relations are functionally linked to one another (Bernstein 2001; Victor and Cohen 2005; Dryzek 2005).

Conclusions

During the following years, more challenges will need to be faced. First of all, the efficiency of the schemes put in place over the last few decades needs to be evaluated. New procedures that evaluate implementation and compliance need to be elaborated. There is also a need for a system of incentives and sanctions. Secondly, the current obligations will need to be adjusted once emerging countries start to emit more pollution. If the categories used to divide countries are too rigid, it could cause political tension and further environmental degradation. Indeed, States' economies are in constant mutation. Third, issues related to global environmental governance that have been disregarded up till now will need to be taken into account. Forestry protection is still not guaranteed by an adequate system and the consequences of overfishing will worsen over time. Fourth, different international regimes that have been developed disjointedly need to be reconciled. This is especially true in the case of commerce systems that are incompatible with global environmental governance systems. The politics of global environmental governance are evolving, and the tools, methods and theories analysts use need to evolve with it.

Questions

1. Is there a "tragedy of the common" in the field of solar energy? Why?

2. Some argue that fresh water should be recognized as a constitutive element of the common heritage of mankind. To your opinion, what are the arguments against this proposal?

3. How North/South tensions have structured the evolution of international environmental governance since 1972?

4. Why do you think the French government calls for the creation of a new World Environmental Organization?

5. Can you name five multilateral agreements on environment?

6. Is there a necessary trade-off between efficiency and legitimacy in environmental protection? Why ?

Further readings

Bernstein, S. 2001. *The compromise of liberal environmentalism*. New York: Columbia University Press.
Betsill, M and Corell E. 2007. *NGO Diplomacy. The Influence of Nongovernmental Organizations in International Environmental Negotiations*. Cambridge: MIT Press
Clapp, J. and Dauvergne P. 2005. *Paths to a Green World*. Cambridge: MIT Press.
Dauvergne, P 2005. *Handbook Of Global Environmental Politics*. Cheltenham: Elgar.
Delmas, M.A. and Young O, 2009. *Governance for the Environment: New Perspective*. Cambridge: Cambridge University Press.
DeSombre, E. 2006. *The Global Environment and World Politics*. London: Contiuum.
Dryzek, J. 2005. *The Politics of the Earth: Environmental Discourses*. Oxford, Oxford University Press.
Haas, P.M. 2008. *International Environmental Governance*. Aldershot: Ashgate.
Litfin, K. T. 1998. *The Greening of Sovereignty in World Politics*. Cambridge: MIT press.

Websites

United Nations Environment Programme
http://www.unep.org/

The Earth System Governance
http://www.earthsystemgovernance.org/

The Earth Negotiations Bulletin
http://www.iisd.ca/

References for the common bibliography

Andonova, L.B. 2010. Public-Private Partnerships for the Earth. Politics and Patterns of Hybrid Authority in the Multilateral System. *Global Environmental Politics*, 10(2), 25-53.
Auer, M. 2010. Better Science and worse Diplomacy: negotiating the cleanup of the Swedish and Finnish pulp and paper industry, *International Environmental Agreements*, 10, p. 65-84.
Bailey, J.L. 1996 Hot Fish and (Bargaining) Chips. *Journal of Peace Research* 33, 257–262.
Barkin, S. 2006. Discounting the Discount Rate. Ecocentrism and Environmental Economics. *Global Environmental Politics*, 6(4), 56-72.
Bernstein, S. 2001. *The compromise of liberal environmentalism*. New York: Columbia University Press.
Betsill, M and Corell E. 2007. *NGO Diplomacy. The Influence of Nongovernmental Organizations in International Environmental Negotiations*. Cambridge: MIT Press.
Biermann, F. and S. Bauer (dir.), 2005. *A World Environment Organization. Solution or Threat for Effective International Environmental Governance?* Aldershot: Ashgate.
Breitmeier, H. A. Underdal and O. Young 2011. The Effectiveness of International Environmental Regimes. Comparing and Contrasting Findings from Quantitative Research. *International Studies Review*, 13(4), 579-605.

Brown W., E. and H.K. Jacobson (eds). 1998. *Engaging Countries. Strengthening Compliance with International Environmental Accords.* Cambridge: MIT Press.
Campbell Keller, A. 2009. *Science in Environmental Policy: The Politics of Objective Advice.* Cambridge, MA. The MIT Press.
Conca, K. 1994. Rethinking the Ecology-Sovereignty Debate, *Millennium* 23(3), 701–711.
Conca, K. 2001. Environmental Cooperation and International Peace, in *Environmental Conflict*, edited by P.F. Diehl and N.P. Gleditsch. Boulder: Westview Press, 225-247.
Delreux, T. 2011. *The EU as International Environmental Negotiator*, Ashgate.
DeSombre, E. 2005. Fishing under Flags of Convenience. Using Market Power to Increase Participation in International Regulation. *Global Environmental Politics,* 5:4, 73-94.
DeSombre, E.R. and J. Kauffman, 1996. The Montreal Protocol Multilateral Fund. Partial Success Story, in *Institutions for Environmental Aid. Pitfalls and Promise*, edited by R.O. Keohane and M.A. Levy. Cambridge: MIT Press, 89-126.
Dimitrov, R. 2005. Hostage to Norms. States, Institutions and Global Forest Politics. *Global Environmental Politics*, 5(4), 1-24.
Dimitrov, R. 2006. *Science and international environmental policy: regimes and nonregimes in global governance*. Rowman & Littlefield.
Dimitrov, R.S. 2003. Knowledge, Power and Interests in Environmental Regime Formation" *International Studies Quarterly*, 47(1), 123-150.
Downs, G.W., Rocke, D.M. and Barsoom, P.N. 1996. Is the Good News about Compliance Good News about Cooperation? *International Organization*, 50(3), 379-406.
Dryzek, J. 2005. *The Politics of the Earth: Environmental Discourses*. Oxford, Oxford University Press.
Gehring, T. and S. Oberthür 2009. The Causal Mechanisms of Interaction between International Institutions. *European Journal of International Relations*, 15(1), 125-156.
Gough, C. and S. Shackley. 2001. The Respectable Politics of Climate Change: The Epistemic Communities and NGOs, *International Affairs*, 77(2), 329-345.
Haas, P. 1992. Banning Chlorofluorocarbons. Epistemic Community Efforts to Protect Stratospheric Ozone. *International Organization*, 46(1), 187-224
Haas, P.M., Keohane R.O. and M.A. Levy (eds). 1993. *Institutions for the Earth. Sources of Effective International Environmental Protection*. Cambridge: MIT Press.
Hardin, G. 1968. The Tragedy of the Commons. *Science*, 162(3859), 1243-1248.
Hasenclever, A., P. Mayer and V. Rittberger. 1997. *Theories of International Regimes*. Cambridge: Cambridge University Press.
Hochstetler, K., A.M. Clark and E.J. Friedman. 2000. Sovereignty in the Balance: Claims and Bargains at the UN Conference on the Environment, Human Rights, and Women, *International Studies Quarterly*, 44(4), 591-614.
Homer-Dixon, T.F. 2001. *Environment, Scarcity and Violence*. Princeton: Princeton University Press.
Kahan, D. et al. 2012. The Polarizing impact of science literacy and numeracy on perceived climate change risks, Nature Climate Change
Keohane, R.O. and Victor, D.G. 2011. The Regime Complex for Climate Change. *Perspectives on Politics*, 9(1), 7-23.
Krasner, S.D. 1982. Structural Causes and Regime Consequences. Regimes as Intervening Variables. *International Organization*, 36(2), 185-205.

Lemos, M.C. and B.J. Morehouse. 2005. The co-production of science and policy in integrated climate assessments. *Global Environmental Change* 15: 57–68.
Lidskog, R. and G. Sundqvist. 2002 The Role of Science in Environmental Regimes: The Case of LRTAP. *European Journal of International Relations,* 8(1), 77–101.
Lieberman, S. and T. ray. 2008. The World Trade Organization's Report on the EU's Moratorium on Biotech Products: The Wisdom of the US Challenge to the EU in the WTO, *Global Environmental Politics*, 8(1), 33-52.
Litfin, K. 1995. Framing Science: Precautionary Discourse and the Ozone Treaties", *Millenium*, 24(2), 251-277.
Litfin, K.T. 1995. Framing Science: Precautionary Discourse and the Ozone Treaties. *Millennium: Journal of International Studies*, 24(2), 251-277.
Litfin, K.T. 1997. Sovereignty in World Ecopolitics. *Mershon International Studies Review*, 41(2), 167-204.
Manners, I. 2008. The Normative Ethics of the European Union. *International Affairs*, 84(1), 45–60.
Meadows, D.H., Meadows, D.L. Randers J. and Behrens W.W. 1972. *The Limits to Growth. A Report for the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books.
Meijerink, S. 2005. Understanding policy stability and change: the interplay of advocacy coalitions and epistemic communities, windows of opportunity, and Dutch coastal flooding policy 1945-2003, *Journal of European Public Policy* **12**:6, 1060-1077.
Miles, E.L., Underdal A., Andresen S., Wettestad J., Skjarseth J.B. and E.M. Carlin (eds.). 2002. *Environmental Regime Effectiveness*. Cambridge: MIT Press.
Oberthür, S. and Strokke O.S. 2011. *Managing Institutional Complexity*. Cambridge: MIT Press.
Oberthür, S. 2011. The European Union's Performance in the International Climate Change Regime, *Journal of European Integration*, 33(6) 667-682
Peterson, M.J. 1992. Whalers, Cetologists, Environmentalists, and the International Management of Whaling, *International Organization*, 46(1), 148-186.
Raustiala, K. and Victor D.G. 2004. The Regime Complex for Plant Genetic Resources. *International Organization*, 58(2), 277-309.
Sand, Peter H. 2004. Sovereignty Bounded: Public Trusteeship for Common Pool Resources, *Global Environmental Politics*, 4(1), 47-71.
Sands, Philippe. 1995. *Principles of International Environmental Law*, Manchester, Manchester University Press.
Sprinz, D.F. and Vaahtoranta T. 1994. The Interest-Based Explanation of International Environmental Policy. *International Organization*, 48(1), 77-105.
Szulecki, K., Pattberg P. and Biermann, F. 2011. Explaining Variation in the Effectiveness of Transnational Energy Partnerships. *Governance: An International Journal of Policy, Administration, and Institutions*, 24(4), 713-736.
Toke D. 1999. Epistemic Communities and Environmental Groups", *Politics*, 19(2), 97-102.
Victor, D.G. and Cohen. L.A. 2005. A Herd Mentality in the Design of International Environmental Agreements. *Global Environmental Politics*, 5, 2005, 24-57.
Victor, D.G., Raustiala K. and Skolnikoff E.B. *(*eds). 1998. *The Implementation and Effectiveness of International Environmental Commitments. Theory and Practice*, Cambridge: MIT Press.
Vogel, D. 1995. *Trading Up. Consumer and Environmental Regulation in a Global Economy*. Cambridge: Harvard University Press

World Commission on Environment and Development. 1987. *Our Common Future*.
Young, O.R. 1999. *The Effectiveness of International Environmental Regimes. Causal Connections and Behavioral Mechanisms*. Cambridge: MIT Press.
Zito, A.. 2001. Epistemic Communities, Collective Entrepreneurship and European Integration, *Journal of European Public Policy*, 8(4), 585-603.