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ENVIRONMENT, STATES AND INTERNATIONAL ORGANIZATIONS:
THE ROLE OF GLOBAL ENVIRONMENTAL CONVENTIONS IN PROTECTING
THE ENVIRONMENT

A Dissertation Presented

by

NATALIA ESCOBAR PEMBERTHY

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2017

Global Governance and Human Security Program

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ABSTRACT

ENVIRONMENT, STATES AND INTERNATIONAL ORGANIZATIONS: THE ROLE OF GLOBAL ENVIRONMENTAL CONVENTIONS IN PROTECTING THE ENVIRONMENT

December 2017

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Global environmental conventions are created to address and resolve global environmental problems. Assessments of the achievement of specific environmental goals, however, indicate that there is room for progress and that stronger collective action is required. Given that there are no empirical instruments to measure implementation and to determine the factors behind individual countries' results, challenges emerge that require the expansion of existing analytical frameworks around environmental conventions and their role as global governance instruments. This study develops an empirical instrument – the *Environmental Conventions Index* – to assess the implementation of global environmental conventions, determining the main trends for both countries and conventions. Using a mixed methods approach, it analyzes the

implementation of four conventions in two clusters – pollution and conservation – by all member states and illustrates trends over time (15 years). The study also examines the underlying reasons for countries' performance and explains the governance mechanisms of international environmental agreements. As the international community is at crossroads in the solution of global environmental challenges and the implementation of new agendas for sustainable development, countries' commitment to international environmental goals should occupy center stage in the political debate.

ACKNOWLEDGEMENTS

Six years ago, when I first started the process of my doctoral studies, my thoughts on this dissertation were much different. Doing a dissertation on global environmental politics seemed to require either a very specific focus on a single country and / or an environmental issue, or a comprehensive and lengthy period of fieldwork to measure the state of the environment. The product of these years of research, however, took a different path, that proved to be invaluable, and turned out to be the most relevant and treasured learning opportunity of my career. While this dissertation, and my work at the Center for Governance and Sustainability at the University of Massachusetts Boston, brought me to multiple places around the world to conduct research and present the results of the Environmental Conventions Project, researching and writing this study was not an individual process. It has counted on the input and support of many individuals who first answered my questions, then questioned their relevance, and finally, pushed this analysis to become the project it is today. To these people, I owe a debt of gratitude.

I owe an immense debt to my committee who guided this project through its various stages. First and foremost, my intellectual and personal gratitude goes to Maria Ivanova, the chair of the dissertation committee, my mentor and the person that motivated me from the very beginning to work on the issues presented here. She provided me the means to conduct the kind of work that corresponded with my interests and skills, offering me new insights, new ideas, and the resources that allowed me to complete this

dissertation. Without her decision to launch the Environmental Conventions Project, and to connect it to institutions as UN Environment and the conventions' secretariats, neither this dissertation nor the Center's project would have become what they are today.

Moreover, Prof. Ivanova is single-handedly responsible for imparting in me fundamental lessons about global environmental governance, about research and teaching skills, about academic work, and about environmentalism. Under her guidance, I learned how research like the one produced by this dissertation is important for academia, but also for the policy world. Bringing academic rigor to the policy process is essential to protect the environment and promote sustainable development. From her example, I found out how “environmentalists in heels” can really make a difference and contribute to improve policy outputs and outcomes locally, nationally, and globally. Throughout these years of working together, I received invaluable professional and personal lessons, and she permanently reinforced my intellectual interests, rigor, and responsibility. Her mentorship was transformative to my PhD experience, and my life path, as she pushed my professionalism and excellence to make me a better student, researcher, and person. I now have an invigorated, and hopefully improved outlook about my future career thanks to her.

Prof. Craig Murphy was fundamental in the development of my research proposal. His lessons during the research methods course that I took in the second year of the PhD program helped me immensely in the design of this research project, and taught me the substance about how academic inquiry can be constructed and developed. His extensive experience in governance issues were essential for my understanding of the actual implications of the Environmental Conventions Project, and its implications for the

policy world, and for the academic frameworks it includes in the study of compliance, implementation, effectiveness, and ultimately, governance.

Prof. Samuel Barkin helped me to sharpen the theoretical structure and research design of this project. During his course on Theories of International Relations, I was able to develop theoretical foundations that proved to be indispensable to this dissertation. In our different meetings to discuss the project, he brought new hypotheses and lines of reasoning, and he spared no time in each conversation to provide inspiration and humor, and to transmit his calmness and certainty to me.

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Ambassador Franz Perrez, Swiss Ambassador for the Environment, and Head of the Division of International Affairs at Switzerland's Federal Office for the Environment (FOEN), generously agreed to serve as a member of my dissertation committee, and has been a strong supporter of the Environmental Conventions Project since its beginning. His work is a clear example of how academia and the policy world can work together to be agents of change for better governance. His commitment, and active engagement in the different scenarios of the environmental conventions is an inspiration for my career.

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One of the defining moments for this research was the opportunity I had to work as research associate for the Center for Governance and Sustainability. The work of the Center's team through these years substantially enriched this dissertation. I am grateful for the discussions, the coding work, the suggestions, and the support. The efforts of several research associates have contributed to the significant progress of the Environmental Conventions Project. Matthew McWorther, Elizabeth Sonia Cooper, Ryan Bartlett, David Love, Clara O'Rourke, and Madeline McGill, devoted part of their time, and in some cases, their summer to work on the coding process for the ECI. And Gabriela Bueno Gibbs, Michael Denney, and Daniel Zaleznik were always a source of feedback and input in the various stages of this research initiative. Melissa Goodall, Associate Director of the Yale Office of Sustainability and Advisor to the Center, offered her invaluable experience in project design and fundraising. Having recently completed a thesis herself, her encouragement and understanding were deeply appreciated. But especially, my appreciation goes to Andrew Fasullo and Anna Dubrova, whose hard work was critical to the development of the country profiles that we developed as a research team.

It was also my work at the Center what brought my attention to the topic of the implementation of global environmental conventions. And it is the Center's approach what makes this research unique and important, as it has a real-time connection to world affairs. Thanks to the Center's support and connections, and to Prof. Ivanova's mentorship, I have had the privilege to witness first-hand the processes of global environmental governance, attending important meetings at the 2012 UN Conference on Sustainable Development, the 2013 UNEP Governing Council, the 2015 Conferences of the Parties of the Basel, Rotterdam, and Stockholm conventions, and the 2016 UNEA, among many other meetings and conferences that allowed me to present parts of this research and get important feedback and suggestions that have planted seeds for new research projects.

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LIST OF ABBREVIATIONS

ASEAN	Association of South East Asian Nations
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species
COP	Conference of the Parties
ECI	Environmental Conventions Index
EPI	Environmental Performance Index
EU	European Union
FAO	Food and Agriculture Organization
GBO	Global Biodiversity Outlook
GEO	Global Environmental Outlook
GEF	Global Environment Facility
HDI	Human Development Index
IOP	International Organization Partner
IPEN	International POPs Elimination Project
IUCN	International Union for the Conservation of Nature
MEA	Multilateral Environmental Agreement
MOP	Meeting of the Parties
NGO	Non-governmental Organization
OECD	Organization for Economic Cooperation and Development
POP	Persistent Organic Pollutant
SAICM	Strategic Approach to International Chemicals Management
SDGs	Sustainable Development Goals
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on the Human Environment
UNDESA	United Nations Department of Economic and Social Affairs Division
UNCSD	United Nations Conference on Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WCED	World Commission on Environment and Development
WHO	World Health Organization
WWF	World Wildlife Fund

CHAPTER 1

INTRODUCTION: THE CHALLENGES OF INTERNATIONAL ENVIRONMENTAL COOPERATION

Environment is the foundation for human life. The natural environment—land, water, air, and living species—has been humanity’s source of sustenance, shelter, services, and spirituality. However, population growth and the quest for economic growth have drastically transformed the environment, affecting the functioning of planetary systems in ways that threaten Earth’s resilience and adaptation capacity. Recent scholarship has pointed to the urgency of the environmental crisis. We have crossed four of a total of nine planetary boundaries that have been defined as the “safe operating space” within which humans can function (Steffen et al., 2015). Human pressure on climate change, biodiversity, chemicals, and land has exceeded the levels required for the stability of earth systems. In addition, the inequality behind economic growth has brought dynamism and advancement in human welfare for some, while others face economic, social, and environmental challenges. Ultimately, we clearly need to integrate the three dimensions of sustainable development—people, planet, and prosperity—in the context of peaceful societies and global partnerships.¹

¹ This logical construction of people, planet, prosperity, peace, and partnership was defined by the 2030 UN Sustainable Development Agenda, as critical areas for action for humanity and the planet towards the promotion of sustainable development (UN General Assembly, 2015).

Traditionally, environmental issues were local concerns, since their sources and consequences seemed confined to a certain physical space. Solutions to environmental concerns were thought to lie within the actors and functions of national governments. Problems like pollution, biodiversity loss, deforestation, climate change, ozone layer depletion, and desertification, however, have brought attention to the planetary dimension of the environmental challenge. Even problems such as deforestation and desertification, which are connected to specific territories, are now considered to have regional and global consequences. The traditional understanding of these issues as local or national is no longer accurate; they need to be mapped from an international perspective, as concerns for global governance and human security. Moreover, most contemporary environmental problems are multidimensional, complex, and defy clear delimitations. In fact, environmental issues are clear examples of the interconnectedness of the contemporary world and the need for international cooperation.

Almost five decades ago states began to recognize their inability to address critical environmental problems on a national basis. At the same time, non-governmental organizations (NGOs) started calling for new international initiatives to facilitate cooperative responses on environmental protection and conservation. Under the auspices of the United Nations (UN), the architecture for global environmental governance took shape around the establishment, in 1972, of the UN Environment Programme, known previously as UNEP and today as UN Environment. Created from the international community's conviction of "the urgent need for intensified action, at the national and international level, in order to limit and, where possible, to eliminate the impairment of

the human environment” (United Nations, 1968) UN Environment started numerous initiatives involving international environmental cooperation.

Since 1972, the international community has undertaken multiple efforts to create institutions and mechanisms that bring governments and other actors together on specific environmental agendas for action, especially global environmental conventions.

However, in the specific case of these agreements, there is no systematic assessment that evaluates the progress in their implementation, and how countries are translating these global commitments into national policies. This dissertation aims to bring empirical data and analysis to the question of the implementation of global environmental conventions, in order to improve these processes and to expand the analytical framework on the concepts of implementation and effectiveness in global governance.

Also known as multilateral environmental agreements (MEAs), environmental conventions are agreements between multiple governments “intended as legally binding with a primary stated purpose of preventing or managing human impacts on natural resources” (Mitchell, 2003, p. 431; 2016).² These international legal instruments address global environmental problems, raise awareness, gather information, and promote coordinated action towards effective solutions (Brunée, 2006; Haas, Keohane, & Levy, 1993; Mitchell, 2010; Steiner, Kimball, & Scanlon, 2003) (see Table 1). However, environmental challenges persist. In 2016, the Second Meeting the UN Environment Assembly (UNEA) called attention to the effects of air pollution on health, estimating

² This study uses the term global environmental conventions instead of multilateral environmental agreements to reflect that the agreements included in this study are considered truly global because of their membership and scope. As a concept, multilateral environmental agreements can also refer to treaties with a smaller list of countries.

that “7 million people across the world die each year due to everyday exposure to poor air quality”, 7 percent of which are caused directly by chemical pollution (UNEP & WHO, 2016, p. 3). In a similar pattern, the 2016 Red List published by the International Union for Conservation of Nature (IUCN) called attention to the global extinction crisis (IUCN, 2016). Ecosystems and biota across the world remain threatened by the adverse effects of economic activities and climate change. For example, the total global area of wetlands declined an estimated 64-71 percent in the twentieth century (Ramsar Secretariat, 2015e). These issues raise questions about the extent to which international cooperation functions, about the success of implementation of specific mechanisms such as the global environmental conventions, and about whether, and to what extent, international agreements contribute to solving environmental problems.

As environmental conventions increased over the years in both number and membership, they transformed into decisive global frameworks to guide policy responses to protect the environment (Brown-Weiss & Jacobson, 1998; DeSombre, 2004; Mitchell, 2003). The academic literature about these global governance instruments has addressed various issues, from the process of negotiation and treaty formation (Bodansky, 2010; Chasek, 1997; Dimitrov, 2003; Gehring, 2007; Susskind, 1994; Susskind, Dolin, & Breslin, 1992) to their operationalization for the achievement of global environmental goals (Breitmeier, Underdal, & Young, 2011; Breitmeier, Young, & Zürn, 2006; Brown-Weiss & Jacobson, 1998; Cameron, Werksman, & Roderick, 1996; Choucri, 1995; Hanf & Underdal, 2000; Jacobson & Brown-Weiss, 1995; Miles et al., 2002; Victor, Raustiala, & Skolnikoff, 1998; Oran R. Young, 1979; Oran R. Young & Levy, 1999), and to the interactions between the governing bodies of agreements and their state parties (Andresen

& Skjærseth, 1999; Bauer, Busch, & Siebenhüner, 2009; Biermann & Bauer, 2003; Biermann & Siebenhüner, 2013; Desai, 2010; Sandford, 1994; Wiersema, 2009).

Additionally, the policy world reinforced the importance of environmental conventions both globally and nationally. In 2012, the UN Conference on Sustainable Development (Rio+20) recognized the importance of MEAs and highlighted their contributions to sustainable development (United Nations, 2012a). The concern at the core of the analysis of global environmental conventions, however, has been their *effectiveness* in the solution of global environmental problems.

Frequently, international legal scholars tend to view the implementation of international commitments as the norm. As first suggested by in his 1979 book *How Nations Behave: Law and Foreign Policy*, “almost all nations observe almost all principles of international law and almost all of their obligations almost all of the time” (p. 661). In the case of international environmental conventions, different studies have approached the question of their implementation through different methodologies. During the 1990s and early 2000s, qualitative and quantitative analyses assessed whether states had taken the steps required to achieve international environmental agreements and their outcomes (Breitmeier et al., 2006; Miles et al., 2002; Victor et al., 1998; Oran R. Young, 1999). Almost all these studies, however, agree that measuring the effects of global environmental conventions on national policies and the environment is difficult. Factors such as the structure and clarity of obligations defined by the conventions, as well as lack of agreement about what constitutes compliance and implementation, impede the establishment of concrete methodologies to provide empirical systematic data across countries and conventions, to help us understand the extent to which countries have

translated their global environmental commitments into national policies that improve the state of the environment. To overcome these obstacles, we must first understand how environmental conventions are being implemented at the national level. In other words, assessing national implementation of conventions and explaining why countries perform differently is essential to understanding the dynamics and effectiveness of global conventions in addressing environmental challenges.

Many stakeholders have recognized the positive effects of conventions on global environmental problems. In 2012, the UN Conference on Sustainable Development (Rio+20) acknowledged the “significant contributions to sustainable development made by the multilateral environmental agreements” (United Nations, 2012a para. 89).

International cooperation is needed to address increasingly complex environmental problems, and multilateral agreements have contributed to the definition of policies, aims, and actions of countries to achieve environmental conservation and sustainability (UNEP, 2012b; UNEP, University of Joensuu, & Government of Canada, 2007). Regarding specific conventions, for example, an 2016 evaluation of the Stockholm Convention stated that it provides a dynamic framework to regulate persistent organic pollutants (POPs)—a group of chemicals with common features including persistence, bioaccumulation, and long-range transport—throughout their lifecycle (Stockholm Convention, 2016b). CITES as well has listed more than 35,000 species that are now protected by tools such as trade measures, species management plans, and enforcement actions (CITES, 2013a).

However, assessments of specific environmental goals indicate that there is still room for progress and that stronger collective action is required. In 2012, the fifth edition

of Global Environmental Outlook (GEO-5) evaluated the progress of ninety global environmental goals from existing MEAs and non-legally binding instruments.³ A summary of those results, published as *Measuring Progress: Environmental Goals & Gaps*, found that only three out of thirty-five goals summarized there have achieved significant progress, and that “there has been little or no progress or further deterioration on about half of the goals and objectives assessed by the GEO-5” (UNEP, 2012a, 2012b). Furthermore, several research and data gaps were identified. The main conclusion was that the “international community (had) made very uneven progress in achieving these goals and improving the state of the environment” (UNEP, 2012b, p. 31). Given the urgency of environmental threats, new analytical frameworks are required to study the policy and legal instruments that address them. Analyzing environmental conventions requires then, empirical data collection and coordination, and the definition of measurable indicators that establish international standards, make data available for all countries, and improve knowledge about global environmental conventions, their implementation, and effectiveness.

This dissertation addresses that challenge. As part of my work at the Center for Governance and Sustainability at the University of Massachusetts Boston, I worked as one of the principal investigators in the design of an empirical instrument—the Environmental Conventions Index (ECI)—to assess the implementation of global environmental conventions. This instrument thus establishes a foundation for the

³ These goals were defined as part of an initiative started by the Government of Switzerland to identify specific indicators that served for the establishment of a reliable baseline against which to measure progress and to establish monitoring systems for the collection of data on critical environmental issues at regular intervals (UNEP, 2012d).

assessment of countries' progress on their international environmental obligations and contributes new insights to the literature on global environmental governance and international environmental law. The ECI is part of a broader research and outreach initiative—the *Environmental Conventions Project*—that not only aims to assess implementation, but to generate a policy space to support countries in the fulfillment of their global environmental commitments. Ultimately, this work could help countries better achieve their obligations under the global environmental conventions, thus providing opportunities for learning and contributing to the solution of global environmental problems.

Using quantitative and qualitative methods to analyze the information from governments and conventions, my analysis offers insights into the actual role of multilateral environmental agreements in the broader system of global governance and their contribution to sustainable development. Previous efforts in international environmental politics scholarship lack the broad scope of this assessment and the standardized empirical approach, and therefore offer limited evidence on which to build theory and provide practical advice to policy-makers. As the international community moves forward with the implementation of a new agenda for sustainable development, empirical data and evidence-based understanding are imperative, and countries' commitment to international environmental goals should occupy center stage in the political debate.

International cooperation for the environment

Global governance—the definition, implementation, and monitoring of global policies—describes the extent to which collective choices will benefit humanity and protect the environment. Laws, institutions, international organizations, international agreements, government agencies, local initiatives, and decision-making processes belong to the systems of governance established by the international community to act together on specific agendas for action. In the case of the environmental challenge, the extent to which global governance instruments are being implemented is a particularly difficult and important question, whose answer will determine the future of the environment and our progress towards sustainable development.

In 1972, the international community held its first-ever global summit on the environment. Three years earlier, the UN Economic and Social Council (ECOSOC) recommended to the UN General Assembly the definition of specific mechanisms to discuss member states' views on problems of the human environment; to evaluate the progress already being made by governments, international organizations, and NGOs; and to identify areas requiring international cooperation (United Nations, 1968). The international community recognized that “a growing class of environmental problems, because they are regional or global in extent or because they affect the common international realm, will require extensive cooperation among nations and action by international organizations in the common interest” (United Nations, 1972), and that managing these problems requires “a cooperative spirit by all countries, big and small, on an equal footing” (United Nations, 1972, Principle 24).

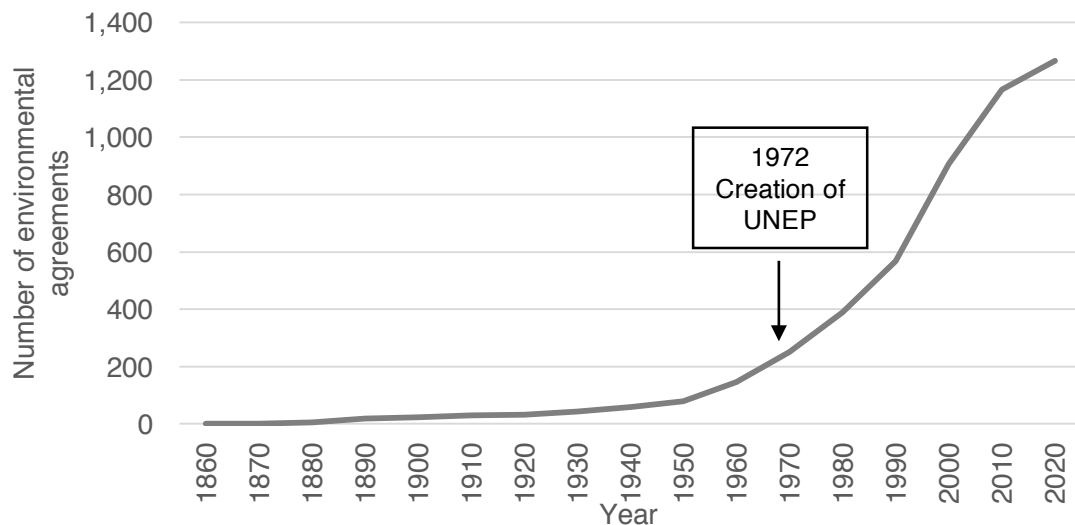
These efforts flourished during the next two decades, and as UN Environment evolved into the anchor institution for the global environment (Ivanova, 2009), other governance mechanisms—including several global environmental conventions—were negotiated. To achieve sustainable development, it was clear that effective international cooperation structures were required (WCED, 1987). In 1992, the UN Conference on Environment and Development (UNCED)—also known as the Earth Summit—reaffirmed governments’ intention to establish “new levels of cooperation among states, key sectors of societies and people” (United Nations, 1992a). Its implementation plan, known as Agenda 21, defined international legal instruments and mechanisms as crucial to achieving sustainable development. UNCED also acknowledged the essential importance of countries' participation in these mechanisms, the need for implementation strategies, and the importance of assessing the implementation of these instruments to ensure the efficacy and effectiveness of international cooperation (UNCED, 1992). Twenty years later, Rio+20 reinforced this message as countries agreed “to promote policy coherence at all relevant levels, improve efficiency, [...] and enhance coordination and cooperation among (the) multilateral environmental agreements” (United Nations, 2012a para. 89).

Within this framework, multiple international environmental law mechanisms have been established to promote environmental conservation, including bilateral and multilateral agreements to bring governments and other actors together on specific environmental agendas (United Nations, 1972), particularly global environmental conventions. These agreements were initially created in the nineteenth century to manage shared environmental resources (DeSombre, 2004). Starting in the 1970s, however, they

experienced two fundamental changes. First, the creation of UN Environment constituted a new framework for global environmental governance. Second, the number of conventions began to increase (see Figure 1). Thus, environmental conventions became key to the system of global environmental governance, with the goal of centralizing commitments and innovations around environmental problems (Steiner et al., 2003).

The number of environmental agreements has now reached more than 1,250 (Brown-Weiss & Jacobson, 1998; DeSombre, 2004; Mitchell, 2016) (see Figure 1), addressing transboundary environmental problems such as climate change, biodiversity loss, and chemical pollution. However, only perhaps fifteen of them could be considered truly global in both membership (universal) and scope (global) (see Table 1). Over the same period, these conventions have also experienced a significant increase in membership (see Figure 2).

Figure 1 Historical evolution in number of international environmental agreements



Source of data: (Mitchell, 2016)

Table 1 Global Environmental Conventions

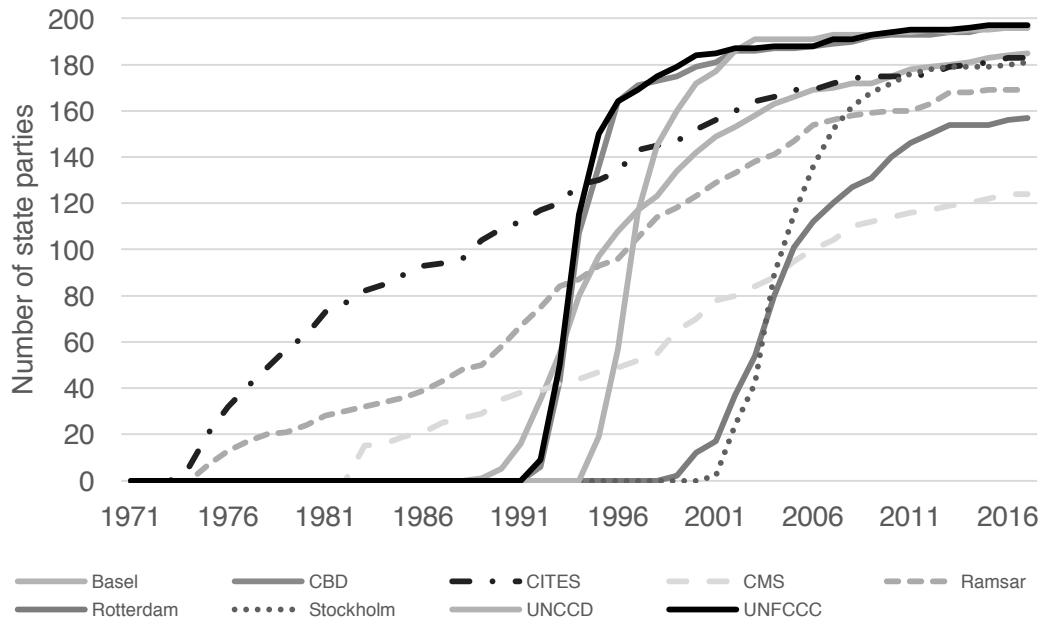
		Start Year	Parties (No.)
Atmosphere	• UN Framework Convention on Climate Change (UNFCCC)	1992	197
Biodiversity	• Convention on Biological Diversity (CBD)	1992	196
	• Convention on International Wetlands (Ramsar Convention)	1971	169
	• Convention on International Trade in Endangered Species (CITES)	1973	183
	• Convention on the Conservation of Migratory Species (CMS)	1979	124
Chemicals and Waste	• Stockholm Convention on Persistent Organic Pollutants	2001	181
	• Basel Convention on Transboundary Movements of Hazardous Wastes	1989	185
	• Rotterdam Convention on Prior Informed Consent Procedure	1998	157
	• Vienna Convention and Montreal Protocol on the Ozone Layer	1987	197
Land	• UN Convention to Combat Desertification (UNCCD)	1994	196

Data to December 31, 2016. Sources: (Basel Convention, 2016b; CBD, 2015; CITES, 2016c; CMS, 2016; Ozone Secretariat, 2014; Ramsar Convention, 2015b; Rotterdam Convention, 2017; Stockholm Convention, 2017; UNCCD, 2016; UNFCCC, 2015)

Environmental conventions thus serve as institutional frameworks that deliver various functions: they set agendas, proscribe behaviors, prescribe actions, contribute to the raise awareness about environmental issues, reduce uncertainty around regulation, and generate policy responses (Brunée, 2006; Haas et al., 1993; Mitchell, 2010; Steiner et al., 2003). Environmental conventions also contribute to policy specialization, opening spaces for the participation of civil society and for the use of innovative instruments to solve environmental challenges. As DeSombre explains, “in the area of international environmental politics, the agreements that get adopted are rarely the end product, but instead create the framework and the process that guide responses to the environmental problem in question” (2004, p. 84).

The academic literature on global environmental conventions addresses multiple issues. Some researchers study the negotiation and treaty-making processes and how

Figure 2 Membership in global environmental conventions



agreements are structured as international law instruments (Bodansky, 2010; Dimitrov, 2003; Susskind, 1994; Susskind et al., 1992). Others address the reasons behind countries' decisions to solve environmental problems through international organizations.

These reasons may include the maximization of their interests, commitment to the common good, and willingness to institutionalize international behavior in order to enhance capacity and power (Abbott & Snidal, 1998; Barkin, 2006; Krasner, 1983). Another strand of the literature evaluates the agreements' institutional performance, their effectiveness in addressing global environmental problems, and the factors that determine countries' and conventions' achievement of their goals (Breitmeier et al., 2011; Breitmeier et al., 2006; Brown-Weiss & Jacobson, 1998; Cameron et al., 1996; Choucri, 1995; Hanf & Underdal, 2000; Jacobson & Brown-Weiss, 1995; Miles et al., 2002; Victor et al., 1998; Oran R. Young, 1979, 1999). Part of the literature also gives special

attention to the interactions between member states and the conventions, how do they operate in principal-agent dynamic, and how this influences implementation.

The analysis of institutional performance is particularly relevant to this study. The conventions established specific mechanisms to evaluate and monitor countries' compliance and implementation. For example, during the sixth meeting of the Conference of the Parties (COP) of the Basel Convention in 2002, state parties established the Committee for Administering the Mechanism for Promoting Implementation and Compliance to help countries comply with their obligations and to facilitate, promote, monitor, and aim to secure the implementation of, and compliance with, obligations under the agreement (Basel Convention, 2002). In the case of the Ramsar Convention, those functions were assigned directly to the COP (UNESCO, 1971 Art. 6). Other conventions, as the Stockholm Convention on Persistent Organic Pollutants (POPs), are still discussing the definition of a specific compliance mechanism (Stockholm Convention, 2015). The Conferences of the Parties (COPs) are the main executive body in environmental conventions, that brings together all parties to take stock of implementation and adopt decisions for the future of the agreement.

Despite these efforts, the global environment continues to degrade at an alarming pace, and planetary boundaries are being pushed to new limits. This raises key questions about the institutional performance of the environmental conventions, including how national policies based on international environmental commitments contribute to solving global environmental problems. In other words, are the conventions, as they are being implemented by states, improving the global environment? Answering this question would make possible to determine the role of conventions as instruments of global

governance, while offering an analytical and empirical framework on their process of implementation. Understanding how the conventions function will also provide insights about states' capacity requirements to accomplish behavioral changes and outcomes at the national level.

Governance and global environmental challenges⁴

Changes in global environmental patterns indelibly transform the future of humanity. Natural disasters and abrupt changes in environmental conditions have altered the parameters supporting the existence of life forms and the subsistence of ecosystems. The erosion of environmental quality has undermined prosperity by damaging human health and the stability of Earth's systems. In the second part of the twentieth century, concerns about the impact and acceleration of industrialization fueled a growing realization that humanity is now a principal driver of the scale and magnitude of environmental change. Deforestation, rising global temperatures and sea levels, increased emissions of greenhouse gases, extinction of species, and destruction of natural habitats are some outcomes affecting Earth's natural stability. Understanding the connections among drivers of environmental change is essential for identifying possible solutions, thereby preserving environmental benefits for human societies and economies.

⁴ This section relies heavily on the findings of the 2012 Global Environmental Outlook (GEO) and its main summary, *Measuring Progress: Environmental Goals and Gaps* (UNEP, 2012b). The GEO, issued periodically by UN Environment, responds to the reporting requirements of the sustainable development agenda, offering a comprehensive assessment of the state of the environment and the main policies associated with it. A newer version published in 2016 does not offer a global perspective, since the analysis was only presented at the regional level. The section also includes data collected in key documents published by some of the conventions and NGOs.

Only about 40 percent of Earth's surface is covered by land, and much of that is uninhabitable. Pressure from population growth, economic development, and global markets has caused more than 30 percent of the usable land to be devoted to agriculture. As a result, the extent of natural habitats has declined 20 percent or more since 1980, and valuable ecosystem services have consequently been lost. Wetlands, for example, continue to decline globally to a startling extent. Social and economic factors, together with infrastructure development, land conversion, deforestation, changes in water temperatures, and invasion by alien species, decreased the extent of world wetlands 64-71 percent in the twentieth century (Ramsar Secretariat, 2015e), costing more than US\$ 20 trillion annually in ecosystem services.

At the same time, the effective and equitable management of protected areas, and their connectivity with ecosystem services, still need improvement. In 2014, 15.2 percent of the world's terrestrial and freshwater environments were covered by protected area agreements, which is below the goals established at the international level. In addition, according to IUCN, 26 percent of 5,500 mammals, 13 percent of 11,100 birds, 42 percent of 6,500 amphibians, 33 percent of 860 reef-forming corals, and 62 percent of 300 cycads are considered at risk of extinction (IUCN, 2016). In 2016, for the first time ever, giraffes were listed as a vulnerable species on the IUCN Red List. The global giraffe population has plummeted by up to 40 percent over the last thirty years, driven by habitat loss, civil unrest, and illegal hunting. Ultimately, all forms of biodiversity loss result in new risks for the multiple benefits that humans receive from biodiversity. As overexploitation has resulted in net economic growth, it has also been accompanied by reduction in other ecosystem services.

Global chemical pollution and wastes are two other acute problems for human health, livelihoods, and the environment. While chemicals play an important role in human life, economic development and prosperity, they can also have adverse impacts. The number of chemicals continues to grow rapidly, and sales of new chemicals to the developing world have more than doubled. Efforts to eliminate the production and use of POPs have achieved important successes, but the pollution they generate is still widespread. In addition, many developing countries lack policies governing the transboundary movement of hazardous waste, resulting in unregulated dumping and human exposure. The diversity and potential consequences of such impacts, combined with limited capacity of developing countries and economies in transition to handle them, make the management of chemicals and waste a cross-cutting issue. Nonetheless, developing these policies depends greatly on scientific knowledge and data, the absence of which definitively constitutes a barrier to the effective management and minimization of chemicals and wastes.

Water supply and quality, atmospheric depletion, and climate change are among other challenges that environmental policies face. Increasing efficiency in the use of water resources is vital to cover human water demands, which are increasing due to growing population and economic activities. In 2011, forty-one countries experienced water stress, and even though the proportion of people without access to clean water declined from 23 percent in 1990 to 9 percent in 2015, there are still important gaps in rural areas and across regions, and access to drinking water of adequate quality and quantity remains one of the largest human health problems globally. Although the extent of the Antarctic ozone hole slightly reduced in the 2010s, some ozone-depleting

substances are still present in the environment and need to be destroyed or recycled (UNEP, 2012a). In 2016, parties to the Montreal Protocol agreed on new strategies to phase out hydrofluorocarbons (HFCs), a category of replacement chemicals for ozone-depleting substances with high global warming potential (UNEP, 2016d). Furthermore, climate change continues to threaten food security and biodiversity, and it is likely to increase sea levels, droughts, and other extreme weather events worldwide. While these concerns are particularly prevalent, atmospheric concentrations of greenhouse gases continue to increase to levels that are likely to push global temperatures to more than 2°C above the pre-industrial average. Controlling emissions and temperatures requires movement toward low-carbon economies and solutions. Governments need to view climate change, air quality, and stratospheric ozone depletion in an integrated way that supports economic development and saves human lives, enhancing the quality of life and protecting the environment.

From agreements to behavioral change: The implementation puzzle

As the GEO asserts, “harmful environmental changes are taking place in an increasingly globalized, industrialized and interconnected world” heightening the risks and reducing the opportunities for the advancement of human well-being (UNEP, 2012a, p. 458). The complexity of environmental processes and our limited understanding make it hard to predict thresholds and effects. In this context, the international system requires “a polycentric governance approach (...) to attain effective, efficient and equitable outcomes.” The successful implementation of global environmental conventions through goal setting, metric development, data collection, and resource mobilization is therefore

fundamental to coordinating, integrating, and systematizing efforts to protect the environment and promote sustainability. Therefore, evaluating their implementation and effectiveness is particularly important. Existing assessments of international law instruments in general, and global environmental conventions in particular, focus on compliance, implementation, and effectiveness. The analysis of the literature on both perspectives includes the three concepts. *Compliance* refers to conformance to expectations, the adherence of state parties to the agreement's obligations (Chayes & Chayes, 1993; Hasenclever, Mayer, & Rittberger, 1997; Jacobson & Brown-Weiss, 1997; Simmons, 2000; Oran R. Young, 1979). *Implementation* refers to the adoption of domestic regulations to fulfill international commitments (Jacobson & Brown-Weiss, 1995; Mitchell, 2001; Simmons, 1998; Victor et al., 1998; Oran R. Young, 1979). *Effectiveness* means fulfilling the goals of the agreement and resolving the environmental problem in question (Bernstein & Cashore, 2012; Miles et al., 2002; Mitchell, 2001; Simmons, 1998).

This study analyzes implementation to assess whether state parties to a particular convention have put in place the necessary conditions to achieve the goals of the agreement, and therefore be effective in addressing the global problems central to each convention. To this end, my analysis will be grounded in the compliance and implementation literature. However, analyzing implementation is a difficult task. Each convention's definition of implementation differs, which increases the difficulty of defining a standard measurement for evaluation. In addition, most academic studies view implementation from a limited perspective that connects specific agreements to the solution of environmental global problems *but omits the process of adopting the national*

policies required for complying with those obligations. Thus, implementation and effectiveness of global environmental conventions have been seen by analysts as pivotally determined by the capacity and resources of member countries. In addition, countries in which certain environmental issues are more urgent, are expected to have higher implementation and effectiveness on the agreements that address those pressing problems.

Overall, states with higher levels of economic capacity and more stable political situations achieve better implementation in terms of their objectives as parties to environmental conventions. Systemic factors also influence the process of translating global environmental obligations into national policies. However, discussions of the determinants of implementation cover multiple issues, which makes it difficult to establish solid overarching causality relationships.

Three gaps--conceptual, empirical, and methodological--characterize the literature on global environmental conventions. Most *conceptual* analyses concentrate on effectiveness, without understanding first how the conventions are being translated into national environmental policies. The causal connections between conventions as instruments of governance and the solution of environmental challenges need to follow a systematic approach that incorporates the measures—informational, institutional, regulatory, technical, and financial—that countries enact to fulfill their global commitments. In other words, assessing individual countries' implementation of environmental conventions and explaining why countries perform differently is essential to understanding the dynamics and effectiveness of international environmental organizations and their contributions to addressing global challenges. Secondly, studies

need to offer *empirical* standard metrics that allow for comparisons across conventions and countries. Specific targets need to be identified and adequate data collected to measure progress under the same parameters for all countries and conventions. And finally, there is a fundamental gap regarding scale. Most analyses only offer information for a limited number of countries, whereas other studies focus on a specific agreement without offering national data that allows comparison among cases. Third, the absence of an accurate, up-to-date *empirical* indicator that estimates the implementation of global environmental conventions leads to the lack of a systematic explanation for the determinants of the process, and fails to connect the implementation of the conventions to the policy actions that countries and international organizations can develop to address weaknesses and improve performance in meeting global environmental goals.

Therefore, studies need to be recalibrated to determine how conventions are being implemented across all member states over a period of time, in order to understand why countries perform differently. In addition, the same methodology should be applied to different agreements to evaluate how the nature of different environmental issues, and the institutional arrangements of different conventions, impact the process of implementation. In this context, I will examine the implementation of global environmental conventions in four agreements and two issue areas—biodiversity and chemicals and waste (see Table 2), as a way to offer a better understanding of the process of implementation and effectiveness, and to provide input for policy-making processes. By analyzing and raising attention to the implementation of global environmental conventions, policy-makers and academic researchers can help solve global planetary challenges and proscribe human activities that are harmful to the environment.

Table 2 Global environmental conventions included in this study

- Ramsar Convention on Wetlands
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)
- Convention on Persistent Organic Pollutants (Stockholm Convention)

Measuring implementation: The Environmental Conventions Index

To address the need for an empirical indicator that measures the implementation of global environmental conventions, the research team at the Center for Governance and Sustainability designed an empirical instrument—the Environmental Conventions Index (ECI), which assesses the actions that signatory countries have taken to fulfill their commitments. The index derives a composite score from the answers to the questions that state parties submit in national reports to each convention’s secretariat; thus, the index illustrates trends between countries, within countries (across issues and over time), and across conventions. Aligning the data from these agreements is a particularly complex and time-consuming effort, as each convention has its own reporting platform, requirements, and timeline.

The methodological approach I used includes description, assessment, and explanation, as is appropriate for a social sciences analysis (King, Keohane, & Verba, 1994). Through a multi-stage protocol (see Chapter 3), the research team I was part of collected the reports submitted by state parties to the four conventions over a 15-year period (2001-2015)⁵; identified implementation indicators for each convention, including the creation of necessary institutions and evidence of the technical capacity to comply

⁵ For each convention, this study includes data for every country that has submitted at least one report in the years 2001-2015. For more information on the selection of case studies, the reporting requirements, and the characterization of the dataset, see Chapter 3.

with obligations; and created and applied scoring scales for each indicator. More than 100,000 data points were coded to build a reliable dataset that includes the data reported by each country. Countries were ranked on their progress toward each convention's goals using an ordinal scale from 0 to 5, with 5 being the highest level of implementation. As a quantitative metric, the index is then comparable by country and by convention.

The index has some important distinguishing characteristics. First, it examines data related to the national implementation of the hard legal obligations defined by the conventions. Second, it assesses whether signatory countries provided the required information, created the necessary institutions, and possess the technical capacity to comply with their obligations. This feedback is important to the convention secretariats, as it will help them to determine how to allocate institutional and financial resources, and how to improve national capacities for implementation. And third, by using a standardized metric, the index makes it possible to establish connections between environmental conventions and to understand changes in policy behaviors and environmental quality, providing an accurate description that enhances explanatory power. In addition, by using a large-*n* analysis, this study evaluates implementation results for every country party to the four conventions analyzed here (see Table 2) for which information was available for 2001 through 2015.

Data from the ECI also sets a performance baseline and promotes learning. The index expands the scale of existing studies about the implementation and effectiveness of global environmental conventions, to include more countries and to compare different conventions across the same parameters. This allows for the identification of patterns that reflect on traditional assumptions about the extent of implementation and the factors that

determine it, and call for alternative explanations of the observed facts. The empirical model developed by this study can be integrated with current theoretical assumptions to offer an alternative explanation to the role of the environmental conventions as global governance mechanisms. The index could also be used as the dependent variable in quantitative and qualitative analyses of multiple factors to test theoretical assumptions about the determinants of the process of implementation. This will provide insights for policy recommendations, addressing conventional beliefs about countries' capacities, the nature of environmental issues, the characteristics of the agreements, and roles of the international system, as well as broadening our understanding of interactions between state parties and conventions in defining national policies to achieve global objectives. Identifying the factors that determine implementation in each country is central to understanding national results, to establish best practices, and to identify challenges that must be addressed to improve countries' implementation of global environmental commitments.

In addition, my methodological approach can be applied not only to other environmental conventions but also to international law instruments in other policy areas that require assessments of their translation into domestic policies. Moreover, the use of national reports as sources of information for the construction of the ECI provides valuable insights about the nature of these information mechanisms, about the information requirements of global environmental conventions in particular and international law agreements in general, and about how these requirements contribute to compliance, implementation, and enforcement.

Fulfilling global environmental goals requires information, assessment, and monitoring. This dissertation covers all three elements, contributing to the system of global environmental governance by developing an analytical and political data baseline of national performance in global environmental conventions, based on the ECI. At the intellectual level, this research bridges a gap in the existing literature about the implementation of global environmental conventions. The ECI brings empirical evidence to the analysis of implementation, and informs countries and conventions about the extent of their progress in fulfilling their international environmental obligations, allowing them to compare results across countries and conventions for the years analyzed. Measuring and understanding implementation is needed to articulate and analyze best practices that could be used by scholars and policy-makers to help improve outcomes. If the challenge of implementation is not addressed through evidence-based global responses, environmental problems will persist, eroding the legitimacy of the governance system and preventing it from providing solutions to issues central to human well-being and sustainable development. The international community stands at a crossroads in the path to solving global environmental challenges, as it attempts to begin implementing the Sustainable Development Goals (SDGs), which include specific targets related to different environmental conventions. Thus, it is critical to define new strategies for globally agreed environmental goals to occupy center stage in the political debate.

Organization of this study

In this analysis, I seek to accomplish three goals: first, to assess the level of implementation of global environmental conventions in the select case studies; second, to

evaluate the main trends regarding the level of implementation across types of countries and regions to offer a preliminary evaluation of the reasons why countries perform differently; and third, to provide information on national policies and measures that inform the relevance of the index, identifying best practices and challenges for each convention's implementation at the national level. Implementing the conventions requires behavioral changes at the institutional, informational, regulatory, and technical levels intended to eventually improve the environment or at least prevent its further deterioration. Offering evidence on how each country is implementing these changes opens a window to better examine the dynamics of implementation, thus improving the literature and informing policy-makers. The ECI also answers many questions about how the obligations and actions defined by the conventions move parties towards the ultimate goal of solving the problems addressed by the conventions. Each chapter provides a piece of this analysis, revealing different aspects of the process of implementation and revealing its main successes and challenges.

In Chapter 2, I set the conceptual foundation for the analysis by laying out a detailed characterization of global environmental conventions and the main debates that exist—both in academia and in the policy world—about their nature, formation, functioning, and implementation. I describe the previous efforts to assess implementation to typify gaps in the literature. The chapter discusses the importance of the conventions as instruments of governance, and the need to evaluate progress in their implementation, as a way to improve their results. This also responds to new debates about the ideas of treaty congestion, the interactions among the existing conventions, the emergence and implementation of new conventions, the connection between environmental agreements

and other policy areas—such as trade and human rights—and their contribution to the implementation of the sustainable development agenda.

Chapter 3 presents the methodology and technical notes for this study. Departing from a general description of the methodologies used in such analyses, I discuss the characteristics of the dataset, the structure and construction of the ECI, and the methodological protocol used in each step. Chapter 3 also introduces the qualitative methodology used to build the country profiles presented in Chapter 6. Finally, this chapter demonstrates the value of the index's methodology and its replicability in other policy areas.

Chapters 4 and 5 analyze the implementation of the conventions in (1) chemicals and waste and (2) biodiversity. They are presented separately to emphasize the patterns of results in each cluster. Each chapter has a similar structure: After introducing each convention, I discuss its membership, national reporting of results, and level of implementation. Each section highlights average results, historical trends, comparisons across developed and developing countries and across regions, as well as top and bottom performers. Chapter 4 explains how countries with greater technical capacities, access to technology, and possibilities for data collection and monitoring achieve better results in implementing their obligations under the Basel Convention on Hazardous Wastes and the Stockholm Convention on POPs. Furthermore, existing disparities in implementation across types of countries and regions call for targeted policy instruments in capacity building and technical assistance, particularly regarding information collection mechanisms. Chapter 5 discusses the implementation of the Ramsar and CITES biodiversity conventions. I show that the nature of the problems of wetlands conservation

and illegal wildlife trade result in different levels of implementation, highlighting the positive results that some developing countries are obtaining. The biodiversity conventions also present specific arguments about the role that their governance bodies have in the process of implementation. I also devote special attention to the connection between the conventions' organizational structures and procedures, and their level of implementation.

Chapter 6 connects the results of the ECI with qualitative analyses at the national level. Given the innovative nature of the index, it is important to evaluate whether its results reflect policy actions that countries are taking to fulfill their international environmental obligations. Using ten countries—Algeria, Argentina, Australia, Canada, Colombia, Czech Republic, Germany, Mozambique, the Republic of Korea (South Korea from now on), and Thailand—I show that the positive results of the index correspond to the existence of governance instruments such as regulation and policy frameworks, as well as to specific initiatives countries have established to address their obligations. Consequently, countries with lower scores face challenges with these same issues. The countries register different national results across clusters (and within clusters in some cases), confirming that the process of implementation results from a series of changes that can be evaluated empirically and quantitatively. Such analysis offers standard metrics that provide insights to policy and contribute to the literature about global environmental conventions and their implementation and effectiveness. Understanding how countries are translating their global environmental obligations at the national level will serve as the foundation for creating a policy space for discussion about implementation that could potentially improve the performance of countries and of

conventions. These profiles were part of a collaborative project developed between the Center for Governance and Sustainability and the Law Division of UN Environment.

Building on these empirical findings and the interpretative analysis, in Chapter 7, I offer conclusions on the dynamics of the implementation process, its results, and the insights that inform improvement. These conclusions contribute to current policy debates on the role of global environmental conventions within the system of environmental governance and the implementation of the sustainable development agenda. This discussion shows a path for future research and explains how the framework established for the ECI forms a foundation to measure the extent of the conventions' effectiveness in the solution of problems such as pollution and biodiversity loss, and in the promotion of the environmentally sustainable management of chemicals and wetlands conservation. While multiple studies have previously tried to evaluate the implementation of environmental conventions, a systematic approach that identifies the steps towards implementation, and measures their progress, provides a new repository of data across countries and conventions. This can then be the departure point for analyses and policy recommendations that improve performance. Furthermore, from this systematic analysis, new steps in this research agenda could focus on the results of individual countries, increasing the salience of environmental issues in national foreign policies that have traditionally been dominated by security, conflict, and development challenges. Ultimately, better understanding of implementation offers the space for policy action and cooperation. Within this space, it would be possible to create a new generation of leadership, at the national level and in the global institutions, as well as in the higher

education system, that motivates organizations to produce this type of analysis and to support policy-making processes with academic rigor and engagement.

CHAPTER 2

ENVIRONMENTAL CONVENTIONS: DEFINITION, FUNCTIONS AND IMPLEMENTATION

This chapter presents an overview of the key issues in the academic literature regarding the global environmental agreements. As discussed in Chapter 1, the research agenda regarding environmental conventions addresses multiple dimensions, from the process of regime formation to their operationalization, functioning, effectiveness, evolution, and consequences (Breitmeier et al., 2006). This chapter creates a conceptual framework for this study, discussing first the scope and functions of these agreements, the factors considered in the process of treaty negotiation and formation, and the institutional arrangements established and their role in the agreements' operation. This chapter provides the foundation for discussions on the institutional performance of environmental conventions'—including the theoretical perspective on the concepts of compliance, implementation, and effectiveness—and on how implementation can be measured, promoted, and ensured. This chapter also investigates selected studies assessing the implementation and effectiveness of global environmental conventions. In sum, in this chapter I contextualize the gap in the academic literature that this study attempts to bridge, and I frame the concept of implementation of the environmental conventions within the system of global environmental governance.

Global environmental conventions are the main law-making fora to protect the environment (Gehring, 2007; Mäler, 1990). They are “intergovernmental document(s) intended as legally binding with a primary stated purpose of preventing or managing human impacts on natural resources” (Mitchell, 2003, p. 431). Subject to the regulations of the Law of the Treaties (Vienna Convention), environmental conventions are the result of a voluntary agreement in which states have committed to bind themselves to international obligations and multilateral rules at multiple levels (Birnie, Boyle, & Redgwell, 2009; Gehring, 2007; Mäler, 1990). These conventions also establish institutional frameworks and mechanisms for participating states to receive support for achieving the specific objectives defined for each environmental issue, as well as to provide important principles guiding the interactions among states and other actors (Gehring, 2007). Even though global environmental conventions have been part of the system of international environmental law since the nineteenth century, the past five decades have seen an expansion of the system of international environmental cooperation—creating more agreements, supporting developing countries in defining their environmental policies, expanding the membership of existing agreements, opening them to the participation of non-state actors, and promoting sustainable development (U.S. General Accounting Office, 1992; UNEP et al., 2007).

Conventions such as the 1971 Ramsar Convention and the 1973 CITES were negotiated and concluded in the context of the same environmental concerns that led to the creation of UN Environment. Soon thereafter, and under the auspices of UN Environment, negotiations concluded for the Convention on Migratory Species (1979), whose purpose is the global conservation of wildlife and habitat by protecting terrestrial,

marine, and avian migratory species throughout their ranges. UN Environment was also the main force behind efforts related to the management of chemicals and wastes. Concerns about environmental damage and the effects of harmful phenomena such as pollution and the degradation of the ozone layer on human health and the environment (Tolba & Rummel-Bulska, 1998) led to the establishment of the Vienna Convention for the Protection of the Ozone Layer (1987) and the Basel Convention on the Transboundary Movement of Hazardous Wastes (1989).

Around the time that preparations were underway for the 1992 Earth Summit, countries agreed on the need to move forward with the commitments established by previous MEAs by developing and applying domestic policies conducive to progress toward sustainable development (U.S. General Accounting Office, 1992; UNEP et al., 2007). At the same time the so-called Rio Conventions were also adopted: The Convention on Biological Diversity (1992), the UN Framework Convention on Climate Change (1992), and the UN Convention to Combat Desertification (1994). With these treaties, conventions moved from specific sectoral approaches into more holistic perspectives that—instead of focusing on specific environmental resources or threats—presented overall approaches that recognized the interconnectedness between environmental issues, their effects on broader ecosystems, and their positive and negative effects on sustainable development (Redgwell, 2014). Two other conventions were negotiated towards the end of the 1990s and the beginning of the new century to expand the scope of global regulations of the management of chemicals and wastes: the Rotterdam Convention on Prior Informed Consent (1998), and the Stockholm Convention on POPs (2001).

Recently, environmental conventions have not only increased in complexity but have also established multiple connections with other areas of international law such as trade, human rights, intellectual property, and maritime law. Agreements have also established stronger and more open mechanisms to promote the participation of civil society and non-governmental stakeholders in the processes of treaty-making, implementation, review, and monitoring (UNEP et al., 2007), and UN Environment and their executive bodies are developing new mechanisms to link their mandates with other global agendas and strategies, particularly those to do with sustainable development (UNEP, 2016b).

Conceptually, environmental conventions can be classified according to multiple characteristics. The type and number of parties, level of legality, and instruments used to achieve goals result in different categories of agreements (Beyerlin & Marauhn, 2011; Bodansky, 2010). However, the most common classifications are based on the geographical range of the environmental problems they address: global, regional, subregional, or bilateral (Beyerlin & Marauhn, 2011); the nature of the obligations they enact, including regulations, procedures, or programs (Mitchell, 2008a); and the environmental issues they address (UNEP, 2012d). This last category refers to the process of clustering that was part of the discussions around the strengthening of the system of international environmental governance that UN Environment started in 2001 (Oberthür, 2002). Agreements can be clustered around atmosphere, biodiversity, chemicals and waste, land, or water (see Table 1). This is a useful policy and methodological instrument to understand the agreements' objectives and their possible linkages. I use this classification to separate the agreements into the chemicals and waste

cluster (Basel and Stockholm) and the biodiversity cluster (Ramsar and CITES) and to present comparative analysis among and within clusters.

Scope and functions of global environmental conventions

Global environment conventions serve multiple functions depending on the issues they address and the characteristics of the countries involved (Brown-Weiss & Jacobson, 1998; DeSombre, 2004; Simmons, 2009). As institutional frameworks to address transboundary environmental problems, they set agendas, raise awareness, gather information, regulate actions, improve knowledge about the state of the environment and the extent of environmental deterioration, reduce uncertainty, and promote consolidated actions and policy responses toward effective solutions by centralizing commitments and innovations (Brown-Weiss & Jacobson, 1998; Brunée, 2006; DeSombre, 2004; Haas et al., 1993; Mitchell, 2003, 2010; Steiner et al., 2003). Ultimately, these functions point toward “the control and prevention of environmental harm and the conservation and sustainable use of natural resources and ecosystems” (Birnie et al., 2009, p. 212). They also contribute to policy specialization, opening spaces for the participation of civil society and the use of innovative instruments to solve environmental challenges.

As part of their functioning, the conventions develop mechanisms for governments to use in addressing environmental challenges (Mäler, 1990). Policy coordination requires complex design in order to develop policy options that work better for a group than those that countries would have implemented individually (Hoel, 1997; Simmons, 2009). These mechanisms are based partly on the institutional arrangements that each convention establishes. Conventions create executive and subsidiary bodies that

work on issues such as decision-making, the provision of scientific recommendations, the review and verification of the agreement's application, and its implementation and compliance at the national level (Birnie et al., 2009). Therefore, the conventions' very purpose is to facilitate a response to common concerns, to build mechanisms for norm creation and adaptation, and to promote compliance "in the context of polycentric problems where states are likely to be both perpetrator and victim" (Brunée, 2006, p. 14).

Agreements "are rarely the end product, but instead create the framework and the process that guide responses to the environmental problem in question" (DeSombre, 2004, p. 84). Beyond their policy roles, they also have additional functions. First and foremost, environmental treaties express collective intentionality (Simmons, 2009), bringing governments and actors together under a series of principles and obligations that enhance their capacity to respond to environmental problems (Bodansky, 2010; Simmons, 2009). They transform "intergovernmental bargaining into deliberative transnational problem-solving" (Gehring, 2007, p. 496). From the perspective of international organizations, conventions support, manage operations, jointly elaborate and produce norms, and coordinate the efforts of countries that agree to work together to address a common issue (Abbott & Snidal, 1998; Choucri, 1995). By opening spaces for interactions among countries, agreements also promote reciprocity, define specific norms, and require countries to establish the national policies necessary to address environmental problems. All these functions, outcomes, and substantive measures would ultimately improve the state of the environment.

The process of treaty formation

The study of environmental diplomacy and of the negotiation of an environmental treaty covers numerous aspects, from the actual motivations for joining an agreement, to the process of reaching it, the relevance of different issues in the negotiation process, and the treaty's design. In addition, the study of environmental conventions also includes aspects such as the role of science in the definition of international policies and commitments, the establishment of monitoring and enforcement mechanisms, and the influence of power and interests behind these decisions.

A core debate within international relations theory regards ways in which states can work together on common problems. States are motivated by the classical concept of maximization of their own results (Krasner, 1982; Stein, 1982). In an anarchic world, states operate as unitary, single actors depending on self-help to achieve their objectives (Morgenthau, 1960; Waltz, 1979). Specific interests determine different forms of interaction between countries (Frieden, 1999; Stein, 1982; Waltz, 1979). However, the evolution of international affairs opened the door for states to build mechanisms to join efforts in solving common problems under other expectations. Different perspectives of liberal institutionalism recognize the relevance of non-state actors, the existence of multiple channels of access, the reduced salience of power, and the increasing relevance of international institutions in the provision of common goods (Hasenclever et al., 1997; Keohane & Nye, 1972; Krasner, 1983; Mitrany, 1975). Neoliberal institutionalism tries to bridge the gap using realist arguments that share the underlying principle that states are rational actors. It also recognizes motivations for cooperation that emerge from the anarchic nature of the international system (Grieco, 1993; Stein, 1982). Under this

framework, institutions serve as catalyzers of states' efforts to define conformity to specific values and mechanisms for policy coordination in which actors adjust their behaviors to the preferences of others (Hasenclever et al., 1997; Keohane, 1984; Krasner, 1983; Mitrany, 1975). States cooperate with institutions according to specific conditions, countries' mutual choice and the possibility for permanent interactions that highlight the need for cooperation (Grieco, 1993; K. Raustiala, 1997).

Even though both the above-stated theoretical strands recognize the role of international cooperation, their perspectives on states' motivations and interests differ significantly. While rational choice is exclusively limited to the maximization of specific interest in each situation, neoliberal institutionalism assumes that states follow strategies that will offer them the best possible results according to their interests and long-term evolution. Cooperation maintains its relevance, since agreements and institutions support joint efforts to achieve policy benefits. However, neoliberal institutionalism fails to address major constraints on states' decision to cooperation, including the ones defined by realism, based on anarchy and the primacy of security (Grieco, 1993).

Overall, developing an international environmental agreement is not an easy endeavor. It involves achieving a voluntary commitment among many nations with various levels of development, technical capabilities, resources, and concern about the specific environmental problems (U.S. General Accounting Office, 1992). Therefore, a finalized agreement results from a multilateral process that connects elements of environmental policy, international law, and governance (UNEP, 2016b). Its formation covers multiple stages, from the recognition of a specific need to the adoption and ratification of the treaty and its entering into force (Gehring, 2007; UNEP et al., 2007;

Oran R. Young, 1989). Negotiations take place within international organizations or through independent or new diplomatic conferences, and are always influenced by the institutional cultures of the organizations conducting the negotiations (Gehring, 2007). Before moving forward with the negotiation of the agreements, however, governments need to establish a series of decision-making procedures, and to declare the values that are to be part of the foundation of the treaty-formation process (Bodansky, 2010). In some cases, states also to work to reduce informational, political, and institutional constraints that would prevent them from obtaining optimal benefits once they start participating in a given agreement (Brandt, 2002). Table 3 lists the steps in the process of treaty formation.

Table 3 Steps in the treaty-making process

Pre-negotiation	<ul style="list-style-type: none"> • Framing of the issue • Formulation of national positions
Initiation of negotiation	<ul style="list-style-type: none"> • Choice of negotiating forum • Adoption of negotiating mandate
Negotiation	<ul style="list-style-type: none"> • Structural issues: committees, coalitions • Procedures: decision-making rules, transparency, access • Formulation of initial draft
Adoption and entry into force	<ul style="list-style-type: none"> • Adoption • National consent: signature and ratification, or accession • Entry into force

Source: (Bodansky, 2010)

For the formulation of the initial draft of an agreement, no specific template exists, but common components of treaties have been identified (U.S. General Accounting Office, 1992). In defining components, parties operate under consensus principles that require negotiations before making decisions. Departing from a statement of common interests, environmental conventions establish specific definitions for the specialized terms that are used through their legal texts, as a way to clarify contents and

obligations. Furthermore, agreements define a series of requirements for parties to institute regulatory mechanisms, report information, establish legislation, and define national institutional mechanisms to work on issues related to the convention. But conventions do not only set rules. They also put in place mechanisms to monitor and verify compliance, collect information about national policies established by state parties, and settle disputes regarding environmental resources (Palmer, 1992).

Treaties also include definitions on the institutional framework for implementation at the national and at the global levels, defining the foundation for state parties to fulfill the obligations they acquire when joining an agreement (Gehring, 2007; Redgwell, 2014). These instruments make the conventions forums for further negotiation and discussion, which will lead to administrative decision-making and additional law-making. In this sense, treaties should be seen not as discrete events but as a process, as flexible components of the system of international environmental law (Brandt, 2002; Choucri, 1995; Gehring, 2007; Mäler, 1990; Miles et al., 2002). Table 4 lists the sections commonly included in the legal text of global environmental conventions.

Table 4 Key elements of global environmental conventions

-
- Preamble
 - Definition and use of terms
 - Objective and principles
 - General provisions and scope
 - Substantive commitments
 - Financial and technical assistance
 - Education, training, and awareness / Research and monitoring
 - Conference of the Parties (COP) / Meeting of the Parties (MOP)
 - Subsidiary bodies / Secretariat, focal points, and authorities
 - Compliance, communication, and reporting
 - Review of effectiveness
 - Dispute settlement
 - Treaty mechanisms
-

Source: (UNEP et al., 2007)

A critical issue in the negotiation and drafting process is the clarity of obligations, which determine the level of engagement that countries will have with the agreement (Brown-Weiss & Jacobson, 1998; Simmons, 2009). Countries are subject to all the obligations in the treaties they join, unless they express a reservation (UNEP et al., 2007). Therefore, it is critical that obligations—especially those substantive ones—are as detailed as possible to reduce the room for additional regulations, and the possibility of misinterpretation. However, in some cases parties use vague obligations to hide the lack of political consensus or to evade concrete commitments (Beyerlin & Marauhn, 2011). Since the agreements materialize cooperation to solve specific environmental problems, it is clear that “environmental protection is an appropriate realm of international law” (Tolba & Rummel-Bulska, 1998, p. 20).

Institutional arrangements

International treaties include a series of institutional arrangements put into place to support state parties in the fulfillment of their obligations (Gehring, 2007). The complexity of environmental problems demands different structures at the institutional level (Choucri, 1995). Normally, a convention establishes two executive bodies—a secretariat and a conference or meeting of the parties—which are the main decision-making and mandated executive bodies for the administration and operation of the agreement. The study of these organizational structures addresses two different topics: the role of these executive bodies in the implementation of the associated treaty, discussing their levels of influence and the conditions they need to advance the implementation of their mandate (Bauer, 2006; Biermann & Siebenhüner, 2009, 2013);

and their actual structures, using the perspective of organizational behavior theories, and evaluating the role of the members of the secretariats' staff as individual and multilateral diplomats, considering variables such as their professional backgrounds and personality traits (Egeberg, 2003; Häfliger & Hug, 2012; Reinalda, 2011; Spies, 2013; Trondal, 2013). Both strands of the literature are important for understanding the structure of executive bodies and how they affect the outcomes and impact of the conventions.

The executive bodies and the international bureaucracies that represent them are generally considered independent actors in world politics (Biermann & Siebenhüner, 2013; Churchill & Ulfstein, 2000), fulfilling both political and technical functions (Urquhart, 1995). They serve as agents of the decisions reached by state parties to the different organizations and treaties. The mandates assigned by countries shape the activities and performance of the secretariats and the behavior of their staff (Trondal, 2013). Mandates include multiple functions not limited to the implementation of a convention (Ege & Bauer, 2013). Functions range from the creation and dissemination of knowledge to the shaping of the discourse associated to the treaty, the influence on the negotiation, the coordination and monitoring of the process of implementation, the institutionalization of the convention, and the definition of standards (Biermann & Siebenhüner, 2013).

COPs and secretariats are important for different reasons. At the global level they act as agents in the international system, dealing with specific international issues and proposing and coordinating problem-solving strategies (Bauer, 2006). At the national level, their relevance lies in how they influence policy outputs, generating change, affecting the distribution of power and transforming the structure and processes of

domestic governance (Trondal, 2013). Discussions about how COPs outcomes expand the obligations and legal scope of treaties evidence the importance of these meetings (Wiersema, 2009). In executing these mandates, executive leadership appears to be a central determinant of authority, capacity, autonomy, visibility, and legitimacy of secretariats (Bauer, 2006; Cox, 1969; Grigorescu, 2013).

A more detailed approach to international bureaucracies incorporates their dimension as international civil servants. In this role, secretariats also perform functions of representation, protection of state interests, negotiation, information gathering and reporting, and promotion of friendly interstate relations (Spies, 2013), making the individual and personal characteristics of the employees of the secretariat particularly relevant, since they bring their positions, values, and political views with them to their jobs (Reinalda, 2011). These characteristics, at the structural and individual levels, result in different typologies of organization, specialization, and leadership that determine the level of engagement of specific secretariats and their capacities to execute the mandate they receive from member states (Bauer, 2006; Trondal, 2013).

Different studies have addressed the role of environmental secretariats in global environmental governance and politics. Issues such as their institutional status and structure are important to establish the capacity of action of international bureaucracies (Bauer, 2006). Biermann and Siebenhüner (2013) and Andresen and Skjærseth (1999) offer different typologies of the determinants of the ability of international bureaucracies to exercise influence. Their characterizations include the nature of the problem; its international salience and level of autonomy; institutional and capacity frameworks at legal, institutional and financial levels; and expertise, culture, and leadership. At the same

time, some challenges that secretariats face—political problems, resource availability, lack of autonomy, and socio-cultural considerations—negatively affect their capacity to exercise influence and execute their mandates (Bauer, 2006; Biermann & Bauer, 2004; Biermann & Siebenhüner, 2009; Sandford, 1994). Analyses have also focused on the specific influence that secretariats have on the implementation of global environmental obligations. Brown-Weiss and Jacobson (1998) identify the structure of the secretariat as “a crucial factor” of implementation, compliance, and effectiveness of an agreement. They highlight a series of functions and institutional arrangements that will facilitate countries’ engagement to advance implementation and the solution of environmental problems, including convening meetings, monitoring, scientific assessment, assistance and capacity-building, connection to stakeholders, standardized data collection, and providing information to parties and the public.

Another key aspect of conventions’ institutional arrangements is the secretariats’ legal status. Each convention establishes specific regulations about the functions of its secretariat, operations, and administration. While some agreements have a more independent structure, in most cases the convention establishes a hosting agreement, locating the secretariat within an already existing international institution (Desai, 2010). In the case of CITES and the Basel and Stockholm conventions, the secretariat is housed at UN Environment. The Ramsar Convention’s secretariat is hosted by IUCN. Different analyses have addressed these administrative arrangements, and programmatic cooperation between the hosting organizations and the environmental conventions they administer (Ramsar Convention, 2005b; UNEP, 2016c). How and where the secretariat is established is fundamental to the convention’s organizational structure and will therefore

influence its role in the implementation process. Furthermore, secretariats' institutional structure will raise questions about the nature and quality of their services, their autonomy and the organizational linkages they establish with other conventions and international organizations.

Institutional performance

Environmental conventions operate in a system with no hierarchical authority to coordinate or enforce them. That is why questions about their institutional performance and their contribution to the solution of environmental problems are particularly relevant. While some analyses consider international agreements as useful instruments, others recognize that their benefits are limited by the circumstances in which they operate (Krasner, 1983). These debates revolve around three core concepts: compliance, implementation, and effectiveness. *Compliance* refers to conformance to expectations, the adherence of state parties to the obligations the agreement represents (Chayes & Chayes, 1993; Faure & Lefevre, 2015; Hasenclever, Mayer, & Rittberger, 1996; Hasenclever et al., 1997; Jacobson & Brown-Weiss, 1997; Simmons, 2000; Oran R. Young, 1979). *Implementation* refers to the adoption of domestic regulations to facilitate compliance (Jacobson & Brown-Weiss, 1995; Mitchell, 2001; Simmons, 1998; Oran R. Young, 1979). *Effectiveness* is the fulfillment of the goals of the agreement and the resolution of the environmental problem in question (Bernstein & Cashore, 2012; Simmons, 1998). A review of the literature shows that the three concepts have received different levels of attention as to their theoretical treatment and conceptualization, measurement, and analysis of the factors that motivate and ensure implementation. This

dissertation uses the concept of implementation to address the existing gap in the literature and to evaluate, under standardized parameters, the extent to which state parties put in place the necessary conditions and measures to fulfill the goals established by the conventions.

As part of the implementation process, international agreements influence states' behavior (Chayes & Chayes, 1993; Mitchell, 2001; Oran R. Young, 1979, 1994). Initially, states' compliance is based on the legal principle of *pacta sunt servanda*—treaties are to be obeyed—as recognized by the Vienna Convention on the Law of the Treaties (Chayes & Chayes, 1993; United Nations, 1969). Implementation and compliance are, however, more complex. While some scholars limit these aspects to the adherence of state parties to the obligations of an agreement (Chayes & Chayes, 1993; Jacobson & Brown-Weiss, 1995; Simmons, 2000), it is necessary to consider the adoption and implementation of measures that change states' behavior. While Downs et al. (1996) argue that compliance is not evidenced in state behavior, other authors such as Young (1979, 1994), Chayes and Chayes (1993), and Mitchell (2001) analyze the effects of compliance in states' behavior in terms of both their foreign and domestic policies and their role in solving global problems. Jacobson and Weiss (1995) define compliance not only around adherence to specific provisions, but also in terms of implementing those measures that treaties institute. Implementation, according to them, refers to the measures that states take to make international accords effective in their domestic law. Victor, Raustiala, and Skolnikoff (1998) are even more specific, referring to national implementation as the creation of new programs and the promulgation and enforcement of laws and standards. What all these approaches have in common is a strong behavioral

component that goes beyond actual conformance with specific legal obligations (Haas et al., 1993; Oran R. Young, 1979). In some cases, however, states do not carry out these changes and behave contrary to expectations (Chayes & Chayes, 1993, 1995; Downs et al., 1996; Simmons, 1998). Additionally, as most agreements offer no standard to measure implementation, studies conducted on global environmental goals established by these conventions evidence a persistent failure to achieve many of their goals.

In the case of environmental law, conventions are often used as examples of positive results in compliance and implementation. However, even though some authors have evaluated these processes (Chayes & Chayes, 1993; Jacobson & Brown-Weiss, 1995), their results do not share a common definition for measurement standards and do not offer a systematic empirical assessment demonstrating results. Even within the same environmental issues, treaties have different conceptions of what is acceptable behavior by state parties (Beyerlin, Stoll, & Wolfrum, 2006; Jacobson & Brown-Weiss, 1995). Difficulties with the vagueness of legal obligations and with countries' reporting reduce the ability to determine the extent to which countries are fulfilling their obligations and translating them into national policies. Common understanding of terminology simply does not exist, and key concepts for assessing the state of the environment and the effectiveness of measures taken are missing (Helm & Sprinz, 2000; M.A. Levy, 1995; Marc A Levy, Young, & Zürn, 1995). In addition, different reports, including the flagship international environmental assessment—the Global Environment Outlook (GEO-5)—show a high level of failure in attaining global environmental goals (UNEP, 2012a, 2012b; UNEP et al., 2007). This raises questions about the extent to which countries comply with international environmental treaties and implement their provisions, as well

as about the effectiveness of international treaties in general, and the factors that determine countries' and conventions achievement of their goals. There is also an important gap in the literature around empirical assessment of the implementation of international environmental conventions.

Theoretical treatment

Compliance and implementation are major topics in the international relations and international law literature (Abbott & Snidal, 2013; K. Raustiala & Slaughter, 2002; Simmons, 2000; Slaughter, 1993). Some analyses of these issues explain how each discipline perceives them. Guzman (2002), for example, combines approaches from international relations and international law, to construct what he calls a 'compliance-based' theory of international law. Other authors assume a more interrelated approach, seeing compliance in the intersection between international relations and international law. Beth A. Simmons (1998) analyzes three perspectives: realism, rational functionalism, and the normative approach, while Anne-Marie Slaughter (1993) compares liberalism and institutionalism, and Jeffrey T. Checkel (2001) adds constructivism. These approaches explain how different international relations theories perceive compliance and the role of legal instruments in international politics:

- Realism: International law is perceived as an 'epiphenomenon of interests' (Simmons, 1998) which maintains the polarity between law and power (Slaughter, 1993). States operate according to their national interests, which motivate their willingness to comply (Downs et al., 1996; Steinberg, 2013; Von Stein, 2005).

- Liberalism/Institutionalism: Regimes are constructed to affect states' behavior and designed to maximize their effectiveness (Slaughter, 1993). International institutions serve as fora to solve contentious issues and exercise pressure to solve disagreements peacefully (McLaughlin Mitchell & Hensel, 2007; Moravcsik, 2013).
- Rational Functionalism: States participate in international regimes because of their need to solve common problems, and this works as an incentive to compliance (Hasenclever et al., 1996; Simmons, 1998; Slaughter, 1993). International law thus has intrinsic value for national-level politics and objectives.
- Normative Approaches: States base their interests in compliance on the role of ideas, beliefs, and standards in promoting appropriate behavior, thus constituting a major influence in governments' willingness to implement international agreements (Brunée & Toope, 2013). This approach is connected to both constructivism (Checkel, 2001) and to Hedley Bull's International Society (Bull, 1977). At this level, the legitimacy of the law also plays a key role in defining compliance and how to achieve it (Hasenclever et al., 1996; Simmons, 2000; Slaughter, 1993).

Of these multiple approaches, most of the literature has focused on the realist perspective (Downs et al., 1996). Theoretical and practical difficulties persist in establishing connections with other theories of international relations. However, the growing role of international law in international politics has raised the relevance of other theoretical approaches and opened debate about the motivations of states to comply and

develop specific behaviors and policies that reflect their international commitments. This approach will be discussed in the next section.

Measuring and motivating implementation

Even though most of the scholarship about implementation stems from the perspective that there is a general propensity of states to comply with international obligations (Choucri, 1995), and although international legal scholars see compliance and implementation as the norm, in practice measuring implementation is a difficult task. There is no specific standard for “good implementation.” In environmental governance, as in other issue areas in which research has assessed compliance, studies do not share a common definition of measurement standards (Chayes & Chayes, 1995; Jacobson & Brown-Weiss, 1995). Treaties have different conceptions of what is an acceptable behavior from state parties (Beyerlin et al., 2006; Jacobson & Brown-Weiss, 1995). Furthermore, implementation is perceived as the result of a subjective evaluation, in which measurement will depend on expectations. Levels are determined according to what parties count as acceptable performance (Chayes & Chayes, 1993). However, some variables have been established by the literature as useful metrics of compliance. According to Raustiala and Slaughter (2002), legitimacy is not only a way to guarantee compliance but also a mechanism to measure it. Legitimacy constitutes a central ‘pulling’ factor that allows for the assessment of implementation as well as incorporating other dimensions such as ideas and beliefs (Hasenclever et al., 1996; Simmons, 1998; Slaughter, 1993). Proxies such as perception, membership, and the speed of entering into

force have also been considered as indicators of implementation and effectiveness (Choucri, 1995)

Based on these concepts, studies have presented various analyses and measures of compliance, implementation, and effectiveness (see

Table 5). As Young explained in his 1999 book on the effectiveness of environmental regimes, during the 1990s, scholarship focused on the question of why some regimes were more successful than others. Under different definitions and methodological approaches, scholars agreed on the need for specific assessments of the level of compliance with and implementation of international environmental agreements.

However, the question of what to measure and how seemed to be an issue in some of the analyses. Some studies used proxies to implementation, limiting their analysis to specific agreements within single environmental clusters (Choucri, 1995) or presented multidimensional approaches to measure progress, including factors such as change in policy outputs, scientific understanding of environmental problems, and overall improvement in economic growth, social justice, and national governance performance (Mitchell, 2008b). Other research focused on the sources of non-compliance, as well as the role of international organizations and NGOs in enforcing the obligations of different accords (Cameron et al., 1996).

Other analyses focus on positive and negative drivers of implementation (Fearon, 1998). Beyond the legally binding nature of the obligations and the design of treaties—including the clarity of the obligations and incentives they establish—states are also motivated by their desire to improve standards or reputation in terms of agenda-setting or

problem-solving (Chayes & Chayes, 1993; Checkel, 2001; Downs & Jones, 2002; Simmons, 1998; Simmons & Hopkins, 2005; Underdal, 1998; Von Stein, 2013; Oran R. Young, 1994). Furthermore, foreign policy considerations and concerns about their sovereignty also motivate countries to develop the necessary conditions defined by environmental conventions (Chayes & Chayes, 1993; Downs & Jones, 2002; Hoel, 1997; McLaughlin Mitchell & Hensel, 2007; Simmons & Hopkins, 2005).

However, states' interactions and the practical role of international law bring other variables into consideration. Implementation should not be considered a unidimensional variable (Simmons, 1998). In their 1995 study, Jacobson and Weiss offer four categories of determinant factors: (a) the nature of the activity associated with each treaty, (b) the structure of the agreement, (c) the characteristics of the country, and (d) the characteristics of the international environment. A similar categorization is presented by Victor, Raustiala, and Skolnikoff (1998), who include the nature of the problem and the commitments, the power configurations, the linkage with other issues and objectives, the level of public concern, and other exogenous factors as determinants of implementation and effectiveness.

In terms of the nature of the activity in each agreement, clearly some issues are less contentious than others and promote cooperation. Some global problems also facilitate nations' objectives of deploying political power and contribute to the process of regime preservation (Chayes & Chayes, 1993; Jacobson & Brown-Weiss, 1995). The structural design of agreements also plays a key role. "If the agreement is well designed—sensible, comprehensible, and with a practical eye to probable patterns of conduct and interaction—compliance problems and enforcement issues are likely to be

manageable” (Chayes & Chayes, 1993, p. 183). Characteristics of the international system also influence the behavior of states and their adherence to international agreements. Among these, the political space for international organizations and NGOs to exercise pressure facilitates and promotes compliance. In particular, civil society influence and pressure on states to commit to international agreements also shape implementation and accountability.

The category in Jacobson and Brown-Weiss’s conceptualization that probably receives more attention in the literature is country characteristics. Here different variables are at play. First, compliance is motivated by the conditions that lead to an agreement (Von Stein, 2005). Under the framework of rational functionalism, states are more motivated to comply when they have a clear understanding of the reasons that support their participation in the regime and the benefits they receive (Simmons, 1998; Underdal, 1998). States may also be interested in improving standards (Chayes & Chayes, 1993) or their reputation (Fearon, 1998) in terms of agenda-setting or actual effectiveness in problem-solving (Downs & Jones, 2002; Simmons & Hopkins, 2005; Oran R. Young, 1994). This raises awareness about how agreements are constructed. In some cases states only commit to the obligations they can actually fulfill, so that their reputation is not negatively affected by non-compliance allegations (Chayes & Chayes, 1993; Checkel, 2001). Second, authors see compliance as dependent on the capacity of states. Technical, political, and financial resources shape capacity, as do information availability and leadership (Haas et al., 1993). A state’s policy history—commitment to international law and the priority given to it in foreign policy traditions—is also relevant to capacity. Third, domestic regimes also a determining factor. Simmons (1998) argues, for example, that a

state's domestic regime influences its perception of the role of law in its foreign policy. Democracies, she contends, are more likely to comply with international legal obligations, since they have standardized processes to adopt domestic legislation and since they depend on honoring commitments to maintain the support of the electorate.

In another theoretical strand, the literature discusses how compliance depends on the mechanisms that each agreement or regime establishes to encourage or discourage it. Agreements should be designed to ensure clarity about the operations, performance, and responses required from state parties (Mitchell, 2001). This design includes mechanisms that work both ways: as strong incentives to comply and as weak incentives to go against agreements (Oran R. Young, 1979). Regimes should establish a persuasive discourse, through monitoring, verification, and enforcement mechanisms, that motivate compliance and promote national implementation (Simmons, 1998). Compliance and implementation therefore comprise a multilevel, multi-actor process that extends beyond governments' preferences, and thus analysis of compliance and implementation requires extensive and systematic empirical evidence.

What is clear from the multiple analyses that try to measure and explain implementation is that questions about this process continue to be as relevant as they are complex. When determining the role of conventions and their effectiveness in solving global environmental problems, clearly there is a long list of determinant variables. However, implementation is definitively "the central process to turn commitments into actions" (Victor et al., 1998) and deserves special attention. International law, international relations, and political science have strongly focused on the legal concept of compliance without taking into consideration its effects on states' policies (L. L. Martin,

2013). Previous scholarship has conceptualized the conflict of implementation and assessed its levels, but “very little empirical research (had tried) to answer these questions in a systematic way” (Jacobson & Brown-Weiss, 1995). Furthermore, some analyses assumed that developing countries did not need to make substantial behavioral changes for the environmental agreements they joined either because their limited resources or because they were not responsible of environmental damage. This lack of empirical evidence constitutes a key gap in both the literature and the practical evolution of the concept. As the research agenda about environmental governance moves forward, agreements should be seen as scenarios for learning. For implementation to lead to more effective international environmental agreements, a better understanding of the extent to which countries implement conventions is fundamental, not only to measure progress but also to adjust the mechanisms to are being established to ensure implementation and to achieve the goals of the conventions in the protection of the environment and sustainable development.

Ensuring implementation

Other strand of the literature on international environmental law and conventions addresses the mechanisms required to facilitate and enforce implementation and compliance. In the system of global environmental governance, a core challenge is to ensure compliance, implementation, and effectiveness. Countries and agencies have acknowledged the importance of implementation and discussed strategies to promote the domestication of international environmental obligations. In 1992, the UN Conference on Environment and Development asked that parties to international agreements develop

“procedures and mechanisms to promote and review their effective, full and prompt implementation” (UNCED, 1992 para. 39.8), including capacity building, information, science, technology, institutional arrangements, and finances, among others. This approach was reinforced by the 2002 Plan of Implementation of the World Summit on Sustainable Development, referring not only to the implementation of environmental conventions but also to the development agenda (WSSD, 2002). More recently, the 2012 UN Conference on Sustainable Development Rio+20 reaffirmed the previous discussion, and invited countries to improve the implementation of their policy commitments, to advance in providing means of implementation, and recognized finance, technology, capacity building, trade and information as decisive factors to achieve the proposed agenda (United Nations, 2012a).

Environmental conventions have also addressed the ensuring of implementation (Beyerlin & Marauhn, 2011; Sands, 2003). “Once an agreement has come into force, compliance by the Parties with their commitments may be controlled by a variety of techniques developed under different environmental regimes” (Sand, 1992, p. 13). However, the process faces multiple challenges, including inadequate means, the existence of multiple environmental commitments at the country level, the collision of those commitments with countries' political and economic interests, and the multidimensional nature of some environmental threats. These factors raise concerns about non-compliance, implementation gaps, and ineffectiveness in the solution of global environmental problems (Beyerlin & Marauhn, 2011; Kurukulasuriya & Robinson, 2006). That is why countries, as part of the development of international environmental law, put into place mechanisms and techniques to guarantee compliance and

implementation, guaranteeing that countries adhere to the provisions of each convention through the definition of domestic policies and measures (Beyerlin & Marauhn, 2011; Sands, 2003).

In the literature, the debate has centered on ways to induce change in behavior by states to address their international obligations. In addition to the realist perspective on enforcement and sanctions (Guzman, 2002), authors have developed a range of models to ensure compliance and implementation. Downs et al. (1996) argue that there is no problem with compliance, since it does not expect any behavioral changes. Other academics recognize a problem but argue that it is mostly managerial (Chayes & Chayes, 1993). Enforcement is also seen as a way to promote compliance and implementation (Avdeyeva, 2007; Chayes & Chayes, 1993; Checkel, 2001). Finally, some writers highlight yet other mechanisms, such as coercion, persuasion, acculturation, and social learning (Avdeyeva, 2007; Underdal, 1998).

These models span two schools of thought about ensuring compliance and implementation (Fearon, 1998). According to the managerial perspective of Chayes and Chayes (1993), compliance should be motivated by strategies of persuasion and assistance that are “less costly and intrusive and certainly less dramatic than coercive sanctions” (p. 205). They argue that non-compliance emerges from problems with agreements that affect parties’ capacity to comply. Issues such as ambiguity and indeterminacy in the treaties’ language, obligations and objectives, and structure prevent countries from complying with the legal obligations they establish. Nonetheless, some agreements tolerate a certain extent of non-compliance, being highly permissive with violations and extenuating circumstances for domestic policies, as long as their

implementation does not threaten the survival of the regime. Mitchell (2001) presents a similar argument about the importance of clarity for compliance. Managerial limitations are also associated with the capacity of states to carry out their commitments (Chayes & Chayes, 1993; Jacobson & Brown-Weiss, 1995). Additionally, each treaty incorporates a vision of the international system and a specific temporal dimension of the social and economic changes envisioned in treaties that affect compliance and implementation; that is, adherence to obligations and making behavioral change takes time, especially when not all parties start from the same point. As Chayes and Chayes (1993) put it, “drive to universality requires accommodation.”

More recently, the managerial approach has evolved into strategic treaty management (McInerney, 2015), which suggests that to ensure implementation, treaties should follow a strategy formulation process and develop other managerial tools such as performance evaluations, strategic assessments, and initiatives for stakeholder engagement. Then it would be possible to identify strategic priorities in areas such as national implementation, finance, synergies and collaboration with other treaties, data collection and scientific assessment, performance management, and the expansion of membership.

The enforcement school of thought addresses the use of incentives, sanctions, and persuasion to promote compliance (Beyerlin & Marauhn, 2011). Positive incentives establish standards of behavior for states to facilitate and monitor the process of national implementation. Negative incentives reduce the benefits of cheating and promote the value of a good reputation (Avdeyeva, 2007; Guzman, 2002; Underdal, 1998). Additionally, decentralized mechanisms of compliance are created on the principle of

Table 5 Selected studies to assess compliance, implementation, and effectiveness

Study author(s)	Core variable	Empirical approach	Determining factors	Key findings and relevance	Key issues
Oran R. Young (1979, 1994)	<ul style="list-style-type: none"> Effectiveness understood as problem-solving 	<ul style="list-style-type: none"> No specific metric is developed Study recognizes challenges in measuring effectiveness Highlights the importance of generalizability 	<ul style="list-style-type: none"> Treaty design State capacity National circumstances 	<ul style="list-style-type: none"> Regimes serve multiple purposes in terms of cooperation, authority, learning, and internal realignments Analysis is required to move forward in designing effective institutions 	
Edith Brown-Weiss and Harold K. Jacobson (1998; 1995)	<ul style="list-style-type: none"> Implementation referrers to measures states take to make international accords effective in domestic law. Compliance is the observance to both obligations and implementing measures Effectiveness is the result of both in relation to the objectives of each agreement and the solution of the problem 	<ul style="list-style-type: none"> Study conducted for five agreements in nine countries Departs from the assumption that “national implementation of and compliance with international accords is not only imperfect but often inadequate” (1998, p. 2) Multifaceted view of performance 	<ul style="list-style-type: none"> Characteristics of the activity Characteristics of the accord International environment Factors involving the country 	<ul style="list-style-type: none"> Development of a model of determinants of implementation, to make agreements effective Improving countries’ engagement will improve the environment, lives, institutions, and add to the academic literature. Acknowledges the difficulty in collecting data 	<ul style="list-style-type: none"> Definition of implementation is not standardized across treaties Not all treaties are evaluated in all countries Need to identify cross national differences in policy implementation Comparisons do not consider timeline Compliance and implementation should not be classified equally

Study author(s)	Core variable	Empirical approach	Determining factors	Key findings and relevance	Key issues
David G. Victor, Kal Raustiala, and Eugene B. Skolnikoff (1998)	<ul style="list-style-type: none"> Implementation is understood as the translation of intent into action 	<ul style="list-style-type: none"> Case studies to assess systems of implementation review Case studies in selected countries to assess national implementation 	<ul style="list-style-type: none"> Nature of the problem Power configuration Nature of the commitments Linkages with other issues and objectives Exogenous factors Public concern 	<ul style="list-style-type: none"> There is no single way for a country to put its international commitments into practice Monitoring and systems of implementation review are critical for implementation Failure to implement is in some cases intentional Commitments have “induced substantial implementation activities within nations” but there is still progress to be made 	<ul style="list-style-type: none"> Historical case studies Descriptive and theoretical approach Focus on formulation and content of the agreements and their systems of implementation review Limited scale of the study
Edward L. Miles, Arild Underdal, Steinar Andresen, Jørgen Wettestad, Jon Birger Skjærseth, and Elaine M. Carlin (2002)	<ul style="list-style-type: none"> Effectiveness compared against a specific standard of success Implementation is an outcome that ultimately will have an impact on nature 	<ul style="list-style-type: none"> Two measures: distance to a collective optimum and relative improvement 	<ul style="list-style-type: none"> Character of the problem Problem solving capacity Institutional capacity Entrepreneurial leadership 	<ul style="list-style-type: none"> Environmental regimes succeed in changing actors’ behavior There are different patterns on regime effectiveness Regimes fall short in providing functionally 	<ul style="list-style-type: none"> The study has a methodological challenge in the definition of a point of reference Analysis is different in periods of time Exclusive factors list effectiveness

Study author(s)	Core variable	Empirical approach	Determining factors	Key findings and relevance	Key issues
Helmut Breitmeier, Oran R. Young, and Michael Zürn (2006)	<ul style="list-style-type: none"> Regime attributes and their design 	<ul style="list-style-type: none"> Inclusion of quantitative methods Focus on regime attributes to determine the extent to which regime designs matters 	<ul style="list-style-type: none"> Sources of compliance Compliance mechanisms and goal attainment 	<ul style="list-style-type: none"> Construction of a database system to move away from case study approaches 	<ul style="list-style-type: none"> Assessments are of an interpretative nature Limited number of case studies and no clear record Definition of measurement units No specific reference to countries
Kate O'Neill (2009, 2017)	<ul style="list-style-type: none"> Regime effectiveness 	<ul style="list-style-type: none"> Conceptual approach to effectiveness, its definition, measures, and methods Specific case study to exemplify arguments about compliance and effectiveness 	<ul style="list-style-type: none"> Treaty characteristics Enforcement mechanisms Transparency and reputation Capacity-building mechanisms 	<ul style="list-style-type: none"> Importance of drafting, enforcing, eliciting, and creating compliance. Regime impacts as measures of effectiveness 	<ul style="list-style-type: none"> No systematic / empirical analysis for a single regime

bilateral or multilateral reciprocity. Even though all mechanisms share the goal of fulfilling the obligations of an agreement, conditions such as existing relationships among the parties and the level of pressure to be exercised towards the observance of the treaty are some factors to consider when deciding which approach to use.

Implementation mechanisms deserve special attention. Environmental conventions use them as instruments for promotion and prevention. Control is not enough, and countries face multiple challenges that require support not only to fulfill their environmental obligations but also for general economic, developmental, and

geopolitical conditions (Beyerlin & Marauhn, 2011; Birnie et al., 2009). This situation was acknowledged by the 1992 UN Conference on Environment and Development, which, in its Rio Declaration, stated that “in view of the different contributions to global environmental degradation, states have common but differentiated responsibilities” (United Nations, 1992a', Principle 7) considering the consequences that environmental problems have in developing countries, and the accountability of developed countries (Beyerlin & Marauhn, 2011). The establishment of implementation mechanisms points out the “growing internationalization of the domestic implementation and legal process, and an awareness that international law will not achieve its objectives if it does not also take account of the need, and techniques available for improving domestic implementation of international environmental obligations” (Sands, 2003, p. 227)

Various authors have developed typologies of implementation mechanisms, that are also used to categorize these instruments in the policy world. The categorization presented below groups these mechanisms based on the kind of support they provide to countries in the implementation of international environmental law.

- National reports: Reporting is the most basic mechanism used by conventions to support implementation. National reports provide critical information on a country's progress in achieving its global environmental commitments (Kiss, 2006). However, national reporting faces multiple challenges. First, in some cases reporting systems are not comprehensive enough to address the multidimensional nature of conventions. Second, reports are not analyzed or included in the scope of compliance and implementation systems (Kiss, 2006), so state parties rarely obtain feedback on the information they provide. And third, questions persist

about the extent to which countries are actually fulfilling their reporting requirements (Beyerlin & Marauhn, 2011).

- Institutional arrangements: As indicated in UN Environment's Training Manual on International Environmental Law, "for the purpose of facilitating implementation, most MEAs establish institutions such as Secretariats, COPs, and other technical bodies to oversee the implementation of the Convention, and to provide policy guidance" (Kurukulasuriya & Robinson, 2006, p. 41). These institutional bodies are crucial to the process of implementation, fulfilling both political and technical functions (Brown-Weiss & Jacobson, 1998; Sands, 2003; Urquhart, 1995). As international bodies advance toward the fulfillment of their mandates, they facilitate implementation and coordinate other mechanisms with the same purpose (Bauer, 2006; Biermann & Siebenhüner, 2013; Ege & Bauer, 2013), strongly influencing institutional performance and policy outputs (Ivanova, 2010; Trondal, 2013). Institutional bodies serve as agents to state parties, by convening meetings, monitoring, providing scientific assessments/assistance/capacity building, connecting with stakeholders, and collecting information and data (Biermann & Siebenhüner, 2013; Ege & Bauer, 2013). Institutional capacity, autonomy, visibility, organizational structure, legitimacy, people, and procedures are central to their capacity to facilitate implementation (Andresen & Skjærseth, 1999; Bauer, 2006; Biermann & Siebenhüner, 2013; Cox, 1969; Grigorescu, 2013).
- Capacity building and technology transfer: Discussions about means of implementation in the system of global environmental governance have usually

focused on capacity building and access to technology for developing countries and economies in transition. Principle 9 of the Rio Declaration mentioned the need to “strengthen endogenous capacity-building” including “the development, adaptation, diffusion and transfer of technologies” (United Nations, 1992a Principle 9). Outcomes from key conferences reinforced this need and established additional mechanisms to provide such support (United Nations, 2012a; WSSD, 2002). Furthermore, in 2002, UN Environment’s Governing Council recognized the urgent need to develop a strategic plan to provide instruments, which led to the development of the Bali Strategic Plan for Technology Support and Capacity. Capacity-building aims to enhance the human, scientific, technological, organizational, institutional, and resource capabilities of state parties to address obligations of conventions, including the development of legal and institutional frameworks. (Beyerlin & Marauhn, 2011). Technology transfer strategies support the development and enhancement of state-level technical capacities to conduct scientific assessment, monitoring, data processing, and analysis (Beyerlin & Marauhn, 2011).

- Finance: Financial resources are central to multilateral diplomacy, not only to support countries in developing national policies, but also to provide resources for conventions to execute broader projects (Kurukulasuriya & Robinson, 2006). Conventions establish financial mechanisms, funded by contributions—mandatory and voluntary—of state parties and other channels, to transfer the cost of implementation in developing countries to other state parties or international actors (Beyerlin & Marauhn, 2011). Such mechanisms take multiple forms,

including loans, credits, grants, and funds, and they may operate not only as means to induce and restore compliance and implementation but also to deal with emergencies (Boisson de Chazournes, 2006). In some cases, financial mechanisms are administered by third parties. In 1992 the Earth Summit established the Global Environment Facility to bring together the resources of various international organizations working on environmental issues and to serve as the funding mechanism for environmental conventions providing grants to developing countries and countries with economies in transition, for projects that generate global environmental benefits within the context of sustainable development (Kurukulasuriya & Robinson, 2006). Some conventions also establish positive or negative economic incentives to promote implementation (Matz, 2006).

Countries are expected to make use of the mechanisms offered by the conventions to facilitate implementation (Kurukulasuriya & Robinson, 2006). However, it is not clear how effective these mechanisms are. Despite some analyses (Sand, 1992, pp. 14-15), establishing a causal connection between the use of these mechanisms and the successful national implementation of a convention is a complex task, especially when no standards exist to measure progress. Additionally, implementation mechanisms face fundamental challenges to exercise positive influence on countries compliance and domestic policies, including:

- Lack of information for determining the best policy approaches and the kinds of assistance each country requires, and for establishing priorities (Stahl, 2011).

- Interlinkages and synergies are required to improve efficiency in facilitating implementation, and to reduce the overlapping in these mechanisms across the different conventions (Beyerlin & Marauhn, 2011).
- Lack of participation from civil society, as the public is excluded from most compliance and implementation mechanisms, which reduces possibilities to raise awareness and identify non-compliance situations and assistance needs (Paddock et al., 2011).
- Often-subjective decisions about the application of specific facilitation implementation mechanisms (Paddock et al., 2011) are conditioned to other policy processes.

In general, facilitation implementation mechanisms of environmental conventions “have been innovative and have posed a variety of challenges” (Beyerlin & Marauhn, 2011, p. 357). Member countries, however, still need to determine the roles and responsibilities of their actors to guarantee effective coordination and action (Kurukulasuriya & Robinson, 2006). Furthermore, policy decisions need to use evidence that connects mechanisms to the conventions and that determines effectiveness over time. Connecting mechanisms to specific types of obligations that countries are expected to adhere to, and reflecting on the main challenges that these mechanisms confront, is essential to supporting conventions’ “effective, full and prompt implementation” (Sand, 1992).

Agreements are of little significance if not translated into national politics. The study of implementation also offers substantial insights about the connection between international law and international relations, and how these fields influence international

politics. The literature on compliance sets out definitions, discusses the implications for state behavior, and explains the factors that affect compliance and implementation at different levels. However, measurement implementation calls for deeper empirical analysis to improve results in the adoption of measures and their effectiveness. Such analysis will offer countries and conventions additional information to balance their national policies with the fulfillment of their international obligations, to obtain the health, economic resources, and ecosystem services benefits promised by implementation of international conventions.

Moving forward in the study of global environmental conventions

As global international conventions have evolved, different issues have emerged as concerns and trends, highlighting the critical role of conventions both conceptually and in practice. One aspect has to do with the increasing number and scope of agreements and international organizations, which brings complexity to the international system (Alter & Meunier, 2009). Because each agreement represents a set of countries, interests, and goals, the creation of multiple agreements raises many questions. On one hand, the literature discusses the problems of duplication, fragmentation, and overlap, and their effects on governance architectures and performance (Biermann, Pattberg, Van Asselt, & Zelli, 2009). The possibility exists for “regulatory congestion” at national and international levels caused by the co-existence of international environmental agreements (UNEP et al., 2007). On the other hand, some scholars focus on how institutions and agreements interact with each other, the possibilities of synergies and collaboration among the conventions, and the effects of these connections on states’ behavior and the

effectiveness of the conventions (McInerney, 2015; Orsini, Morin, & Young, 2013; K. Raustiala, 2013; Kal Raustiala & Victor, 2004; Oran R Young, 1996). Furthermore, there are cross-cutting issues that have to do with governance mechanisms. The coexistence of multilateral agreements is opening the space for *regime complexity* that can be both an advantage and an opportunity (Gehring & Faude, 2013). The extent to which the mechanisms established by the conventions can generate spaces for capacity development, technology transfer, and financing is critical to ensuring that state parties support each other in achieving the conventions' goals, contributing to the solution of environmental problems and advancement in sustainable development.

In addition, UN Environment identified various factors affecting the substance and functioning of global environmental conventions (Kanie, 2007; UNEP et al., 2007). Multiple national institutions manage this process, which raises the challenge of further fragmentation and demands stronger coordination skills to present a unified position on each agreement. At the international level, overlap in the issues addressed by conventions is both a challenge and an opportunity. Overlap transforms how agreements are negotiated and how their institutional arrangements operate, and calls for conventions to rethink their focus, strategic visions, and interaction with other global governance mechanisms. At the procedural level, countries are required to participate in numerous post-agreement negotiations. These negotiations also take place at a very fast pace, supported by communications technologies, under the premise of more available information, and more spaces for countries to provide input and present their concerns. How the focal points—the institutions that implement the agreements at the national level—balance their multiple commitments and timelines is a critical challenge,

especially for countries with limited institutional and financial resources. Negotiations themselves are also being transformed, as new formats and coalitions—based not on countries' capacities or location but on like-mindedness—are emerging. There is also increasing rapport among individual negotiators, as well as increasing influence and engagement from stakeholders and civil society representatives (UNEP et al., 2007).

At the substantive level, several trends are critical. One overall trend is the evolution of the common concern of humankind for the environment and the increasing challenges that it presents. Numerous approaches refer to the principle of common but differentiated responsibilities, which acknowledges disparities in economic development among countries and therefore on responsibility for solving environmental problems (Cullet, 2010; United Nations, 1992a). In some cases, conventions—such as the UNFCCC—ended up establishing different types of obligations for different countries (Redgwell, 2014). While all countries need to contribute to the solution of planetary environmental problems, each convention should differentiate the kinds of support that developing countries require (financing, capacity development, technology, and expertise) to put in place institutions and policies needed to achieve the objectives.

Conventions also need to make progress in the recognition of community environmental interests and the integration of non-state actors. Engagement with NGOs, work on education, awareness and communication, research initiatives, and action plans through local actors are just some examples of how environmental agreements can engage stakeholders. Conventions also need to define time-bound targets, flexible regulations, and stronger compliance regimes to guarantee that they fulfill the monitoring and review function that, by definition, they have. Through the specification of

performance review and strategic assessment approaches, conventions need to identify specific indicators to assess their progress (McInerney, 2015). Under the premise that you cannot control what you do not measure, agreements need to design and execute initiatives for data collection, measurement, assessment, and feedback to evaluate progress in policy objectives, both nationally and globally (UNEP, 2012d).

Lastly, as the world moves forward on the implementation of the SDGs, the role of global environmental conventions is indisputable. Different targets refer directly and indirectly to the conventions and their implementation, including SDG12 Responsible Consumption and Production, SDG13 Climate Action, SDG14 Life below Water, and SDG15 Life on Land (UN General Assembly, 2015). Furthermore, the goals address the importance of partnerships, access to technology, resource mobilization, and assistance, factors that apply not only to environmental agreements but to international cooperation in general. In this context, the conventions need to understand their role in the sustainable development agenda, in order to put in place mechanisms to implement the goals (UNEP, 2016b). Conventions also have to integrate within their own institutional structures and plans of action the economic, social, and environmental dimensions of sustainable development. Furthermore, in the process of achieving the SDGs, countries need to draw lessons from the conventions that have worked on implementing, monitoring, and assessing similar global commitments. Global environmental goals are reflected in the sustainable development agenda, and existing information from the conventions and their implementation can certainly contribute to the monitoring and fulfillment of the SDGs.

CHAPTER 3

THE ENVIRONMENTAL CONVENTIONS INDEX: DESIGN AND METHODOLOGY

A key recent trend in the systems of global governance is the use of quantification, assessment, the measurement of results, and governance indicators to promote performance evaluation, accountability, and public regulation (Davis, Fisher, Kingsbury, & Merry, 2012; de Siqueira, Leite, & Beerli, 2017). Using indicators to inform decision-making processes changes the nature of that process and, if designed correctly, can offer consistent, efficient, transparent, and impartial metrics to gather information, summarize complex realities, exercise judgment, and support actors in designing and executing policies and in justifying choices. Furthermore, scholarly attempts to apply strategic management to international treaties highlight the need to monitor compliance and evaluate treaty performance through the use of different instruments, including reviews and assessment, evaluations, and the use of performance metrics and indicators (McInerney, 2015). The central purpose behind these metrics is to establish linkages between treaty objectives and outcomes (Alesani, 2014).

In the case of global environmental governance, different measures exist to study the effectiveness and implementation of environmental agreements and regimes (O'Neill, 2009, 2017). Even though qualitative methods seem to dominate the field, there is a clear need for a quantitative mechanism that provides description, assessment, and explanation

(King et al., 1994). This type of social science approach will make possible to evaluate, from a positivist perspective, the existing linkages between environmental conventions and changes in policy behaviors, and the extent to which it contributes to improve environmental quality. Empirical assessment can provide an accurate description of these linkages and enhance explanatory power. An empirical approach to global environmental governance would definitively improve the understanding of different international instruments used to protect the environment. Indices such as the Environmental Performance Index developed by Yale University (YCELP, Data-Drive Yale, & CIESIN, 2016), and the Environmental Democracy Index developed by the World Resources Institute (Worker & De Silva, 2015), have addressed ecosystem health and environmental vitality, and environmental rights, respectively. In the case of global environmental conventions, although these international law instruments are broadly acknowledged to be central to the environmental protection, sustainable development, and effective global environmental governance, the extent to which countries have established the laws and regulations to fulfill their obligations has yet to be systematically measured.

In seeking to assess the level of implementation of global environmental conventions, I have used a mixed-methods approach based on both qualitative and quantitative analysis, and that is part of the work I developed in the *Environmental Conventions Project*, as member of the Center for Governance and Sustainability's research team.

After identifying the main units of analysis, I will describe the data sources, methodology, and technical approach for the quantitative and the qualitative analyses. In the case of the quantitative analysis, describing the steps taken to develop the ECI not

only clarifies its structure but also presents the important information that the index contains and how it can be useful for understanding specific aspects of implementation. This chapter describes the qualitative methodology used in the elaboration of the country profiles presented in Chapter 6. I describe the technical nature of the index's methodology and demonstrate its replicability and usefulness for assessing the implementation of other international law instruments in different policy areas. In addition, the use of specific sources of information such as national reports submitted to the convention secretariats reflects on the nature of these information mechanisms. Using these reports as part of the methodology for this study certainly informs analyses on information requirements in global environmental conventions and international agreements, and on how these requirements contribute to processes of compliance, implementation and enforcement.

Measuring the extent to which the conventions have been implemented determines the breadth of countries' progress in putting in place regulations, institutions, and strategies needed to achieve global environmental goals, and in addressing challenges to fulfilling their obligations. This allows us to identify systematic patterns that reflect on the current assumptions of theories and to call for alternative explanations of the observed facts. This type of description serves as a foundation for solid social science research on the implementation of international agreements and offers the necessary elements to propose improvements to the policy process. Using an index constructed with clear goals, audiences, and indicators is essential for measuring progress and change, and can be an effective tool to mobilize action and resources from governments, academia, civil society, and stakeholders. It provides a report card to countries and conventions to

track progress and ensure accountability. Ultimately, it could improve strategic governance processes to increase environmental protection and achieve sustainable development.

Units of analysis

Two core units of analysis form the basis of this study: countries and conventions. This section explains their characteristics and the criteria for their selection.

Countries

The master list of countries included in this study includes the 193 member states of the UN (United Nations, 2015c), four other states with a different UN status (the Cook Islands, Niue, Palestine, and the Holy See), and one regional organization: the European Union. The Holy See, Palestine, and the EU have received a standing invitation to participate as observers in the sessions and the work of the UN General Assembly, to which they maintain permanent observer missions. The Cook Islands and Niue are states in free association to New Zealand, but they behave as sovereign states in international law.⁶ The total 198 units of analysis are distributed in different categories based on regions and levels of development (see Table 6). Both classifications are based on those established by the UN Statistical Division (UN DESA, 2016) (see Appendix H).⁷

⁶ Some countries have recognized the Cook Islands and Niue as sovereign states, and they maintain diplomatic relations in their own name, including participation in international agreements.

⁷ Additional classifications can be made based on regional groupings established by the conventions, or by other characteristics based on income, geography, development (i.e., Small Island Developing States / SIDS or Least Developed Countries / LDCs), or membership in international groups such as the

Table 6 Countries included in this study, by type of country and region

	Number. of countries	Percentage
UN Membership		
UN permanent Members	193	97%
Observers	4	2%
Regional Organization	1	1%
Total	198	100%
Level of development		
Developed	50	25%
Developing	148	75%
Total	198	100%
Regions		
Africa	54	27%
Americas	35	18%
Asia	48	24%
Europe	44	22%
Oceania	16	8%
Regional Organization	1	1%
Total	198	100%

Agreements

Of the ten agreements considered by that research initiative (see Table 1), four are considered in this study. They fall within two thematic clusters—chemicals and waste and biodiversity—and include the Basel Convention on Hazardous Waste, the Stockholm Convention on POPs, the Ramsar Convention on Wetlands, and the Convention on International Trade in Endangered Species (see Table 7). In developing the Index, the Center for Governance and Sustainability collaborated with top leadership in the secretariats of the Basel, Rotterdam, Stockholm, Ramsar, and CITES conventions, as well as with officials from UN Environment. Collaboration included making site visits to several convention secretariats and attending some COPs.

Organization for Economic Cooperation and Development (OECD) or the Africa, Caribbean and Pacific Group of States (ACP).

Table 7 Global environmental conventions included in this study

		Start Year	No of parties
Biodiversity	• Convention on International Wetlands (Ramsar Convention)	1971	169
	• Convention on International Trade in Endangered Species (CITES)	1973	183
Chemicals and Waste	• Basel Convention on Transboundary Movements of Hazardous Wastes	1989	185
	• Stockholm Convention on Persistent Organic Pollutants	2001	181

Quantitative analysis

Sources of data

The quantitative analysis of the ECI is grounded in the national reports submitted by state parties to each convention. Environmental conventions introduce obligations for parties to report on the implementation of and compliance with the provisions established by each agreement (Kiss, 2006). Each treaty determines the type of information it wants to collect through national reports, including the measures that the state parties have taken, and establishes the office or executive body to which the reports are to be submitted (see Table 8). Normally national reports contain two sorts of information. On one side, they focus on the legal, administrative, and policy measures that state parties adopt or intend to adopt to implement each agreement. They also collect scientific data on the state of the environmental problem addressed by each convention at the national level. For the four agreements included in this study, reporting requirements differ in frequency and content as well as in the mechanisms for submission and the use of information included in the reports.

Table 8 Reporting requirements for the conventions included in this study

Convention	Reporting requirements
Basel Convention	<p>According to Article 13 of the convention, reports should include:</p> <ul style="list-style-type: none"> • Information on focal points • Information on transboundary movement of hazardous wastes and other wastes • Measures adopted to implement the convention • Statistics on the effects of hazardous waste generation, transportation, and disposal • Information on accidents, disposal options, and technologies to manage hazardous wastes. • Information on other agreements for hazardous waste management
Stockholm Convention	<p>According to Article 15 of the convention, reports should include:</p> <ul style="list-style-type: none"> • Measures adopted to implement the convention, and their effectiveness • Statistical data on the production, import, and export of the chemicals included in the annexes to the convention.
Ramsar Convention	<p>After the convention entered into force, the second meeting of the COP recommended the submission of national reports and requested the Bureau of the Convention (then equivalent to the secretariat) to establish the requirements for this process. Reports are submitted for each COP based on a format established by the standing committee. Questions are based on the convention's strategic plan and are designed to measure progress on key indicators and considering continuity to permit time-series analyses.</p>
CITES	<p>Article VIII para (7) establishes two types of reports for the convention that should be transmitted to the Secretariat:</p> <ul style="list-style-type: none"> • An annual report containing a summary of the records of trade in the specimens regulated by the convention, including detailed information as indicated in Art. VIII para (6). • A biennial report on legislative, regulatory, and administrative measures taken to enforce the provisions of the present convention.

Source: (Basel Convention, 2016a; IUCN, 1973 Art. VIII; Ramsar Convention, 1984, 2013; Stockholm Convention, 2016a; UNEP, 1989 Art. 13; United Nations, 2001 Art. 15)

Based on these reporting requirements, the conventions established specific questionnaires and the frequency with which reports—responding to these questionnaires—were to be submitted *Cycles* (see Appendix A for the questionnaires for each reporting cycle included in this study). For the purposes of this study, those have been designated *Reporting Cycles* (see Table 9). Reports are collected by the convention secretariats, except for the Ramsar Convention, for which reports are officially submitted to the COP. Only the Basel Convention (since 2012) and the Stockholm Convention have electronic reporting systems. Once the reports have been collected, they are intended to be publicly available. Convention secretariats have made reports submitted in 2001 or

later available online. This study, therefore, uses the online reports, the structure of which is comparable and standardized through the different reporting cycles between 2001 and 2015. That information forms the basis for creating the dataset for the ECI.

Table 9 Reporting cycles structure and availability

	Structure of reporting cycles	Reporting cycles available
Basel Convention	Reporting cycles are annual. An electronic reporting system was implemented in 2012.	2001-2015
Stockholm Convention	Reporting cycles are defined by the COP. So far it has established three.	Three reporting cycles: 2002-2006, 2006-2010, and 2010-2014
Ramsar Convention	Reports are submitted for each COP, which takes place every three to four years.	2005, 2008, 2012, and 2015
CITES	Reports are biennial	Six reporting periods: 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, and 2013-2014.

Index design

In the empirical analysis part of this study I will discuss the design and implementation of a measurement instrument to obtain data about national implementation that, evaluating the process under the same parameters, allows for analysis and comparison across conventions, within conventions but across countries, and for the identification of trends along the different reporting cycles. As the main outcome of the *Environmental Conventions Project*, designing and defining the index involved a multi-stage process to obtain the required information to assess implementation and developing a methodology that includes all the aspects of this process in a way that assures replicability across environmental conventions, as well as for other mechanisms of international law. The steps in constructing the index are described in the next sections.

Analysis of the structure of global environmental conventions

This stage includes the analysis of the legal text of the conventions to identify the hard legal obligations defined by them. Obligations constitute binding rules that determine the actions and commitments to be undertaken by the conventions target subjects, in this case their member states (Bodansky, 2010).

National Reports compilation

This step includes the collection of the national reports submitted by state parties to the conventions. As mentioned above, these reports are the main sources of information to evaluate implementation and construct the index. However, the delayed submission or lack of submission of some reports posed challenges to the data analysis. A review of the reporting cycles resulted in the availability of 2,754 reports distributed among the four agreements, as indicated in Table 10.⁸ This introduces a bias, since results and analysis were only possible for those countries that submitted at least one report between 2001 and 2015. However, the number of reports for each convention does not affect the distribution of the data, since they maintain the same unit of analysis—reporting cycle—and eventual comparisons across conventions are only done using the latest available report for each country. Historical trends are presented with the purpose of assessing the evolution of the index. However, references to individual countries are based on the last available report. Table 11 presents the number of countries for which data was available and distribution of type of country and region. For each convention,

⁸ Chapters 4 and 5 present detailed information on the national reporting trends for each of the conventions included.

the analysis evaluates the information for all parties available through December 31, 2016.⁹

Table 10 Number of national reports analyzed by convention

	Basel Convention	Stockholm Convention	Ramsar Convention	CITES
National reports available	1,355	226	768	405

Table 11 Number of countries that have submitted at least one report

	Basel Convention		Stockholm Convention		Ramsar Convention		CITES	
	Countries	%	Countries	%	Countries	%	Countries	%
By type of country								
Developed	46	29%	39	33%	46	28%	44	40%
Developing	115	71%	81	67%	120	72%	66	60%
By region								
Africa	41	25%	30	25%	50	30%	17	15%
Americas	31	19%	25	21%	30	18%	24	22%
Asia	38	24%	28	23%	37	22%	27	25%
Europe	42	26%	35	29%	41	25%	39	35%
Oceania	9	6%	2	2%	8	5%	3	3%
European Union	0	0%	0	0%	0	0%	0	0%
TOTAL	161	100%	120	100%	166	100%	110	100%
Reporting compliance (1)								
Total	161	87%	120	66%	166	98%	110	60%
Developed (2)	46	100%	39	89%	46	98%	44	94%
Developing (2)	115	86%	81	60%	120	98%	66	50%

(1) Percentage of countries, of those obliged to report, that have submitted at least one report during the period of analysis.

(2) Percentage of countries, of those in each specific category obliged to report, that have submitted at least one report during the period of analysis.

National Reports analysis

The analysis of national reports aims to determine the structure of the questionnaires—number and nature of the questions, the type of indicators they

⁹ The ECI includes also the Agreement on the Conservation of African-Eurasian Migratory Waterbirds, the Convention on the Conservation of Migratory Species, and the World Heritage Convention. These agreements, however are not part of this study.

measure, and how they are related to the process of implementation. The methodology chose indicators for the index that connect to the actual process of implementation and are suitable for coding. Indicators reflect countries' commitments to provision of information, creation of the necessary institutions, and the technical capacity to comply with obligations. The indicators fall into five categories: information, regulation, management, technical, and financial obligations (see Box 1). These categories reflect the types of obligations and create the same structure of the components of the index for all conventions, independently of the number and type of indicators. Table 12 presents the number of questions in each reporting cycle for each convention, the total number of indicators, and their category classification.

Box 1 Definition of categories of indicators

- *Information:* Obligations to conduct scientific assessment, measurement, and evaluations associated with the activities connected to each convention; submission of reports to the conventions' executive bodies; and the establishment and maintenance of databases and records required for the implementation and operation of each convention.
- *Management:* Designation or creation of administrative bodies and focal points to manage the implementation and general functioning of each convention, the linkages with the conventions' executive bodies, and the definition of strategic frameworks for the operation of each convention at the national level.
- *Regulation:* Legislative and policy measures that each state party has to implement according to the framework of each convention.
- *Technical:* Technical measures and procedures to address or manage the environmental problems associated with each environmental convention.
- *Financial:* Payment of dues and assistance, and other financial responsibilities by state parties.

Table 12 Number of questions and indicators by reporting cycle

	Questions	Indicators for ECI	Category (number and percentage)				
			Information	Management	Regulation	Technical	Financial
Basel Convention							
2001-2011	30	15	-	2 (13%)	2 (13%)	11 (74%)	-
2012-2015	30	15	-	2 (13%)	2 (13%)	11 (74%)	-

	Questions	Indicators for ECI	Category (number and percentage)				
			Information	Management	Regulation	Technical	Financial
Stockholm Convention							
2002-2006	67	48	4 (8%)	15 (31%)	14 (29%)	12 (25%)	3 (6%)
2006-2010	65	59	4 (7%)	26 (44%)	8 (14%)	18 (31%)	3 (5%)
2010-2014	72	56	4 (7%)	20 (20%)	9 (16%)	20 (20%)	3 (5%)
Ramsar Convention							
2005	581	45	8 (18%)	24 (53%)	1 (2%)	11 (24%)	1 (2%)
2008	69	36	8 (22%)	16 (44%)	1 (3%)	10 (28%)	1 (3%)
2012	83	48	14 (29%)	20 (42%)	2 (4%)	11 (23%)	1 (2%)
2015	67	45	13 (29%)	20 (44%)	2 (4%)	9 (20%)	1 (2%)
CITES							
2003-2014	120	46	11 (24%)	14 (30%)	10 (22%)	10 (22%)	1 (2%)

Examples of indicators from the various categories are presented in Table 13. For each indicator, the analysis establishes the available data options that countries can use to report their progress (see Appendices B and C for a complete list of indicators by convention and reporting cycle and their scoring scales).

Table 13 Sample indicators across conventions

Category	Indicator	Convention
Information ¹⁰	• Provision of information on CITES relevant legislation	CITES
	• Maintenance of wetland inventory data and accessibility for stakeholders	Ramsar Convention
	• Transmission of the National Implementation Plan to the COP	Stockholm Convention
Management	• Existence of a national definition of waste and hazardous waste	Basel Convention
	• Trade/taking /possession/transport conditions included by domestic measures adopted for CITES-listed species	CITES
	• Existence of a national wetland policy	Ramsar Convention
	• Existence of measures to manage stockpiles in a safe, efficient, and environmentally sound manner	Stockholm Convention

¹⁰ The Basel Convention does not include information obligations.

Category	Indicator	Convention
Regulation	<ul style="list-style-type: none"> Existence of border control for transboundary movement of waste 	Basel Convention
	<ul style="list-style-type: none"> Review of legislation regarding access to or ownership of natural resources/harvesting/transport of live specimens 	CITES
	<ul style="list-style-type: none"> National arrangements established for the custodianship, storage, and maintenance of wetland inventory data 	Ramsar Convention
	<ul style="list-style-type: none"> Development of strategies to identify products and articles in uses and wastes consisting of, containing or contaminated with chemicals listed in Annex A, B or C 	Stockholm Convention
Technical	<ul style="list-style-type: none"> Existence of measures for reduction and/or elimination of the generation of hazardous and other wastes 	Basel Convention
	<ul style="list-style-type: none"> Development of written permit procedures for permit issuance/acceptance, registration of traders, and registration of producers 	CITES
	<ul style="list-style-type: none"> Implementation of measures to protect wetlands of special importance 	Ramsar Convention
	<ul style="list-style-type: none"> Inventory of PCDD/PCDF/PCB/pentachlorobenzene/hexachlorobenzene 	Stockholm Convention
Financial ¹¹	<ul style="list-style-type: none"> Use of CITES fees for wildlife conservation 	CITES
	<ul style="list-style-type: none"> Payment of Ramsar dues 	Ramsar Convention
	<ul style="list-style-type: none"> Existence of measures to provide financial support and incentives to achieve the objectives of the convention 	Stockholm Convention

Creation of scoring scales

The scoring scales are based on the options for reported data available for each indicator. Each indicator is accompanied by a guidance note that includes the question to which it corresponds, and its correspondence in previous reporting cycles if available. Scoring scales are in place for each score to be logical and justifiable. The scales rank reported data options from 0 to 5, with 1 meaning activities not being implemented and 5 meaning fully implemented. Using scoring scales is essential for the empirical assessment behind the index and allows for comparability across indicators and conventions, which otherwise would not be possible, since indicators have different reporting options for data. Table 14 provides a sample of response options and the coding scheme. A missing value

¹¹ Only some of the conventions include financial obligations.

(no response) is indicated by NR and scored with a zero. When the option for reported data is not applicable, indicators are not scored and are not considered in the index. When data is not provided, this are indicated by N/A and scored with the most negative possible score (normally one) and considered in the index.

Table 14 Sample responses and coding scheme

Convention	Scoring for Index							
	5	3	2	1	0	Blank		
Basel Convention	<ul style="list-style-type: none"> • Implemented • Exists • Used 	<ul style="list-style-type: none"> • In preparation 		<ul style="list-style-type: none"> • Not implemented • Does not exist • Not used 				
Stockholm Convention	<ul style="list-style-type: none"> • Yes 	<ul style="list-style-type: none"> • In progress 	<ul style="list-style-type: none"> • Being planned 	<ul style="list-style-type: none"> • No 	No information available	No response	Not applicable	
Ramsar Convention		<ul style="list-style-type: none"> • Partly • In some cases • In progress • In some sites 	<ul style="list-style-type: none"> • Being planned 	<ul style="list-style-type: none"> • No 				
CITES	<ul style="list-style-type: none"> • Yes 	<ul style="list-style-type: none"> • Partly 		<ul style="list-style-type: none"> • No 				

Data coding

The next step in the construction of the ECI is the coding of the national reports to build a database that includes the reported data submitted by each country to each convention through the different reporting cycles, for all selected indicators. The coding process was done by myself and one other research associate from the Center for Governance and Sustainability, in a rotation set up to ensure intercoder reliability (see Table 15). Both sets of coding results then were compared to ensure that differences did not exceed 5 percent. When required, the two independent coders reviewed one more time the national reports for which the first coding registered discrepancies, and adjusted the code. The

information resulting from the coding process shows to what extent countries have fulfilled the obligations defined by each convention, according to their own national policies and objectives. National reports also provide insight about which factors determine the overall success of the convention and help us to understand why countries perform differently.

Table 15 Intercoder reliability by reporting cycle

	Basel Convention	Stockholm Convention	Ramsar Convention	CITES
Intercoder reliability	98.0%	97.8%	99.7%	98.5%

This coding process was done using Microsoft Excel spreadsheets. Based on the number of reports and the number of indicators used for the index, over 100,000 data points were coded independently by two researchers to build a reliable dataset that includes the reported data submitted by each country to each convention for all selected indicators over the fifteen years of the reporting period. Each reporting cycle was coded in a separate table, including all the indicators and countries and their reported data. Additional spreadsheet summarized membership, national reporting rates, and compliance with national reporting.

Data scoring

This step includes scoring the reporting data, ranking individual countries' responses according to the previously defined scales. This resulted in a score for each indicator as reported by each country. Scores were assigned automatically using specific logic functions in Microsoft Excel. Using the logical formula IF, the Excel spreadsheets are designed, based on the options for reported data and

the scoring scales presented in Table 14, for the coders to enter just the reported data. Once the data is entered, the spreadsheet automatically calculates the score corresponding to that response (see Box 2). When a country failed to report data for a particular indicator (but otherwise reported), it received a score of zero for that specific metric. Indicators that were not applicable to a country or for which countries reported that the information was not available are not included in the index.

Box 2 Example of Microsoft Excel formulas for data scoring

Basel Convention

- Reporting cycle 2009
- Question 2B
- Indicator No. 2 Existence of a national definition of hazardous waste
- Options for reported data: Exist
 Does not exist
 In preparation
 No information available (N/A)
 No response (NR)

Excel formula:

IF (CELL= "Exist", 5, IF(CELL= "Does not exist", 1, IF(CELL= "In preparation", 3, IF(CELL= "NR", 0, ""))))

Ramsar Convention

- Reporting cycle 2012 (COP11)
- Question 4.1.1 A
- Indicator No. 33 Development of a National Action Plan for Wetland CEPA
- Options for reported data: A. Yes
 B. No
 C. In progress
 D. Planned
 No information available (N/A)
 No response (NR)

Excel formula:

IF (CELL="A",5,IF(CELL="B",1,IF(CELL="C",3,IF(CELL="D",2,IF(CELL="NR", 0, ""))))))

Index computation

The process of calculating the index uses the scores given to each indicator. The overall index score is the arithmetic average of the scores obtained by each country in each category of indicators. This protocol resulted in an empirical measurement that assesses implementation progress by country and by convention and ensures comparability of results by country and convention. Using this method implies that all the categories have the same weight. (Further progress in the construction of the index might, however, change this approach, depending on the process of validating the methodology that the Center for Governance and Sustainability will conduct with a group of experts in the field. If changed, weights for the different types of indicators will be determined based on expert consensus.) This core step of the research process ultimately results in an empirical measurement that assesses the progress of each country in the implementation of global environmental conventions. This database includes trends analysis for the index, overall ranking, and analyses by type of countries and regions. Countries' rankings by index scores are provided both at the global and the regional level, but they could also be provided for specific indicators' categories. These data constitute the main input to explain implementation and determine the causes for countries' performance.

Qualitative analysis

The quantitative methods are supplemented by a qualitative analysis of ten country profiles (presented in Chapter 6). The selected countries include Algeria,

Box 3 Summary of research protocol for the ECI

A seven-step protocol for the construction of the index ensures analytical rigor.

- (1) Identify obligations and commitments by member states.
- (2) Collect reports submitted by member states to the conventions as the main formal source of information to evaluate implementation and construct the index.
- (3) Use national reports to identify implementation indicators for each convention (see Tables 1 and 2).
- (4) Create and apply scoring scales for each indicator. To this end, each answer to each question under a specific convention is evaluated using an ordinal scale from 0 to 5, with 5 being the highest level of implementation. A score of 0 is given when no information is provided.
- (5) Code data from national reports to build a dataset that includes the reported data submitted by each country to each convention for all selected indicators. Two researchers conduct the coding process to ensure inter-coder reliability.
- (6) Score reported data and rank countries both on whether they have submitted reports according to their obligations and whether their reports demonstrate progress toward the aims of the conventions.
- (7) Construct the index using the scores for each indicator. The indicators are not weighted. A weighting could take place at a later stage or users could do it once the database is available online in an interactive format.

Argentina, Australia, Canada, Colombia, Czech Republic, Germany, Mozambique, South Korea, and Thailand. Countries were chosen as part of an analysis conducted in partnership with the Law Division of UN Environment. The selection process was based on criteria of membership in the conventions, availability of information (see Table 16), equitable representation of developed and developing countries, and distribution among the five UN geographic regions (see Figure 3).

Figure 3 Countries selected for qualitative analysis in Chapter 6

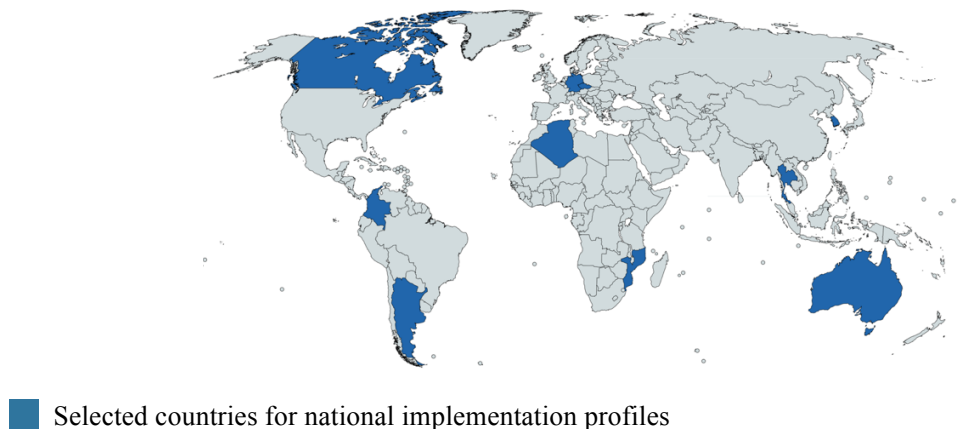


Table 16 National reporting rates for countries in selected implementation profiles, by convention¹²

	DZA	ARG	AUS	CAN	COL	CZE	DEU	MOZ	KOR	THA
Basel	51% - 80%	81% - 100%	81% - 100%	81% - 100%	51% - 80%	81% - 100%	81% - 100%	51% - 80%	1% - 50%	81% - 100%
Stockholm	1% - 50%	81% - 100%	81% - 100%	81% - 100%	81% - 100%	81% - 100%	81% - 100%	1% - 50%	1% - 50%	81% - 100%
CITES	No reports	51% - 80%	81% - 100%	81% - 100%	1% - 50%	81% - 100%	81% - 100%	51% - 80%	81% - 100%	81% - 100%
Ramsar	81% - 100%	81% - 100%	81% - 100%	81% - 100%	81% - 100%	51% - 80%	81% - 100%	81% - 100%	81% - 100%	81% - 100%

No reports
 1% - 50%
 51% - 80%
 81% - 100%

These country profiles seek to illustrate the range of factors that shape implementation, and connect the actions that countries implement at the national level with the quantitative assessment resulting from the ECI. They include information from the national reports submitted by state parties to the conventions, and use the index results. They also use additional primary and secondary sources of data including COP decisions and other relevant documents of the conventions as well as country reports, legislation, and various action and implementation plans as well as various newspaper and scholarly articles and reports from NGOs.

The analysis is based on rigorous research of national measures to implement the international agreements. It identifies best practices that facilitate implementation and challenges that hinder implementation for each convention in the two clusters—chemicals and waste and biodiversity. To ensure consistency and comparability, a set of common concepts across the countries were identified and discussed in each case. As the

¹² The country codes listed here include: Algeria (DZA), Argentina (ARG), Australia (AUS), Canada (CAN), Colombia (COL), Czech Republic (CZE), Germany (DEU), Mozambique (MOZ), South Korea (KOR), and Thailand (THA). See Appendix H for a complete list of country codes.

countries were selected from a pool of both developed and developing countries and from different geographic regions, the findings provide valuable insights on the overall implementation of the four conventions.

This study's methodology provides key empirical tools for both quantitative and qualitative assessment of the level of implementation of the four conventions included in this study. By evaluating implementation under the same parameters, using a set of indicators based on the national reports signatory countries submit to the convention secretariats, the index allows for multifaceted analysis and comparison. It also identifies trends over time for individual countries, groups of countries, and the conventions. Complementing this analysis with the qualitative national implementation profiles validates the index results and connects it with the regulation and policy instruments established at the national level as part of the obligations under each agreement. The ECI database, its methodology, and the national implementation profiles contribute to the understanding of how countries are translating their obligations into national environmental policies, offering policy inputs to improve the performance of countries and conventions.

CHAPTER 4

PROTECTING THE ENVIRONMENT AND HUMAN HEALTH: IMPLEMENTING THE CHEMICALS AND WASTE CONVENTIONS

Chemicals are critical to all aspects of modern life. They play an important role in agriculture, industry, energy, and medicine. Through the different stages of their life cycle, from extraction to disposal, chemicals might pose various threats to human health and the environment (Selin, 2010). As the *Global Chemicals Outlook* notes, “exposure to toxic chemicals can cause or contribute to a broad range of health outcomes. These include eye, skin, and respiratory irritation; damage to organs such as the brain, lungs, liver or kidneys; damage to the immune, respiratory, cardiovascular, nervous, reproductive or endocrine systems; and birth defects and chronic diseases, such as cancer, asthma, or diabetes” (UNEP, 2013a, p. 50). Every year the number of chemicals available on the market increases, and as consumption rises across countries, the international chemicals industry is growing dramatically. Just in the European Union it is expected that 30,000 new chemicals will be registered by 2018. Furthermore, the global chemical industry output, which was valued at US\$ 171 billion in 1970, had by 2010 increased more than twentyfold to US\$ 4.12 trillion (UNEP, 2013a, p. 50). By 2020, chemicals are expected to represent a third of overall global consumption (UNEP, 2012a).

Chemical pollution has become a transboundary issue as many hazardous substances are transported through air and water across the globe. The disposal of

hazardous wastes has also become an international concern. National regulatory systems are critical to the safe management of chemical substances but are often insufficient as trade volumes increase, opportunities for illegal dumping appear in places around the globe with weak regulatory systems, and the cost of chemical management in industrialized countries increases. As governments have noted, “the challenges posed by chemicals and wastes are global, enduring and constantly evolving and (...) are interrelated with crucial environmental issues such as environment-dependent human health, the health of ecosystems and better ecosystem management, the preservation of biodiversity, and the link between poverty and environment, environmental disasters, climate change and sustainable consumption” (UNEP, 2013a, 2013c).

For decades, global environmental governance has been concerned with hazardous chemicals, pollutants, their management, and their effects on health and the environment. Through various international agreements, countries have consistently articulated a clear commitment to reduce the generation of toxic substances, improve their management, and reduce the environmental and health risks associated with them (UNCED, 1992; United Nations, 1972, 2002). To address these issues, a global regulatory system for chemicals and waste has emerged, developed around specific mechanisms to regulate the production, use, and trade of chemical substances worldwide. Most recently, the SDGs connected the issue of chemicals and waste to various goals in terms of human health, water management, and sustainable consumption and production (UN General Assembly, 2015).

Scholarship in global environmental governance has addressed multiple dimensions of this regime complex. Factors such as its creation, effectiveness, and future

challenges have been studied and evaluated by scholars, experts, and policy-makers. Debates have also included the obstacles to managing the threats of hazardous waste and pollution. Issues such as the lack of information regarding the uses and effects of chemicals, the low degree of implementation of the conventions, and the lack of capacity of developing countries and economies in transition to design and implement cross-cutting policies for chemicals and waste management (UNEP, 2012a), have raised questions about the role and relevance of the chemicals and waste regime. However, as it is also the case with the general literature about the implementation of global environmental conventions, most of these studies lack the empirical evidence and scientific rigor required to demonstrate an apparent failure of the regime to achieve global environmental goals.

Using two of the multilateral agreements at the core of the chemicals and waste regime—the Basel Convention (UNEP, 1989), and the Stockholm Convention on POPs (United Nations, 2001), this chapter demonstrates that even when challenged by implementation, capacity, and institutional arrangements, the conventions perform an important role in protecting the environment and human health. In particular, this chapter discusses how factors such as countries' level of development, technical capacities, access to technology, data collection, and monitoring mechanisms are needed to implement the obligations to these agreements. Even though some exceptions can be highlighted, and demonstrate that developing countries can in fact achieve the goals established by the conventions, there is a clear correlation between the level of development of countries and their progress in implementing their obligations with the chemicals and waste conventions, particularly the Stockholm Convention.

This chapter characterizes the chemicals and waste conventions, discussing first the nature of the problem of wastes and pollution, and then the context in which they were negotiated and drafted, their objectives, and institutional characteristics. Departing from these two points, the chapter assesses the level of implementation of the Basel and Stockholm conventions, analyzing the membership and level of national reporting to these to agreements, and presenting the results for implementation as measured by the ECI across type of countries and regions, the historical evolution of implementation since 2001, and the top and bottom performers. Existing disparities in implementation call for targeted policy instruments in capacity building and technical assistance, particularly regarding information collection mechanisms. Furthermore, the results demonstrate the need for solid empirical indicators that support countries' progress towards achieving the targets defined by the SDGs that are connected to the chemicals and waste regime. In particular, Target 4 in Goal 12 aims to "ensure sustainable consumption and production patterns" and achieve "the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment" (UN General Assembly, 2015).

The chemicals and waste regime: Origins, characteristics, goals, and challenges

Chemicals play an important role in agriculture, industry, energy and medicine. However, they pose, through the different stages of their life cycles, threats to both human health and the environment (Selin, 2010). Some chemicals become hazardous wastes, a condition that completely eliminates their economic benefits and development

advantages. A small minority of chemical substances—the Persistent Organic Pollutants (POPs)—remain in the environment for long periods of time, bio-accumulating in different ecosystems and resulting in numerous harmful effects for people and the environment. These effects vary across geographies and social groups. As disposal places in industrialized countries are scarce, developing countries become extremely vulnerable to hazardous substances and lack proper disposal procedures (Critharis, 1990; Krueger, 2001; Lucier & Gareau, 2014). All these dimensions of the problem of chemical pollution often lead to intentional violations of the regulations for the transportation of hazardous wastes. Such violations generate health and environmental consequences, incur important economic costs, and affect the existing international mechanisms designed to regulate these procedures (Krueger, 1999; Waugh, 1999).

At the same time, the quantity of hazardous substances in the environment continues to increase. According to the Chemicals Abstract Service, more than 345,000 chemical products are now inventoried or regulated (American Chemical Society, 2016). Consumption of chemical products in both developed and developing countries is growing fast, and could account for a third of global consumption by 2020 (UNEP, 2012a). This leads to the production of all kinds of wastes that are often poorly managed through precarious practices affecting communities and ecosystems. In 2004, the World Health Organization (WHO) estimated that 4.9 million deaths—8.3 percent of total deaths that year—were due to environmental exposures to selected chemicals (Prüss-Ustün, Vickers, Haefliger, & Bertollini, 2011). This is the context in which the movement of hazardous waste and the control of pollutant substances became one of the most contentious issues in global environmental governance (Krueger, 1998).

Global cooperation is essential to address the wide range of issues related to hazardous chemicals, and efforts have been made to establish international obligations and standards (DeSombre, 2017; Kummer, 1992; Selin, 2010). In 1972, at the UNCHE, governments committed to preventing pollution and to collaborating with other states to address common challenges (United Nations, 1972 Principle 7). Twenty years later, at the Earth Summit, states agreed to “effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health” (United Nations, 1992a Principle 14). Specifically, Agenda 21, the plan of action established at the Earth Summit, acknowledged two major problems regarding chemicals and wastes, particularly in developing countries: lack of sufficient scientific information to assess the risks entailed by the use of chemicals, and lack of resources to evaluate the chemicals for which data is available (UNCED, 1992). The 2002 Plan for Implementation of the WSSD followed up on previous decisions and established as one of its objectives the minimization, by 2020, of the adverse effects of chemicals (WSSD, 2002). These decisions resulted in two international treaties: the Basel Convention and the Stockholm Convention. The SDGs maintain this intent and define patterns for sustainable consumption and production that call for the reduction and elimination of wastes and the control of hazardous substances.

Thus, for about four decades the international community has been actively working towards bridging the science-policy gap, promoting international cooperation, and increasing awareness about environmental issues related to hazardous chemicals and waste. In addition to the broader political efforts to include chemicals on the international

agenda, countries have also created specific policy instruments to address the challenges of hazardous substance management in an environmentally sound manner. Sands and Peel identify four approaches by which international agreements define hazardous substances and activities (Sands & Peel, 2012, p. 516):

- by reference to their inherent characteristics, including their toxicity, flammability, explosiveness, and oxidization,
- by reference to a listing system which identifies certain activities or projects on the basis that they are, per se, likely to have significant effects on the environment,
- by reference to national laws, and
- by regulating specific substances instead of establishing definitions.

The next section describes four international treaties that regulate chemicals and waste (see Table 17). Even though two of them are not part of this study, the four treaties regulate multiple aspects of the use, management, and disposal of hazardous substances through their life cycle. The Basel, Stockholm, and Rotterdam Conventions regulate hazardous wastes and POPs, and the Minamata Convention regulates mercury. Following a brief overview of each convention, I will discuss implementation and the role of the agreements in the policies established at the national level to protect human health and the environment.

Chemicals and Hazardous Waste Regulation

In the 1970s and 1980s, the number of sites available for disposal of hazardous substances in industrialized countries was inadequate for the storage and safe treatment of

the chemicals to be disposed. Sites in developing countries therefore became more appealing, as there were no domestic regulations in those countries to hinder acceptance of hazardous chemicals and no international regulations to prevent their transboundary movement. However, developing countries lacked proper disposal procedures and therefore became extremely vulnerable to the hazards of these substances (Critharis, 1990; Krueger, 2001; Lucier & Gareau, 2014). Chemical pollution and other misuses of hazardous substances generated environmental harms, health consequences, and economic costs that called for the design of international mechanisms to regulate these procedures (Krueger, 1999; Waugh, 1999). The movement of hazardous waste and the control of pollutant substances became among the most contentious issues in global environmental governance (Krueger, 1998) and brought momentum for the negotiation of multiple multilateral agreements to address the challenge of managing, reducing, and eliminating chemicals and waste.

Initially, UN Environment decided to tackle the issue with regulations to stabilize the transportation and disposal of toxic wastes, leading to the establishment in 1985 of the Cairo Guidelines and Principles for the Environmentally Sound Management of Hazardous Wastes (UNEP, 1987). A joint proposal by the governments of Switzerland and Hungary mandated the Executive Director to convene a working group for the elaboration of a global convention to control the transboundary movements of hazardous wastes (UNEP, 1987). The Basel Convention on the Transboundary Movement of Hazardous Waste was signed in March 1989 with 53 original state parties, and entered into force in 1992 (UNEP, 1989). The Convention “discourages exports of hazardous and other wastes, which should only be allowed if the exporting state does not have the

capacity, facilities or suitable sites to dispose of them in an environmentally sound or efficient manner, or if the wastes are required as a raw material for recycling or recovery in the importing state, or in accordance with other criteria decided by the parties.

Moreover, parties may not transfer to importing or transit states their obligation under the Convention to carry out environmentally sound management, and can impose additional requirements consistent with the Convention to better protect human health and the environment” (Sands, 2003, p. 693). It also provides specific rules for the international movement and transport of waste, including packaging and labeling guidelines. Once negotiated, the convention was perceived as the most comprehensive solution so far to the problem of hazardous wastes at different levels. It was also expected that the convention would shed light on UN Environment’s ability to implement multilateral environmental agreements, since it was the first agreement administered by this organization in which so many nations were likely to participate (Hackett, 1989).

An additional key step in the regulation of the movement of hazardous wastes had to do with information and notification processes among exporters and recipients of these substances. The 1998 Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (FAO/UNEP, 1998) regulates this matter. Specifically, it creates legally binding obligations to ensure that governments respect certain rules in the distribution of chemicals, particularly having all the information required to assess and take informed decisions on export and import transactions. The overall objective of the convention is to facilitate information exchange and to promote shared responsibility and cooperation among parties in the international trade of hazardous chemicals (Rotterdam Convention, 2010).

Responding to increasing international concern about pollution and hazardous substances, in 1995 UN Environment developed an international assessment of the effects of POPs. Based on the alarming results, in 1997 the organization received a mandate to negotiate a binding international agreement to identify, regulate, and control the effects of POPs (Hagen & Walls, 2005; Stockholm Convention, 2008; UNEP, 1997). In 2001, after five negotiation rounds, 92 countries signed the Stockholm Convention on POPs, which entered into force in 2004 (United Nations, 2001). The Stockholm Convention includes detailed provisions to eliminate releases of POPs and their associated risks. The convention also obliges countries to submit a national implementation plan, which is designed to establish a clear route for countries to advance implementation of their commitments under the convention (Lu, Giesy, & Holliday, 2007). Nonetheless, the agreement recognizes the need to work with developing countries to strengthen their capacities to achieve this objective.

More recently, regulation of the anthropogenic emissions and releases of mercury and mercury-containing compounds became another focus of the chemicals and waste regime. Since the 1950s, the environmental effects of and diseases caused by mercury poison called for voluntary commitments to decrease emissions. But only in 2009 did UN Environment adopt the decision “to initiate action to manage mercury in an efficient, effective and coherent manner” (UNEP, 2009). Through five intergovernmental negotiation committees, the chemicals branch of UN Environment’s Division of Technology, Industry and Economics led countries in negotiations. The resulting Minamata Convention on Mercury, finalized in 2013, also aims to protect human health and the environment. It draws global attention to a substance which is broadly used, and

which releases hazardous components in the atmosphere, soil, and water. The main objective of the convention is to control the anthropogenic releases of mercury throughout its life cycle. As of December 2016, the convention had 128 signatories, and 35 countries had ratified it. It will enter into force after ratification from 50 countries (UNEP, 2013b).

Since the chemicals and waste regime does not have a framework convention, each agreement addresses a specific dimension of this environmental cluster under the common goal of protecting human health and the environment, and each has specific legal, political, and practical implications (Krueger & Selin, 2002; Selin, 2010). Table 17 summarizes the main objectives of each convention. As some of their objectives may differ, the four agreements also complement each other. Under that premise, the Basel, Rotterdam, and Stockholm conventions started a process to enhance cooperation and coordination among them. At the 2008/2009 COPs of each convention, parties adopted what have been called "synergies decisions" to coordinate organizational, administrative, technical, informational, and decision-making practices and improve efficiency and implementation through joint activities (Basel Convention, 2006; Rotterdam Convention, 2008; Stockholm Convention, 2006). A fundamental consequence of this process was the establishment of a joint executive secretariat to oversee the three agreements.

Most academics and policy analysts recognize the importance of the chemicals and waste regime and its contribution to environmental protection. However, there is an increasing concern about the level of implementation and the availability of data on how countries are translating global commitments into national policies (Stockholm Convention, 2016d). In the case of the Basel and Stockholm conventions, policy-makers

Table 17 Environmental agreements in the chemicals and waste regime

	Year	Parties ¹³	Main objectives
Basel Convention	1989	185	<ul style="list-style-type: none"> • Protect human health and the environment against the adverse effects of hazardous waste • Control of the transboundary movement of hazardous wastes as well as responsible trade in hazardous chemicals • Support for countries to strengthen their capacity for the sound management of chemicals and waste • Promote safe radioactive and nuclear waste management • Reduce the transboundary movement of hazardous wastes • Restrict those movements of hazardous wastes that are perceived in discordance with the principles of environmental sound management • Regulate the transboundary movements when they are permissible • Promote the environmentally sound management of hazardous wastes and adequate disposal activities
Rotterdam Convention	1998	156	<ul style="list-style-type: none"> • Promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm • Contribute to the environmentally sound use of those hazardous chemicals
Stockholm Convention	2001	180	<ul style="list-style-type: none"> • Regulate the sound management of chemicals throughout their life cycle, including POPs and heavy metals, as well as wastes
Minamata Convention	2013	35	<ul style="list-style-type: none"> • Protect human health and the environment from anthropogenic emissions and releases of mercury and mercury-containing compounds • Ban new mercury mines and phase out existing ones • Phase out and phase down mercury use in several products and processes • Develop control measures for emissions to air as well as releases to land and water • Regulate the informal sector of artisanal and small-scale mining • Ensure the environmentally sound interim storage of mercury, and of its disposal once it becomes waste

Sources: (Basel Convention, 1987; Kummer, 1998; Porta & Zumeta, 2002; Rotterdam Convention, 2010; Stockholm Convention, 2008; UNEP, 2013b)

¹³ The data presented in this study is updated to December 31, 2016. However, it is important to clarify the evolution in the membership up to April 30, 2017:

- Angola joined the Basel Convention on February 6, 2017, and the agreement will enter into force in the country on May 7, 2017.
- Malta joined the Rotterdam and Stockholm conventions on January 17, 2017, and the agreements will enter into force in the country on April 17, 2017.
- Five additional countries ratified the Minamata Convention: Costa Rica, Ghana, Honduras, Liechtenstein, and Togo.

and scholars argue that although progress has been achieved in the effective management and minimization of chemicals, “lack of data, information, and knowledge on waste scenarios, lack of comprehensive regulations and weak enforcement of existing legislation, weak technical and organizational capacities, poor public awareness and cooperation, and lack of funds” remain (Fiedler, 2008; Selin, 2010; UNCSD, 2011; UNEP, 2012a).

Three specific propositions emerge from this assessment. First, global policy objectives in the area of chemicals and waste have not been achieved, which questions the implementation of the conventions and their role in protecting the environment (UNEP, 2012a). Second, developing countries and economies in transition need to strengthen their national capacities, including by establishing institutional frameworks for the “coherent implementation of the agreements” (Perrez, 2015; UNEP, 2012a) to achieve the objectives of the convention. This assumes a causal inference between countries’ level of development and the implementation of global environmental commitments. And third, there is not enough information regarding the uses, emissions, and effects of chemicals, which brings scientific uncertainty to monitoring and implementation (Krueger, 2001; Lallas, 2001; UNEP, 2012a).

Scientific data is at the core of the chemicals regime. Science-based evaluations and management procedures are essential for identifying substances and for managing, reducing, and eliminating them. This directly reflects on the science-policy interface and the role of scientific information in the assessment and monitoring mechanisms that support the conventions' efforts for the sound management of chemicals and hazardous waste, particularly when designing technical assistance programs for developing

countries (Selin, 2010; WSSD, 2002 para. 23). Lack of data has persistently hindered the evaluation of chemicals and wastes globally and the effectiveness of the conventions. Also, the information submitted by state parties is often incomplete and unverified, specifically in regards to the assessment of inventories, stockpiles, and generation and movement of hazardous wastes and POPs (Basel Convention, 2011e; Stockholm Convention, 2011).

Implementing the Basel and Stockholm conventions

As the global chemistry business keeps growing, particularly in developing countries, regulation and legislation need to keep pace in order to develop national and local standards. These standards are expected to reflect the reality of national chemical industries, and to establish monitoring, inspection, reporting, and enforcement mechanisms, and institutional and strategic arrangements to comply with international requirements (American Chemistry Council, 2014; UNEP, 2012a). Scholars argue that the challenges of the conventions are based on both ratification and implementation (Selin, 2009). Even though the number of ratifications is high, the chemicals and waste agreements have not “always transposed into national legislation in a comprehensive manner,” and countries still “face considerable difficulties establishing effective policies and administrative structures for managing hazardous chemicals” (Selin, 2010, p. 1; UNEP, 2012a). Factors affecting the implementation of the agreements include the level of development, the level of technical capacity, the debate between sovereignty and cooperation, and the fact that the policies seem not adaptable to the different national

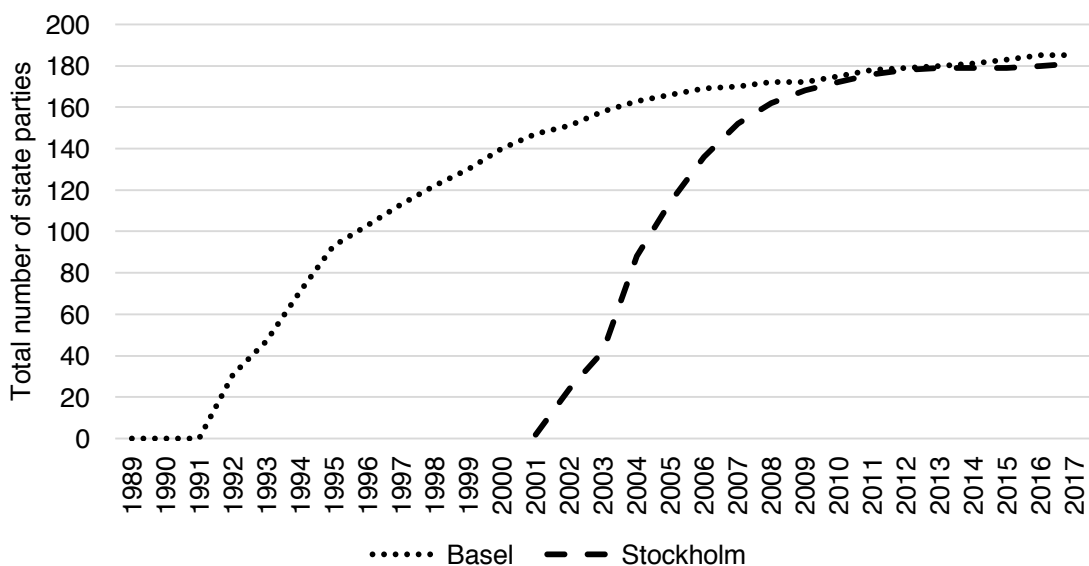
characteristics of state parties (DeSombre, 2017; Krueger, 1998, 1999; Schneider, 1996; Selin, 2009; Walsh, 1992).

The next two sections provide empirical evidence from the ECI to demonstrate how the implementation of the Basel and Stockholm conventions at the national level frequently differs from the premises of the traditional environmental governance literature. Three findings support this argument. First, the implementation of the conventions is progressing in both developed and developing countries, which evidences that in fact they are making progress regarding the definition of strategies, policies, and legislation for the management of hazardous wastes and POPs. Second, developing countries and economies in transition have strongly engaged in both conventions, not only in terms of membership but also in terms of national reporting and policy development, with some countries performing better than expected. However, factors such as national capacity, levels of development, and availability of scientific data are critical to fulfilling the obligations established by the Basel and Stockholm Conventions. As international cooperation is vital to the sound management of chemicals and waste, implementation of policy instruments such as the Basel and Stockholm conventions creates momentum and contributes to understanding and action. However, many countries still need more capacity and more solid implementation (Karlagnis, Marioni, Sieber, & Weber, 2001; Okaru, 1992). Bringing empirical evidence to the analysis of these agreements will certainly serve as a foundation to understand, explain, and improve countries' performance in translating global commitments into national policies.

Membership

To understand implementation, it is important first to define the signatory parties for each convention. Membership is a point of departure in the evaluation of countries' performance in achieving the obligations they acquired when signing and ratifying the convention. Legislation, strategies, institutional arrangements, and monitoring efforts differ among developed and developing countries. Furthermore, the nature of the problem of chemical production and pollution also varies across different countries and regions. According to the UN Environment flagship environmental assessment GEO-5, the production of chemicals has shifted in the last decade, moving from developed countries to the BRIC countries (Brazil, Russia, India, and China) and other developing countries, which are also increasing sales and generation of new chemicals (Ghosh et al., 2016; UNEP, 2012a).

Figure 4 Historical evolution of the membership in the Basel and Stockholm conventions



Sources: (Basel Convention, 2016b; Stockholm Convention, 2017)

Membership in the Basel Convention reached 185 countries in 2016 (see Figure 4). Twenty-five percent of the members are developed countries and 75 percent are developing countries. In a similar pattern, 24 percent of the 180 parties to the Stockholm Convention are developed countries and 76 percent developing countries. The Stockholm Convention had approximately three times more original signatories than the Basel Convention, and twice as many as the Rotterdam Convention, illustrating the evolution of the regime from the 1990s when the Basel and Rotterdam conventions entered into force and increased the awareness of the international community about the importance of international cooperation to address chemical pollution and wastes. Expanding membership also confirms the success of the 2001 Johannesburg Plan of Action (WSSD, 2002) in its objective to increase the ratification and implementation of the conventions. Since 2001, 38 countries have joined the Basel Convention, which represents 21 percent of its current membership. 95 percent of those new members are developing countries. Sierra Leone was the last country to join the convention in 2016 (Basel Convention, 2016b). Membership in the Stockholm Convention has also increased. 156 countries ratified the convention after 2002, 79 percent of those countries (123) are developing while 21 percent (33) are developed. Iraq was the last country to join the convention in March 2016 (Stockholm Convention, 2017)¹⁴.

All the conventions, however, have notable gaps in membership. Seven countries are not members in either convention: Grenada, Haiti, San Marino, South Sudan, Timor-Leste, the United States, and the Vatican City. Other non-members include Angola for the

¹⁴ Malta joined the Stockholm Convention in January 2017 and the agreement entered into force in April 17th of that year.

Basel Convention¹⁵, and Israel, Italy, Malaysia, and Uzbekistan for the Stockholm Convention. The absence of some countries then leads to lower levels of implementation. Italy, for example, shows lower implementation of the Stockholm Convention when compared to other European countries (Miniero, De Felip, Magliuolo, Ferri, & Di Domenico, 2005), and ratifying the convention will be critical to improving national chemicals regulations. Other countries, such as Malaysia, have designed and executed policies consistent with the issues addressed by the conventions, but have not ratified the agreements yet, which leads to illegal use of some substances listed as POPs and their detection in the environment (IPEN, 2005). Israel—for the Basel Convention—and Angola—for the Stockholm Convention—have expressed their adherence to the conventions, and their preparations for ratification, but they have yet to go through the process (Angola Press, 2013; SCP/RAC, 2011). Yet others, such as the United States, possess advanced cradle-to-grave hazardous waste management systems and have signed both conventions but have not ratified, largely due to domestic political gridlock. Appendix D presents a summary of the membership for the conventions included in this study.

The importance of the conventions' membership trends is twofold. On the one hand, it evidences the increasing participation of developing countries in the system of global chemicals governance in particular, and global environmental governance in general. Given the transboundary nature of the threat of wastes and pollution, it is critical that all countries engage in their regulation to control harmful events for the environment

¹⁵ Angola joined the Basel Convention on February 6, 2017 and the agreement will enter into force in the country in May 7, 2017.

and human health. Furthermore, the historical membership gap between the different conventions, which has been seen as a factor affecting the process of implementation (Krueger & Selin, 2002), has declined. Membership is now almost the same for the two agreements, and, as explained above, only 16 countries are members of only one of the conventions: 10 for Basel¹⁶ and 6 for Stockholm.

National Reporting

As I explained in Chapter 3, the fundamental measure of implementation is reporting. Each convention secretariat requires parties to submit national reports on the fulfillment of their obligations under the agreement. Both the Basel and Stockholm conventions have specific reporting systems, requesting annual and periodic (every four years) reports, respectively, on detailed information about the measures established by each country to implement the conventions (see Table 18).

Table 18 National reporting mechanisms for the Basel and Stockholm conventions

	Basel Convention (Art. 13)	Stockholm Convention (Art. 15)
Reporting requirements	<ul style="list-style-type: none"> • Information on focal points • Information on transboundary movement of hazardous wastes and other wastes • Measures adopted to implement the convention • Statistics on the effect of hazardous waste generation, transportation and disposal • Information on accidents, disposal options and technologies for the management of hazardous wastes. • Information on other agreements for hazardous wastes management 	<ul style="list-style-type: none"> • Measures adopted to implement the convention, and their effectiveness • Statistical data on the production, import, and export of the chemicals included in the annexes to the convention.

¹⁶ With Angola's ratification, this number is now 9.

	Basel Convention (Art. 13)	Stockholm Convention (Art. 15)
Reporting cycles	Reporting cycles are annual. An electronic reporting system was implemented in 2012.	Reporting cycles are defined by the COP. So far it has established three.
Reports available	2001-2015	Three reporting cycles: 2002-2006, 2006-2010 and 2010-2014

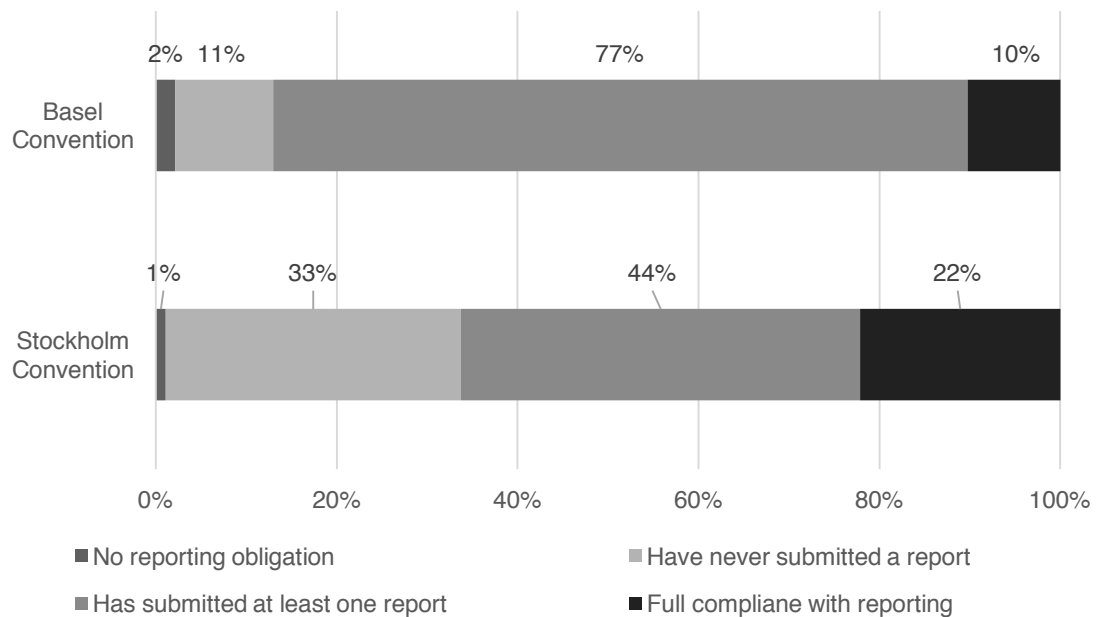
Source: (Basel Convention, 2016a; Stockholm Convention, 2016a; UNEP, 1989 Art. 13; United Nations, 2001 Art. 15)

Even though reporting obligations have been part of the agreements since their beginning, reporting rates for the conventions are relatively low. A detailed diagnosis of the process of national reporting requires an analysis of three aspects: how the overall group of state parties complies with reporting obligations, how the process of national reporting has evolved over time, and how compliance with national reporting differs among different groups of countries or regions. For the chemicals and waste conventions, these factors reflect different trends that should be considered to understand countries' implementation and the relevance of information exchange to achieve the conventions' objectives and improve their effectiveness.

A key initial finding is that not all countries submit the national reports they are required to submit, and, of the ones that do, some delay submission, inhibiting the prompt availability of data to assess performance. Also, not all reports are available online, and only in recent reporting cycles—particularly in the case of the Basel Convention—data has been collected through electronic reporting systems. In the Basel Convention, countries have reported on average 52 percent of the time they were required to report since 2001, while for the Stockholm Convention they have only fulfilled this obligation 44 percent of the time since 2002 (Basel Convention, 2016a; Stockholm Convention,

2016a)¹⁷. Only 19 countries have a 100-percent reporting rate for the Basel Convention. Most of them (15) are developed countries, but Bahrain, Madagascar, Malaysia, and Thailand are also part of this group. However, 20 countries—all of them developing—have never submitted a report. For the Stockholm Convention, only 40 countries (22 percent of the members) have submitted all the reports they were required to submit, including the Central African Republic, Costa Rica, Mali, Nepal, and Sri Lanka, while 59 countries (33 percent of the parties) have never submitted a report. Figure 5 presents the compliance with national reporting obligations in the two agreements.¹⁸

Figure 5 Compliance with national reporting obligations in the Basel and Stockholm conventions



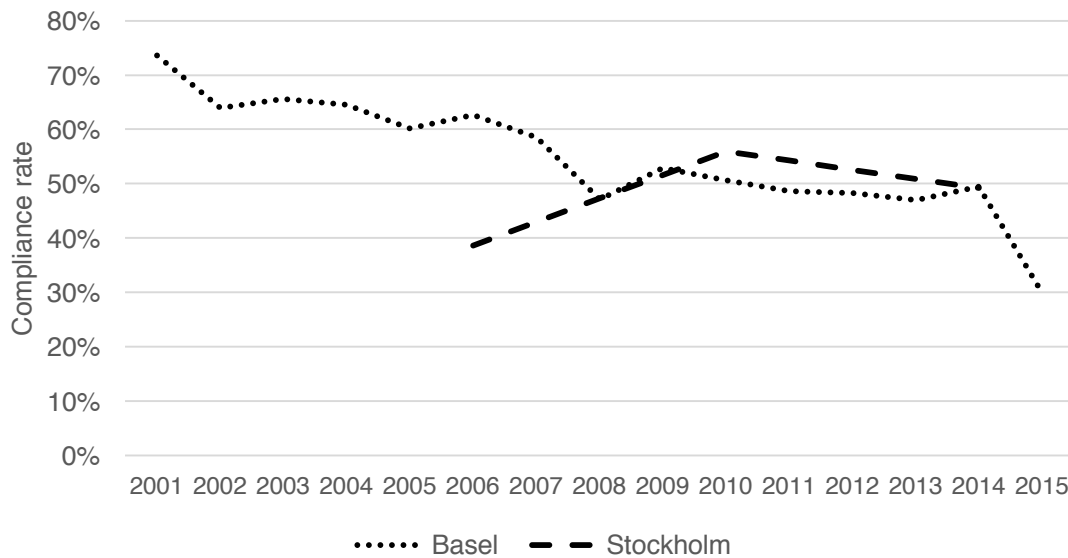
Source of data: (Basel Convention, 2016a; Stockholm Convention, 2016a)

¹⁷ See Appendix E for detailed analysis on each country’s national reporting rates to each of the conventions included in this study.

¹⁸ See Appendix F for detailed data on the reporting compliance rates – by each reporting cycle – for the conventions included in this study.

Historical analysis of reporting behavior illustrates a key challenge in the process of implementation, as the conventions follow different trends in terms of national reporting (see Figure 6). For the Basel Convention, the number of countries submitting a report each year has decreased from 74 percent in 2001 to 30 percent in 2015. The Stockholm Convention exhibits a more positive trend, with countries' reporting increasing from 39 percent in 2002-2006 to 56 percent in 2006-2010 and 49 percent in 2010-2014. However, there is still a significant group of countries for which data is not available, and it includes both developed and developing countries.

Figure 6 Historical evolution of general compliance to national reporting obligations in the Basel and Stockholm conventions



Furthermore, different types of countries or regions perform differently, attesting to some extent to the conventional wisdom about implementation of international obligations. For the Basel Convention, the average national reporting rate for developed countries (82%) is almost twice as high as that for developing countries (42%). In terms

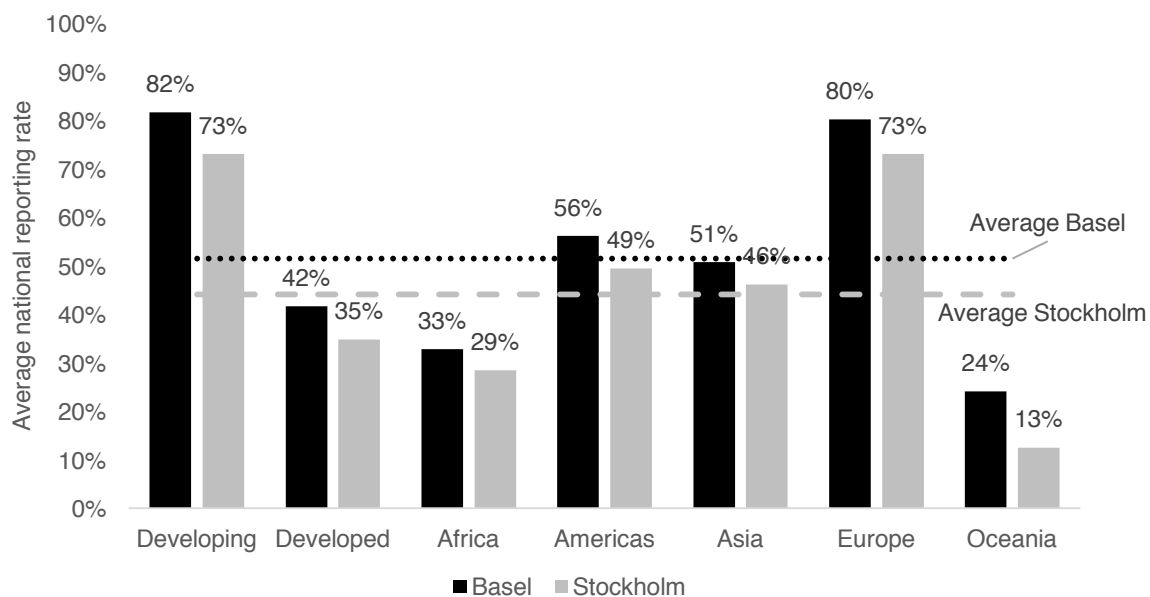
of regions, Europe obtains the best results, submitting reports on average 80 percent of the times. Oceania, on the other hand, registers the lowest average national reporting rate (24%) (see Figure 7). Out of all the countries in that region that are state parties, only Australia and New Zealand have submitted their reports since 2007. The Cook Islands, Papua New Guinea, and Samoa have reported less than 10 percent of the time, and Tonga and Palau have never submitted the reports they were obliged to since they joined the convention in 2010 and 2011 respectively. For the Stockholm Convention, the average national reporting rate also differs between developed and developing countries. While for developed countries it is 73 percent, for developing countries it is only 35 percent (see Figure 7). Small islands in the Pacific and African countries fall short on this obligation. Out of 52 countries in Africa that are state parties to the Stockholm Convention, 22 have never submitted a report. Europe is the region with the best average national reporting rate—73 percent.¹⁹

The historical evolution of the compliance with the reporting obligations is also different across different types of countries and regions. For the Basel Convention, the number of developed countries that submit reports has declined from 41 in 2001 to 22 in 2015, while for developing countries it has decreased from 62 in 2001 to 32 in 2015 (see Figure 8). Factors such as the lack of capacity at the national level and the frequency of the reporting cycles may explain this situation. In the case of the Stockholm Convention, trends differ. Both developed and developing countries have managed to increase the submission of national reports (see Figure 9).²⁰ However, there are still important gaps. In

¹⁹ See Appendix E

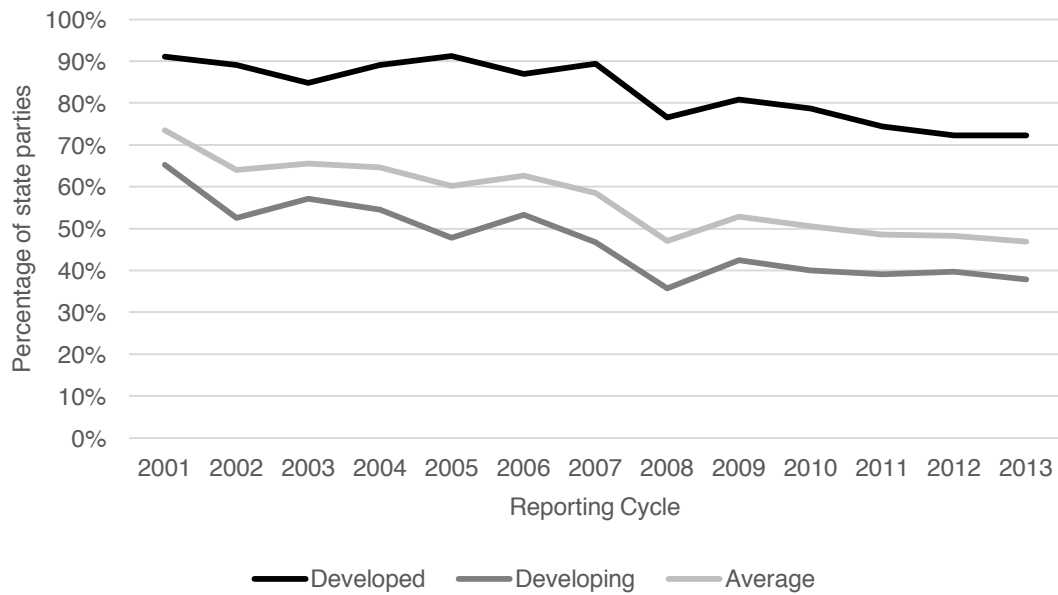
²⁰ See Appendix F

Figure 7 Average national reporting rate by category of country and regions for the Basel and Stockholm conventions



the last reporting cycle (2010-2014), 20 percent of developed countries and 60 percent of developing countries parties to the convention have not submitted their reports as of December 31, 2016. Issues with the scientific information associated to the management of POPs and the technical capacity of some countries may cause non-compliance with this obligation. Furthermore, the historical trend of late submission for the reports to this agreement indicates that there is still a possibility for more countries to submit their reports, even two years after its original deadline (December 31, 2014). Interestingly, for both Basel and Stockholm, the number of countries submitting the reports has not changed drastically since 2009 and 2010 respectively, both in total and in the distribution among types of countries. That explains why patterns for both regions and the average follow similar trends.

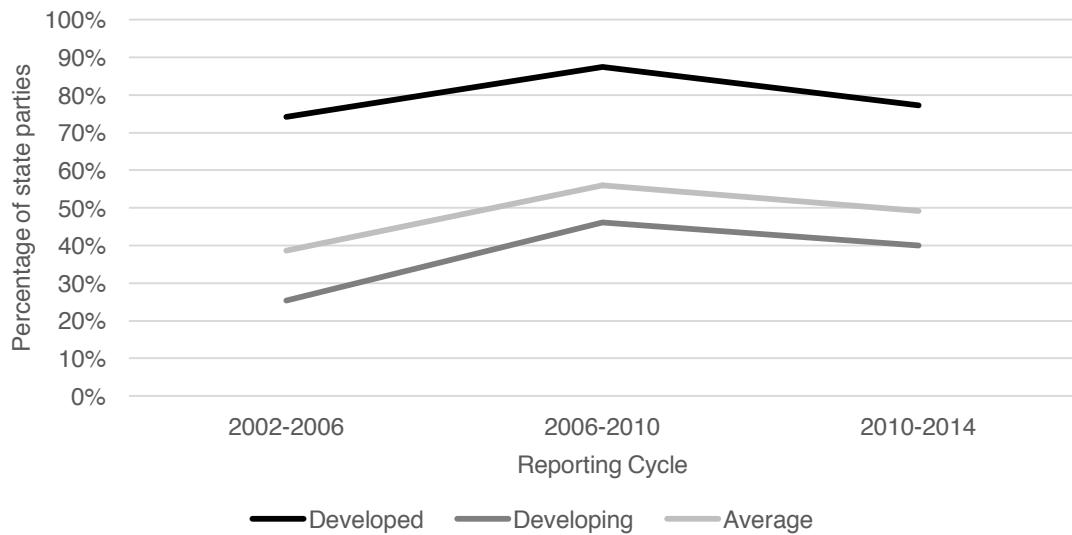
Figure 8 Evolution of national reporting compliance indicators for the Basel Convention



Comparing individual countries’ reporting compliance for the two conventions also offers important observations. On average, there is a 25-percent difference between the national reporting rates of the Basel and the Stockholm Convention, with the latter being lower. Individual countries also differ in their reporting patterns across the conventions. While Hungary, for example, has submitted every report it was obliged to submit to the Basel Convention, the country has never reported to the Stockholm Convention. And, on the other hand, five countries that are fully compliant with the Stockholm Convention’s reporting obligations—Cameroon, Central African Republic, Mali, Nepal, and The Former Yugoslav Republic of Macedonia—have only complied with the obligations to the Basel Convention one third of the times or less.²¹

²¹ See Appendix E

Figure 9 Evolution of national reporting compliance indicators for the Stockholm Convention

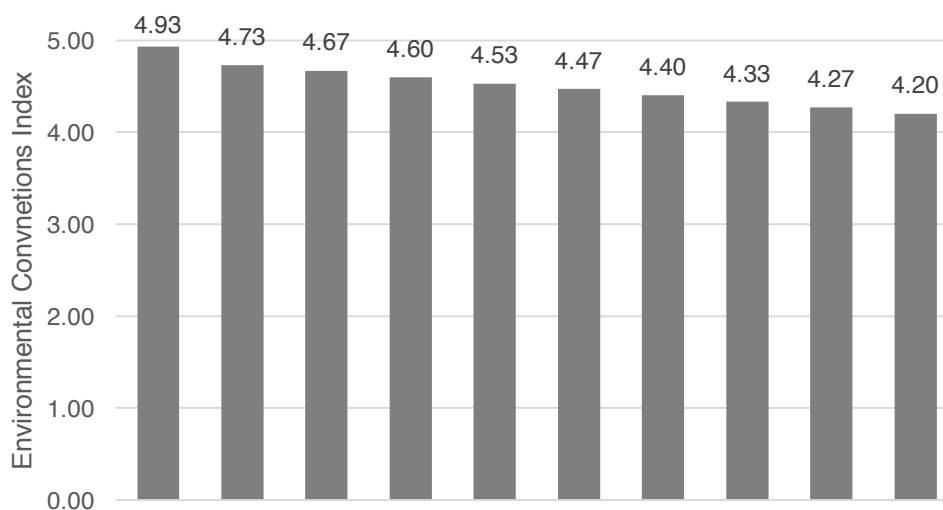


Reporting is a prerequisite to monitor and evaluate implementation. National reporting indicators as the ones presented above illustrate the characteristics of the reporting process, the challenges countries face in collecting the information and completing the reports, and the extent to which these impact the process of implementation. Analyzing and processing the information contained in national reports is essential to determine if countries have established the institutional, technical, and regulatory frameworks that will consequently contribute to the solution of environmental problems. If this information is not analyzed and processed, it will not be possible to determine the extent to which conventions are being translated into national policies. The next section addresses these issues.

Implementation

In the case of the Basel Convention, 161 countries submitted at least one report in the period 2001-2015. They register an implementation score ranging from 0.87 (Burkina Faso) to 4.93 (Portugal and Spain). While this may initially reinforce the argument about developed countries obtaining better results in the implementation of their international environmental obligations, a detailed analysis of individual country results evidences that out of the 57 countries ranked in the top ten scores on the index (from 4.20 to 4.93), 27 (47%) are developing countries, including Colombia, Madagascar, Algeria, Ecuador, Indonesia, Rwanda and Nigeria (see Figure 10).

Figure 10 Environmental Conventions Index—Top performers for the Basel Convention



List of countries for each score

4.93	Portugal and Spain
4.73	Argentina, Bulgaria, Colombia, Malaysia, Mexico, Morocco, Serbia, and Slovakia
4.67	Austria, Cyprus, Czech Republic, Germany, and Madagascar
4.60	Algeria, Belgium, Burundi, Canada, China, Ecuador, Egypt, Estonia, Greece, Indonesia, Latvia, and Rwanda
4.53	Malta and Sweden
4.47	Denmark and Hungary
4.40	Albania and Tunisia
4.33	Finland, Iran, Norway, Qatar, South Korea, and Slovenia
4.27	Iceland, Nigeria, Paraguay, Poland, South Africa, and Zambia
4.20	Belarus, Kyrgyzstan, Libya, Liechtenstein, Lithuania, Luxembourg, Nicaragua, Panama, Russian Federation, Switzerland, Thailand, and the United Kingdom

As explained in Chapter 3, index scores are based on the latest available report for each country, but even though for some cases—30 percent of the countries—scores date back to reports submitted in 2010 or before, the rest of the 161 state parties analyzed submitted at least one report after that year. Of the 57 countries ranked in the top ten performers, only five countries did not report after 2010—Burundi, Ecuador, Iceland, South Korea, and Zambia. Countries such as Colombia, Madagascar, and Rwanda register reporting rates higher than 80 percent, and submitted at least one report since 2013.²²

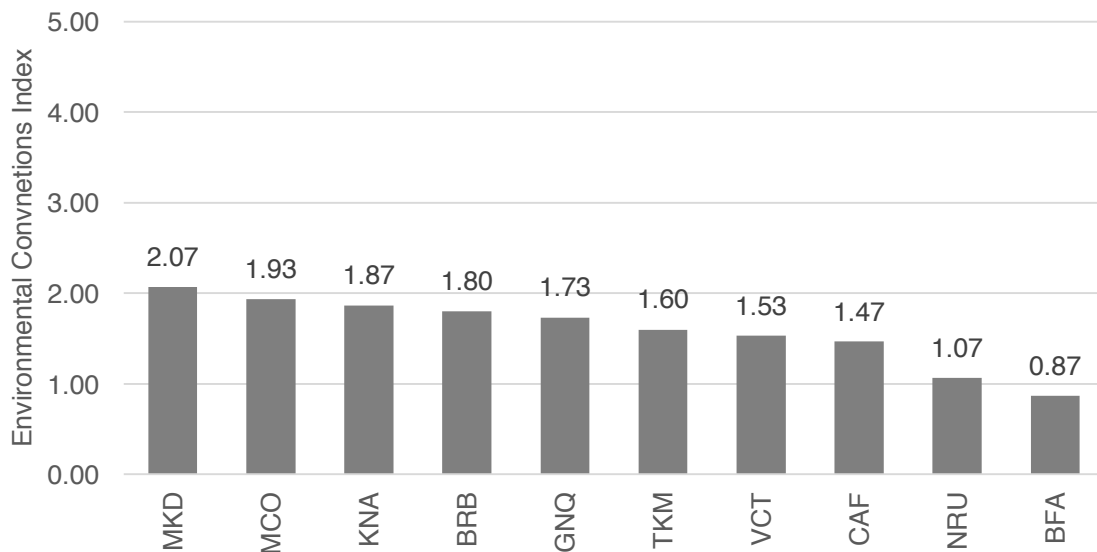
At the bottom level, ten countries register low implementation index scores. Two—Monaco and the Republic of Macedonia—are classified as developed countries. Other bottom performers include Burkina Faso, Nauru, the Central African Republic, Turkmenistan, Equatorial Guinea, and Barbados (see Figure 11). The fact that most of the bottom-ranked countries are developing emphasizes the influence of state capacities and resources in the process of implementing global environmental conventions. Furthermore, it appears that this influence starts by the obligation to submit national reports. Of the countries that perform poorly, only two—Barbados and Monaco—have submitted their reports more than half of the times that they were obliged to. Poor implementation results in developing countries also raise questions about the nature of the movement of hazardous waste threat (Kummer, 1992) and the process of implementation, and about the extent to which storing these materials is a source of

²² See Appendix G for detailed data on the ECI for the conventions included in this study.

income for some developing countries, which prevents them from fully implementing the obligations established by the Basel Convention.

For the Stockholm Convention, the index has results for 120 countries in the period covered by the convention's three reporting cycles (2002-2014). Index scores for these countries range from 1.52 (Myanmar) to 4.67 (Switzerland), results that are more closely connected to development / capacity argument than in the case of the Basel

Figure 11 Environmental Conventions Index—Bottom performers for the Basel Convention²³



Convention. This last finding is reinforced by the fact that all the countries with the top scores are considered developed (see Figure 12). On the contrary, all the bottom performers are developing countries, except for the Russian Federation, which ranks 113th. Index scores for this group range from 1.52 for Myanmar to 2.00 for the United Arab Emirates. Almost all the countries with an index below 2.50 are classified as

²³ See Appendix H for a complete list of country codes

Figure 12 Environmental Conventions Index—Top performers for the Stockholm Convention

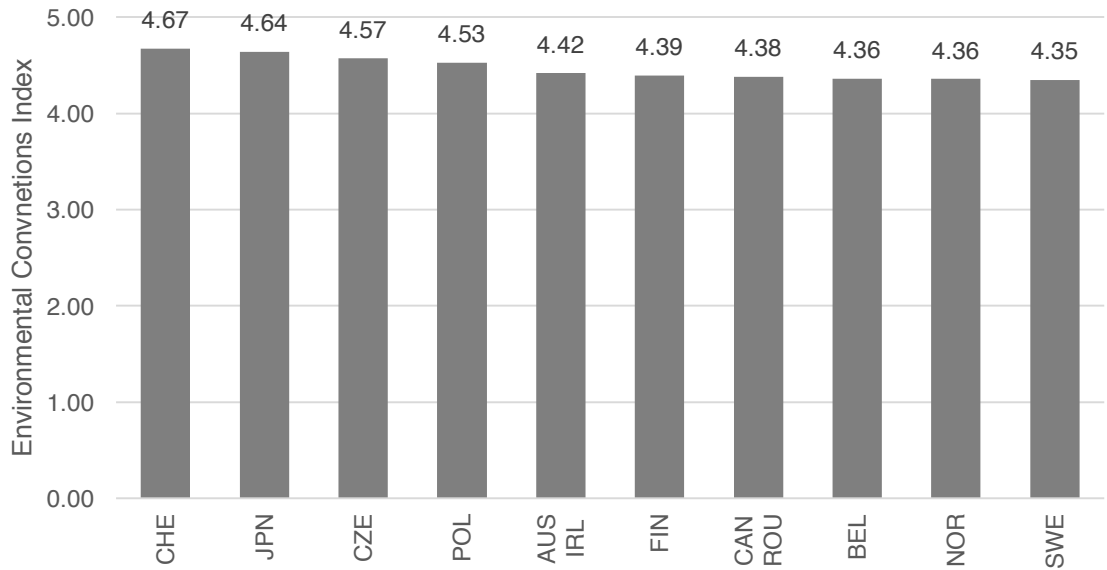
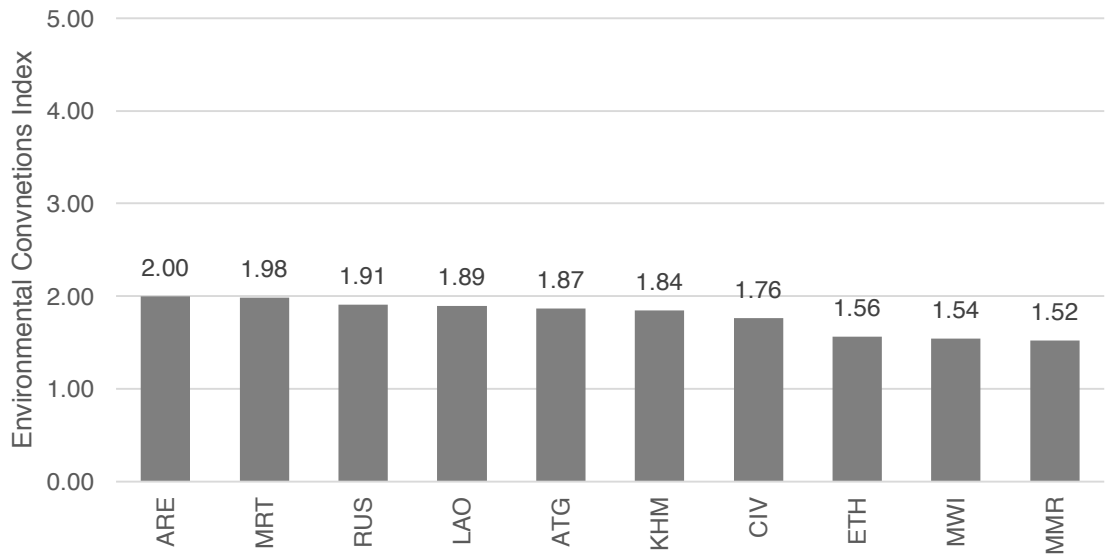


Figure 13 Environmental Conventions Index—Bottom performers for the Stockholm Convention



developing nations. The apparent correlation between countries' level of development and implementation reflects the importance of science and technology for the sound management of POPs. Collection and access to detailed scientific information are

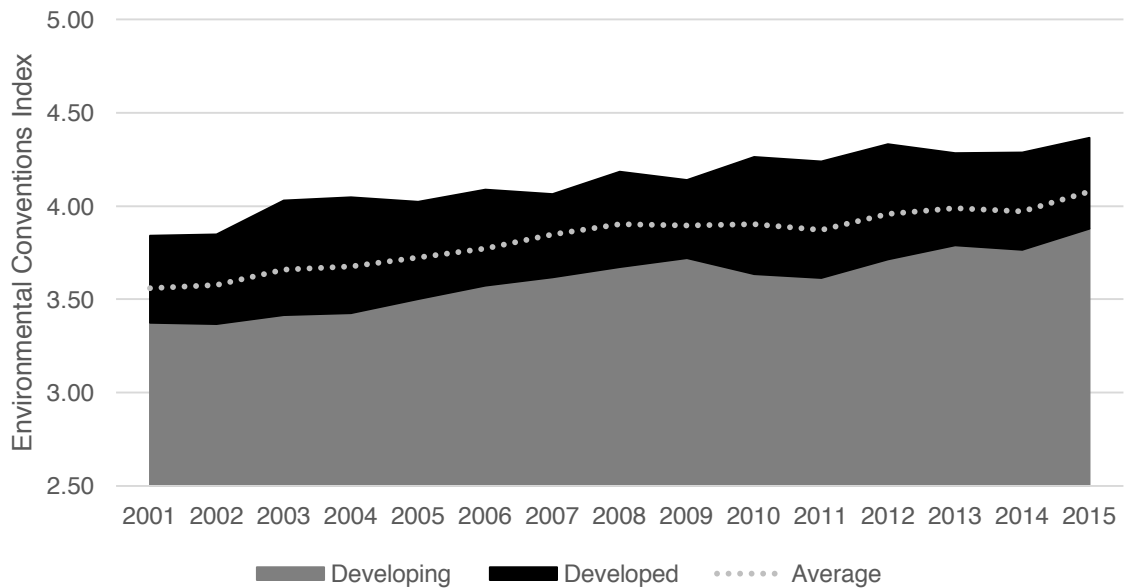
required to identify, regulate and eliminate POPs (Selin, 2010), and as countries and international organizations have recognized, there is an important gap at that level that definitely undermines developing countries' potential to fully implement their obligations under the Stockholm Convention (see Figure 13).

Comparing national report and implementation patterns provides additional insights for both conventions on the linkages between the two processes. Interestingly, countries report not only when they are complying with all their technical obligations, but also when they are failing to do so. For instance, Barbados has submitted almost every report to the Basel Convention (for a total of 14) but indicates a very low level of implementation (ECI score of 1.80). This case is particularly relevant because of the impact of the transboundary movement of hazardous waste on small island developing states (SIDS) and the existence of specific national projects to advance in the implementation of the Basel Convention. Detailed analysis of the national reports evidences that Barbados provides information about its progress on obligations regarding legislation, information and regulations for transactions in hazardous wastes, but it does not submit information on the generation, export, and import of these substances, which reflects on the need for systematic and scientific monitoring mechanisms to support developing countries in fulfilling all the obligations under the convention.

In the case of the Stockholm Convention, there are also similar cases of countries that have full compliance with the reporting obligations, but register low scores. Specifically, Indonesia and the Central African Republic rank 95th and 110th in the overall convention's results with index scores of 2.55 and 2.02 respectively. Furthermore, none of the countries that ranked as bottom performers have fully complied with their

reporting obligations. Switzerland, on the other hand, illustrates the government’s full engagement in the chemicals and waste cluster conventions, and the fact that the country hosts the conventions' secretariats. Switzerland is the top performer (with a score of 4.67 for 2014) among the countries that fully comply with their reporting obligations.

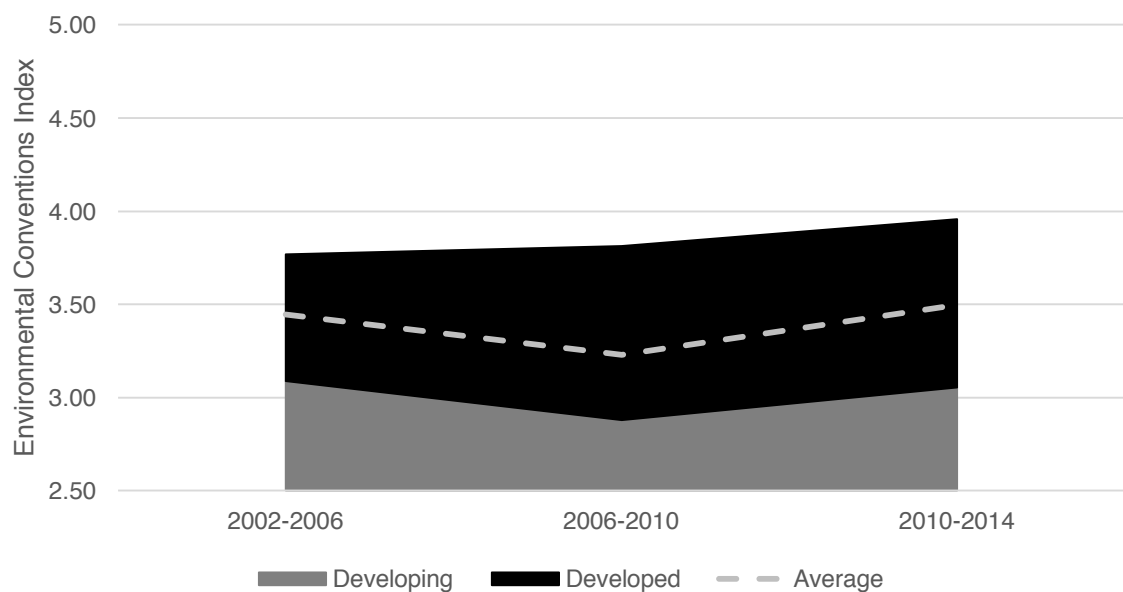
Figure 14 Evolution of implementation index for Basel Convention



To finalize, the analysis of the historical trends of the process of implementation also reveals important patterns. In the Basel Convention, the average index has increased at an annual equivalence rate of 15 percent, going from 3.56 in 2001 to 4.08 in 2015. This trend is similar for developed and developing countries, with variation rates of 14 and 15 percent respectively (see Figure 14). The region that has progressed the most is the Americas. In the case of the Stockholm Convention, the average implementation index has maintained the same level from the first reporting cycle (2002-2006), which had an average score of 3.44, to the third reporting cycle (2010-2014), in which the average

index score was 3.42. This apparent stagnation is caused by the lack of progress among developing countries, where the average index score has only improved from 3.09 to 3.10 across the three reporting cycles (see Figure 15). Even some state parties in regions such as Africa, the Americas, and SIDS have registered declines in their level of implementation. As more countries submit their reports for the third reporting cycle, the real trends of these indicators would be confirmed.

Figure 15 Evolution of implementation index for Stockholm Convention



The evolution of the process of implementation for both the Basel and the Stockholm conventions reflects multiple realities not only for specific countries but also for the conventions' institutional structures and leadership. First, it is evident that additional efforts are required to improve compliance with national reporting. Second, contrary to arguments presented by the literature, and by some analyses developed by policy-makers and NGOs (Selin, 2009, 2010; UNEP, 2012a), which argue that the

chemicals and waste agreements are not being implemented, evidence from the ECI shows a wide spectrum of results that confirm the engagement of developing countries and economies in transition in the chemicals regime and reflect the importance of factors such as the availability of data, comprehensive regulations, national capacities, cooperation, and funding in the process of implementation (Fiedler, 2008; Selin, 2010; UNCSD, 2011; UNEP, 2012a). These results call for analysis to determine which factors—besides the level of development—act as the main obstacles to progress, so that both conventions and countries can address them. Data are also required to connect the definition of national policies with the effectiveness of the conventions. According to the Global Chemicals Outlook, for example, more than 70 percent of the countries that have submitted information on hazardous waste generation to the Basel Convention reported an increase of 12 percent in average in these substances (UNEP, 2013a). Furthermore, even though developing countries and economies in transition are decreasing the amount of hazardous waste they import, the amount exported has increased considerably. In the case of POPs, positive results have been achieved for some compounds, but some new substances still need to be phased out (Stockholm Convention, 2016d). However, since data are incomplete, additional information is necessary to evaluate the extent to which the conventions are effectively addressing the threat of chemical pollution and its effects on human health and the environment.

Environmental conventions have defined “high priority substances” for countries to establish national policies and baselines (UNEP, 2013a). However, existing disparities in the implementation across types of countries and across regions call for “chemicals policy instruments and approaches that are appropriate to the economic conditions and

strategies” of specific countries (UNEP, 2013a). The use of the ECI allows for a clear assessment of the disparity in the process of implementation across types of countries and across regions, which should be a factor in the design and execution of capacity building and technical assistance programs coordinated by the conventions, other international organizations and donor countries. Additional research will help determine best practices that can be replicated and the type of information collection mechanisms and integrated approaches at the national level to implement the required chemicals policies.

As the chemicals and waste conventions advance in the process to develop joint, synergistic operations at the global and national levels, it is important to determine the extent to which countries are following the guidance and objectives established by the conventions. Greater cooperation and coordination between the chemicals and waste conventions provide an opportunity for capacity building, knowledge transfer, enhanced awareness, and efficiency as well as for improved implementation. Furthermore, the chemicals and waste regime is being integrated with other global agendas. The SDGs—specifically Goal 12 “Responsible Production and Consumption”—aim to achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, a goal that goes hand in hand with the framework of the conventions. Attaining this target will require the full implementation of the conventions, which now have both the opportunity and the responsibility to coordinate their efforts and integrate chemical management strategies in ways that contribute to the ultimate objective of sustainable development at the global, national, and local levels.

CHAPTER 5

THE BIODIVERSITY CONVENTIONS: HOW INSTITUTIONAL ARRANGEMENTS AND ENVIRONMENTAL ISSUES INFLUENCE IMPLEMENTATION

Biological resources, and the services they provide, are essential for human well-being. They provide food security, human health, clean air and water, livelihoods, and economic development, factors all that are critical to poverty reduction and sustainability (CBD, 2009; MEA, 2005). Despite their value and relevance, the interaction of population growth, socio-economic development, and scientific and technological progress increases the pressure on these resources, causing their decline (UNEP, 2012a). Specific threats to biodiversity resources include extinction, degradation, overexploitation, pollution, climate change, and the presence of alien invasive species (Secretariat of the Convention On Biological Diversity, 2014). The extinction risk of species, the loss of natural habitats, the presence of invasive alien species, the indiscriminate and unregulated access to genetic resources, and the degradation of protected areas are some of the indicators that raise concerns. In 2016, the IUCN published an updated assessment of its Red List. Of the more than 85,000 species evaluated, 24,300 (28 percent) are threatened with extinction (IUCN, 2016). Furthermore, relevant studies suggest high rates of decline for global wetland area, both in area and in quality (Ramsar Secretariat, 2015e; Secretariat of the Convention On Biological Diversity, 2014).

Biodiversity is defined as the “variability among living organisms from all sources, including the diversity of genes, people, species, communities and ecosystems” (United Nations, 1992b Art. 2). As natural resources bring different perspectives into their management and conservation, their diversity should be maintained and protected. Therefore, both the resources—organisms and ecosystems—and their contribution to life on Earth should be protected (Rayfuse, 2007). This contribution or value is categorized as instrumental, inherent, and intrinsic (Bowman & Redgwell, 1996). *Instrumental value* refers to the use of the resources, not only in terms of production and consumption, but in issues such as education and recreation. *Inherent*, refers to the non-use values based on aesthetic, spiritual, or religious considerations, and *intrinsic* refers to their value as entities, independently of economic or external considerations. Under these definitions, the protection of these resources is critical.

Approaches to the management of biological resources has evolved over time, following changes in the balance between environmental considerations and economic activities. Starting from a very basic consideration of resources allocation among states, management of biological resources has evolved into approaches such as protection, preservation, conservation and sustainable use (Rayfuse, 2007). These concepts have been used in international regulations. The evolution of the system of global environmental governance offered various perspectives to address the different components of biodiversity (UNCED, 1992; United Nations, 1972, 2002). For the past five decades, the international system has adopted regulations to address the challenges of species extinction, biodiversity conservation and sustainable use, wetlands conservation and sustainable use, among other issues, and to protect the benefits these

resources provide for people. Most recently, the SDGs specifically established two goals to protect Life below Water (SDG14) and Life on Land (SDG15) to protect marine, coastal, and terrestrial biodiversity.

As part of the study of global environmental conventions, scholars have discussed the creation, evolution, and effectiveness of the different agreements that protect biodiversity. Debates have also addressed the relationship between nature and economics (Clapp & Dauvergne, 2011; Nunes, Van Den Bergh, & Nijkamp, 2003; Perrings & Gadgil, 2003; WCED, 1987). Furthermore, issues such as the lack of resources mobilization, effective biodiversity strategies and plans at the national level, and knowledge and monitoring (UNEP, 2012a), have raised questions about the role and relevance of the biodiversity conventions, and about how the different dimensions of resources management they address may influence global progress in the protection of these resources. However, as in the case of the chemicals and waste regime, empirical evidence and systematic analysis are required to assess how the conventions are being implemented and contribute to the overall strategies for biodiversity protection, conservation, and sustainable use.

This chapter demonstrates the degree to which the Ramsar Convention and CITES are being implemented and contribute to addressing the challenges of wetlands degradation and loss as well as illegal wildlife trade. It discusses how factors such as the nature of these problems, and the institutional arrangements established by the conventions determine the degree to which countries fulfill their different obligations. Specifically, it shows how developing countries are making substantive progress in wetlands conservation, and how the decisions and procedures established by the Ramsar

Convention's executive bodies are a factor for successful implementation. On the other, it highlights how the complexity of environmental problems such as illegal wildlife trade may affect the process of implementation, and the importance of reporting and enforcement mechanisms.

This chapter uses a similar structure than Chapter 4 to characterize the biodiversity conventions, discussing first the nature of the specific problems they address, the context in which they were negotiated and drafted, and their objectives and institutional characteristics. From there, it presents an assessment of the implementation of the Ramsar Convention and CITES, analyzing membership, level of national reporting, and results for the Environmental Conventions Index (ECI) across type of countries and regions, the historical evolution of implementation since 2001, and the top and bottom performers. Comparing the implementation results from these two strands of the global efforts for biodiversity conservation is fundamental to determining three things: first, the extent to which biodiversity conventions can work together, developing synergies that facilitate their operations and their contribution to sustainable development (UNEP, 2016b); second, how the institutional arrangements and strategies that the conventions define influence the process of implementation; and third, which are the existing gaps in the implementation of the legal regime for biological resources. Only by understanding these three issues would it be possible to continue advancing the global agenda for the conservation, restoration, wise use and sustainability of biodiversity and its benefits for people and a healthy planet (Secretariat of the Convention On Biological Diversity, 2014).

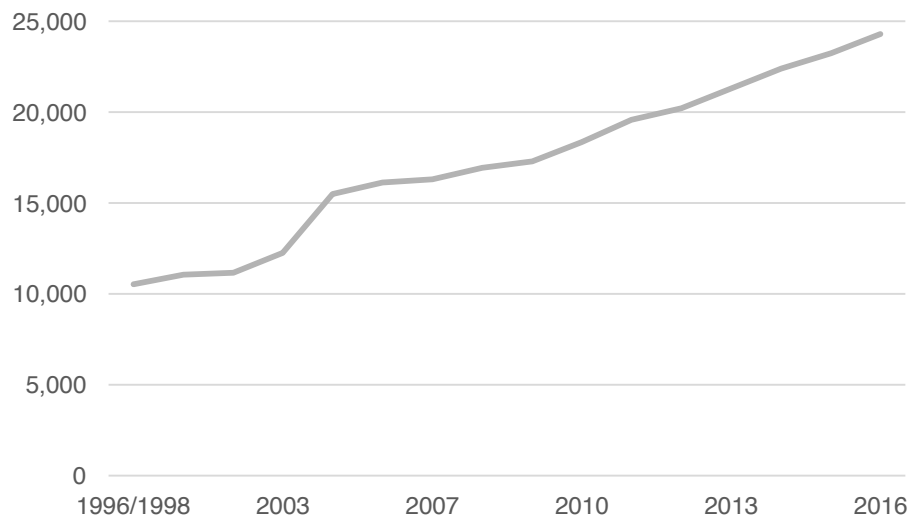
The legal regime for biodiversity: Species, ecosystems, their use and benefits

Biodiversity provides important benefits for the humans and the planet. Biological resources, their benefits, and diversity, represent “capital asset(s) with great potential for yielding sustainable benefits” (UNCED, 1992 para. 15.3). Each resource or ecosystem faces different challenges, but overall the pressure of human activities, development, and growth leads to their degradation and loss (Brooks et al., 2006). Nonetheless, the consequences of habitats and species loss are increasingly economic in nature. The increasing connection between biodiversity, poverty reduction, climate change, food security, and sustainable livelihoods puts biological resources at the core of the sustainable development agenda. Reducing the negative impacts on biodiversity is thus critical to advance towards sustainable development (Secretariat of the Convention On Biological Diversity, 2014).

As the Millennium Development Goals concluded in 2015, it was clear that by 2010 the world had failed to achieve the target of reducing the rate of biodiversity loss (UNEP, 2012b; United Nations, 2015a). Multiple variables exemplify the seriousness of the threats and challenges in biodiversity conservation, and continued decline in populations, species, and habitats. Even though the net loss of forest slowed, 5.2 million hectares of forest were lost each year between 2000 and 2010 (UNEP, 2012a). This is particularly concerning, considering that 1.6 billion people still depend on forests for their livelihood (United Nations, 2015b). Threatened species have increased from 10,500 in 1996/1998 to 24,300 in 2016 (see Figure 16) (IUCN, 2016). And fisheries captures more than quadrupled from the early 1950s to the 1990s, as fish provide 20 percent of animal protein to about 3 billion people (United Nations, 2012b). Furthermore, habitats’

conditions have declined more than 20 percent since the 1980, wetlands and coasts being the most affected ecosystems (UNEP, 2012b). The Wetland Extent Index estimates a 40-percent global decline in the extent of both marine/coastal and inland wetlands between 1970 and 2008 (Ramsar Secretariat, 2015e; Secretariat of the Convention On Biological Diversity, 2014).

Figure 16 Number of species included in the IUCN Red List



Source of data: (IUCN, 2016)

In the past five decades, cooperation to protect biodiversity has evolved. Different approaches to managing biological resources (Bowman & Redgwell, 1996) have been part of the discussions and decisions at the environmental governance summits. In 1972, at the Stockholm Conference, concerns about the “ecological balance of the biosphere” and the “destruction and depletion of replaceable resources” were some of the motivations for placing environment at the center of the international agenda (United Nations, 1972). Twenty years later, the concept of biodiversity was fundamental in the agenda of the 1992 Rio Earth Summit, and governments reaffirmed the need to balance

environment and development policies, guaranteeing the protection of national resources, and their sovereign exploitation within countries (United Nations, 1992a). Agenda 21 focused its approach to biodiversity on its conservation and sustainable use, recognizing that it was not limited to species or resources, but include the variability of genes, species, populations and ecosystems (UNCED, 1992). Four fundamental threats to biodiversity were identified at the Earth Summit: habitat destruction, over-harvesting, pollution, and the inappropriate introduction of foreign plants and animals. In addition, Agenda 21 recognized the value and sustainable benefits that biodiversity would have for present and future generations. In the next twenty years, commitments to the protection of biodiversity were reaffirmed (United Nations, 2002). In 2012, the Rio+20 summit offered a comprehensive approach to biodiversity conservation, including specific references in its declaration to terrestrial and marine biodiversity, and connecting these resources to economic activities such as agriculture and tourism (United Nations, 2012a). In addition, the Rio+20 declaration reinforce the importance of area-based conservation measures (para. 177).

In a parallel but interconnected process, since the 1970s the international community also worked on the definition of international agreements for biodiversity. The 1971 Ramsar Convention on Wetlands of international importance, the 1973 Convention on International Trade in Endangered Species (CITES), the 1979 Convention on Migratory Species (CMS), and the 1992 Convention on Biological Diversity (CBD) were at the core of international cooperation and law for biodiversity conservation. These instruments established specific measures to regulate conservation, define sustainable use, reduce the threat of extinction, and guarantee the benefits that biodiversity provide

for humankind. The SDGs maintained this approach, and through the SDG14 and SDG15, incorporated specific targets to sustainably manage marine and coastal ecosystems; regulate harvesting and overfishing; conserve coastal and marine areas; ensure the conservation, restoration, and sustainable use of ecosystems; and take action to end poaching and the traffic of protected species, among many other targets (UN General Assembly, 2015).

The next section describes the main international law instruments for biodiversity conservation through a more detailed historical analysis of the Ramsar Convention and CITES, the two biodiversity agreements included in this study.

Biodiversity Regulation

Towards the mid-twentieth century, discussions in the international community made clear that natural resources required protection and conservation efforts against over-exploitation. Back then, countries were mainly concerned with their distribution and their sovereign exploitation. However, around the discussions that led to the creation of UN Environment in 1972, new visions about the urgency and relevance of protecting biodiversity resulted in more structural approaches and institutional frameworks (Baakman, 2011). The Ramsar Convention and CITES were some outcomes from this period.

In 1962, different NGOs called attention to the importance of wetland ecosystems. The IUCN established the MAR project for the conservation and management of wetlands. This led to an international conference organized by the International Waterfowl & Wetlands Research Bureau, whose main outcome was an

agreement on the need for an international wetlands conservation treaty (Matthews, 1993). After years of negotiations, a draft was presented for approval at the Ramsar Conference, organized by the government of Iran in the city that gives its name to the convention. The text of the convention was approved by representatives of 18 nations in 1971 and entered into force in 1975 (Ramsar Secretariat, 2015b). The Ramsar Convention's main mission is the conservation and wise use of all wetlands (Ramsar Convention, 2014; UNESCO, 1971). To achieve this goal, the convention established specific criteria for its list of wetlands for a list of Wetlands of International Importance—"the Ramsar List"—that are subject to specific conservation strategies. Currently, there are 2,264 Ramsar Sites that cover more than 2.1 million square kilometers (Ramsar Secretariat, 2017b).

In the 1980s, the COP started discussions to create a permanent secretariat (Ramsar Convention, 1980). The Ramsar Convention first established the Ramsar Bureau, which duties were to be performed by IUCN. Functions of the bureau included the organization of the meetings of the COP, the maintenance of the Ramsar List, tracking—in coordination with the parties—the changes in the ecological character of the listed wetlands, and making recommendations on wetlands management (UNESCO, 1971 Art. 8). After different discussions about the legal status of the secretariat and which organization should host it, IUCN was selected and in 2012, the COP meeting renewed the hosting arrangements with this organization (Ramsar Convention, 2012b). The Standing Committee meets once a year to oversee the convention matters and the activities of the secretariat (Ramsar Convention, 1987). Two other bodies—the Scientific and Technical Review Panel and the Communication, Education, Participation and

Awareness Oversight Panel—provide technical guidance and collaborating in the formulation of policies. The main activities of the convention are handled through a strategic plan defined every eight years to establish priorities, goals, and indicators (Ramsar Secretariat, 2015c). The convention also works closely with stakeholders, the private sector, and other conventions (see Box 4).

Box 4 International Organization Partners in the Ramsar Convention

In 1999, the Ramsar COP established an innovative measure of institutional cooperation, through the establishment of partnerships with “international organization partners” that provide support, technical advice, implementation assistance, and financial resources. IUCN, Birdlife International, Wetlands International, and the WWF have been partners to the convention since its beginnings. Later, the International Water Management Institute and the Wildfowl & Wetlands Trust were granted this status.

Source: (Ramsar Convention, 1999, 2005c; Ramsar Secretariat, 2015d)

Not long after the adoption of the Ramsar Convention was adopted, a similar approach was taken for CITES. The origins of the convention go back to the 1960s, when the general assembly of IUCN started a campaign to develop an international instrument for species conservation (Epstein, 2006; Hill, 1990; Hutton & Dickson, 2000), recognizing that commercial development, illegal trade, hunting, and trapping were among the major threats that increase species vulnerability and risk of extinction (Hill, 1990; UNEP, 2012a). This coincided with the U.S. passage of regulation to prevent the import of endangered species, and with the meeting of the Stockholm Conference and the creation of UN Environment. These factors resulted in the drafting and signature of CITES, also known as the Washington Convention, with nine original signatories: Chile, Cyprus, Ecuador, Nigeria, Sweden, Switzerland, Tunisia, the U.S. and Uruguay. Entering into force in 1975, CITES now has 183 state parties.

CITES has two key objectives: to reduce the effects of trade on threatened species and to establish a system to ensure that trade in other species is sustainable (Hill, 1990; Patel, 1995). To achieve these goals, three basic principles serve as the foundation of the agreement: the recognition of biodiversity and its value, the role of people and states in the protection of biological resources, and the need for international cooperation to prevent the over-exploitation of nature through international trade (IUCN, 1973). The agreement's legal text identifies its key components:

- Regulations for signatory parties to achieve CITES' objectives, including the system of permits and certificates and the procedures to manage the species lists (Art. III to VIII, X and XIII)
- National institutional arrangements and the convention's organizational bodies (Art. IX, XI and XII)
- Legal matters of the convention as an international treaty, including ratification, entry into force, amendments and dispute resolution (Art. XIV to XXV)

To support its regulations, the treaty established a detailed control system based on three appendixes that include species under different levels of risk (Hill, 1990; IUCN, 1973). For each of the lists, CITES defines specific measures to guarantee that trade operations (exports, imports and re-exports) are conducted under conditions that do not generate or increase the risk of extinction. Therefore, the focus of the convention is highly operational. Additionally, the convention counts on an institutional structure to support its activities and establishes connections with other environmental organizations. The most important body is the COP, which according to Martin (2000) conducts probably the best organized meetings of the environmental conventions. Decisions at

COPs are based on specific rules of procedure that include different voting mechanisms for each issue. The COP meets every two or three years to consider amendments to the list of species protected by the convention, analyze reports, recommend measures to improve the effectiveness of the convention, and make the necessary institutional and financial provisions for the normal functioning of the secretariat (CITES, 2013c). Observers, including non-state parties, UN agencies, representatives from other conventions and NGOs can participate in the COP in addition to state parties.

Three committees carry out the key functions in the inter-sessional periods between COPs (CITES, 2000a, 2013c). The *standing committee* provides policy guidance to the secretariat on the implementation of the convention. It also oversees the management of the secretariat's budget and carries out other tasks assigned by the COP. Membership in the standing committee includes regional representation, the agreement's depository government (Switzerland) and the host countries for the previous and next COP meetings. The standing committee usually meets once a year. The *animals and plants Committee* establishes connections between the convention and the scientific specialized knowledge about species of animals or plants that are or might be part of CITES appendices. This committee also provides technical support for decision-making at COP meetings, and recommends action to the parties regarding the regulation of unsustainable trade. Finally, the CITES *executive secretariat* is administered by UN Environment. Its functions include coordination, advice, communications, monitoring, assistance, recommendations, and information provision (IUCN, 1973 Art. XII). The secretariat is also responsible of arranging meetings of COPs and permanent committees, and servicing those meetings.

Two other conventions complement the biodiversity legal regime. Following the recommendations of the UN Conference on the Human Environment regarding species inhabiting international waters or migrating from one country to the other (United Nations, 1972), Germany led the work to draft a convention to grant protection to migratory wildlife. The Convention on Migratory Species (CMS), also known as the Bonn Convention, was adopted in 1979 and entered into force in 1983. The CMS brings together states to develop internationally coordinated conservation measures throughout a species' migratory range (Baakman, 2011; CMS, 1979). It establishes a series of general standards, and facilitates the conclusion of regional agreements to address threats to specific species based on their taxonomy or geographical location (Baldwin, 2011; Caddell, 2005). Currently the convention has 124 parties.

In 1988, concerned about the increasing threats to ecosystems and species and about the recognition of the value of biological diversity, UN Environment convened an Ad Hoc Working Group of Experts on Biological Diversity to explore the need for an international convention on this topic. In 1991, an intergovernmental committee started the negotiation process that led to the adoption in 1992 of the text of the Convention on Biological Diversity (CBD). The agreement was opened for signature at that year's Earth Summit, and entered into force in 1993, 90 days after the thirtieth country ratified it (McConnell, 1996; Secretariat of the Convention On Biological Diversity, 2004). The CBD is a comprehensive and holistic agreement that covers ecosystems, species, and genetic resources.

To achieve its objectives, the CBD established various instruments (Le Prestre, 2002). In addition to the 1992 convention, it has approved two protocols: the Cartagena

Protocol on Biosafety to regulate the handling, transport and use of living modified organisms, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, approved in the tenth meeting of the COP (Secretariat of the Convention On Biological Diversity, 2000, 2010). In that same session, parties adopted the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. The plan was conceived as an overarching framework for the conservation and use of biodiversity to be used by the entire UN system and other partners engaged in biodiversity policy and management (CBD, 2010; Mace et al., 2010). In this context, the other biodiversity conventions are working to establish strategies and targets that converge with the Aichi targets and correspond to specific environmental issues. Furthermore, each country is required “to prepare a national biodiversity strategy (or equivalent instrument) and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact (positive and negative) on biodiversity” (United Nations, 1992b Art. 6).

Even though the CBD can definitively be considered a framework convention, each of the agreements listed above addresses an important component of the protection of biodiversity under the common goal of conservation and sustainable use. Each agreement also has its own legal, political, and practical implications. Table 19 summarizes the objectives of each of the main conventions in the regime. In 2012 the then governing council of UN Environment recognized the need to enhance cooperation and synergies nationally and regionally (UNEP, 2012c). Since then, UN Environment has carried out various activities to discuss and elaborate options for possible ways of “enhancing synergies in the implementation of biodiversity-related conventions” (UNEP,

2016a, 2016b). However, these arrangements have not led yet to any legal or administrative changes in the nature of the conventions and their executive bodies.

Table 19 Environmental agreements for biodiversity conservation

	Year	Parties ²⁴	Main objectives
Ramsar Convention	1971	169	<ul style="list-style-type: none"> • The conservation and wise use of wetlands through actions at the international, national, and local levels, as a contribution to achieving sustainable development. The parties commit to: <ul style="list-style-type: none"> ○ Work towards the wise use of wetlands ○ Designate suitable wetlands for a list of Wetlands of International Importance (Ramsar sites) and ensure their effective management ○ Cooperate internationally on transboundary wetlands, shared wetlands systems, and shared species
CITES	1973	183	<ul style="list-style-type: none"> • Ensures that the international trade in specimens of wild animals and plants in risk of extinction does not threaten their survival. • Establishes certain controls for the export, import, and re-export of species that identified as threatened. Controls are based on three lists (appendices) with different trade regulations: <ul style="list-style-type: none"> ○ Appendix I includes species threatened with extinction, for which trade is permitted only in exceptional circumstances. ○ Appendix II includes species not necessarily threatened with extinction but in which trade must be controlled. ○ Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling trade.
Convention on Migratory Species	1979	124	<ul style="list-style-type: none"> • Provides of a global platform for the conservation and sustainable use of migratory species and their habitats. • Brings together the states through which migratory animals pass and establishes international mechanisms for coordinated conservation measures throughout this range. Parties are expected to: <ul style="list-style-type: none"> ○ provide immediate protection to all endangered migratory species (Appendix I), and ○ work on the adoption of agreements for the conservation and management of migratory species which an unfavorable conservation status (Appendix II) • Promotes, cooperates in, and supports research relating to migratory species.
Convention on Biological Diversity	1992	196	<ul style="list-style-type: none"> • Conservation of biological diversity. • Sustainable use of the components of biodiversity. • Fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Source: (CMS, 1979; IUCN, 1973; UNESCO, 1971; United Nations, 1992b)

²⁴ The data presented in this study are updated to December 31, 2016.

As this comprehensive biodiversity regime evolved, concerns emerged about the effective and coherent implementation of the corresponding conventions. The environmental problems addressed by the Ramsar Convention and CITES persist (DeSombre, 2017). With Ramsar, the conversion of wetlands, and the lack of data collection are critical factors, affecting in particular the creation of wetlands inventories and the monitoring of their ecological characteristics (Ramsar Secretariat, 2010; UNEP, 2012a). In the case of CITES, the management of wildlife trade and use requires the strengthening of border controls, training, public campaigns to raise awareness, and enforcement (UNEP, 2012a). Since the two conventions take different approaches to implementation, two specific factors require further analysis. While both conventions aim to protect natural resources, they are affected by different threats; for CITES the complexity of illegal wildlife trade creates continual new challenges. In addition, the institutional arrangements that countries set up for each convention, and the strategies and procedures they define—such as national reporting, capacity building, and technical assistance—influence their effective translation into national policies and the consequent success of the conventions themselves.

Implementing the Ramsar Convention and CITES

Human activities, development, urbanization, and increasing economic expansion continue pressing biological resources towards degradation and depletion. Regulations need to be enforced to guarantee that the conventions that protect these resources are being implemented, and that their implementation contributes to sustainable development. In the case of the Ramsar Convention, data gathering and assessment, and

targeted strategies are critical factors to stopping and reversing the loss and degradation of wetlands and their services to people (Bowman, 2002; Bridgewater, 2008; Mauerhofer, Kim, & Stevens, 2015). In the case of CITES, data on the number of transactions of illegal trade of endangered species evidences that there is still much work to do. More legislation, policies, strategies, and enforcement mechanisms are required to control trade transactions under the convention (S. Young, 2003). In addition, CITES needs to engage with different actors in the fight against the criminal activities behind illegal wildlife trade (Curlier & Andresen, 2002).

Based on the ECI, the next two sections provide empirical evidence of how implementation of the Ramsar Convention and CITES has differed over time. Three findings emerge from this analysis. First, that the procedures established by each convention for national reporting result in different outcomes in terms of compliance. Second, developing countries are strongly engaged in both the Ramsar Convention and CITES, their membership, national reporting, and policy development. In the case of Ramsar, especially, developing countries are achieving remarkable results, and they can use their experience and practices to participate more actively in global environmental governance. Third, the nature of the environmental issues addressed by these agreements influences the process of implementation. In some cases, the socio-economic and cultural value of wetlands and their ecosystem services increases the interest of governments and stakeholders to engage in their conservation. Similarly, the complexity of the criminal networks behind the traffic of endangered species has created a definite obstacle in the enforcement of CITES. For all these areas of concern, countries need additional implementation and enforcement mechanisms to advance implementation (Bowman,

2002; Dickson, 2009; Ferrajolo, 2011; Hepworth, 1998; Mauerhofer et al., 2015; McOmber, 2001). Bringing empirical evidence to the analysis of the Ramsar Convention and CITES explains countries' progress to protection biological resources, and offers insights about how the conventions can work together in addressing the protection and sustainable use of these vital resources.

Membership

As mentioned in Chapter 4, membership analysis is the foundation for determining performance by parties to specific environmental conventions. Since developed and developing countries approach their obligations differently, a characterization of membership is necessary to understand how the distinction between developed and developing countries, and the differences in the availability of natural resources among them, influence how each group of countries implement their obligations.

Membership to CITES reached 183 countries in 2016. The Ramsar Convention has 169 parties, fewer than the other conventions analyzed in this project, a distinction that can be explained by the specific nature and geographical location of wetlands ecosystems (see Figure 17). Out of total countries, 28 percent are developed countries and 72 percent are developing. CITES similarly has 26 percent—48 countries—being developed, and 74 percent—135 countries—being developing. Even though the two conventions were adopted close in time and have increased their memberships since then, more developing countries joined CITES sooner. By 1992, CITES had 115 parties, of which 87 (76 percent) were developing countries, while the Ramsar Convention had 74

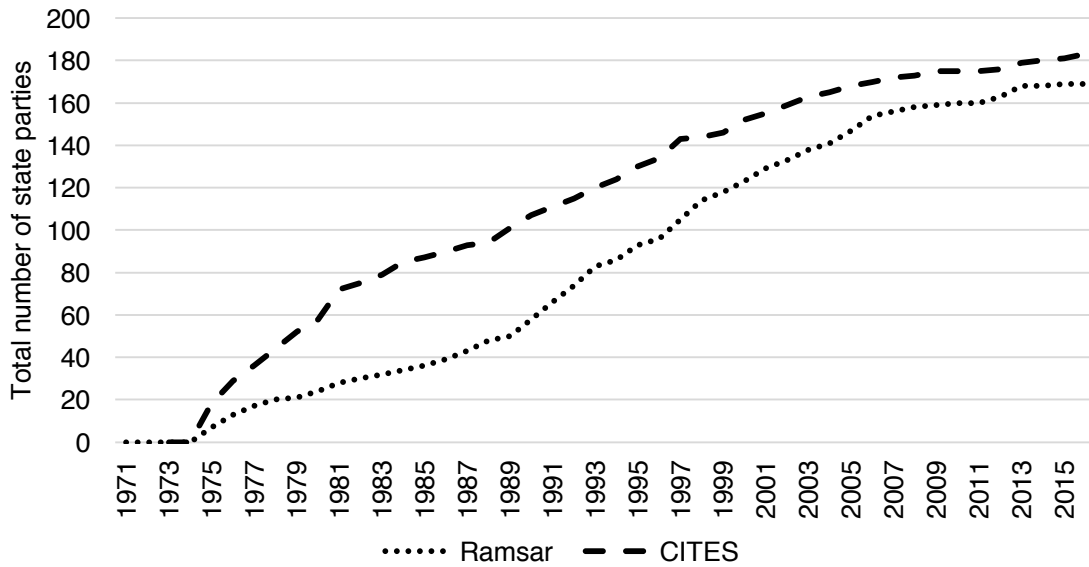
parties, with 53 percent (39 countries) being developing. The 1992 Earth Summit definitively contributed to the ratification of the agreements, particularly for Ramsar, which more than half of the parties joined after 1993. In addition, nine countries joined the Ramsar Convention and eight joined CITES joined the conventions after 2010. These new parties for Ramsar came mostly from Africa, South East Asia, the Pacific and the Middle East, whereas new members for CITES represented other parts of the world, as well as the EU, which joined in 2015.²⁵

Both conventions, however, also have gaps in membership. Notable absences in CITES include mainly Small Island Developing States (SIDS). Nine of the fifteen countries that have not joined CITES are SIDS, including Kiribati, the Marshall Islands, the Federated States of Micronesia, Nauru, and Tuvalu. This can be partially explained by these nations' limited resources and the critical importance of climate change on their environmental policies. In the case of Ramsar, the list of non-state parties is longer. Twenty-four UN member countries are not parties to Ramsar, including Angola, Ethiopia, Guyana, and Saudi Arabia. SIDS that are absent from the convention include Dominica, Maldives, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Singapore, Tonga, Tuvalu and Vanuatu. Some of these absences—such as the cases of Afghanistan and Qatar—could be explained by geographic and biosphere characteristics such as the absence of wetland ecosystems, and by their political challenges. Other cases—such as Ethiopia—are due to internal political dynamics. Only three African nations have not ratified Ramsar: Angola, Ethiopia, and Eritrea. Contrarily to the case of the chemicals

²⁵ Andorra, Bhutan, Grenada, Kiribati, Kuwait, Oman, South Sudan, Swaziland, and Zimbabwe are the countries that joined the Ramsar Convention, while Angola, Bahrain, the European Union, Iraq, Lebanon, Maldives, Tajikistan, and Tonga are the countries the latest parties to CITES.

conventions, the US is one of the original signatories of CITES and joined the Ramsar Convention in 1987. Appendix D presents a summary of the membership for the conventions included in this study.

Figure 17 Historical evolution of the membership in the Ramsar Convention and CITES



Sources of data: (CITES, 2016c; Ramsar Convention, 2015b)

Membership in the biodiversity conventions brings up two issues. First, developing countries engaged in both agreements from the start. Given the nature of wetlands and biodiversity, and the value they represent for societies and economies—in some countries the use of biological resources and ecosystems services are key to economic output—it is critical that nations protect and guarantee the sustainability of these resources.

Furthermore, the differences in membership between the Ramsar Convention and CITES, and with the CBD and the CMS, even when due to geographic considerations—such as absence of wetlands ecosystems or migratory species, may affect the

implementation and the synergies in the biodiversity cluster. Nineteen countries are members of CITES but not the Ramsar Convention, while five countries—Andorra, Kiribati, Marshall Islands, South Sudan, and Turkmenistan, are parties to Ramsar only. Ten countries are non-parties in both conventions.²⁶

National Reporting

The Ramsar Convention and CITES have different approaches to the process of national reporting (see Table 20). While Ramsar organizes its reporting obligations around the meetings of its COP, CITES has a dual system.

Table 20 National reporting mechanisms for the Ramsar Convention and CITES

	Ramsar Convention	CITES (Art. VIII para. 7)
Reporting requirements	<p>Defined by the standing committee for each COP. Reports should include:</p> <ul style="list-style-type: none"> • Data and information on how the convention is being implemented, including indicators on strategic plans, the Scientific and Technical Review Panel, and on the Communication, Education, Participation, and Awareness Strategies • Lessons and experiences to help state parties develop future action. • Identification of emerging issues and challenges that require attention • National reports, which provide an opportunity for countries to draw attention to their achievements 	<p>CITES requires parties to submit two reports to collect information on the implementation of the convention:</p> <ul style="list-style-type: none"> • Annual trade report on the number and type of permits and certificates granted for trade operations in the species listed on the convention appendices • A biennial report on the measures taken for implementation²⁷
Reporting cycles	Reporting cycles correspond to each meeting of the COP (every three years in average), and are submitted by the countries to the secretariat. The questionnaire was standardized to multiple choice questions in 2005	Biennial

²⁶ This include Cook Islands, the Democratic People’s Republic of Korea, Haiti, the Federated States of Micronesia, Nauru, Niue, Palestine, Timor-Leste, Tuvalu, and the Vatican City. However, these, except for the Holy See, are parties to the CBD.

²⁷ For the implementation analysis included in this study only the biennial reports are considered.

	Ramsar Convention	CITES (Art. VIII para. 7)
Reports available	2005 (COP9), 2008 (COP10), 2012 (COP11), 2015 (COP12)	Biennia 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, and 2013-2014

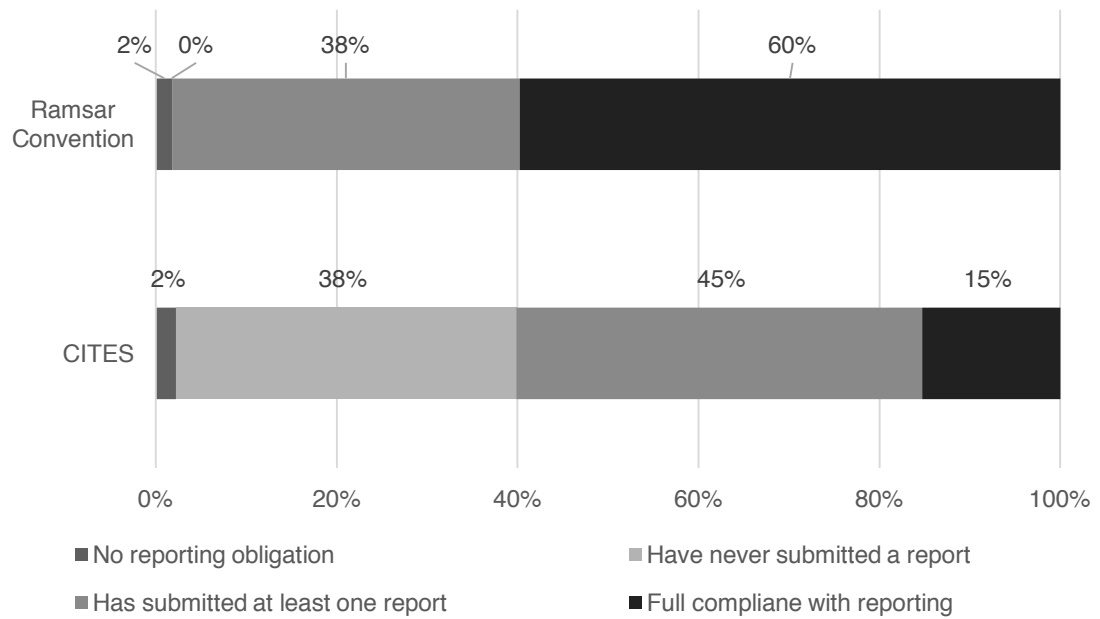
Source: (CITES, 2000b; IUCN, 1973; Ramsar Convention, 2013)

According to Art. VIII para. 7 of the CITES convention countries shall prepare and transmit to the secretariat an annual report containing a summary of the permits and certificates granted for trade transactions, the states with which such trade has occurred, and the quantities and types of specimens; and a biennial report on the legislative, regulatory, and administrative measures taken to enforce the provisions of the convention (IUCN, 1973). Both reports are considered central to the monitoring of the implementation of the convention. Data from the annual reports goes into a database that provides the basis for comparative trade analysis to verify the overall compliance and effectiveness of the CITES. In addition, parties have agreed to specific measures to address non-compliance with the annual reports. If a party fails to submit the annual report for three consecutive years, the case should be presented to the standing committee, and this instance decides on recommendations to the parties to not authorize trade operations in CITES specimens with countries that are not fulfilling this obligation (CITES, 2000b). Currently, 31 countries are subject to trade suspensions, three of them—Afghanistan, Grenada, and Lesotho—because of their failure to submit annual reports (CITES Secretariat, 2017).

Reporting rates for the two conventions differ dramatically. The analysis based on the level of compliance with reporting obligations and the national reporting rates, shows the outcomes and challenges of the different reporting systems established by the biodiversity conventions. In the case of the Ramsar Convention, a key initial finding is

the high rate of compliance with reporting obligation and submission of national reports. An average of 137 reports are submitted to each meeting of the COP, which represents 88 percent of the countries that are parties to the convention (Ramsar Convention, 2005a, 2008, 2012a, 2015a). Sixty-eight percent of the countries have submitted all required reports, and all state parties with reporting obligations have submitted at least one report since 2005 (see Figure 18).

Figure 18 Compliance with national reporting obligations in the Ramsar Convention and CITES

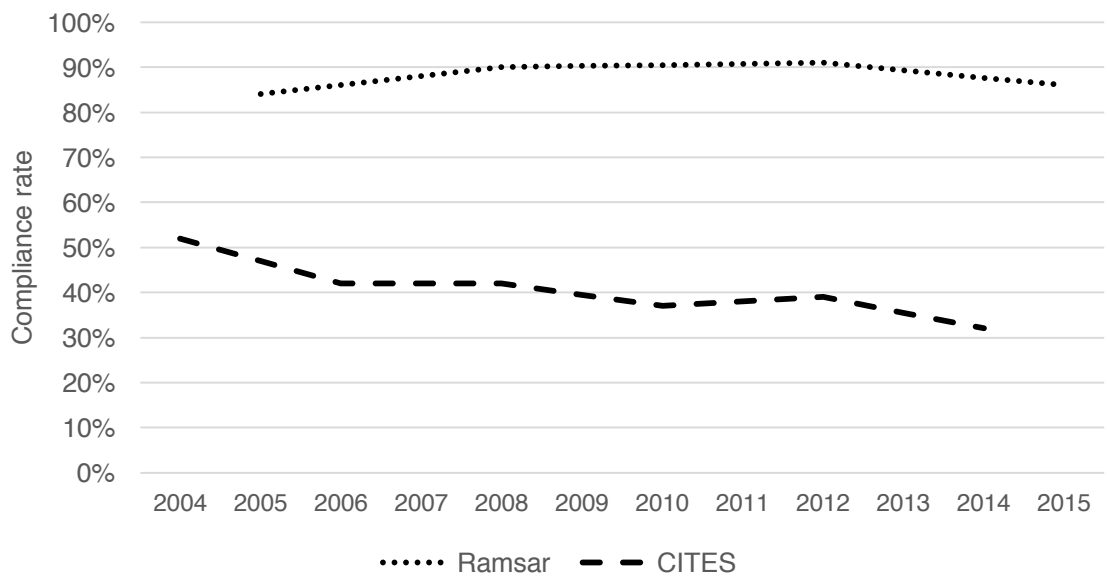


Only six countries—Bahrain, Belize, Jordan, Luxembourg, Malta, and Nicaragua—have struggled with the process of national reporting, submitting only half or less of the reports.²⁸ Compliance with reporting for CITES is considerably lower (CITES, 2016a). Only 28 countries—18 of them developed states—have submitted all required

²⁸ See Appendix E

reports. Interestingly, countries such as Barbados, Bolivia, Costa Rica, Malaysia, and Thailand have fully complied with this obligation. Since these countries are some of those with a larger number of species at risk under the IUCN Red List, this raises questions about the influence that the nature of problem addressed by a convention has on fulfilling the reporting obligations (IUCN, 2016). In addition, the evolution of the reporting compliance rates also evidences important challenges for CITES. For Ramsar countries report an average of 88 percent of the time, for CITES the average is only 39 percent, and it has systematically decreased from 52 percent for 2003-2004, to 32 percent for 2013-2014 (see Figure 19). Thirty-nine percent of the countries have not submitted a report since 2010, and 69 countries—equivalent to 38 percent of the parties—have never submitted any of these biennial reports. Sixty-six of the countries in this group are developing.

Figure 19 Historical evolution of general compliance to national reporting obligations in the Ramsar Convention and CITES

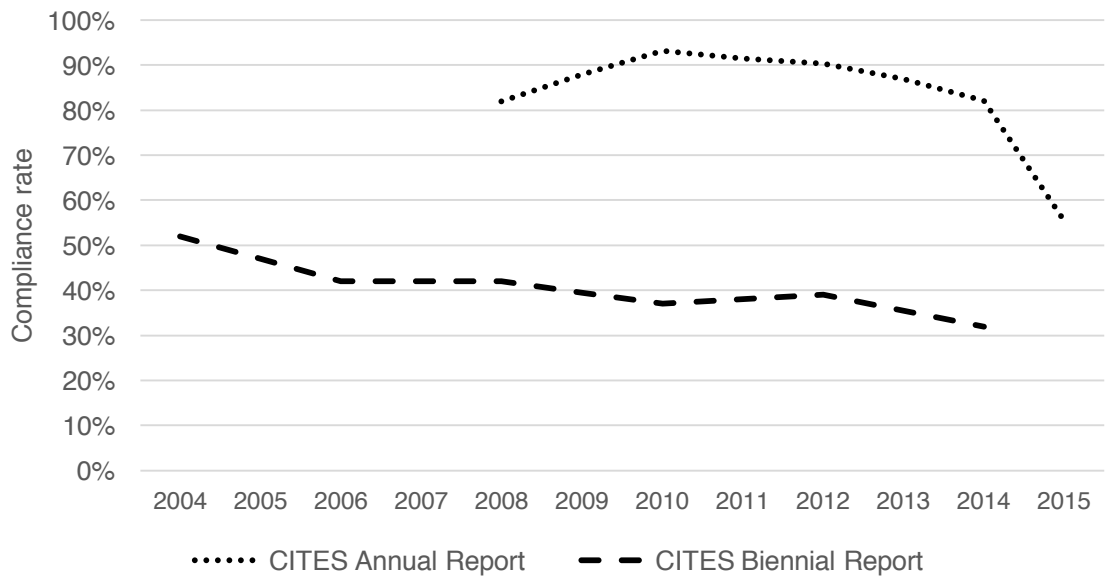


Interestingly, the submission of annual trade reports for CITES shows different behavior. On average, 84 percent of the countries submit their annual reports every year, as recent efforts from the secretariat and the COP have stressed the importance of this fundamental obligation. Eighty-three countries have submitted reports for every year since records have been available (2008-2015), 60 percent of them (50 countries) developing nations. Sixteen countries, all of them developing and mostly from Africa and Asia, have not reported since 2013. Furthermore, there is often a significant delay in the submission of the reports. Annual reports for 2015 were due in October 2016, but only 100 of the 180 countries had submitted their data by February 2017. Figure 20 presents a comparison between the compliance rate with each of the reports established for CITES. Data for annual reports before 2008 is not available for analysis.

These differences in compliance with reporting requirements between the biodiversity conventions emphasize the importance of the institutional arrangements that the conventions prescribe for the process of data collection and reports submission. The Ramsar Convention exemplifies that specific strategies and approaches to the national reporting process result in better outcomes. Three factors make the national reporting process for Ramsar different: the preparatory process, the submission of the reports, and the use of the information in the reports (see Box 5). On the other hand, the format for the biennial reports to CITES has not been adjusted since 2003, and even though the secretariat follows up and urges parties to submit their reports at least one year before each meeting of the COP, the submission rate has not improved (CITES, 2000b). Analysis of the national reporting records of CITES also evidences critical delays in the submission of reports. On average, reports are submitted a year after they were due.

Morocco for example, only submitted its reports for 2009-2010 and 2011-2012 in 2014. Panama submitted all the reports in 2010 for the three biennia between 2003 and 2008. This delay seriously impacts the availability and use of the information, including preventing the secretariat from having enough and timely information for decision-making processes.

Figure 20 Comparative compliance rate with reporting obligations for CITES



Box 5 National reporting process in the Ramsar Convention

The Ramsar Convention’s standing committee defines specific procedures for the convention’s national reports.

Preparatory process

- Approximately two years in advance the standing committee approves the national report format (NRF) for the next COP. In the process of agreeing to these questionnaires, the standing committee takes into consideration the previous formats; the convention’s strategic plan; the need to reduce, if possible, the parties’ reporting burden; and the simplification of the process for handling information and completion of the reports.

- The NRF is also expected to permit continuity of the analyses of progress in implementation, by ensuring that indicator questions are maintained through the different reporting cycles.
- The NRF is distributed to the parties about one year prior to the COP.
- Once the parties are working on the completion of the reports, the secretariat closely follows up the process, through the different focal points, and organizes regional meetings.

Submission of the reports

- Reports are expected to be submitted at least nine months before each COP meeting.
- The convention counts on its regional senior advisors to coordinate with the parties for the submission of the reports.

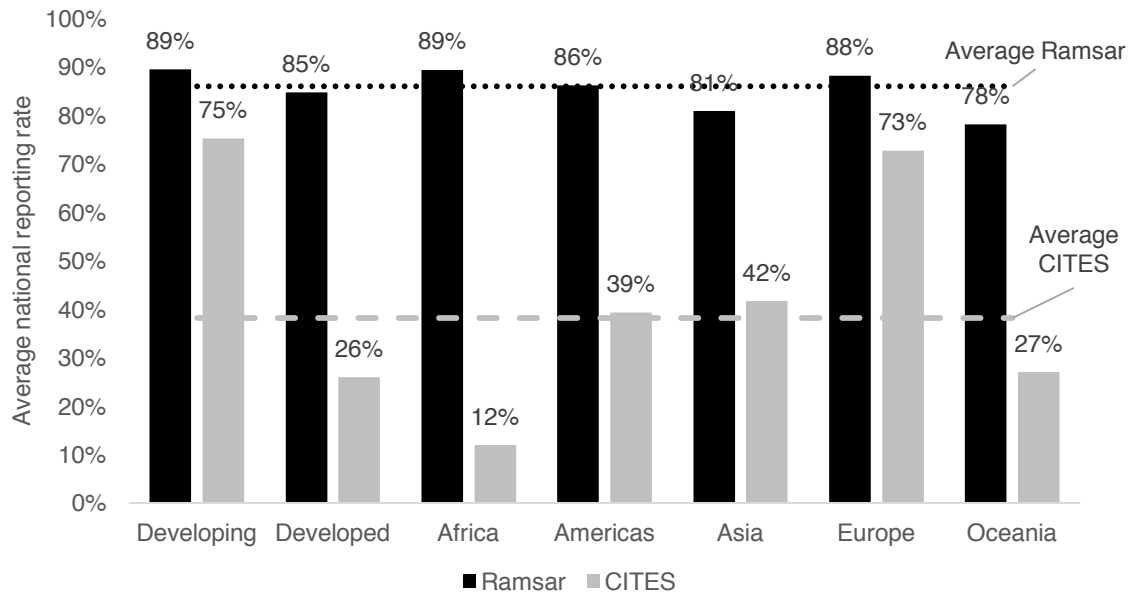
Use of the reported information

- National reports provide the basis for reporting by the secretariat to each meeting of the COP on global and regional implementation and on progress in meeting the conventions' obligations.
- Provision of information on specific implementation issues supports the decision-making and recommendations at each COP.
- Assessment of time-series progress on specific aspects of the implementation of the convention and its specific programs
- Submission of reports on collaboration with other conventions, particularly the CBD

Source: (Ramsar Convention, 2013)

Classification of regions and types of countries also confirms the different reporting behaviors of the Ramsar Convention and CITES. For the former, both developed and developing countries have shown similar behaviors in terms of national reporting, with average reporting rates of 89 percent and 85 percent respectively (see Figure 21). The same can be said about the regions, since all of them have similar averages (above 80 percent), except for Oceania, where three of the eight countries that are parties to the convention—the Marshall Islands, Palau, and Papua New Guinea (Burundi, Cabo Verde, Guinea Bissau, Libya, Sao Tome and Principe, and Sierra Leone)—have failed to submit all required reports. On a positive note, only 6 of the 50 African countries that are parties to the Ramsar Convention have submitted half or less of the reports. For the rest, national reporting rates are 75 percent or higher, with 35 countries having submitted all reports.

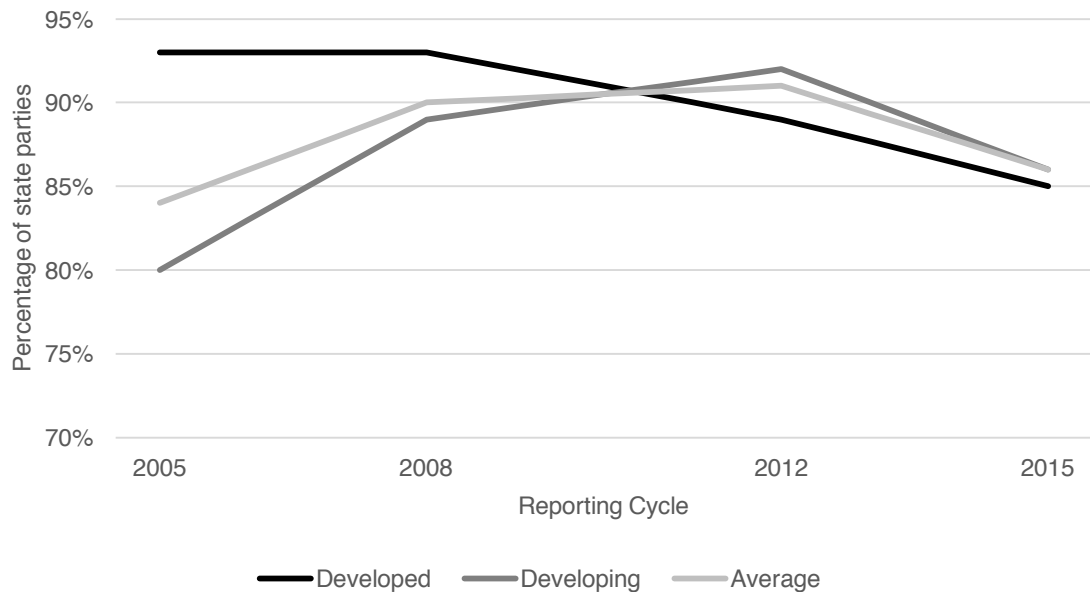
Figure 21 Average national reporting rate by category of countries and regions for the Ramsar Convention and CITES



The national reporting rates for CITES reveal a different pattern. First, there is a critical difference between the averages for developed (75%) and developing (26%) countries (see Figure 21). Out of the 135 developing countries that are members to CITES, 66 have never delivered the biennial reports, and 39 have only do so half or less of the times. Across regions, the level of development creates the disequilibrium between Europe and the other regions. Fifty percent of the countries that have fully complied with their reporting obligations are in Europe. The rest of the developed nations that have the same behavior are Canada, Japan, New Zealand and the United States. Average reporting rates for Africa and Oceania are considerably lower. Sixty percent of the countries (41) that have never reported come from these two regions. Only five countries in Africa have reported half or more of the times: Ethiopia, Mauritania, Morocco, Mozambique, and Swaziland.

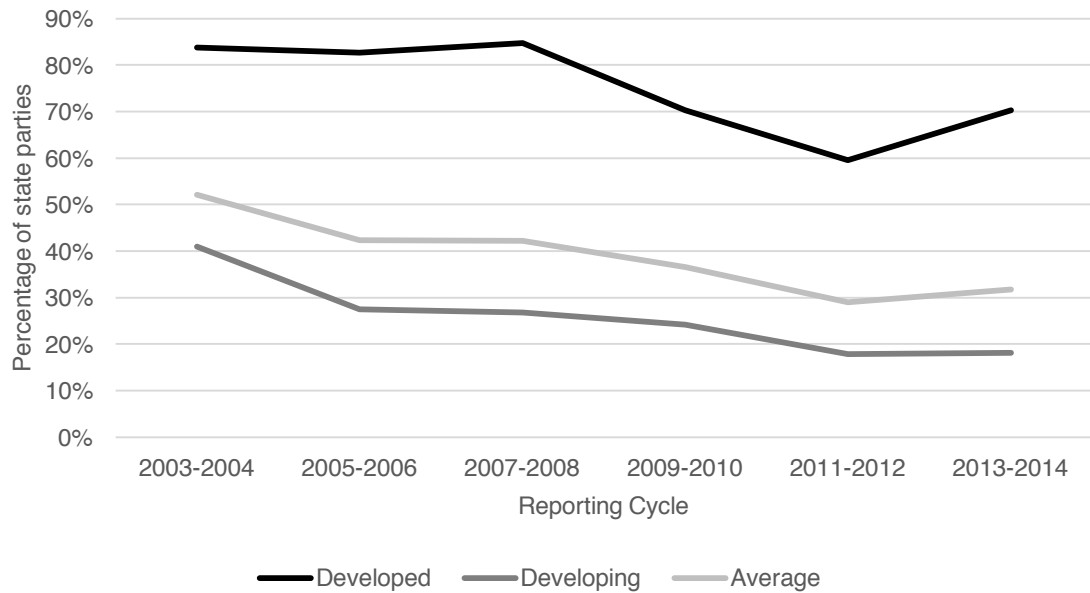
The historical evolution of compliance with reporting obligations is also different across different types of countries and regions. For the Ramsar Convention, the number of developing countries that submit their reports has been significant since the 2005 reporting cycle, when 80 percent of the developing state parties (77 countries) fulfilled this obligation. In 2015, this increased to 104 countries (86 percent). For developed countries, the number has slightly decreased, going from 42 to 40. However, changes in membership cause a more relevant decrease in the compliance rate, going from 93 percent to 85 (see Figure 22). Factors such as the structure of the national reporting process and the importance of wetlands ecosystems at the socio-economic level may explain this situation. Also, the materiality of wetlands facilitates its monitoring and the assessment of the changes in their ecological character.

Figure 22 Evolution of national reporting indicators for the Ramsar Convention



For CITES, the number of countries submitting reports between 2003 and 2014 considerably decreased, from 86 to 57 (see Figure 23). However, developing countries performed much more poorly than this. Submission of biennial reports declined from 50 countries for the 2003-2004 biennium, to 24 (18%) for 2013-2014.²⁹ This is particularly concerning considering that membership only increased by 11 states in the same period. Factors such as challenges enacting legislation to protect endangered species, lack of capacity, and lack of institutional resources should be considered.

Figure 23 Evolution of national reporting indicators for CITES



Implementation

In the case of the Ramsar Convention, 166 countries have submitted at least one report for the meetings of the COP between 2005 and 2015. They register an implementation index spectrum in which developing countries are at the top of the

²⁹ See Appendix F

ranking. ECI scores range from 0.28 (Luxembourg) to 4.65 (Mali). This reflects the importance of wetlands for developing countries. A detailed analysis of individual country results shows that of the eleven countries ranked in the top ten for the ECI (from 4.33 to 4.65), ten are developing (see Figure 24). Only France, with an ECI of 4.36, ranks at the top of the convention. Other developed countries follow closely—New Zealand, Australia, Austria, and the United Kingdom—rank in the top twenty performers for this agreement, but still most the countries with high implementation scores are developing. This is even more significant when considering that 87 percent of the countries' scores correspond to recent assessments since they are based on reports submitted for COP12 in 2015.³⁰

At the bottom level, eleven countries have low implementation ECI scores (see Figure 25). Two of them—the Former Yugoslav Republic of Macedonia and Luxembourg—are classified as developed countries. Seven of the other nine bottom performers are in Africa, including Cote D'Ivoire, Chad, Swaziland, Sao Tome and Principe, the Democratic Republic of Congo, South Sudan, and Djibouti. African wetlands are considered some of the most productive and biologically diverse ecosystems in the world. However, the ways that countries in the region are prioritizing their development policies (land use, drainage, agriculture, and settlement) is increasing the risk of overexploitation of natural resources and inadequate planning (Gardner, Connolly, & Bamba, 2009). In this sense, the Ramsar secretariat has launched specific initiatives to support African countries in their wetland conservation efforts. An example of this is the

³⁰ See Appendix G

Figure 24 Environmental Conventions Index - Top performers for the Ramsar Convention³¹

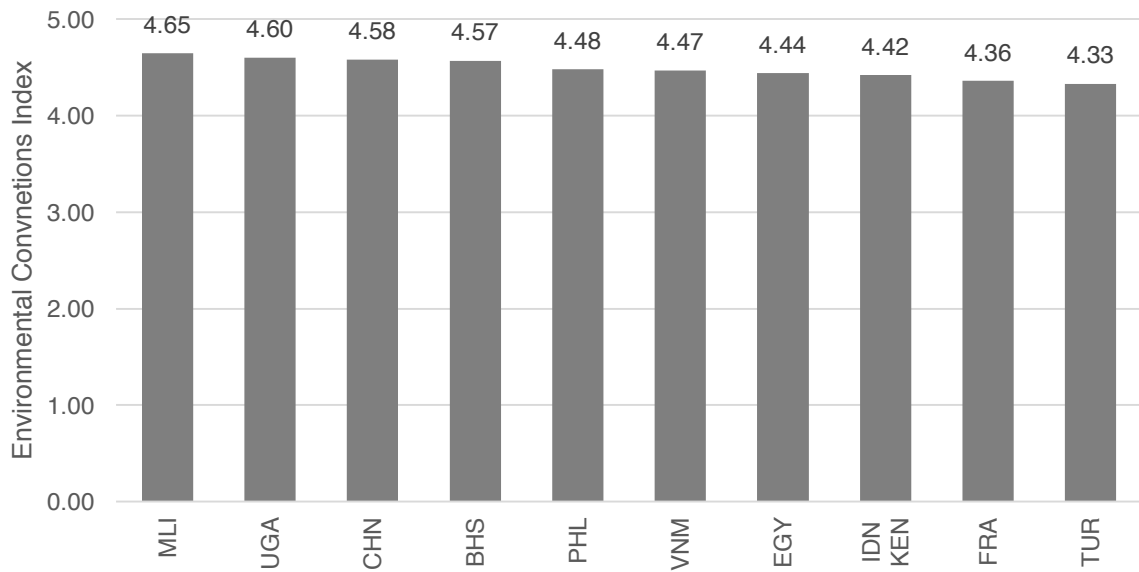
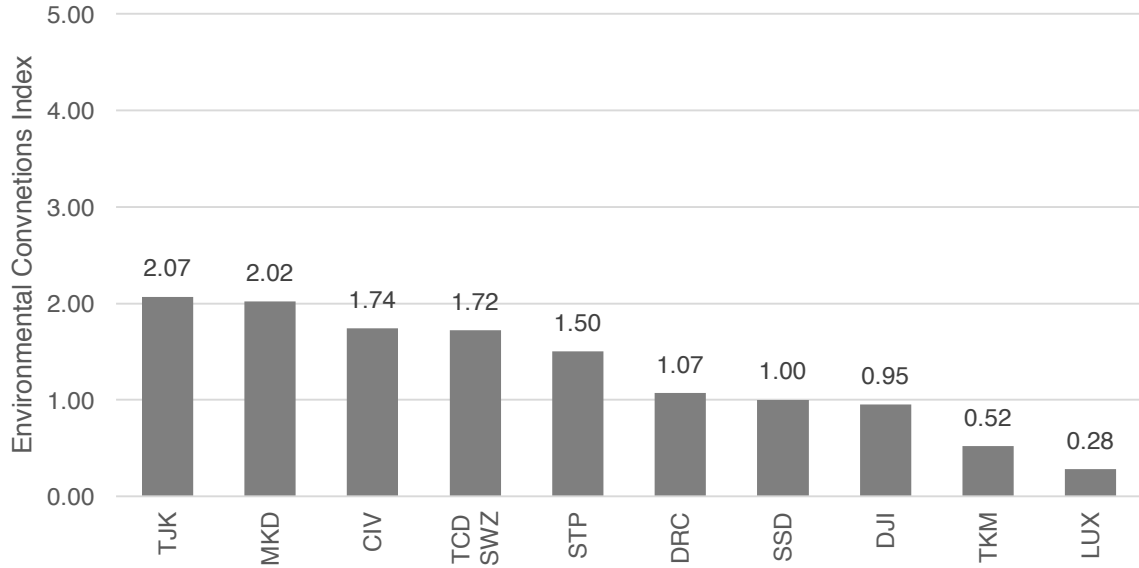


Figure 25 Environmental Conventions Index - Bottom performers for the Ramsar Convention



³¹ See Appendix H

Global Wetland Africa initiative, developed in partnership with non-governmental organizations and the European Space Agency. The project provides technology and tools to assess the condition of wetlands and better monitor their trends over time (Ramsar Secretariat, 2015a).

For CITES, the ECI developed results for 110 countries over the six reporting cycles analyzed (2003-2014). ECI scores for these countries range from 1.05 (Antigua and Barbuda) to 4.61 (Philippines) (see Figure 26). A more detailed analysis of the ECI scores reflects first that developing countries are obtaining positive results. Of the twelve countries with the top ten scores for CITES, 75 percent (9 countries) are developing, including Mozambique, Peru, and Nepal. Interestingly, seven of those countries are in Asia, and five—Indonesia, Malaysia, Philippines, Thailand, and Viet Nam—are in the southeast region of that continent. This deserves special attention, considering that multiple studies have established that Southeast Asia is a wildlife trade hotspot, a region that faces disproportional challenges in terms of wildlife trade management (Nijman, 2010; Rosen & Smith, 2010; Wilcove, Giam, Edwards, Fisher, & Koh, 2013). Despite national and regional efforts of the Association of Southeast Asian Nations (ASEAN) to control this threat, pressures from economic growth, urbanization, expansion of infrastructure, free trade promotion, and development, make this part of the world a “supplier, consumer, and general import-export emporium” for wildlife (TRAFFIC, 2004).

On the other hand, bottom performers include countries from different regions around the world. The bottom scores range from 2.07 (Serbia) to 1.05 (Antigua and Barbuda) (see Figure 27). Countries are evenly distributed among developed and

Figure 26 Environmental Conventions Index - Top performers for CITES

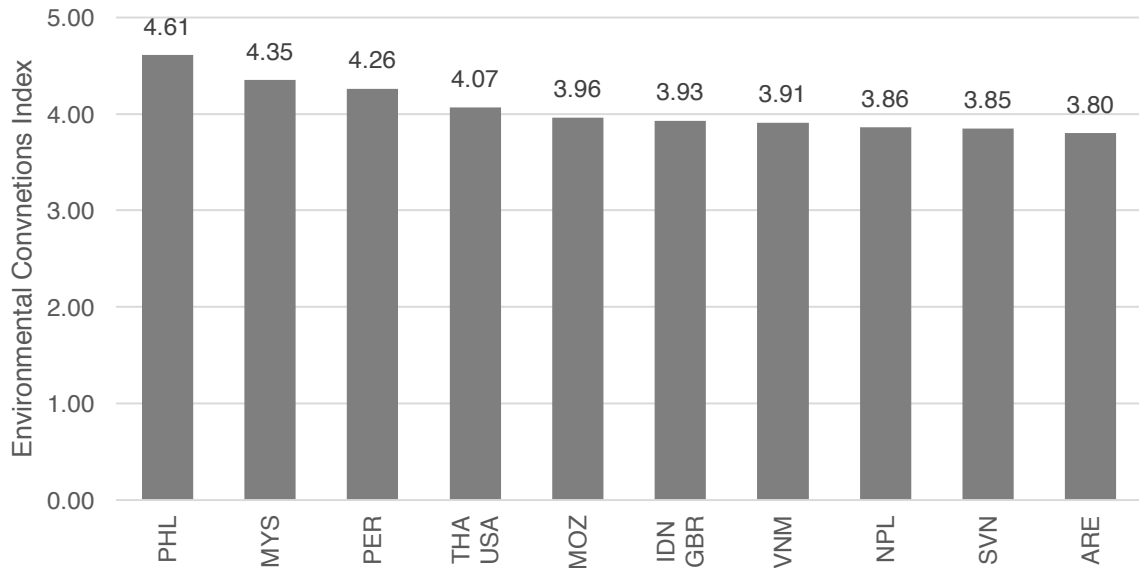
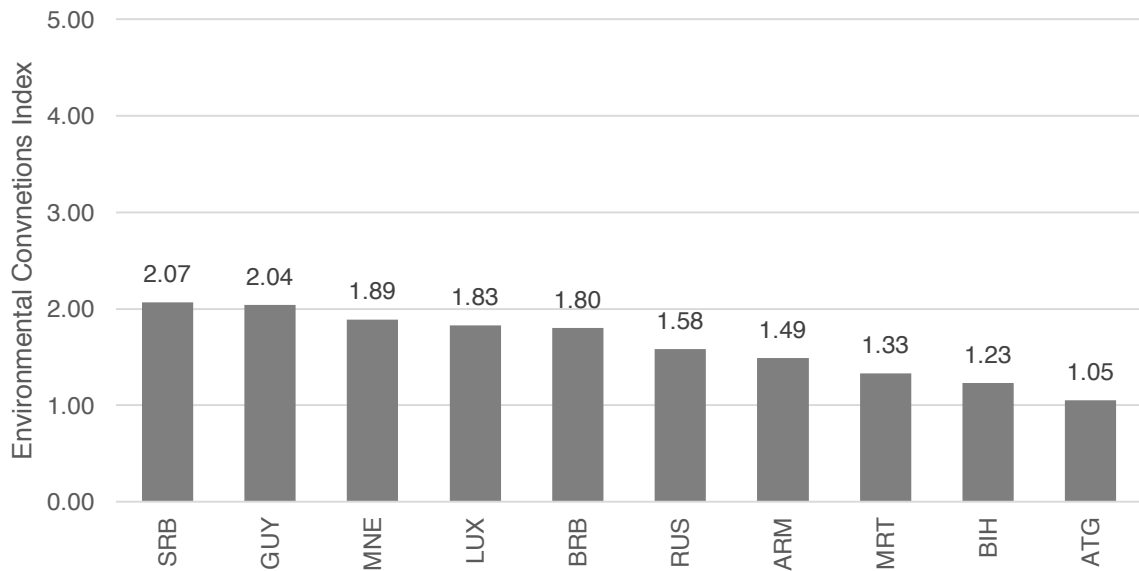


Figure 27 Environmental Conventions Index - Bottom performers for CITES



developing nations. Among developed countries, three of the countries were part of the former Yugoslavia—Serbia, Montenegro, and Bosnia and Herzegovina. According to TRAFFIC, the center of illegal hunting of birds in Europe shifted from countries such as Bulgaria and Romania to the former Yugoslav republics (TRAFFIC, 2008), which may

reflect these countries' low degree of implementation. In the same way, three of the developing countries are Caribbean states—Guyana, Barbados, and Antigua and Barbuda—where illegal wildlife trade obeys regional traditional practices of harvesting wild species for food, pet trade, and ornamental and medicinal purposes (CARICOM, 2016). This also demonstrates the lack of an apparent connection between the level of development and progress in implementation of CITES obligations.

A comprehensive analysis of the national reporting rates and the implementation patterns also result in important findings. In the case of Ramsar, the high rates of reporting include countries whose implementation has not been very positive. Five countries with ECI scores of 2.00 or below—the Democratic Republic of the Congo, Djibouti, South Sudan, Swaziland, and Turkmenistan—have submitted 100 percent of the reports that they were obliged to, although their achievements in terms of implementation were not very significant. The first two cases—the DRC and Djibouti—deserve special attention, since they were obliged to report in all the cycles included in this study, and their ECI scores of 1.07 and 0.95 respectively are some of the lowest. Of the top 20 ECI scores, only three countries—Bahamas, Turkey, and Uruguay—failed to submit any reports to the convention.

The situation differs for CITES, given low compliance with the reporting obligations. Out of the 28 countries that have fully complied with their reporting obligations, only three register ECI scores below 2.50: Barbados, Georgia, and Qatar. Barbados is the only country among the bottom performers that has 100 percent reporting rates. Five of the countries ranking at the bottom ten—Antigua and Barbuda, Armenia, Bosnia and Herzegovina, Guyana, and the Russian Federation—have only reported one

third or fewer of the times they were expected to. At the top of the ranking, ten of the twelve countries with positive results have reported more than half of the times.

Interestingly, the country at the top of the board—the Philippines—systematically failed to submit its reports until 2014, and it is this data on the 2013-2014 biennial report grants the country the spot at the top of the ranking.

To finalize, analyzing historical trends of the implementation process also reveals important patterns. For the Ramsar Convention, the average ECI has increased 26 percent in the period included in this study, going from 2.62 to 3.31, with the most significant changes taking place between 2005 and 2008. This trend is more significant among developing countries, since they have improved at a higher rate closing the implementation gap with developed countries (see Figure 28). For the past two reporting cycles, the ECI scores for developed countries have remained stable. Regionally, all regions except Europe have significantly progressed in the implementation of Ramsar, with ECI scores improving an average of 12 percent each reporting cycle for Africa, the Americas, and Asia, and 20 percent for the case of Oceania.

In the case of CITES, ECI scores have increased from 2.83 in the first biennium (2003-2004) to 3.18 in the last reporting cycle (2013-2014), which reflects a total change of 12 percent and an average of 2-percent improvement each biennium. Differences among developed and developing countries are not significant, as they have shown similar behavior (see Figure 29). Regional comparisons, however, result in more relevant findings. All regions except Oceania have managed to improve their degree of implementation. Africa and the Americas improved the most, increasing their average ECI scores by 29 and 16 percent respectively. Africa, however, registered an important

Figure 28 Evolution of implementation index for Ramsar Convention

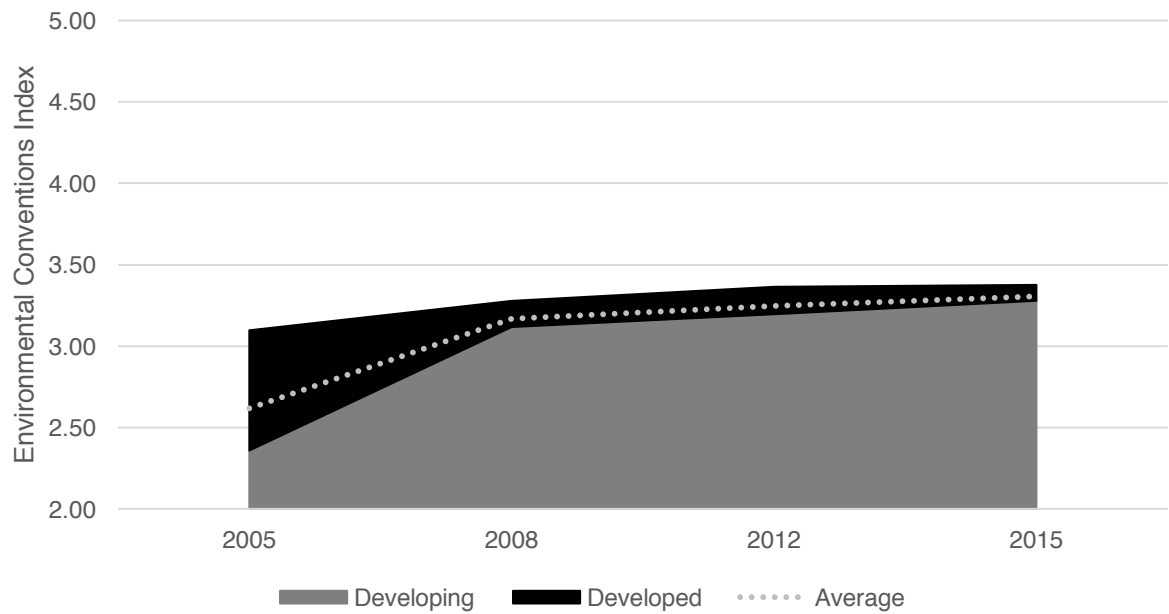
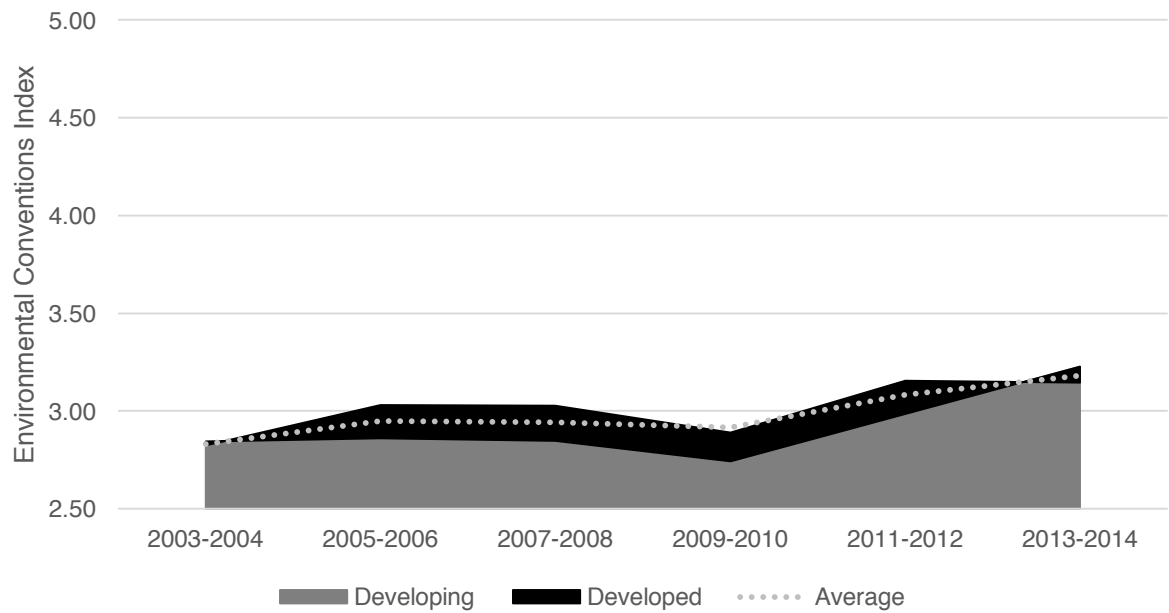


Figure 29 Evolution of implementation index for CITES



decline in their progress for the 2011-2012 biennium. These changes are partially connected to the patterns of national reporting. Starting with the 2011-2012 biennium,

four of the African countries that had traditionally submitted information—Benin, Eritrea, Liberia, and Swaziland—stopped sending their reports. In the Americas, improvement has been steady, but still the number of countries reporting significantly decreased; e.g., Argentina, Colombia, and Venezuela did not submit reports after 2010.

Implementing global environmental commitments around the protection of wetlands and the regulation of illegal wildlife trade reflects the diverse realities of countries and conventions in their national policies, global strategies, and managerial approaches. Evidently, CITES requires additional effort in terms of national reporting. Strategies to update the national reports format and to improve compliance with implementation would definitively contribute to better information for decision-making on global efforts against illegal wildlife trade. Some of these measures have already been established by the CITES COP and executive secretariat. The reporting cycle and national report format have been adjusted, and the next reports are to be submitted in 2018 for the 2015-2017 period (CITES Secretariat, 2016). This will reflect the three-year cycle between meetings of the COP. Reports are expected to measure progress on the CITES Strategic Vision 2008-2020 and the contributions of the convention to the Aichi Biodiversity Targets. On the other hand, the results of the Ramsar Convention exemplify the importance of institutional arrangements for national reporting to obtain optimal outcomes from the process.

Evidence from the ECI shows a wide spectrum of results across and within conventions. Even when the ECI scores for CITES show a larger distance to target, the progress achieved by developing countries deserves special attention. Developing countries demonstrate how the nature of the biodiversity issues influences the process of

implementation. States that are either better equipped or more concerned to address the challenges of wetland degradation and illegal wildlife trade seem to reflect specific implementation patterns. These two problems also register different levels of complexity that may affect the process of implementation. The corporality of wetlands, and the complexity of the criminal activities behind the non-compliance to CITES, are some of the variables that could be analyzed when explaining why countries achieve different results in implementation of the biodiversity conventions. Data is also required to connect the definition of national policies with the effectiveness of the conventions. As habitat losses persist, focused efforts to reduce biodiversity degradation and reduce the extinction risk of threatened species is critical (Ramsar Secretariat, 2015e; Secretariat of the Convention On Biological Diversity, 2014; UNEP, 2012a). Further research will include this type of analysis. Using specific indicators that measure the changes in the ecological character of wetlands, and in the unregulated trade transactions in endangered species, data can be compared with the ECI to determine the extent to which countries that are making progress in the implementation of the convention, are experiencing improvement in the environmental issues that the Ramsar Convention and CITES address. This can also raise awareness and identify the specific strategies that are improving results, and the issues on which progress is still required, to guarantee that all the state parties obtain the same outcomes.

As the fourth *Global Biodiversity Outlook* (GBO-4) explained, biodiversity policies are motivated by multiple factors that are increasingly economic in nature, as these resources are essential for livelihoods, ecosystem services, habitats, and food security (Secretariat of the Convention On Biological Diversity, 2014). International

goals and targets for the protection of biodiversity range from the conventions, to the SDGs and the Aichi targets. However, adherence to regimes, low implementation, and the lack of compliance mechanisms prevent countries from effectively conserving biodiversity (Rayfuse, 2007). Data from the ECI provides the elements for a clear assessment across countries and conventions, which inform decisions to improve the impact and outcomes of the Ramsar Convention, CITES, and the other agreements in the biodiversity regime. Data on best practices and challenges can support how countries assist each other, and establish integrated approaches to biodiversity conservation.

Every day, additional pressures are placed on the life and Earth systems. Decisive work of the parties to the conventions and their executive bodies will be needed to overcome these. As the conventions explore the possibilities for collaboration, it is necessary to determine the degree to which countries are fulfilling the objectives of each agreement. This information will also provide opportunities for capacity building, and technical assistance, to improve compliance, implementation, and effectiveness. Stronger results and collaboration are central to bringing ecosystems back from degradations and overexploitation, and to guarantee that the conventions contribute to the sustainable development agenda. To achieve these results, biodiversity conservation approaches need to be integrated into economic, social, and development policies. Only in this way it would be possible to advance in the value, conservation, and sustainable use of biodiversity in ways that prevent its loss and guarantee benefits for all sectors and all people.

CHAPTER 6

CONNECTING IMPLEMENTATION TO NATIONAL POLICIES AND STRATEGIES

Multiple drivers affect the implementation of global environmental conventions at the national level (Fearon, 1998). As Chapter 2 illustrated, traditional approaches to the implementation of environmental law assume that states comply with all their international agreements. The evidence from the ECI, however, demonstrates that countries make different amounts of progress on their international environmental obligations, and that progress varies on a convention-by-convention basis. In addition to factors such as the functional benefits of international cooperation on the environment (Simmons, 1998; Underdal, 1998), states' reputation (Chayes & Chayes, 1993; Fearon, 1998), or effectiveness in problem-solving (Checkel, 2001; Downs & Jones, 2002; Simmons & Hopkins, 2005; Oran R. Young, 1994), the implementation of global environmental conventions depends on specific factors such as the nature of the environmental problems, the characteristics of each country, the momentum of the international system, and the initiatives developed by the agreements to promote and enforce compliance (Brown-Weiss & Jacobson, 1998; O'Neill, 2009, 2017) (see Table 21). Ultimately, results depend on the specific measures that countries develop to domesticate their international environmental commitments, and on the challenges—internal and external—that they face in the execution of those measures.

Table 21 Determinants for the implementation of environmental conventions

System	Issues	Strategies	Actors
<ul style="list-style-type: none">• Structure of the international system• Governance and leadership• Existence of the necessary conditions for implementation	<ul style="list-style-type: none">• Nature of the issues from which international agreements emerge• Complexity• Availability of information	<ul style="list-style-type: none">• Definition of the objectives, targets, obligations, and mechanisms of enforcement	<ul style="list-style-type: none">• Capabilities of the actors involved• Existence of the necessary conditions for implementation

To understand the process of implementation, it is necessary to connect the results of the ECI with qualitative analysis at the national level that evaluate national legislation, institutions, and other relevant measures. The national implementation profiles allow us to assess with greater empirical evidence how countries define and implement policies to fulfill the various obligations they acquire when joining the conventions. This chapter presents such an analysis for ten countries—Algeria, Argentina, Australia, Canada, Colombia, Czech Republic, Germany, Mozambique, South Korea, and Thailand (see Figure 30)—to exemplify how specific best practices or challenges affect implementation of their obligations. Countries were selected by the Center for Governance and Sustainability at UMass Boston, as part of a research project developed in partnership with the Law Division of UN Environment using three core criteria:

- *Membership*: Only state parties to all the conventions included in this study were considered.
- *Reporting*: Only countries that submitted at least one report from 2010 to 2014 in accordance with each agreement’s reporting cycles are included. An exception was made for CITES, considering the convention’s low rates of compliance with reporting.

- *Representativeness*: To ensure that all UN regions are represented in the study, and that both developed and developing countries are included.

Table 22 shows how the selected countries represent different socioeconomic, developmental, and environmental circumstances. Furthermore, the fact that these ten countries register different national implementation results across and within clusters, confirms that the process of implementation is not static and determined by a set of constant variables, but is rather the dynamic result of the interaction of multiple factors.

Figure 30 Ten country profiled for national implementation

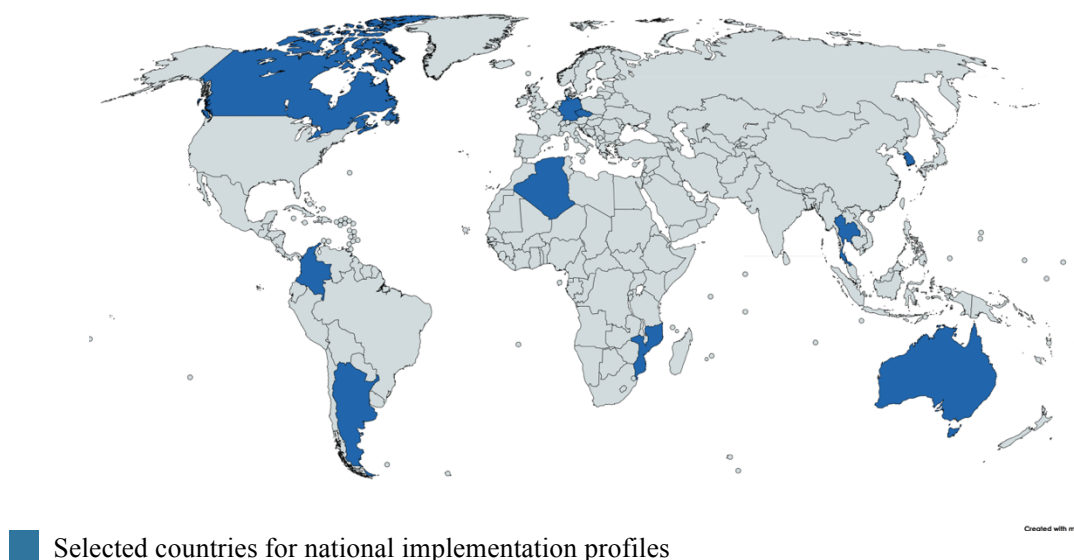


Table 22 Select countries for national implementation profiles

	Algeria (DZA)	Argentina (ARG)
Population	40.3 million	43.0 million
GDP per capita (PPP 2016 est.)	\$15,000	\$20,170
HDI (2016)	0.745 (83 rd)	0.827 (45 th)
Forest areas (% of total)	0.8%	9.9%
Deforestation (Average annual % 2000-2015)	-1.6%	1.0%
	Australia (AUS)	Canada (CAN)
Population	23.0 million	35.4 million
GDP per capita (PPP 2016 est.)	\$48,800	\$46,200
HDI (2016)	0.939 (2 nd)	0.920 (10 th)
Forest areas (% of total)	16.2%	38.2%
Deforestation (Average annual % 2000-2015)	0/2%	0.0%

	Colombia (COL)	Czech Republic (CZE)
Population	47.2 million	10.6 million
GDP per capita (PPP 2016 est.)	\$14,200	\$33,200
HDI (2016)	0.727 (95 th)	0.878 (28 th)
Forest areas (% of total)	52.7%	34.5%
Deforestation (Average annual % 2000-2015)	0.4%	-0.1%
	Germany (DEU)	Mozambique (MOZ)
Population	80.7 million	25.9 million
GDP per capita (PPP 2016 est.)	\$48,200	\$1,228
HDI (2016)	0.926 (4 th)	0.418 (181 st)
Forest areas (% of total)	38.2%	48.2%
Deforestation (Average annual % 2000-2015)	0.0%	0.5%
	South Korea (KOR)	Thailand (THA)
Population	50.9 million	68.2 million
GDP per capita (PPP 2016 est.)	\$37,900	\$16,800
HDI (2016)	0.901 (18 th)	0.740 (87 th)
Forest areas (% of total)	63.4%	32.1%
Deforestation (Average annual % 2000-2015)	0.1%	0.2%

Sources: (Central Intelligence Agency, 2017; International Monetary Fund, 2016; UNDP, 2016; World Bank, 2016)

The qualitative analysis of the implementation profiles seeks to explain countries' results in the ECI. To that end, together with the research team at the Center for Governance and Sustainability, we analyzed primary and secondary sources such as legislative and institutional documents, implementation plans, and NGOs reports to identify the legislative and institutional arrangements for implementation, technical capacity, data management, levels of public awareness, and cooperation. Rigorous research on national measures led to the identification of best practices that facilitate implementation and challenges that hinder it. These factors are then classified according to the specific categories of obligations that are part of the ECI (see Chapter 3). This analysis reflects on the specific interactions that governments develop with conventions, with stakeholders, and between the different national agencies, to work together on specific environmental obligations. These interactions also require capacity, openness, and engagement. The analysis resulted in a typology of eight factors that operate as either

best practices, challenges, or both (see Table 23). The examples characterized under each type of obligation demonstrate how the assessment of implementation connects to the policies, strategies, and measures developed at the national level.

Table 23 Best practices and challenges in implementing global environmental conventions

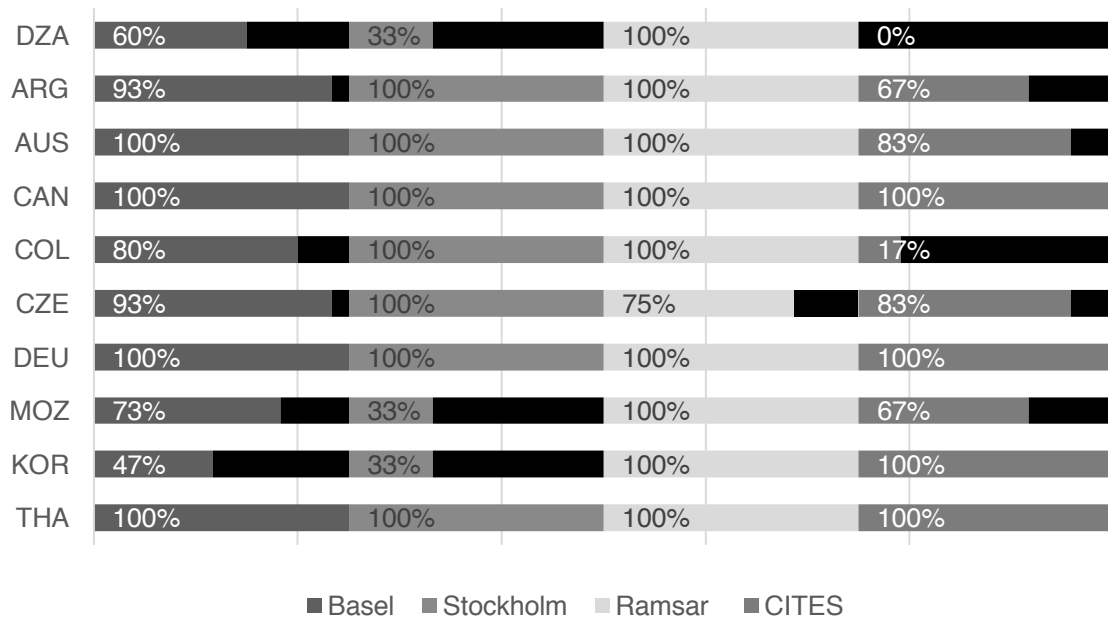
Type of obligation	Factor
Regulation	1. Legislation
Management	2. Institutional arrangements, strategies, and policies 3. Cooperation and engagement
Informational	4. Information, science, and monitoring 5. Public awareness
Technical	6. Technical measures 7. Exogenous factors
Financial	8. Availability of financial resources

Explanatory factors also provide insights for policy-makers at the national and global levels that would enable improvement of performance and the creation of the necessary conditions for the achievement of global environmental goals. Best practices provide a source of information to improve the effectiveness of environmental conventions, and to connect state parties through assistance and capacity-building mechanisms. Furthermore, information on how specific challenges hinder the process of implementation can serve as a foundation for the development of targeted strategies that solve countries' challenges and improve their performance. In this way, academic analysis and policy mechanisms can help improve the process of implementation and the effectiveness of multilateral environmental agreements. If these challenges are not addressed, environmental treaties will be perceived as failed mechanisms, since they will not be fulfilling their problem-solving and cooperation mission.

Implementation Comparison across ten countries

National reports are the main source of information for analyzing the implementation of global environmental conventions. All ten countries included in this study register high rates of national reporting (see). However, there are exceptions. South Korea has not submitted a report to the Basel Convention since 2008, and has, together with Algeria and Mozambique, submitted only one of the three required reports for the Stockholm Convention. Colombia has very low reporting rates for CITES, having submitted only one of the six required reports. Algeria has never reported to CITES. Interestingly, all countries have submitted all their reports to the Ramsar Convention, except for the Czech Republic, which did not submit the latest report due in 2015.

Figure 31 National Reporting Rate by convention and country



The implementation of the conventions varies across and within countries (see Figure 32). While some countries perform similarly across all the conventions, others

register different degrees of implementation among or within clusters. Germany, for example, has very consistent performance. Even when the country has low scores in some cases—as in CITES—it outperforms most other countries. Other countries, like the Czech Republic, register important differences in performance for each of the clusters, with outstanding results in the chemicals cluster for both the Basel and Stockholm Conventions, and low scores in the biodiversity cluster for both Ramsar and CITES. Mozambique, on the other hand, has better results in the biodiversity cluster. Its overall results evidence mid-level performance globally, but this country has some important challenges in the case of the chemicals conventions, particularly in technical management of hazardous wastes and regulations for control of POPs. Mozambique shows important positive results in the protection in endangered species and has considerably improved its implementation for the Ramsar Convention, making it a model both regionally and globally. Australia exemplifies a different trend, with relatively important differences in the implementation within the clusters. Its scores for the ECI evidence important progress in the Stockholm and Ramsar conventions because of the efforts to enable legislation that translates commitments into national policies. However, the results also show the need for additional efforts in the CITES and Basel Conventions, particularly regarding technical obligations. Figure 33 and Figure 34 summarize the results of the ECI for the countries in each of the clusters. The global and regional rankings of the ECI scores contextualize the performance of the countries (see Table 24 – The number in parentheses under each ranking corresponds to the number of countries for which there is data at either the global or the regional level).

Figure 32 Environmental Conventions Index for selected countries, by convention

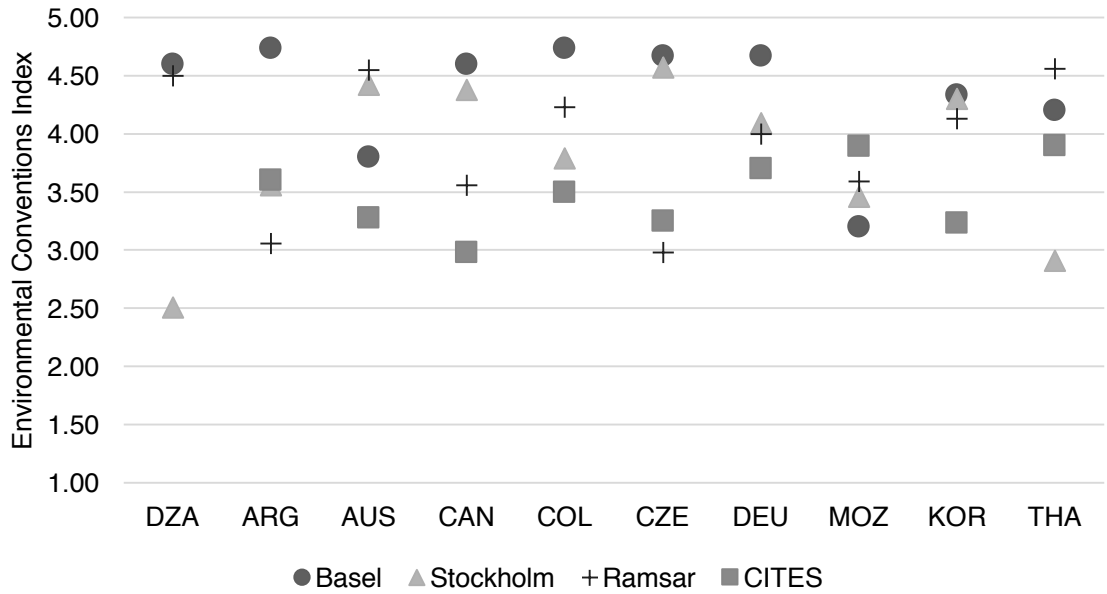


Figure 33 Environmental Conventions Index for selected countries, chemicals and waste cluster

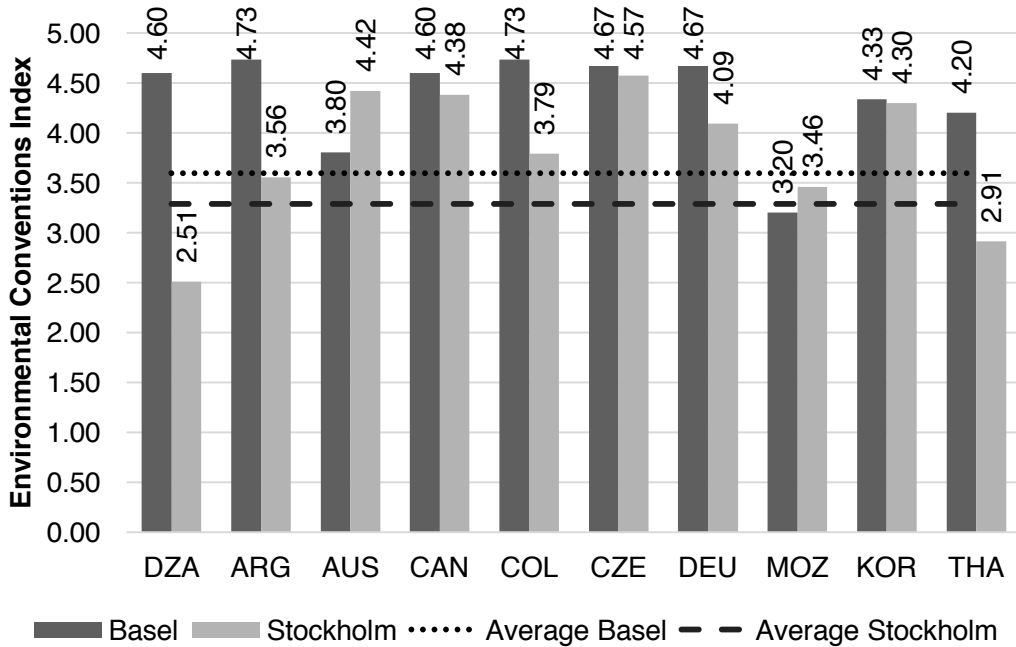


Figure 34 Environmental Conventions Index for selected countries, biodiversity cluster

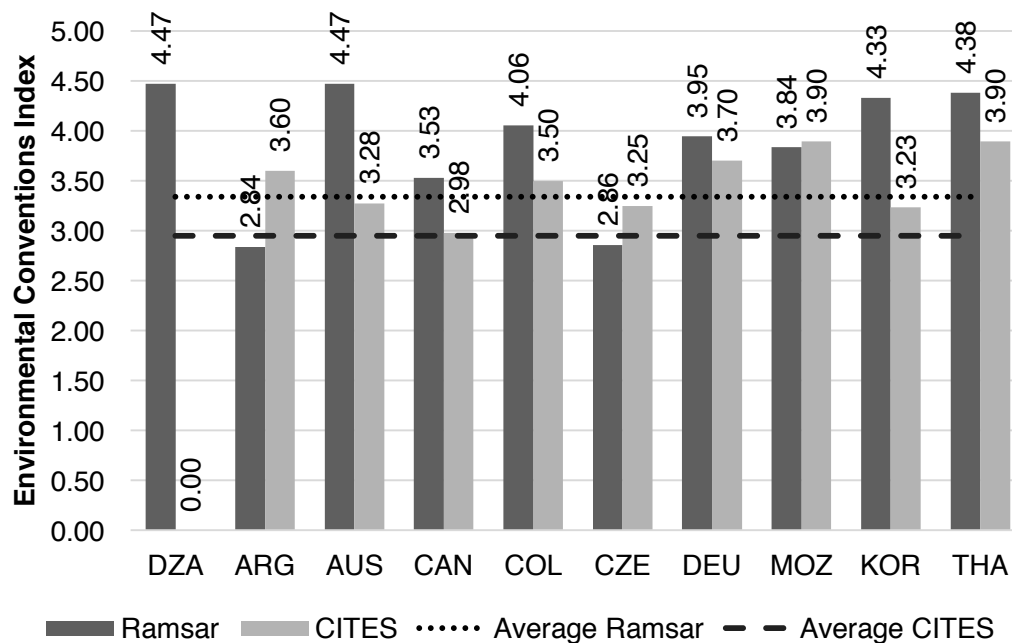


Table 24 Environmental Conventions Index ranking for selected countries, by convention

	DZA	ARG	AUS	CAN	COL	CZE	DEU	MOZ	KOR	THA
Basel Convention										
Global	16 (161)	3 (161)	76 (161)	16 (161)	3 (161)	11 (161)	11 (161)	112 (161)	34 (161)	46 (161)
Regional	3 (41)	1 (31)	2 (9)	4 (31)	1 (31)	6 (42)	6 (42)	24 (41)	5 (38)	8 (38)
Stockholm Convention										
Global	97 (120)	50 (120)	5 (120)	8 (120)	35 (120)	3 (120)	20 (120)	60 (120)	13 (120)	87 (120)
Regional	19 (30)	12 (25)	1 (2)	1 (25)	6 (25)	2 (35)	14 (35)	9 (30)	2 (28)	19 (28)
Ramsar Convention										
Global	12 (166)	110 (166)	8 (166)	68 (166)	22 (166)	114 (166)	38 (166)	65 (166)	30 (166)	7 (166)
Regional	4 (50)	22 (30)	1 (8)	14 (30)	4 (30)	28 (41)	7 (41)	19 (50)	10 (37)	3 (37)
CITES										
Global	N.A.	13 (110)	30 (110)	48 (110)	25 (110)	33 (110)	14 (110)	6 (110)	34 (110)	4 (110)
Regional	N.A.	3 (24)	1 (3)	14 (24)	8 (24)	12 (39)	3 (39)	1 (17)	9 (27)	3 (27)

Regulation: Legislation enactment and enforcement

Enactment of national legislation for addressing the concerns subject to international environmental agreements is the foundational element for successful implementation of international environmental law. All ten countries have delivered in this regard. This is true particularly for the Basel Convention and CITES, as the adoption of domestic laws is critical to defining categories of hazardous wastes and their sound management, and procedures for trade in endangered species must be defined at the national level.

Countries approach regulatory frameworks in different ways. Some establish laws for the respective components of each convention, while others define comprehensive legislative frameworks to protect the environment. Algeria, for example, established a specific law (Law No. 01-19 of 12/12/2001) to regulate the management, control, and disposal of waste, and it also set up the National Special Waste Management Plan (Plan national de gestion des déchets spéciaux or PNAGDES) (Basel Convention, 2008a; REVADE, 2016). In addition, the government of Algeria enacted specific legislation to establish transportation requirements and nomenclature for dangerous special wastes (Basel Convention, 2008a; Ministry of Energie (Ministère de l'Energie), 2004, 2006). Argentina took a similar approach. National Law 24.051 (approved in 1992) regulates the generation, handling, transport, treatment, and final disposal of hazardous wastes. For the Stockholm Convention, however, the legislative framework includes multiple laws that address various types of pesticides. Argentina's regulations cover nine of the sixteen pesticides listed in the convention and possesses several draft laws to regulate some of the rest of the substances (Government of Argentina, 2007). Germany has also enacted

several pieces of legislation relating to hazardous waste management. Some of the country's federal states have also issued waste management plans, and ten of the sixteen states have implemented an obligation for delivery of certain types of wastes to public facilities (Basel Convention, 2011b).

In the chemicals and waste cluster, some countries treat the Basel and Stockholm Conventions as a unified block when establishing regulations, while others create separate regulations for each agreement. In the case of South Korea, for example, the Basel Convention is regulated by the 1994 Act on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal. This act limits or bans the export and import of specific wastes harmful to human health or the environment (Basel Convention, 2008b). Korea also enacted additional regulations for the management of waste, including the Waste Management Act in 1986 and the Act on the Promotion of Saving and Recycling of Resources in 2008. For the Stockholm Convention, Korea's regulatory framework includes the 1990 Chemical Substance Control Act, which controls the import, export, and usage of chemicals including POPs, and the POPs Control Act of 2007 (Government of the Republic of Korea, 2009).

By contrast, Colombia's regulation for the conventions came down from the country's national constitution (O'Brien, 1995). The 1991 constitution set forth new laws and principles for a balance between the environment and national development. This serve as the foundation for several policies, including the Environmental Policy for the Integrated Management of Hazardous Waste, Resolution 1045 of 2003 and Resolution 1390 of 2005 on the reformed disposal of waste, the 1997 Policy for Cleaner Production, and the Policy for the Use and Handling of Pesticides. These policies were complemented

by national health policies for the management of hazardous wastes and POPs, including epidemiological surveillance, an agricultural policy, and monitoring of environmental conditions by poisoning, accidents, or emergencies (Ministerio de Ambiente Vivienda y Desarrollo Territorial, 2010).

Specific components of legislation are also important to achieving the objectives of some of the conventions. In 2008, South Korea introduced specific legislation for electrical and electronic equipment and automobiles. Thailand has also included explicit regulations for special wastes such as packaging waste and electrical and electronic equipment waste (the Integrated Strategy of the Management of Waste from Electrical and Electronic Equipment or WEEE) (Basel Convention, 2008b, 2011d). Both countries also have innovative measures for Extended Producer Responsibility (EPR) systems, and Thailand has included the “polluter pays” principle in its legislation. Furthermore, the Thai cabinet adopted the National Master Plan on Waste Management (2016-2021) aimed to encourage the 3Rs concept—reduce, reuse, recycle—and to establish proper disposal methods.

In the biodiversity cluster, legislation treats the Ramsar Convention and CITES separately, because of the differences in the nature of each agreement. In the case of CITES, strong and comprehensive legislation is necessary to regulate the exports, imports, and trade transactions in endangered species. That is why one of the convention’s key facilitation mechanisms is the National Legislation Project (NLP), created in 1992 to analyze parties’ enabling and implementing legislation. Under the regulations of the convention, the project reviews each country’s legislation and classifies it in one of three categories: Category 1 (requirements fully met), Category 2

(requirements partly met), or Category 3 (requirements generally not met) (CITES, 1992). Eight out of the ten countries analyzed are classified under Category 1, which means that the country’s legislation meets the requirements of CITES implementation (see Table 25). The two African countries—Algeria and Mozambique—have yet to meet the legislation requirements of CITES.

Table 25 2016 classification of selected countries under CITES National Legislation Project

DZA	ARG	AUS	CAN	COL	CZE	DEU	MOZ	KOR	THA
2	1	1	1	1	1	1	2	1	1

Source: (CITES, 2016b)

In this context, countries have specific regulations for CITES. In the Czech Republic, for example, the Act on Trade in Endangered Species No. 100/2004 is the main piece of legislation to protect endangered species. Germany also has the Federal Ordinance on the Conservation of Species, established in 2005. The two countries however, are also subject to the EU Wildlife Protection Regulations. Additional national regulations principally cover species that require protection based on specific directives. In other countries, regulation of trade in endangered species is part of broader biodiversity conservation laws. In Australia, the 1999 Environment Protection and Conservation Act is the main legislative instrument to regulate compliance with CITES requirements (Farrier & Tucker, 2000). It was amended in 2006 to specify that permits for trade are required not only for CITES-listed species but also for species that appear in the declared specimens list defined by the Ministry of Environment (Alacs & Georges, 2008). Thailand has comprehensive regulation for trade in endangered species. In 1992, the country adopted the Wild Animal Preservation and Protection Act (B.E. 2535), and

new measures for derivatives were defined in 2003 (B.E. 2546), and in the 2015 constitution (B.E. 2557) (Government of the Kingdom of Thailand, 1992). In addition to limiting hunting and controlling the trade of wildlife, the act also made provisions for the institutional arrangements for CITES implementation within the Ministry of Natural Resources and Environment (Oswell, 2010). South Korea's regulations for CITES are also part of a broader piece of legislation, the 1992 Natural Environment Preservation Act, that contains, after being amended in 1994, basic provisions on the international trade in CITES-listed species and their derivatives.

Legislation for the Ramsar Convention also tends to be part of general environmental measures. In the case of Colombia, Law 357 (1997) was the main instrument for the protection of wetlands. Furthermore, Law 99 of 1993—which established general environmental policies for Colombia—explicitly listed paramo ecosystems (in the Andean mountains) as needing special protection. In 2001, the Constitutional Court acknowledged the constitutionality of these regulations and recognized paramo ecosystems as areas of special ecological importance (Murillo Chavarro, 2011). Other subsequent resolutions also connected wetlands to the Code of Renewable Natural Resources providing measures for the protection of Ramsar sites and other paramo ecosystems.

National regulation for the biodiversity conventions also includes innovative measures to connect these global agreements to other policy areas. South Korea, for example, recently amended its Pharmaceutical Affairs Act to include regulation of the import and export of drugs made from processed goods of animals and plants as prescribed by CITES (Ministry of Food and Drug Safety, 2016). In a similar approach,

the Czech Republic has connected the protection of wetlands to its water management policies. The government has undertaken significant water policy reform (including the Water Act of 2008) to promote the wise use of water resources and return water to key environmental assets (including Ramsar wetlands) (Ramsar, 2012). Equally important, the mining code defined by the government of Colombia extended protection of natural areas from mining activities to wetlands (Law 1382 of 2010) (Murillo Chavarro, 2011).

Enacting legislation also poses important challenges. Mozambique, for example, has struggled with the need to continuously update or add elements to existing legislation in order to regulate the Basel and Stockholm Conventions. Different pieces of legislation regulate Mozambique's production of waste (Article 9 Decree 13 of July 13, 2006), the management of solid municipal waste (Decree no. 94/2014), the management of hazardous waste, the management of POPs (Environmental Management Act, enacted in 2002), and the liability of those who damage the environment (Basel Convention, 2011c; Cambule & Gouveia Pereira, 2015). This fragmentation affects the process of implementation. Coordination among government agencies for planning, execution, monitoring, and reporting on the multiple pieces of legislation requires additional time and resources. In addition, adjusting the multiple laws to reflect decisions made at the conventions' COPs is also a complex process. These issues delay progress in implementation. Furthermore, Mozambique has submitted its legislation to be evaluated by the CITES National Legislation Project (NLP). While the existing regulation is comprehensive, and the country has participated in workshops developed by the secretariat to improve compliance with legislation, the legislation has not been published

and no agreement exists with the secretariat for revised legislative analysis, including possible Category 1 status (CITES, 2016b).

Algeria faces similar challenges. In the case of the chemicals conventions, there are important legislation gaps. Algeria has not enacted legislation or regulations to identify unregulated transboundary movement of waste, or to specify the responsibility for illegal traffic, and therefore cannot ensure proper waste disposal in these cases (Government of Algeria, 2015). In addition, the National Implementation Plan for the Stockholm Convention acknowledges that “Algerian legislation in the case of polluted sites has not taken into account and has not provided the necessary steps to rehabilitate soils to be in line with the principle of polluter pays” (Ministère de l’Aménagement du Territoire et de l’Environnement, 2006). For CITES, Algeria’s legislation is also classified under Category 2. The country has submitted a draft of its legislation for the secretariat’s review and has participated in the different workshops. However, the finalization and submission of implementing legislation to Parliament for enactment remains to be done (CITES, 2016b).

Other countries also face legislative challenges regarding aspects of some of the agreements. A 2015 report commissioned by Australia’s Department of the Environment, for example, recommended updating the 1989 Hazardous Waste (Regulation of Exports and Imports) Act (O’Farrell & Marsden, 2015). In Canada, despite the existence of some controls regarding shipments for hazardous wastes outside the OECD region, the country needs additional technical definitions about trade in non-hazardous recyclables in order to ratify the Ban Amendment (Basel Convention, 1995). Colombia needs to reconcile mining codes with existing regulation for biodiversity conservation and wetlands

protection. Inconsistent compliance with Ramsar obligations due to anthropogenic activities has evidenced the fragmentation and weaknesses in the regulations of the Code of Renewable Natural Resources for ecosystems protection. “The main problem in Colombia regarding protecting areas of ecological importance, such as the paramo, is not a deficient legal regime but the absence of compliance and enforcement measures to ensure that it is properly implemented” (Murillo Chavarro, 2011).

Management: Institutions, strategies and engagement

Management obligations are at the core of national processes to domesticate global environmental obligations. Implementing them involves various activities, including the appointment of institutions to serve as focal points and authorities—the institutions that work on the implementation—for each of the agreements, the design of strategies and policies, and the establishment of cooperation mechanisms (see Table 23). These arrangements create the policy spaces for countries engage with all actors involved in the creation of the necessary conditions to achieve the obligations of each of the agreements and solve the corresponding environmental problems.

The designation of focal points is a basic obligation and requirement in the process of implementation. In addition, countries sometimes must establish institutions to support the implementation of other obligations, or introduce policy spaces so that different actors can come together around specific obligations. Algeria, for example, established the National Observatory for Environment and Sustainable Development, the National Centre for Environmental Training, and the National Waste Agency (Ministry of Land Planning and the Environment, 2010) to work on the implementation of the

chemicals conventions. Australia has also established different institutions; the Stockholm Intergovernmental Forum facilitates consultations between the Australian government, state, and territory agencies that work on POPs (Department of the Environment and Heritage, 2006), and the National Measurement Institute was the first and remains the largest facility in the country dedicated to the analysis of hazardous substances (Department of the Environment and Heritage, 2006).

While these examples show that institutions are specifically designed for each environmental convention, Germany has taken a different approach, connecting its institutional arrangements for the chemical conventions to other policy areas related to health and safety. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit) is the lead agency responsible for implementing the Stockholm Convention. But it works closely with the Federal Institute for Occupational Safety and Health (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin), which is the authority for the export and import of POPs, in charge of permanently monitoring these substances in blood samples (Federal Republic of Germany, 2006). The country also connects the implementation of the different conventions to the issue of sustainable development, through the Council for Sustainable Development, and to education and research through the Federal Ministry for these topics (Bundesministerium für Bildung und Forschung).

Partnerships with institutions for data collection and analysis are also an important best practice. In South Korea, the National Institute of Environmental Research (Kyungseodong, Seo-Gu, Incheon), the Korea Environment Institute (Bulgwangdong, Eunpyong-gu, Seoul), the Korea Environmental Management Corporation

(Kyungseodong, Seo-Gu, Incheon), and the Korea Environment Resources Corporation (Kyungseodong, Seo-Gu, Incheon) work together on the management and regulation of transboundary movement of hazardous waste (Basel Convention, 2008b). Furthermore, the Ministry of Commerce, Industry, and Energy operates the Center for Development of Resources Recycling Technology (Government of the Republic of Korea, 2004). In Thailand, different departments provide technical assistance and training for implementation of the Basel Convention, including the Department of Industrial Works, the Pollution Control Department, the Environmental Research and Training Center, the Department of Environment Quality Promotion, and the Environmental Research Institute of Chulalongkorn University (Basel Convention, 2011d). Some of these institutional arrangements have also been relevant to the Stockholm Convention. The Pollution Control Department is the focal point for the Stockholm Convention and the Ministry of Natural Resources and Environment is responsible for implementing the National Implementation Plan (Ministry of Natural Resources and Environment (MNRE), 2007). As countries deal with multiple levels of governance and institutions working on the process of implementation, coordination among them becomes a critical factor for the achievement of the policy goals established by each convention. A good example of this comes from Colombia, where the national government has developed a successful degree of coordination between several ministries involved in the management of POPs, including regional autonomous corporations (Ministerio de Ambiente Vivienda y Desarrollo Territorial, 2010).

In the definition of policies and strategies, countries have also taken different paths. Successful approaches have been developed by defining broad strategies and

policies to focus national efforts around specific environmental conventions. A noticeable process is being executed by the Czech Republic, whose State Environmental Policy 2012—2020, underlines the importance to implement provisions of multilateral environmental agreements aimed at protecting health and the environment from harmful effects of chemical substances, including the Basel and Stockholm Conventions, among others (Ministry of the Environment (Ministerstvo životního prostředí), 2013). Algeria, also reflects important connections between policy areas. The management of chemicals, wastes and POPs is based on its National Environmental Strategy (NES) and the National Environmental Action Plan and Sustainable Development (NEAPSD) (Ministry of Land Planning and the Environment, 2010). The country has also established several action plan goals related to the elimination of PCBs, limit the sources of emissions, and reduce unintentional releases (Ministère de l'Aménagement du Territoire et de l'Environnement, 2006).

In terms of cooperation, countries collaborate at various levels from convention secretariats to other countries and non-state actors at global and national levels. When working with the conventions' executive bodies, some countries, such as Canada, directly engage with conventions' functioning and overall operation. In the case of the Stockholm Convention, for example, Canada's international engagement in the process of implementation includes institutional support and financial assistance for UN Environment, the convention's secretariat, and other national governments for activities around specific obligations, providing funding and hosting different activities such as workshops and summits to discuss implementation (UNEP, 2000). The country has also promoted and funded the establishment of the convention's regional centers (Basel

Convention, 1999). Canada has also been active in the negotiation and diplomatic processes around the Stockholm Convention. The country also was highly influential on the Intergovernmental Negotiating Committee, being the first signatory to provide financial assistance. In 2000, Canada established the five-year \$20 million Canada POPs Fund, administered by the World Bank, to assist developing countries and countries with economies in transition in building their capacities to deal with POPs and in implementing their obligations under the convention (Government of Canada, 2006). In 2016, Canada also chaired the Effectiveness Evaluation Committee under the Stockholm Convention (Stockholm Convention, 2016b). In 2001, Klaus Töpfer, then Executive Director of UN Environment, recognized Canada as a “pioneer in working with other parts of the world to achieve environmental agreements” (UNEP, 2001).

Algeria, Argentina, and the Czech Republic provide more targeted support by hosting some of the Regional Centers established by the Basel and Stockholm conventions. In 2002, Argentina established the Basel Convention Regional Center for Capacity Building and Transfer of Technology for South America, and has since then provided funding for its operation (Basel Convention, 2011a; Basel Convention Regional Center, 2015). The government of the Czech Republic established the National Centre for POPs, to provide expert support, coordinate, and implement goals and targets featured in action plans for the implementation of the Stockholm Convention. The activities of the National Centre are coordinated and overseen by a multi-ministerial Council (the National Centre Council) composed of representatives of nine different ministries (RECETOX, 2017b). Similarly, Algeria hosts the North Africa Regional Centre for the Stockholm Convention, known in the region by its French acronym CNTPP (Le Centre

National des Technologies de Production plus Propre) (Ministère de l'Aménagement du Territoire et de l'Environnement, 2006). The center serves seven countries: Algeria, Egypt, Mali, Mauritania, Morocco, Niger, and Tunisia.

Collaboration and engagement are also important to countries, as cooperation both with neighboring states and regionally can contribute to successful implementation. In Canada, the implementation of the Basel and Stockholm conventions is closely connected to the 1986 Canada-US agreement on the transboundary movement of hazardous wastes. In 2014 “more than 99% of imports and 98% of exports [of transboundary waste] occurred between Canada and the United States” (Environment and Climate Change Canada, 2013). Also, under the North American Agreement on Environmental Cooperation, both countries have created specific North American Regional Action Plans related to management of POPs. Germany also takes part in different multilateral and bilateral agreements on waste transportation. The most notable are the 1994 Germany-Afghanistan agreement and the 2000 Germany-Kosovo agreement, both designed to export the waste generated in these two places to Germany for the purpose of environmentally sound management (Reinhardt, 2000). A similar approach is used in the implementation of the Ramsar Convention, as Germany cooperates with the Netherlands in practicing cross-boundary nature conservation of the Gelderse Poort, an area where the Rhine leaves Germany and flows into the lowlands of the Netherlands (de Jong & van Tatenhove, 1998). The country has also engaged in bilateral collaboration in Ramsar site designation. In 2008 Germany and France jointly designated two new Wetlands of International Importance, the Oberrhein / Rhin supérieur

in Germany and the Rhin supérieur / Oberrhein in France (Secretariat of the Ramsar Convention, 2008).

At the regional level, cooperation has led some countries to assume a position of leadership, helping and supporting the implementation of the agreements in other countries. South Korea, for example, has promoted a database of POPs monitoring results from each country in East Asia, as well as data sharing and data exchange with international organizations (Ministry of Environment, 2013). Eleven East Asian countries participate in this initiative (South Korea, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Philippines, Singapore, Thailand, and Viet Nam), and they have been holding annual workshops since 2005. In a like manner, in 2003 Thailand ratified the Agreement on Transboundary Haze Pollution, adopted by the Association of South East Asian Nations (ASEAN) (Ministry of Natural Resources and Environment (MNRE), 2007).

This type of regional organization is also the scenario for cooperation around the implementation of global environmental obligations. In December 2005 at a Special Meeting of ASEAN, the Ministers responsible for CITES implementation established a regional action plan to create a regional intergovernmental law-enforcement network for illegal wildlife trade, as well as a mechanism to share information and collaboration between countries and government agencies (Oswell, 2010). As a result, ASEAN members, which include Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Vietnam, and Thailand, launched the ASEAN Wildlife Enforcement Network (ASEAN-WEN, 2017). Thailand, a leader of the network, has worked closely on the promotion of networking among relevant law enforcement

authorities in ASEAN countries to curb illegal trade in wild fauna and flora (ASEAN-WEN, 2017). This scheme for regional collaboration has favored important seizures in the Thai/Cambodia border in 2006, when over 200 Siamese crocodiles *Crocodylus siamensis* (CITES I) were recovered, and in the Thai/Laos border when 260 Malayan Pangolins *Manis javanica* (CITES II) were found (TRAFFIC, 2016). In Africa, Mozambique and twenty-four other countries are parties to the regional multilateral Bamako Convention (Agreement on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes) within the continent. The Bamako Convention, which came into force in 1996, prohibits the import of all hazardous wastes, including radioactive waste, into African countries. The agreement imposes stricter regulation than the Basel Convention, since it prohibits all imports of hazardous wastes and provides no exemption for radioactive wastes.

Cooperation with stakeholders is also important. Countries engage with non-state actors to develop specific projects and activities that support implementation at the local level. Community organizations, industry conglomerates, and NGOs support and create plans and projects to advance environmental goals. Examples of such cooperation include the provincial Environmental Directions and the regional Environmental Inspections in Algeria (Ministry of Land Planning and the Environment, 2010), and the work by Argentinean state, municipal, and local governments on the adoption of specific waste management goals and plans (International POPs Elimination Network, 2010). NGOs in Argentina are also actively engaged in the implementation of the POPs convention. One of the most prominent is the Citizen's Anti-Incineration Coalition, a network of NGOs

and citizens opposed to incineration and committed to the promotion of awareness about the effects of POPs on human health and the environment (Bianco & Campra, 2005).

NGOs also serve purposes of agenda-setting, public awareness raising, and institutional arrangements. Since 2008, the Arnika Association, a national NGO in the Czech Republic, has served as a coordination center for Central and Eastern Europe on the right to healthy environment. As part of its efforts, it hosts the secretariat of the International POPs Elimination Project (IPEP) (Arnika Association, 2005, 2006b; Holoubek, 2006). In Argentina, the NGO Taller Ecologista has worked on the promotion of zero waste ordinances in main cities (International POPs Elimination Network, 2010). Since 2005 Thailand has worked to promote the participation of NGOs and civil society organizations in the implementation of the conventions. The National Master Plan on Waste Management (2016-2021) supports all relevant sectors for participation in the management of solid and hazardous waste. Thailand has hosted workshops that bring together different organizations to foster communication and collaboration in fulfilling the goals around environmentally sound management of POPs (Pesticide Action Network – Philippines and Global Alliance for Incinerator Alternatives, 2005). Groups from Thailand, Cambodia, Indonesia, Malaysia, and the Philippines have taken part in its activities. Industry participation in POP management is another important best practice in implementation. In July 2005, the Ministry of Environment of South Korea signed an agreement with companies that had high emissions of POPs such as dioxins and furans (Government of the Republic of Korea, 2009), which has contributed to a dramatic decline in the level of emissions.

All these institutional arrangements are critical to fulfilling related management obligations. Capacity building and training mechanisms are essential to achieving the goals of environmental conventions. Algeria, for example, has trained high-level technicians to analyze POPs (Ministère de l'Aménagement du Territoire et de l'Environnement, 2006) and has designed strategies to promote stakeholder engagement. The Ministry of Environment signed an environmental performance contract with its industries to follow their environmental actions and encourage them to use best available techniques (Ministry of Land Planning and the Environment, 2010). In Argentina, the Basel Regional Centre includes among its objectives the goal of promoting Argentina's capacity-building role, facilitating synergy among the chemicals conventions (Basel Convention Regional Center, 2015). Similar management strategies are used by Canada in the implementation of CITES (Cooper & Chalifour, 2004). Environment Canada provides interagency training in different regions, promoting regional collaboration and the adoption of policies that clarify the roles of the different authorities—scientific, management, and enforcement—that the convention requires.

Information: Data collection, scientific assessment, and reporting

In implementing global environmental conventions, the availability of information is fundamental, for two reasons. First, data collection is essential to monitoring the state of the environment, to establish baselines for future reference, to assess progress in fulfilling obligations, and to produce the reports that constitute the most important evidence of how countries are advancing in implementing the conventions. Second, availability of information supports public awareness and engages

communities and stakeholders in developing policies to achieve the objectives of each agreement. Ultimately, information, science, and monitoring constitute fundamental inputs to the policy-making process as countries move forward with their commitments.

Best practices in data collection and monitoring take multiple forms. In the case of the Ramsar Convention, monitoring are critical factors since it determines and maps the wetland sites to be protected. Countries take different initiatives in this aspect. Algeria developed a partnership between the General Directorate of Forests and the Mediterranean Wetlands Observatory to produce thematic maps on land use and flooding dynamics of the country's Ramsar sites (Guelmami, 2016). In Canada, one of the country's main assets in the implementation of the Ramsar Convention are the data and information management systems. After the country ratified the convention in 1991, it has consistently worked on the design and establishment of a national wetland inventory that has reliable accuracy and provides information on ecosystems and natural resources value (Fournier, Grenier, Lavoie, & Hélie, 2007; Molnar & Kubiszewski, 2012). Although Canada has still not developed a systematic ecosystem valuation analysis, the Canadian Wetland Inventory is a useful tool and provides baseline data for monitoring programs (Fournier et al., 2007; Molnar & Kubiszewski, 2012). In South Korea, surveys were critical once the country joined the Ramsar Convention in 1997 as well. Between 1999 and 2004, the country conducted its first survey of coastal wetlands of international importance. Later, between 2008 and 2012, Korea conducted a second survey for the establishment of a wetland information system under the operations of the Ministry of Oceans and Fisheries (Kim, 2010). Both surveys supported the designation of Ramsar sites.

Data is not only important for designating Ramsar sites but also for maintaining them and evaluating whether they are fulfilling the various requirements established by the convention. Argentina, for example, despite its low levels of implementation has consistently worked to improve information on Ramsar sites and has made important progress in implementing the information-related obligations established by the convention. In the Czech Republic, research is used to improve knowledge among government and civil leaders about the management and multipurpose use of wetland reservoirs. Studies are employed for both the monitoring of wetlands ecological change, the promotion of community involvement in their management, and the inclusion of local organizations and government authorities in the management of these ecosystems (Petřík et al., 2007). The most recent study on the conservation, research and sustainable use of wetlands in the Czech Republic (2014-2017), provided assessment of the ecological state of Ramsar sites, including biodiversity.

Managing POPs also requires information and monitoring. Countries need to collect data on the substances present in humans and the environment. One country that has made good progress on this is the Czech Republic. The country established a national database for records on hazardous substances, and an information system for contaminated sites and old environmental burdens (Arnika Association, 2006a). The Czech government, through its State Health Institute, has also worked on the creation of a database to record and monitor the results of dietary exposure to POPs since 1994. Levels of POPs are also made available through GENASIS, an environmental data repository that provides comprehensive information on chemical contamination of the environment and human matrices (Klánová et al., 2009; RECETOX, 2017a). Another country,

Thailand, focused research on the creation of a POPs inventory to evaluate the existence of stockpiles of some pollutants, particularly pesticides. In 2001, with the support from the UN Food and Agriculture Organization (FAO) and the Thai government, the Thai department of agriculture conducted an inventory of obsolete POP pesticide (Ministry of Natural Resources and Environment (MNRE), 2007). In 2004, these organizations formed a pesticide task team engaging national expert consultants on POPs pesticides and staff from the Pollution Control Department in conducting a new inventory (Ministry of Natural Resources and Environment (MNRE), 2007). Further inventories have showed a decrease in obsolete POPs pesticide stockpiles and have addressed specific substances, including DDT.

South Korea uses data collection, scientific assessment, and monitoring in a combined effort to strengthen implementation of the Stockholm Convention. Since 1999, the Ministry of Environment has conducted studies to evaluate the effects of industrial POPs and their presence in the air (Government of the Republic of Korea, 2009; Ministry of Environment, 2013; Shin et al., 2011). Additionally, each of the ministries engaged in the reduction and eradication of POPs has a subsidiary research institute that studies the presence of these substances in fish, food products, human breastmilk, and human blood (Government of the Republic of Korea, 2009). Korean efforts to make information available for the implementation of the chemicals conventions has also expanded to East Asia. Korea has hosted the POPs Information Warehouse Project to evaluate the implementation of the Stockholm Convention in East Asia (Ministry of Environment, 2013); as part of the project, it promoted the creation of a database of POPs monitoring results from each country in East Asia as well as data sharing and data exchange with

international organizations (Ministry of Environment, 2013). The Ministry of Environment also works with stakeholders in conducting different research studies on POPs in the country. A PCBs Policy Council and a PCBs Safety Evaluation Group involving the utilities corporations and civic groups has conducted different studies and established a “Roadmap for PCBs Elimination” (Government of the Republic of Korea, 2009).

Public awareness, education, and communication strategies are also necessary to fulfill the information obligations under the environmental conventions. In the case of the Ramsar Convention, countries carry out different activities related to information dissemination. Algeria facilitates public awareness by distributing materials for events including World Wetlands Day, World Tree Day, and Environment Day (Gardner et al., 2009). In 2017, as part of the country’s celebrations for World Wetlands Day, the Ministry of Agriculture and Rural Development and the Ministry of Education held a competition for primary school students’ artwork on wetlands (Ramsar Secretariat, 2017a). Colombia has also developed informative campaigns and education projects alongside local communities to teach children—and ultimately communities—about the preservation of local wetlands (Ramsar Secretariat & Ruiz-Carvajal, 2006). The Thailand Biodiversity Division, under the Office of Natural Resources and Environmental Policy and Planning, along with WWF Thailand, have promoted public awareness of wetlands since 2002, especially regarding the national parks system (Office of Natural Resources and Environmental Policy and Planning & Ministry of Natural Resources and Environment, 2009). This program includes the establishment of a network of schools and a curriculum based on wetlands and their conservation. A similar educational

approach has been developed in Australia, where the government has established Wetland Environment Centres in various regions to provide public education about specific Ramsar sites and about wetlands protection in general, and to promote cooperation with NGOs involved in wetlands management (Brisbane City Council, 2016; Department of the Environment, 2016). All these activities are coordinated with the Ramsar Secretariat, as part of the convention's Communication, Education, Participation, and Awareness Programme (CEPA), started in 1999.

Chemicals management and waste disposal also require public awareness. Countries such as Argentina have developed a series of activities including workshops, conferences on POPs, and media campaigns to involve communities in the implementation of the Stockholm Convention (Bianco & Campra, 2005; Government of Argentina, 2007). One of the main goals of these strategies is to produce a publicly available, valid inventory of the sources of polluting substances, and an inventory of contaminated sites. Australia has also established a consultation with non-government organizations dealing with POPs denominated the Stockholm Reference Group (SRG). Other governmental agencies also work in the development of a National Awareness Plan, to ensure that government officers and stakeholders are aware of the obligations under the convention (Government of Australia & Department of the Environment and Heritage, 2006). Other campaigns are specifically oriented to consumers. Germany has developed eco-labeling programs, such as the German environment label The Blue Angel (Der Blau Engel), established in 1978. The program comprises more than a hundred product categories (e.g. tires, copiers, paper), around 1,500 companies, and over 12,000 labeled products (The Blue Angel, 2017). The label guarantees that products meet

standards for environment, health, and performance characteristics (Basel Convention, 2011b). Germany's Federal Environment Agency (Umweltbundesamt) also provides information on POPs to the public through print media, press releases, and the internet (Federal Republic of Germany, 2006).

Germany also make efforts to promote public awareness and data and information availability regarding endangered species, both nationally and as part of global biodiversity conservation initiatives. The Federal Agency for Nature Conservancy (Bundesamt für Naturschutz, BfN) is the German management authority for CITES, for which it produces brochures and leaflets. However, its core project has to do with the determination of age and geographical origin of ivory of African elephant (CITES, 2013b), which demonstrates the importance and value of data in tackling environmental problems. The project led to the creation of a database—the IvoryID—that was handed over to CITES Secretariat during COP17 in 2016. The database also embodies the importance of modern forensic techniques in the fight against illegal wildlife trade (CITES, 2016e). In a similar approach, South Korea has initiated public awareness on biodiversity by launching a Natural History Research Information Center, to combine biodiversity databases from other national sources such as natural history museums as well as molecular and genomic databases that support biodiversity conservation efforts (Korea Natural History Research Information Center, 2017).

Technical: Capacities and measures for problem-solving

Implementing environmental conventions also requires the setting up of technical measures to control the environmental problems addressed by each agreement. Aspects

such as the reduction and/or elimination of the generation of hazardous waste, permits for endangered species trade, measures to physically protect wetlands, and control of the stockpiles of pollutant substances are some of the technical obligations that countries should fulfill to achieve their international environmental goals. In addition, countries need to address technical challenges generated by the effects of other policies they put into place, and that negatively impact the control hazardous substances and the protection of biodiversity. In most cases, these exogenous factors result from the consequences of other human activities.

Some countries have developed multiple best practices for putting in place technical measures. Algeria for example, has defined specific policies to address the negative impact of land-use activities on different ecosystems. As acknowledged by Algeria's forest department, that serves as the country's Ramsar administrative authority, "Algeria's key environment issues include the depletion of water resources, land degradation and desertification, overuse of forest resources and decrease in species populations" (Gardner et al., 2009; Ramsar Secretariat, 2017a). To minimize the negative effects of these factors on wetlands, the country had to design policies to technically address those issues. Canada faces similar challenges regarding land-use. It set up reverse auctions to incentivize wetlands conservation and restoration on agricultural lands. The program is contingent upon payments and/or benefits from conservation funding mechanisms. Expert analysis has pointed out that farmers are more interested in agricultural benefits than wildlife protection in contrast to other countries, which calls for decisive measures such as rotation programs and crops control (Molnar & Kubiszewski,

2012). Canada has also established several water pollution trading schemes as another mechanism to protect wetlands.

In the Czech Republic, technical measures to protect wetlands include specific recognition of ecological changes in some Ramsar sites. Consequently, four sites were listed in the Montreux Record, a register of wetland sites where changes in ecological character have occurred, are occurring, or are likely to occur as a result of human activities (Ministry of the Environment (Ministerstvo životního prostředí), 2005). Specifically, sites are threatened by the need to develop adequate plans for the technical and sound management of the fishponds, balancing current levels of protection with anthropogenic interference (Harmáčková & Vačkář, 2015).

Other innovative initiatives are also relevant best practices in the process of implementation. South Korea, for example, has worked on the development of a “Wetland City Concept.” The objective of this collaboration is for the country to designate pilot sites for wetland cities, and to contribute to application of same process in other countries, by hosting a workshop for the guidelines on wetland city accreditation (Ramsar Convention, 2012c; Ramsar Secretariat, 2013). Korea has also designed technical measures to solve multiple environmental problems at once. Wetland management programs, for example, also aim to improve the protection of migratory bird species (Korea National Park Services, 2009). A similar approach has been developed in Argentina, where wetland conservation policies define long-term plans that include the conservation of endangered bird species protected, in some cases, by CITES. Examples include the protection of the Andean flamingo at Laguna Melincué (Derlindati, 2011;

Romano, Luppi, & Pagano, 2015). In Colombia, the designation of some national parks aims to conserve both wetlands and endangered species (IUCN, 2013).

Management of POPs also requires technical procedures, ranging from certificates that confirm the sound management of waste from cradle to grave, as they were designed in Argentina (Basel Convention, 2011a), to the creation of policies to avoid adding new sources of POPs (Bianco & Campra, 2005). Germany has also worked on measures and technologies for the proper disposal of waste and to prohibit the production, placing on the market, and use of DDT (Federal Republic of Germany, 2006). Policies are also focused on the management of raw materials efficiency projects along the entire production value chain (Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung), 2017; German Council for Sustainable Development (RNE), 2017).

In some cases, technical measures are developed through specialized organizations. Canada, for example, created the Habitat Stewardship Program for Species at Risk, one of three pillars in Canada's national strategy to protect species at risk. Canada strengthened the program in 2014 by allocating funding to protect non-endangered species as well (Environment and Climate Change Canada, 2017). However, external factors continue impacting the technical components of environmental conventions. In South Korea, technical measures have not been enough to control the trade and farming of moon bears (*Ursus thibetanus*), a species declared protected by CITES. Despite strict oversight on international trade, domestic activities in Korea still contradict the fundamentals of the convention and its global goals (IAKA, 2014). Because of beliefs about the medicinal properties of bear bile, its price—estimated at

more than US\$20,000 per specimen—makes it an attractive source of income, and more than one third of traditional medicine shops in South Korea still sell it, thereby creating demand for bear farms. Since 2010, the National Assembly has been considering a law that will prohibit the further breeding and sale of bears. As part of these efforts, a research project was conducted in 2011 on the logistics of ending bear farming (IAKA, 2014). In a similar way, measures to control turtle hunting in Colombia have not been effective because of their religious value. Despite strategies to arrest smugglers of Matamata turtles (*Chelus fimbriatus*), red-eared slider turtles (*Trachemys scripta*), and poison frogs (*Dendrobates histrionicus*), seizures still take place and the species remain listed under CITES Appendix II (TRAFFIC, 2016).

Financial

As expected, countries only list the availability of financial resources as a challenge, not a best practice. However, only two countries do so. Argentina has historically struggled with its contributions to the Stockholm Convention, which are the core financial obligations that countries are expected to comply with as part of the agreement. As of January 31, 2016, Argentina had \$29,129 in unpaid pledges for 2015 and years prior, and \$28,410 for 2016 and future years, for a total of \$57,539 in unpaid dues. This ranked it as the twentieth country with most unpaid dues out of 180 parties that were analyzed. This was partially explained by the fact that the country, in the aftermath of its financial crisis, had reallocated resources originally dedicated to environmental protection to other programs and initiatives. However, since then

Argentina has met these obligations and, as of the end of 2016, had no pending payments (Stockholm Convention, 2016c).

Other countries also struggle to implement specific projects because of the lack of financial resources. Mozambique, for example, has faced challenges in implementing the National Ivory and Rhino Action Plan, which was requested by the CITES Standing Committee because of Mozambique's lack of regulatory progress to include significant penalties for illegal killing of elephants and rhinos and for the possession of ivory and rhino horn (CITES, 2016d; TRAFFIC, 2013). However, a new report presented to the 67th meeting of the CITES Standing Committee in 2016 reported "substantial achievements" in most of the actions (Ministry of Land & National Administration for Conservation Areas (ANAC), 2016). To implement the not-yet-executed activities, the World Bank gave a grant to the Mozambique's Conservation Areas for Biodiversity and Development Project (CITES, 2016d).

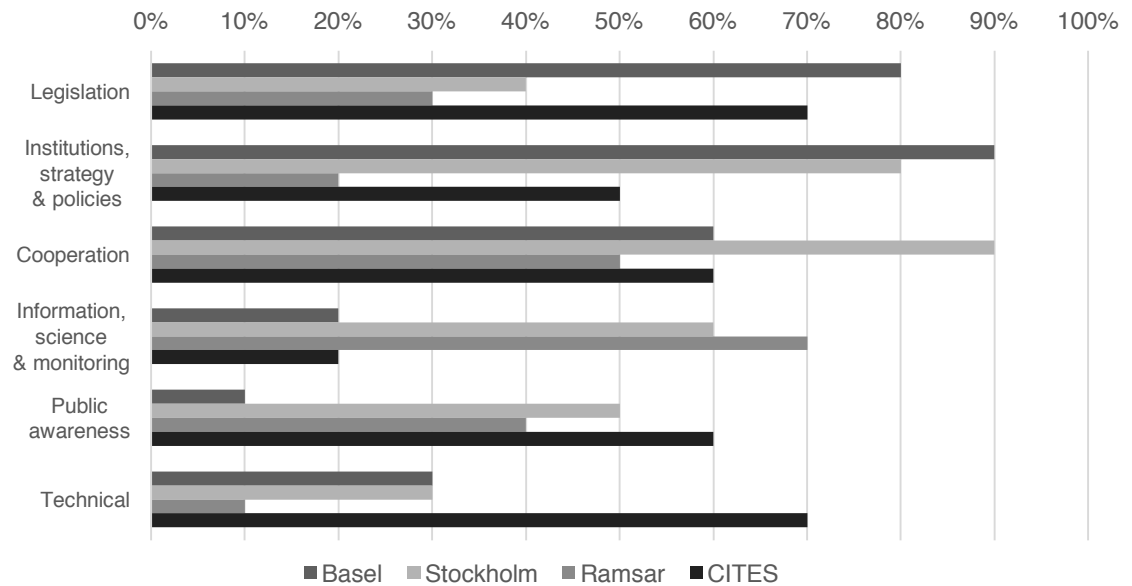
Overall lessons for cooperation and implementation

The analysis of the ten qualitative national implementation profiles presented in this chapter confirms that the process of implementation is intrinsically connected with the measures countries establish to fulfill the obligations they acquire when joining conventions. This connection confirms the complexity of the process of implementation, and the relevance of evaluating and explaining it.

All countries identified best practices for the conventions. Germany and the Czech Republic listed more factors as best practices, which could reflect their experience in implementing the conventions, the positive results that they have achieved, their

engagement with the conventions, and the availability of information. Analyzing the data by convention confirms the experience of both countries, since they have listed more best practices for the conventions in which they perform relatively better than the rest of the countries in the study: Stockholm for the Czech Republic and CITES for Germany. Algeria, on the contrary, is the country with the least factors, which is the result of the lack of data about the process of implementation in the country, especially for CITES, in which the country failed to submit even the national reports it was obliged to.

Figure 35 Percentage of countries listing best practices, by convention



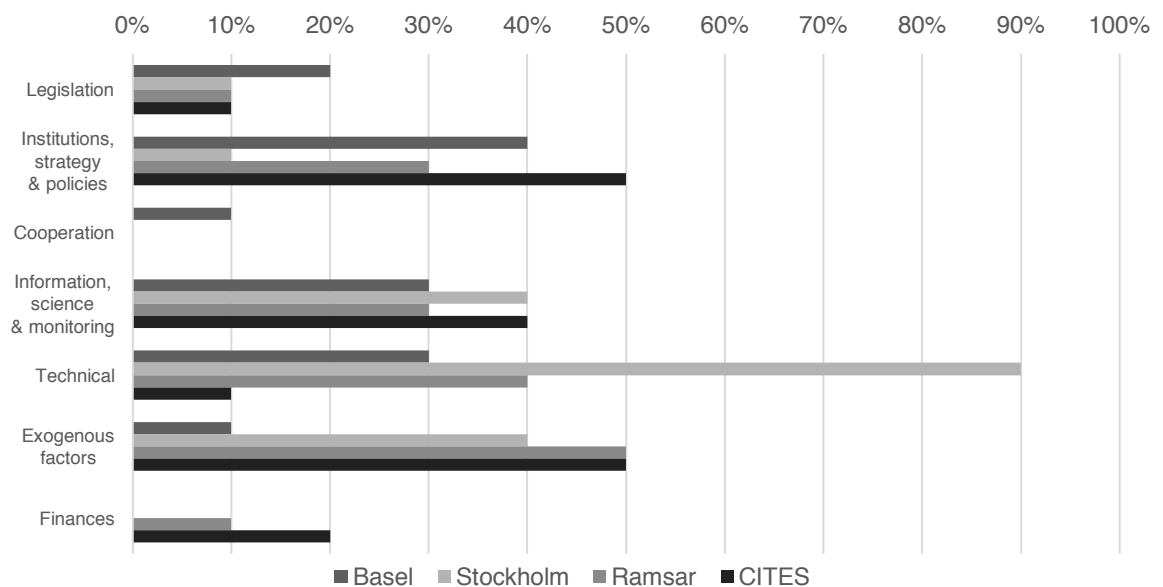
Legislation, institutions, and public awareness seem to be the factors that have more influence in the process of implementation (see Figure 35 and Table 26). Eight out of the 10 countries indicate that legislation is a critical factor to implement the Basel Convention, while 7 percent reflect the same for CITES. In the case of public awareness,

the factor is critical for 6 and 5 countries for CITES and the Stockholm Convention respectively.

Table 26 Most relevant best practices in implementation, by country

	Legislation	Institutions, strategies & policies	Cooperation	Information, science & monitoring	Public awareness	Technical measures
DZA		X		X		X
ARG		X				
AUS		X				
CAN		X	X	X		X
COL	X					
CZE		X	X	X		X
DEU			X	X		
MOZ			X			
KOR	X					
THA			X			

Figure 36 Percentage of countries listing challenges, by convention



Countries also identified challenges for all conventions, except the Basel Convention in Korea, and CITES in the Czech Republic and Germany. For the Basel Convention, this could be partially explained by the fact that there is no clear information about its implementation in Korea after 2008. The most challenges were identified for Algeria and Mozambique. Algeria appears to have more issues with the Stockholm Convention. Mozambique has challenges with both conventions, which is particularly interesting since the country is at the top of the results for implementation. However, this apparent contradiction can be explained by the fact that the distance to the target of “complete” implementation remains high. Three factors appear to be critical to successful implementation: technical capacity, exogenous factors, and information, science and monitoring (see Figure 36 and Table 27). Technical capacity was shown to be critical for at least two of the conventions in Australia, Colombia, Czech Republic, Mozambique, South Korea, and Canada, while exogenous factors affected all countries except Argentina in at least one convention.

Table 27 Most relevant challenges in implementation, by country

	Legislation	Institutions, strategies & policies	Cooperation	Information, science & monitoring	Technical measures	Exogenous factors	Finances
DZA				X			
ARG				X			X
AUS					X	X	
CAN		X					
COL				X			
CZE					X		
DEU		X					
MOZ		X		X			
KOR					X	X	
THA					X	X	

Best practices and challenges are then the departure point for understanding the lessons that conventions and governments need to learn from the process of implementation. By evaluating the extent to which countries are implementing the environmental conventions and how they are achieving those results, it will be possible to design technical assistance and capacity-building mechanisms that are targeted to specific needs and characteristics, in order to guarantee that any investment in improving implementation obtains the most and best-possible outcomes.

CHAPTER 7

CONCLUSION: ASSESSMENT, LEARNING, AND POLICY SPACE

Problems such as pollution, the presence of harmful chemicals, biodiversity loss, and illegal wildlife trade have come to exemplify the importance of international environmental cooperation. Environmental conventions are policy responses that regulate behaviors and raise awareness about the specific issues they address. In the system of global governance, traditional scholarly analyses argue that such conventions are effective instruments of governance, since most of the countries fulfill the obligations they acquire. However, international environmental conventions have not stopped most problems they were designed to address. Meanwhile, new mechanisms of cooperation are emerging to protect the environment and promote sustainable development. The recent adoption of the Paris Agreement on Climate Change and the 2030 UN Agenda on Sustainable Development reinforces the need for more compelling and effective policies that translate international commitments into national strategies. In particular, the fact that the SDGs integrate many existing environmental goals—not only as specific goals (see Table 29) but also in ways that cut across multiple SDGs—shows the importance of monitoring environmental goals to guarantee their effectiveness and implementation.

This study has argued that implementation requires the expansion of existing analytical frameworks. By focusing on four global environmental conventions—the Basel and Stockholm conventions in the chemicals and waste cluster, and the Ramsar

Convention and CITES in the biodiversity cluster—this analysis uses the Environmental Conventions Index to measure implementation and creates a baseline. This research, therefore, offers new understanding about how countries translate international environmental conventions into domestic policies. In addition, this methodological construction also can be applied to other international legal instruments. Furthermore, this is the first step of a comprehensive method to improve the implementation and effectiveness of international environmental conventions. This concluding chapter summarizes the analytical foundations that underlie the study and outlines the main theoretical and empirical contributions of this work. It also describes the next steps for a suggested research agenda, and maps possible paths to use the main findings as inputs for the policy world, creating a science-policy interface that leads to a more effective system of global environmental governance.

Implementing global environmental conventions: What is missing?

Scholars of global environmental governance and international environmental conventions have explained that these agreements bring together governments and stakeholders around the establishment of common obligations and mechanisms to improve the state of the environment. Since the creation of UN Environment in 1972, the number of environmental agreements has increased greatly. Global environmental conventions—classified as such because of their global scope and universal membership—ensure that governments take coordinated and effective actions to protect and improve the environment. Evaluating the implementation and effectiveness of these conventions, therefore, is particularly important. Countries need to assess how well they

are succeeding at adopting domestic regulations, designing strategies, appointing institutions, establishing technical measures, and allocating financial resources to fulfill their international environmental obligations. It would then be possible to evaluate how the agreements contribute overall to resolving global environmental problems.

However, evaluating implementation is a complex task. Each convention's definition of implementation differs, and in most cases, it does not consider adoption of specific measures to comply with obligations, but focuses exclusively on the solution of the environmental problems. Furthermore, the literature argues that implementation results depend directly on the capacities and resources available in each country. It also fails to offer specific evidence that offers the possibility for comparisons, and for the analysis of historical trends. Therefore—as explained in Chapter 1—the puzzle behind the implementation of global environmental conventions is based on three specific gaps: First, analyses are focused purely on effectiveness, without understanding first how the conventions are implemented. Second, no empirical metrics assess the extent to which individual countries are fulfilling their global environmental obligations. And third, the scope of existing implementation studies is limited to specific group of countries, which halts comparisons across countries and conventions. Only by using a standard empirical methodology would it be possible to determine the degree of implementation and the reasons for variations in countries' performance. This study addressed these three gaps, offering rigorous data and analysis that could inform policy-making processes.

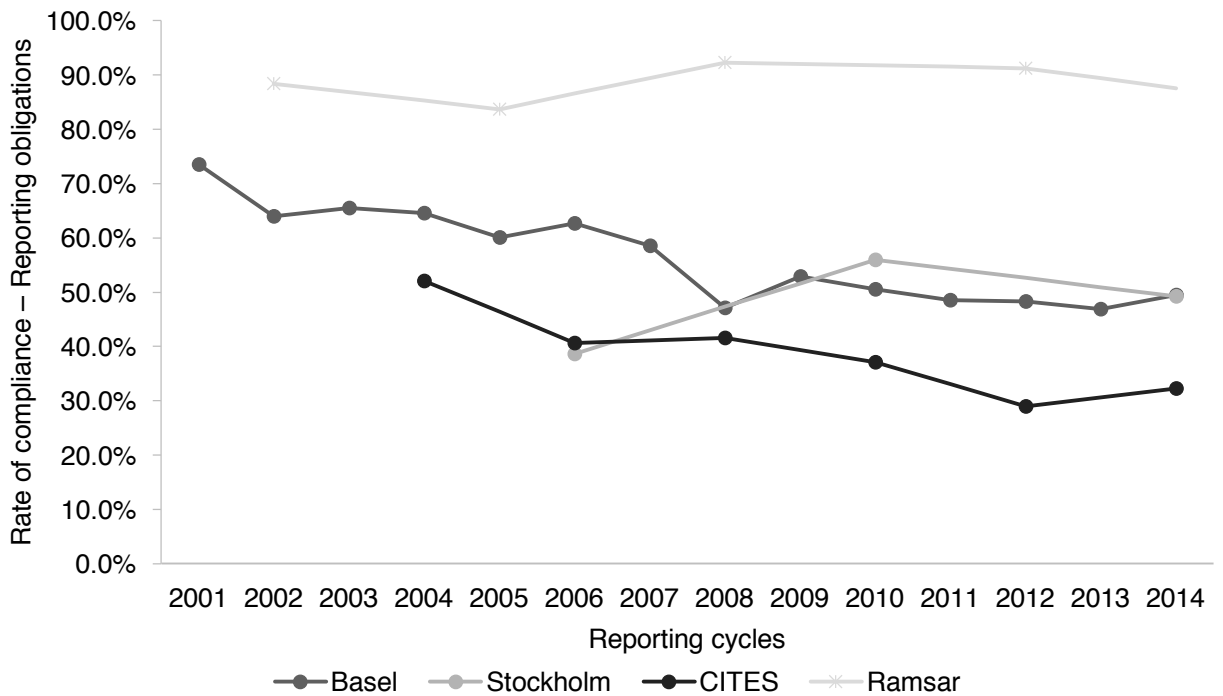
Measuring and explaining the implementation of environmental conventions

Chapters 4 and 5 presented a detailed analysis of the degree of implementation of four global environmental conventions. In addition to this baseline for national performance, other findings also deserve attention. First, compliance with national reporting obligations is critical. By using national reports as sources material, this study reflected on the nature of these information mechanisms. National reports are the most basic method used by the agreements for ensuring compliance. However, it is concerning that the number of countries submitting reports has been decreasing over the past fifteen years, as the cases of the Basel Convention and CITES illustrate starkly (see Figure 37). The fact that there are important gaps both in national reporting rates and in the rate of compliance with reporting obligations also raises important questions about the structure of national report questionnaires, the data collection process to answer them, the timing of reporting cycles, and the kinds of instruments that the conventions need to put in place to prepare and coordinate with state parties for the submission of information.

Evidence from the four conventions covered by this research demonstrates that close collaborations among the secretariats and countries, together with a clear structure of the reports and a specific purpose for the information they collect, could improve the results for this important obligation, generating consistent and coherent data about implementation. Governments and the conventions' executive bodies could determine the obstacles to the submission of national reports and best practices around structure and frequency of those reports, to guarantee that all state parties submit the required information to assess progress towards the environmental commitments defined by each agreement.

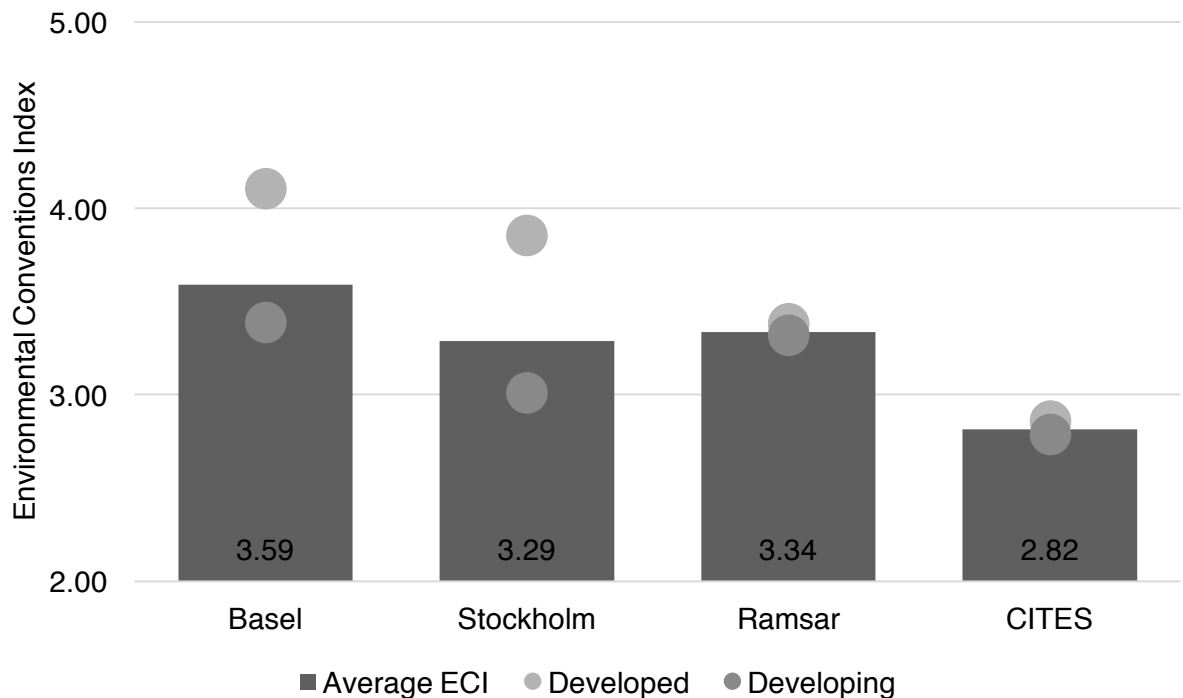
Evidence from the four conventions covered by this research demonstrates that close collaborations between the secretariats and the countries, together with a clear structure of the reports, and a specific purpose for the information they collect, could improve the results for this important obligation, generating consistent and coherent data about implementation. Governments and the conventions' executive bodies could determine the obstacles to the submission of national reports and the best practices in terms of the structure and frequency of national reports, to guarantee that all state parties submit the required information to assess their progress towards the environmental commitments defined by each agreement.

Figure 37 National reporting rates over time



The measurement of implementation for each of the conventions included in this study also resulted in important findings. On average, there is still progress to be made in all the conventions. There are also marked differences across clusters. Differences in index scores between developed and developing countries are more pronounced in the chemicals and waste conventions while, on average, scores are equal for the biodiversity conventions. This reflects the importance of technical capacities, science, and financial resources to achieve the obligations of the Basel and Stockholm Conventions (see Figure 38). For the Stockholm Convention, the gap between developed and developing countries has not narrowed, which calls for additional support for developing countries to environmentally sound manage POPs.

Figure 38 Environmental Conventions Index, by convention and type of country



In the biodiversity cluster, the positive results of some developing countries in the implementation of the Ramsar Convention, can certainly be used to identify best practices for CITES and other agreements. For CITES, results show a lower degree of implementation than the other agreements, calling for new strategies that integrate the measures that parties are expected to establish in terms of institutions and legislation, with the mechanisms of international cooperation, and the specific factors that increase the complexity of illegal wildlife trade.

Individual country results also confirm the degree of variation in the process of implementation. No country has positive similar scores across all the conventions included in this study. As Chapter 6 pointed out, even developed countries face challenges, especially at the institutional level, and in balancing the outcomes of their economic and environmental policies. Also, the individual countries' results for the ECI show some exceptional cases that require additional analysis. The fact that several developing countries rank among the top performers in the Basel and Ramsar conventions as well as CITES, indicates that even when dealing with the challenges of development, some countries have created successful policies and measures that contribute to achieving global environmental goals. Interestingly, these are not the same countries for all four conventions. The performance of Argentina, Colombia, Rwanda, and Nigeria for the Basel Convention; Malaysia, Peru, Mozambique, and Thailand for CITES; and Mali, Uganda, Viet Nam, Kenya, Indonesia, and Bahamas for Ramsar illustrates this diversity.

The results of the ECI illustrate the need for a more detailed analysis that examines each of the indicators and explains the reasons for the decline that some

countries are experiencing in the degree of implementation. ECI analysis also offers important insights about the factors that explain implementation, going beyond traditional approaches that focus solely on countries' performance and indicate that developed countries with strong institutional backgrounds perform better. The best practices and challenges identified in Chapter 6 illustrate these assumptions and demonstrate the need for targeted implementation mechanisms across conventions (see Table 28). The fact that the countries recognize cooperation as a best practice most of the times demonstrates the increasing role of stakeholders and IGOs in the system of governance. Countries need to work with international organizations, with the conventions' executive bodies, and with stakeholders to achieve their commitments. Challenges in terms of technical measures, exogenous factors and information, scientific assessment, and data availability also require urgent action.

Table 28 Best practices and challenges ranked by importance

Best practices	Challenges
1. Cooperation	1. Technical measures
2. Institutions, strategies, and policies	2. Exogenous factors
3. Legislation	3. Information, science, and monitoring
4. Information, science, and monitoring	4. Institutions, strategies, and policies
5. Public awareness	5. Legislation
6. Technical measures	6. Finances
	7. Cooperation

Rethinking the process of implementation

This research brings a new dimension to the understanding of the process of implementation of global environmental conventions. First, this study recognized that implementation is a decisive step towards effectiveness that needs to be measured and

understood separately. Secondly, this research introduced empirical data that allows for comparisons across countries and conventions; and third, it designed a systematic methodology for the assessment of implementation. The national implementation profiles presented in Chapter 6 complement existing models of the variables and issues that influence countries' engagement to global environmental commitments. They also connect national policies with specific global environmental obligations, to improve countries' outcomes in terms of implementation. Countries and conventions now have information available both to strengthen their systems of environmental governance, and to support the creation of better and more effective approaches to environmental protection and sustainable development.

Questions also emerge regarding the connection between the degree of implementation and the role of the conventions in solving environmental problems. For example, the different ECI results between the chemicals and waste and the biodiversity clusters inform discussions about how the nature of environmental problems influences the implementation of agreements. Establishing the relationship between the ECI and variables that measure the state of the environment—in the issues addressed by the conventions—will serve to determine if implementation and effectiveness are correlated. Variables such as the presence of POPs in the environment, changes in wetlands' surface, or variations in trade in endangered species can be used to assess the status of the environmental issues addressed by each of the conventions, and will offer new insights about the actual contributions of the conventions to improvement or decline of the environmental conditions they address

The analysis of the institutional arrangements behind each environmental convention also offers a new vision about how the interaction between governments and executive bodies influences the implementation of international environmental law. Traditionally, conventions act as agents of the mandate given to them by state parties. The evidence from the conventions presented in this dissertation explains the interactions between secretariats and states, and the extent to which the executive bodies perform the mandate given to them by the state parties. Results from the ECI and this study's analysis of the conventions explain that the extent to which the secretariats are fulfilling their functions—and in some cases additional functions oriented to coordination, visibility, and engagement—and contributing to the successful implementation of conventions.

Connecting academia and the policy world

By expanding our understanding about the effective implementation of global environmental conventions, academia can provide input for policy processes that address planetary challenges and proscribe human activities harmful to the environment. Measuring and explaining implementation support effective and better governance, through the definition of a series of policy recommendations that inform governments and international organizations. The best practices identified in this dissertation can be used to design strategies in specific policy areas, and new research projects that can be developed to expand the work to other global conventions as well as other international agreements in policy areas related to environment, development, and sustainability.

The Environmental Conventions Index also can be used as a public information resource. The Center for Governance and Sustainability plans to make to make the ECI

available to the public in 2018, in a user-friendly online format. Furthermore, since the index is composed of specific indicators on issues such as legislation institutions, information, technical environmental operations, and finances, it offers a wealth of data on areas of implementation that require more progress, contributing to the definition of targeted capacity-building mechanisms that can improve national performance and consequently how successfully conventions themselves address environmental problems. The Environmental Conventions Project will comprise six analytical outreach strands:

- *Data analysis*, through the development of a systematic protocol and methodology to evaluate the level of implementation of the four conventions included in this study, applicable not only to environmental conventions but also to other international law instruments. Making all the data on implementation available will constitute a central body of information for governments, conventions, and other stakeholders, providing insights on variables relevant to policy processes beyond implementation.
- *Policy recommendations*, opening space for using the outcomes of the proposed research in additional projects directed not only to governments and the secretariats of global environmental conventions but also to stakeholders and civil society representatives, and fostering dialogue about the need to enhance the capacity of countries and conventions to improve their policies and strategic approaches towards the achievement of global environmental goals. This is particularly relevant in the current context, when the international community is embarking on a new development agenda oriented towards sustainable

development and with a significant emphasis on several environmental challenges included in the conventions.

- *Creation of a policy space*, to bring together and stimulate collaboration among officials from the convention secretariats and national governments as well as scientific and policy experts. Developing this research within the Center for Governance and Sustainability will provide information significant to the analysis, since the center will convene, consult with, and engage officials from environmental conventions in developing the data analysis framework, evaluation of policy processes, and articulation of future strategies.
- *Communication*, since the ECI is a powerful tool for users to communicate which countries are leaders and laggards in meeting global environmental goals. In turn, this will engage and inform the public and empower citizens to demand improved performance.
- *Leadership development*, as the Center for Governance and Sustainability, using the key findings in this project, will create training programs to provide guidance to governments and environmental conventions officials in substantive environmental policy issues as well as in negotiation and conflict resolution processes.
- *Solution of global environmental problems*, supporting countries and environmental conventions with information needed to take actions to improve environmental performance. Offering a scientific perspective on the process of implementation and its connections to solving environmental problems will

improve the policy-making processes and the conventions' effectiveness in addressing environmental challenges.

The ECI, its national implementation profiles and explanatory analysis, together with the results of additional projects in terms of policy recommendations and potential training modules for capacity building, constitute a robust portfolio of resources for giving governments, international organizations and stakeholders fresh ideas to enhance international cooperation and bridge the gap between policy and solutions. Furthermore, with its emphasis on transparency and accountability, this Environmental Conventions Project will challenge assumptions about reporting and performance on the treaties it analyzes, and can offer strategies for improvement on a case-by-case basis.

What is next?

While multiple studies have previously tried to evaluate implementation, the systematic approach created by this research project provides a new repository of data that can be the departure point for academic analysis and policy recommendations. In terms of future research, the application of the methodology to other environmental conventions is an obvious and necessary next step. Additional in-depth analyses that focus on the results that individual countries are achieving could also be developed. Countries could then increase the salience of environmental issues in foreign policy, which has traditionally been dominated by issues of security, conflict, and development. Furthermore, the role and relevance of environmental conventions in achieving the SDGs under the umbrella of the new Sustainable Development Agenda is critical. The conventions and the indicators that comprise the ECI can provide data and information to

measure progress on some of the goals. The SDGs, targets, and indicators include direct and indirect references to environmental conventions (see Table 29). Some references are specific to environmental problems, while others are linked to the system of governance as means of implementation. For example, all conventions can contribute to the implementation of SDG16 (Peaceful and Inclusive Societies), and SDG17 (Partnerships for the Goals). The SDGs, therefore, connect with the international environmental conventions, and governments can learn from the agreements about the challenges of governance instruments, implementation, and responsibilities such as national reporting, monitoring, and follow-up.

Table 29 Reference to environmental conventions in the SDGs

SDG		Target	Conventions
SDG2 Zero Hunger	2.4.	Ensure sustainable food production systems and implement resilient agricultural practices	Basel Stockholm Ramsar
SDG3 Good Health and Well-being	3.9	Reduce the number of deaths and illnesses from hazardous chemicals, pollution, and contamination	Basel Stockholm
	3.d	Strengthen countries' capacity for risk reduction and management of global and national health risks	Basel Stockholm
SDG6 Clean Water and Sanitation	6.3	Improve water quality by reducing pollution and eliminating release of hazardous chemicals	Basel Stockholm
	6.6	Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	Ramsar
SDG11 Sustainable Cities and Communities	11.6	Reduce the adverse environment per capita impact of cities by paying attention to waste management	Basel Stockholm
SDG12 Sustainable consumption and production	12.2	Achieve the sustainable management and efficient use of natural resources	Ramsar CITES
	12.4	Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle	Basel Stockholm
	12.5	Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle	Basel Stockholm
SDG13 Climate Action	13.b	Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing states	Ramsar

SDG		Target	Conventions
SDG14 Life Below Water	14.1	Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	Basel Stockholm
	14.2	Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts,	CITES
	14.4	Effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices, and implement science-based management plans, in order to restore fish stocks	CITES
SDG15 Life on Land	15.1	Ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	Ramsar
	15.7	Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	CITES
	15.b	Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	CITES

Sources of data: (UN General Assembly, 2015; UNEP, 2016b)

Better understanding of implementation also offers the space for policy action and cooperation to create a new generation of leadership—at the national level, in global institutions, and in the higher education system—motivating organizations to produce this type of analysis and to support policy-making processes with rigor and engagement.

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