

Institutional diffusion in international environmental affairs

ALEXANDER OVODENKO AND ROBERT O. KEOHANE

Political institutions are established because organized groups of people seek to achieve certain purposes that can be realized only by creating new institutions or modifying old ones. International institutions reduce transaction costs and uncertainty for governments in their future interactions within a specific issue-area. Once bargaining problems have been overcome, institutions can help to facilitate mutually beneficial cooperation among governments. However, it is rare that only one institutional design could perform these functions in a satisfactory way. So there is scope for choice.

In negotiating the design of institutions, governments often face uncertainty over the likely outcomes of various institutional options. That is, although institutions help to solve informational problems, their creation is often difficult owing to incomplete and imperfect information. Informational scarcity is particularly problematic because all international institutions are established through negotiations involving states, on which authoritative institutions cannot be legally imposed. Non-state actors with strong views and advocacy positions are typically also involved. To pass the 'screens' applied by such negotiations, proposed institutional designs must be widely acceptable.

These features of international institutional negotiations make familiar institutional designs potentially attractive. For governments seeking information about the likely consequences of specific institutional designs, existing institutions are natural sources of information. Such institutional designs can also provide focal points that are helpful in resolving bargaining problems. In this way, a situation with multiple equilibria, each preferred by some actor or actors, is simplified so that the choice is between the status quo and a single salient alternative.¹

For these reasons, the familiarity of a given institutional design should breed acceptability, not contempt. Institutional designs that are familiar and perceived by a wide variety of participants in negotiations as successful in relevant contexts should have greater chances of being adopted than those that are new. A priori, therefore, under some conditions we should expect *institutional diffusion* in world

¹ James Fearon, 'Bargaining, enforcement, and international cooperation', *International Organization* 52: 2, Spring 1998, pp. 269–306. See the discussion on p. 298: 'Focal points and bargaining precedents are undoubtedly created by the experience of repeatedly negotiating certain sets of issues within the context of a regime . . . Regimes establish connections and parallels between different rounds of bargaining and may legitimize focal principles.'

politics: *the adoption in new or reformed institutions of institutional features already operating in other institutions, national, international or transnational.*

Institutional diffusion refers to the processes by which institutional characteristics spread to international institutions from a point of innovation to points of potential adoption. It entails three distinct elements: (1) a similarity of form or practice; (2) a temporal sequence between the point of origin and the point of adoption; and (3) a process by which the innovation is applied in a new setting. Therefore, institutional diffusion refers to a causal and temporal relationship between similarly designed institutions, not merely to the institutional similarity alone.² It denotes both the mimetic and the non-mimetic processes by which an institutional innovation becomes subsequently applied in other international policy contexts.³

There is a substantial literature on cross-national diffusion of policy initiatives.⁴ For example, Sarah Brooks finds that pension reform diffusion most often occurs on a regional basis because governments in the same region share characteristics, suggesting that a successful policy in one country could be similarly successful in its regional neighbours.⁵ But there has been less analysis of institutional diffusion, particularly on international environmental issues.

Our concern in this article is with the diffusion of international institutional designs from international institutions in one issue-area to newly created institutions in a different issue-area. That is, we are concerned with *institutional* diffusion in multilateral policy contexts. Relatively little attention has been given to such diffusion in international environmental governance, in contrast to the extensive sociological research on private and public institutions or the political science research on *policy* diffusion and its variants.⁶

The present article seeks to correct this shortcoming by offering a tentative analysis of how institutional diffusion occurs with respect to international

² This definition incorporates the elements of diffusion identified in previous conceptual refinements. See Everett Rogers, *Diffusion of innovations*, 3rd edn (New York: Free Press, 1995); Zachary Elkins and Beth Simmons, 'On waves, clusters, and diffusion: a conceptual framework', *Annals of the American Academy of Political and Social Science* 598, 2005, pp. 33–51; David Strang, 'Adding social structure to diffusion models', *Sociological Methods and Research* 19: 3, 1991, pp. 324–53.

³ We thank an anonymous referee for drawing our attention to the difference between policy diffusion and policy transfer. Our concept is distinguishable from policy transfer, which generally refers to a learning process between one institutional innovation and a singular point where that innovation is later applied. For an overview of the policy diffusion and policy transfer literatures, see David Marsh and J. C. Sharman, 'Policy diffusion and policy transfer', *Policy Studies* 30: 3, 2009, pp. 269–88.

⁴ Busch Per-Olof, Helge Jorgens and Kerstin Tews, 'The global diffusion of regulatory instruments: the making of a new international environmental regime', *Annals of the American Academy of Political and Social Science* 598, 2005, pp. 146–67; Beth A. Simmons, Frank Dobbin and Geoffrey Garrett, eds, *The global diffusion of markets and democracy* (Cambridge: Cambridge University Press, 2008); *Journal of European Public Policy*, special issue on 'Cross-national policy convergence: causes, concepts and empirical findings', 12: 5, 2005.

⁵ Sarah M. Brooks, 'Interdependent and domestic foundations of policy change: the diffusion of pension privatization around the world', *International Studies Quarterly* 49: 2, 2005, pp. 273–94.

⁶ For an overview of the sociology literature, see David Strang and Sarah A. Soule, 'Diffusion in organizations and social movements: from hybrid corn to poison pills', *Annual Review of Sociology* 24: 1, 1998, pp. 265–90. For overviews of the political science literature, see Katharina Holzinger, Helge Jorgens and Christoph Knill, 'State of the art: conceptualizing environmental policy convergence', in Katharina Holzinger, Christoph Knill and Bas Arts, eds, *Environmental policy convergence in Europe: the impact of international institutions and trade* (Cambridge: Cambridge University Press, 2008), pp. 7–30.

environmental regimes. Our dependent variable is the extent to which we observe institutional diffusion with respect to international environmental institutions. We focus on two principal analytical questions. First, what are the *causal mechanisms* that promote diffusion? That is, what are the observable processes associated with the diffusion of institutional characteristics from an established institution or set of institutions to new or reformed institutions? Second, *under what conditions* does institutional diffusion on international environmental issues occur or fail to occur? These questions reflect our view that institutional diffusion depends on specific conditions and operates within a definable set of parameters that constrain the scope and depth of institutional isomorphism in international environmental governance.

We begin the article by describing institutional diffusion, or the lack thereof, in several important international environmental issue-areas. The second section then develops a functional argument about diffusion, focusing on *mimetic diffusion* as a baseline for analysing the conditions for institutional diffusion. The third section briefly discusses alternative mechanisms, including ideas, coercion and private actors, because the functional analysis outlines a necessary but not sufficient set of conditions for diffusion. Our conclusion briefly considers some implications of our analysis and relates it to possible outcomes of the forthcoming Rio+20 conference.

Variation in the diffusion of international environmental institutions

In recent decades, international institutions concerned with the natural environment have proliferated.⁷ United Nations conferences with expansive agendas have catalysed new institutions and agreements on an increasingly broad range of environmental problems. Governments have developed more sophisticated institutional arrangements on biodiversity, endangered species, regional marine pollution, transboundary and atmospheric air pollution, and other issues. Over time, international environmental governance has become more institutionalized, as governments have added provisions to perform a wider set of functions and address a growing array of common concerns.

These developments offer an opportunity for analysing institutional similarities and differences across environmental regimes and over time. In the course of their development, some environmental regimes have adopted similar institutional forms and common practices, but in other cases institutional forms have diverged. That is, the landscape of international environmental institutions exhibits variation in whether diffusion occurs.

Institutional diffusion processes may operate across issue-areas, levels of governance and groups of governments. Governments may view domestic environmental regulations as a model for international environmental regulations. Similarly, they

⁷ The multilateral environmental agreements made between 1992 and 2012 have far outnumbered those made between 1972 and 1992. See the International Environmental Agreement Database Project: <http://iea.uoregon.edu/page.php?file=home.htm&query=static>, accessed 16 Jan. 2012.

may regard regulations adopted for one issue-area as instructive in managing a different issue-area. They may likewise decide to implement the same kind of innovations as do other groups of governments when handling a similar regulatory problem. Finally, international organizations and private non-state actors may serve as agents of diffusion. Thus diffusion may follow different pathways, summarized in table 1.

Table 1: Diffusion pathways

<i>Pathway Number</i>	<i>Source of diffusion</i>	<i>Diffusion to</i>
1	Domestic practice in home government	Institutional proposals by home government in international negotiations
2	International regulations in one issue-area	International regulations in other issue-areas
3	One set of governments	Other governments, facilitated by multilateral institutions
4	International organization	Other issue area or geographical location with same international institution
5	Private non-state actors	Other issue area with same non-state actors

We elaborate these pathways and examine several cases, in which diffusion has or has not occurred, that are marked by nominal similarities in the environmental regulatory problems facing governments. We focus on the following innovations:

- US sulphur dioxide emissions trading;
- the UN regional seas programme for the Mediterranean Sea;
- the Intergovernmental Panel on Climate Change (IPCC)
- the Montreal Protocol on ozone depletion; and
- the Forest Stewardship Council.

Table 2 previews the empirical variation we describe. In all these cases, governments originally generated an institutional innovation, but some of these innovations were not subsequently applied in nominally similar regulatory settings. Others, however, were applied to a significant extent in later institutional development efforts.

US sulphur dioxide trading programmes and European regulations on acid rain

With the Clean Air Act Amendments of 1990, the US government imposed a schedule of sulphur dioxide caps on electric utility companies nationwide. Legislators in Congress eased the compliance burden on these companies by instituting a trading system, allowing companies to reduce their operating costs by

Table 2: Diffusion patterns and cases

<i>No diffusion</i>	<i>Partial diffusion</i>	<i>Close diffusion</i>
US sulphur dioxide programme / LRTAP second sulphur protocol	Montreal Protocol / Kyoto Protocol (<i>diffusion: baskets of gases; no diffusion: commitments</i>)	US sulphur dioxide programme / Kyoto emissions trading
NASA-led ozone research/ IPCC		LRTAP Western Europe / Eastern Europe
Multilateral Fund / Green Climate Fund (proposed)		Med Plan / UNEP Regional Seas Programme IPCC / IPBES (proposed) FSC / standards certification schemes

FSC: Forestry Stewardship Council; IPBES: Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services; IPCC; LRTAP: Long-Range Transboundary Air Pollution agreement; UNEP: United Nations Environment Programme.

purchasing permits if they expected to surpass their total emissions allowances. The electricity companies could thus decide how much to reduce emissions on the basis of a price signal determined by market forces under a regulated allocation and review system. Robert Stavins has written that the sulphur dioxide trading scheme was considered successful as early as 1995 and 1996 in reducing sulphur dioxide emissions in aggregate across the United States.⁸ The ideas underpinning this programme have found wider application in other areas of American environmental regulations.

The US sulphur programme has become a model for international responses to climate change in global and European contexts. The Kyoto Protocol to the UN Framework Convention on Climate Change (UNFCCC) codified the use of several forms of market mechanisms for reducing greenhouse gas (GHG) emissions. These mechanisms allow for the development of global markets for emissions credits to offset national mitigation costs for the advanced developed countries, which accepted absolute caps on their GHG emissions under the agreement. Before and immediately after the Kyoto climate conference in December 1997, the sulphur emissions programme was viewed as effective in reducing acid rain cost-efficiently. Under-Secretary of State Stuart Eizenstat testified before a Senate Foreign Relations Committee hearing that the US position on emissions trading at the Kyoto conference reflected the 'very positive experience with permit trading in the acid rain programme, [which reduced] costs by 50 percent from

⁸ Robert N. Stavins, 'What can we learn from the grand policy experiment? Lessons from SO₂ allowance trading', *Journal of Economic Perspectives* 12: 3, 1998, pp. 69–88.

what was expected, yet fully serving our environmental goals'.⁹ Between 1997 and 2001 the Kyoto flexibility mechanisms took shape in the UN climate negotiations while the US 'experiment' with emissions trading was exceeding expectations in terms of both environmental performance and economic efficiency. The diffusion of institutional arrangements from the US sulphur dioxide trading programmes illustrates our first pathway: diffusion from domestic to multilateral institutions.

Despite initial reluctance to accept US proposals regarding international emissions trading, the European Union Emissions Trading Scheme (EU ETS) became the first application of this idea at the international level. Voss writes that support for emissions trading grew substantially in Europe following the Kyoto conference, beginning with the development of internal emissions trading by firms such as British Petroleum and Royal Dutch Shell and expanding nationally and then internationally to the European level.¹⁰ According to one study, the EU ETS arrangement for penalizing compliance failure was modelled on the corresponding arrangement under the United States sulphur emissions programme.¹¹ Moreover, the EU ETS system for allocating permits, based on a network of national registries for both emissions and permits, also reflects the allowance tracking system developed under the US sulphur programme.

In contrast to institutional responses to climate change, the responses to European acid rain have shown a consistent focus on reducing sulphur emissions by national means alone. The Long-Range Transboundary Air Pollution (LRTAP) agreement was drafted and opened for ratification in 1979. Six years later, nearly two dozen countries negotiated a protocol to reduce sulphur emissions to fulfil the original purpose of the LRTAP agreement, which served as a framework for institutionalized cooperation on a new international policy problem. When the Cold War ended, new states formerly in the Eastern Bloc and part of the Soviet Union joined LRTAP and adopted several of its protocols. LRTAP in its first phase illustrates our third pathway: policies developed first in countries in north-western Europe diffused to southern and eastern Europe within the framework of an international institution.¹²

In 1994, a second sulphur protocol was negotiated under the LRTAP framework to further reduce European acid rain. Whereas the first sulphur protocol was negotiated five years before the US national programme on sulphur emissions was instituted, the second sulphur protocol was negotiated four years *after* the Clean Air Act Amendments were passed and the US national emissions-trading programme was first implemented. The second sulphur protocol makes a vague reference to 'joint implementation', but no institutional manifestation of this

⁹ Stuart Eizenstat, 'Statement before the Senate Foreign Relations Committee', Washington DC, 11 Feb. 1998, State Department web page archive, <http://www.state.gov>, accessed 27 Feb. 2012.

¹⁰ Jan-Peter Voss, 'Policy instruments as innovation in governance: the case of emissions trading', SPRU Electronic Working Paper Series (Brighton: University of Sussex, 2007).

¹¹ Chad Damro and Pilar Luaces Méndez, 'Emissions trading at Kyoto: from EU resistance to Union innovation', *Environmental Politics* 12: 2, 2003, p. 75.

¹² Marc A. Levy, 'European acid rain: the power of tote-board diplomacy', in Peter M. Haas, Robert O. Keohane and Marc A. Levy, eds, *Institutions for the earth: sources of effective international environmental protection* (Cambridge, MA: MIT Press, 1993), pp. 75–132.

concept has been developed under LRTAP. Joint implementation allows parties the opportunity to meet national obligations by joint mechanisms. Under the Kyoto Protocol, this takes the form of emissions trading and a separate mechanism permitting developed countries to finance projects among themselves in exchange for emissions credits. Unlike the EU ETS or the Kyoto regime, the second sulphur protocol under LRTAP places obligations on states in respect of sulphur dioxide emissions but does not specify a market-based mechanism such as emissions trading to facilitate joint implementation and cost-efficient emissions reduction. We highlight this as a case of non-diffusion because institutional arrangements employed under Kyoto have not diffused to LRTAP.

The Med Plan

Much like the US sulphur emissions programme, the Mediterranean Plan for marine pollution and coastal protection was a significant innovation in environmental governance. Directed by the United Nations Environment Programme (UNEP), the Med Plan, as it is called, has helped to spur over a dozen regional seas plans for coastal areas bordering over 140 countries.¹³ The 1974 Helsinki Convention on Protection of the Baltic Sea and the London and Oslo Conventions of the early 1970s offered templates for the UNEP Regional Seas Programme because of the range of marine issues they covered.¹⁴ The UNEP Regional Seas Programme received a catalytic boost from the Med Plan, as several other regional seas plans were instituted under its direction over the next decade. As new regional seas plans were instituted, institutional designers tailored provisions to the specific circumstances of each applied setting but retained the pillars of the original Med Plan. The Regional Seas Programme director during the earlier 1980s, Stjepan Kecke, remarked that the Med Plan provided a learning experience for staff at the programme, highlighting effective and ineffective initiatives.¹⁵ The political success and perceived benefits of the Med Plan catalysed the UNEP programme both internally and among governments seeking similar environmental initiatives to those the Mediterranean states had undertaken.

The UNEP Regional Seas Programme proceeded in multiple steps, all of which stemmed from the Med Plan experience.¹⁶ The first step was to create an agreement with five categories of provisions: environmental assessment, environmental management, environmental legislation, institutional arrangements and financial arrangements. The legislative component involved an umbrella convention, followed by specific protocols on dumping and land-based sources of pollution, and then by technical annexes to the protocols on remaining issues. This tiered approach helped build confidence among participating governments and was

¹³ P. Akiwumi and T. Melvasalo, 'UNEP's Regional Seas Programme: approach, experience and future plans', *Marine Policy* 22:3, 1998, pp. 229–34.

¹⁴ Peter Hulm, 'The regional sea program: what fate for UNEP crown jewels?', *Ambio* 12: 1, 1983, pp. 2–13.

¹⁵ Hulm, 'The regional sea program', p. 12.

¹⁶ Laurence Mee, 'The role of UNEP and UNDP in multilateral environmental agreements', *International Environmental Agreements: Politics, Law and Economics* 5: 3, 2006, pp. 227–63.

deployed successively in different regional settings with similar marine pollution problems. The diffusion of institutional arrangements from the Med Plan to the UNEP Regional Seas Programme illustrates our fourth diffusion pathway: diffusion resulting from the initiative of an international organization.

Scientific assessments on ozone depletion, climate change and biodiversity

Global environmental problems typically arise as part of very complex systemic processes, so that it is not entirely clear, even when a problem is recognized, what causes it or how best to respond. Scientific assessments, often on a large scale, need to be organized before specific proposals for action can gain widespread support. The leading example of a global scientific assessment process is the IPCC, established in 1988 under the auspices of UNEP and the World Meteorological Organization. The IPCC has organized four major scientific assessments, involving thousands of scientists. Its history throws some light on diffusion and non-diffusion in international environmental affairs.

Prior to the IPCC, the only major international research body organized to handle a pressing global commons problem was the ozone layer research programme organized by the US National Aeronautics and Space Administration (NASA). The international assessments produced under this programme reflected a growing number of participating research institutes and scientists.¹⁷ The IPCC represented a significant innovation in global environmental governance, reflecting a departure from the NASA-led ozone research programme in its intergovernmental nature and its formal establishment by two international organizations.¹⁸ Once constituted, the IPCC served as a model for intergovernmental scientific research organizations because of its overall success in providing a public good in climate change governance and its high degree of institutionalization within the global climate change regime. Over time, the IPCC has provided both a reference point for future initiatives to establish global science policy institutions and a template for setting out the practices and mandates of such institutions. Indeed, recent discussions over an intergovernmental study group on biodiversity have accepted the IPCC as a template.

In particular, efforts were made in 2010, the International Year of Biodiversity, to create an Intergovernmental science–policy Platform on Biodiversity and Ecosystem Services (IPBES) on the model of the IPCC. Much like that for the IPCC, ‘the vision for IPBES is that of a mechanism, which would provide on a regular basis, global and regional trends in biodiversity and associated ecosystem services, analyse their causes, and explore possible future changes, in order to inform decision making’.¹⁹ Although the proposed research body has yet to take

¹⁷ Edward A. Parson, *Protecting the ozone layer: science and strategy* (Oxford: Oxford University Press, 2003), ch. 4.

¹⁸ For a summary, see Shardul Agrawala, ‘Context and early origins of the Intergovernmental Panel on Climate Change’, *Climatic Change* 39: 4, 1998, pp. 605–20.

¹⁹ Anne Larigauderie and Harold A. Mooney, ‘The Intergovernmental science–policy Platform on Biodiversity and Ecosystem Services: moving a step closer to an IPCC-like mechanism for biodiversity’, *Current Opinion in Environmental Sustainability* 2: 1–2, 2010, p. 9.

form, the UNEP Governing Council has requested a plenary meeting to determine appropriate arrangements and modalities for its operation. The IPCC–IPBES case also illustrates our fourth diffusion pathway: diffusion through an international organization, in this case UNEP.

The Montreal Protocol on the ozone layer

In contrast to the IPCC and the proposed IPBES, a prominent example of *non-diffusion* is provided by the failure of the negotiators of the Kyoto Protocol to follow the example of the Montreal Protocol on Substances that Deplete the Ozone Layer, negotiated in 1987 and strengthened several times since then with new amendments and a financing mechanism.

In the early phases of the UN climate change regime, the Montreal Protocol process was viewed as a model for addressing the global atmospheric commons problem presented by climate change. Negotiators who had developed the Montreal Protocol recommended using that agreement as a template for the climate change convention under negotiation by an international committee prior to the Rio Earth Summit of 1992.²⁰ For example, soon after the UNFCCC entered into force, negotiators in the US State Department who were preparing for the Kyoto conference developed a proposal to add three gases to the three already covered under the UNFCCC, creating a ‘basket of gases’ that would be converted in carbon-equivalent national totals of GHG emissions. The basket idea was intended to provide governments with flexibility in determining which response measures to take domestically, giving them an opportunity to develop efficient GHG regulations on the basis of national circumstances.

This basket idea had earlier been introduced into the preparatory meetings leading to the Montreal Protocol. To avoid placing specific restrictions on specific ozone-depleting substances, the United States supported the idea of converting those gases into ozone-depleting potential (ODP), with CFC-II valued at 1.0 ODP as a reference gas for other chlorofluorocarbons.²¹ Countries could then adopt national targets with timetables in respect of the ODP basket and take response measures with specific attention to national trajectories and business-as-usual projections. The adoption of the basket-based measure of global warming potential under the Kyoto regime thus reflected an earlier innovation in the Montreal Protocol process regarding measuring and reducing ozone-depleting gases. This represents an illustration of our second pathway: international arrangements in one issue-area diffused to another.

Yet in a broader sense the Montreal Protocol did not become a model for the UNFCCC process. Most notably, the mandated phase-out for CFCs in the Montreal Protocol included developing countries, although with a ten-year grace

²⁰ James K. Sebenius, ‘Towards a winning climate coalition’, in Irving M. Mintzer and J. Amber Leonard, eds, *Negotiating climate change: the inside story of the Rio Convention* (Cambridge: Cambridge University Press, 1994), p. 298.

²¹ Richard Elliot Benedick, *Ozone diplomacy: new directions in safeguarding the planet* (Cambridge, MA: Harvard University Press, 1998), pp. 78–9.

period and financial assistance for countries consuming less than 0.3 kilograms per capita of ozone-depleting substances.²² In dramatic contrast, the Kyoto Protocol, as a result of a deal made in Berlin in 1995 institutionalizing the concept of ‘common but differentiated responsibilities’, exempted developing countries from any requirements to reduce their GHG emissions. The decision to exempt rather than include developing countries sent the UNFCCC/Kyoto process on a very different trajectory from that of the ozone agreements. Exemption of the developing countries doomed 15 years of attempts to secure US ratification of Kyoto, which would have been difficult in any event. Hence a variety of loosely connected arrangements to attempt to reduce climate change—a ‘regime complex’—has been developed rather than a coherent international regime.²³ Progress has been stymied because the developing countries refused to give up the property right to emit given them at Berlin and the rich countries outside Europe refused to take emissions-reducing measures that would create competitive disadvantages for them *vis-à-vis* rapidly industrializing countries such as China, India and Brazil. In this respect, the Montreal–Kyoto relationship illustrates clear non-diffusion, as governments instituted differentiated responsibilities in the Kyoto regime after having negotiated similar responsibilities in the ozone-layer regime.

The Forest Stewardship Council

Perhaps the clearest example of diffusion by private non-state actors (our fifth pathway) followed the creation of the Forest Stewardship Council (FSC) in 1993, after governments had failed to negotiate a forestry convention at the 1992 Rio summit. The World Wide Fund for Nature (WWF), other environmental organizations and a few timber companies began the FSC to develop global standards for ‘well-managed’ forests, defined by social and environmental criteria. Timber companies and forest owners that met these criteria would receive certification attesting to their socially and environmentally responsible management of a forest. By 2008 the FSC had issued 940 forest management/chain of management certificates across 82 countries, with more forest companies seeking certification from the FSC at rapidly accelerating rates.

Having witnessed the immediate attraction exerted by the FSC, in 1996 the WWF went into partnership with global corporation Unilever to create the Marine Stewardship Council (MSC)—also a private certification institution. The MSC was designed to improve fishery standards and facilitate compliance with global fishery regulations, including those codified in the 1995 Code of Conduct requirements adopted by the UN Food and Agriculture Organization. The WWF

²² Elizabeth R. DeSombre and Joanne Kaufmann, ‘The Montreal Protocol Multilateral Fund: partial success story’, in Barbara Connolly and Robert O. Keohane, eds, *Institutions for environmental aid* (Cambridge, MA: MIT Press, 1996), pp. 89–126 at p. 96.

²³ Robert O. Keohane and David G. Victor, ‘The regime complex for climate change’, *Perspectives on Politics* 9: 1, 2011, pp. 7–23. The Durban meetings of the IPCC parties, in December 2011, finally departed from the ‘common but differentiated responsibilities’ formulation, which may open the door to greater negotiating success for the next UNFCCC commitment period.

modelled the MSC certification process on the corresponding FSC process, with exceptions in key areas, such as the scope of the standards (global rather than local) and the attention to environmental considerations more than social ones.²⁴ These differences reflected the different regulatory problems posed by deforestation and overfishing. However, the similarities between the MSC and the FSC reflected the accountability structures of the prior institution, which rested on extensive stakeholder involvement in setting standards and processing certification requests.

Indeed, private standard-setting institutions have proliferated since the advent of forestry certification. The WWF, having developed an expertise in this area, has also helped to launch the Aquaculture Stewardship Council to pursue largely the same standard-setting goals as the FSC and MSC in their respective regulatory areas.

A functional explanation of institutional diffusion

A functional analysis of institutional diffusion would posit that diffusion reflects the functions that the institutions are designed to perform, focusing especially on their value in solving bargaining problems, reducing transaction costs and providing information.²⁵ When institutional diffusion occurs along such functional lines, governments choose to adapt an institutional arrangement resembling an earlier arrangement to serve a purpose similar to the earlier one. The earlier innovation does not dictate precise institutional arrangements, but acts as a general model for handling a similar regulatory problem.

From this functional standpoint, the adoption of similar institutional forms reflects an underlying similarity in the challenges facing actors. In international environmental governance, *problem similarity* between the point of innovation and the point of adoption is one condition for institutional diffusion. A second key condition is an institution's *record of effectiveness*. Finally, within the set of situations marked by problem similarity and past success, we expect that governments will be more inclined to reapply an institutional characteristic with which they are familiar than to apply an institutional solution developed elsewhere by other governments. These theoretical expectations suggest that institutional diffusion is most likely to occur where either the issue-area or the set of governments is the same as in a prior application of an institutional innovation, or when an international organization is involved.

As we have seen, states are not the only agents of institutional diffusion: international organizations and private non-state actors with a stake in institutional

²⁴ Lars H. Gulbrandsen, *Transnational environmental governance: the emergence and effects of the certification of forests and fisheries* (Cheltenham and Northampton: Edward Elgar, 2010).

²⁵ In addition to Robert O. Keohane, *After hegemony: cooperation and discord in the world political economy* (Princeton, NJ: Princeton University Press, 1984), see Elinor Ostrom, *Governing the commons* (Cambridge: Cambridge University Press, 1990). See also Robert O. Keohane and Elinor Ostrom, eds, *Local commons and global interdependence: heterogeneity and cooperation in two domains* (London: Sage, 1995). A recent outstanding example of work in this research programme is Jaroslav Tir and Douglas M. Stinnett, 'The institutional design of riparian treaties: the role of river issues', *Journal of Conflict Resolution* 55: 4, 2011, pp. 606–31.

Table 3: Key conditions hypothesized to facilitate diffusion

<i>Feature of situation or actor</i>	<i>Attribute facilitating diffusion</i>
Nature of problem	Problem similarity
Effectiveness of past uses of institutional innovation	Effectiveness
Issue area	Same or linked issue areas
Governments involved	Same governments
International organization involvement?	International organizations involved
Private non-state actors?	Private non-state actors involved

outcomes are also often involved in the institutional design process.²⁶ International organizations such as UNEP and private actors like WWF have helped governments develop international environmental institutions, having accumulated bodies of knowledge corresponding to specific types of environmental problems and specific cases of institutional development. We expect that involvement by an international organization or private actors such as business groups or environmental NGOs should raise the probability of cross-actor institutional diffusion.

These arguments, summarized in table 3, outline functional expectations about the conditions under which institutional diffusion is likely to occur. We introduce them now in a general manner to indicate the directions that our baseline analysis will take.

A simple way to think about diffusion from a functional standpoint is to regard it as *mimetic* diffusion. In this view, actors confront a decision problem characterized by uncertainty over the consequences of different actions. They choose either to mimic the behaviour of those who have adopted an apparently successful innovation under similar circumstances or to reject the innovation to varying extents. As research in the administrative sciences has found, mimetic diffusion reflects both the salience of observed outcomes and the uncertainty one faces in choosing among different courses of action.²⁷

Our functional analysis makes some very strong and politically unrealistic assumptions. First, it assumes an absence of distributional issues: the governments involved are pure problem-solvers. Since there are no distributional issues involved, it ignores the role of power, defined as the capability to get others to do what they would not otherwise do.²⁸ Second, a functional analysis ignores the role of ideas in general and of ideology in particular. Finally, it ignores the role of private interests. Thus the analysis in this article, which emphasizes functional arguments to see to what extent they can illuminate our cases of international

²⁶ This is consistent with the claim that international organizations, private non-state actors and subnational government can act as agents of policy transfer. See David Benson and Andrew Jordan, 'What have we learned from policy transfer research? Dolowitz and Marsh revisited', *Political Studies Review* 9: 3, 2011, pp. 366–78.

²⁷ See e.g. Pamela R. Haunschild and Anne S. Miner, 'Modes of interorganizational imitation: the effects of outcome salience and uncertainty', *Administrative Science Quarterly* 42: 3, 1997, pp. 472–500.

²⁸ See Joseph S. Nye, *The future of power* (Oxford: Oxford University Press, 2011), and references therein.

environmental diffusion, is presented as only a baseline analysis. We will return in the next section to distributional issues, power, ideas and the role of private interests, all of which would require more analysis in a fuller exploration of institutional diffusion.²⁹

Processes of mimetic diffusion may involve the use of precedent by negotiators in deciding among different options for new institutions. For example, in determining how to negotiate an agreement for the post-2012 UN climate regime, some officials viewed the Ad Hoc Group on the Berlin Mandate (AGBM) over a decade earlier as a precedent.³⁰ The Berlin Mandate resembled the Bali Action Plan, adopted in December 2007, in that each provided a mandate to negotiate treaties to further develop the UN climate regime. The AGBM was launched after the first Conference of the Parties to the UNFCCC (COP-1), despite the opportunity to negotiate a protocol to the Framework Convention in the Subsidiary Body for Implementation, which was about to meet for the first time later in 1995. The Ad Hoc Working Group for Long-Term Cooperative Action under the Convention (AWG LCA), which was set up following the Bali decisions, reflected the earlier decision to create a wholly new ad hoc negotiating track that led to the Kyoto Protocol, despite the opportunity to use bodies previously established by earlier agreements. The decision to create a separate negotiating track in 1995 at Berlin provided a precedent for the formation of a second negotiating track at Bali—that is, separate from the Kyoto track—to prepare a new agreement for the post-2012 period.

This set of causal mechanisms is also illustrated by the links, focused on UNEP, between the Med Plan and UNEP's Regional Seas Programme, which have demonstrated similar legal evolutions and similar functional goals. The UNEP template for management of regional seas has been deployed in over a dozen different locations with very diverse political circumstances and ecological demands.

Table 4: Baseline expectations regarding institutional diffusion

<i>Problem similarity</i>	<i>Past effectiveness</i>	
	<i>Yes</i>	<i>No</i>
<i>Yes</i>	Diffusion	Little diffusion
<i>No</i>	Little diffusion	Very little diffusion

As noted, mimetic diffusion depends on problem similarity and on past success. Table 4 summarizes these baseline conditions. It posits that institutional innovations will tend to diffuse only in a limited set of situations—an expectation consistent with the institutional diversity that characterizes international environmental governance.

²⁹ We are grateful to our discussants at the Chatham House meeting on 28 Oct. 2011 for emphasizing the roles of ideas and private interests in explaining variation in patterns of institutional diffusion.

³⁰ Personal interview with senior State Department negotiator, Washington DC, 24 Aug. 2011.

Problem structure

As Ronald Mitchell and Patricia Keilbach argue, institutional responses to environmental problems depend on the nature of the incentives that these problems generate for states and other actors: what they call the 'problem structure'.³¹ In situations marked by asymmetrical incentives, institutional responses will tend to include bargains or issue linkage to provide those governments that have more influence in the issue-area with enough incentive to maintain their cooperation. By contrast, situations marked by symmetrical incentives across the actors are fundamentally common pool resource problems similar in structure to those that Elinor Ostrom analysed in *Governing the commons*. Mitchell and Keilbach contend that symmetrical situations tend to generate institutionalized relationships marked by specific reciprocity among the participating governments.

Because of the different problem structures, the relative costs and benefits of policy adjustment and institutionalized cooperation can vary across different environmental issue-areas and categories of issue-area. For example, the patterns of side-payments in river management regimes reflect the geography of transboundary rivers: downstream states often make side-payments to their upstream counterparts, but co-riparian states separated by a river that marks their shared borders tend not to exchange side-payments.³² When upstream states take actions beneficial to downstream counterparts without side-payments being involved, they are often the wealthier of the two parties, suggesting a greater willingness to manage river resources without compensation. These patterns highlight how the institutional arrangements of environmental governance may reflect underlying economic and structural disparities among parties.

Institutional effectiveness

Problem similarity, however, is not sufficient for institutional diffusion, even on a functional basis, because governments may reject an institutional innovation that has failed to achieve its goals, despite ostensible similarities between two environmental cooperation problems. As we have said, similar institutional responses to similar environmental cooperation problems do not alone suggest that diffusion has occurred, as they represent only the outcome element of institutional diffusion. The diffusion literature generally views a record of success as the other condition spurring diffusion among those situations marked by underlying problem similarity. The diffusion of an innovation is sometimes attributed to its apparent success or value.³³ The institution's past success provides information about its likely success in the present setting precisely because of the similar problem structures they share.

³¹ Ronald B. Mitchell and Patricia M. Keilbach, 'Situation structure and institutional design: reciprocity, coercion, and exchange', *International Organization* 55: 4, 2001, pp. 891–917.

³² Shlomi Dinar, *International water treaties: negotiation and cooperation along transboundary rivers* (London: Routledge, 2008).

³³ See e.g. Sarah A. Soule, 'The diffusion of an unsuccessful innovation', *Annals of the American Academy of Political and Social Science* 566, 1999, pp. 120–31.

Table 5: Expected diffusion across governments and issue-areas, given past effectiveness and problem similarity (upper left of Table 4)

<i>Governments</i>	<i>Issue-area</i>	
	<i>Same</i>	<i>Different</i>
<i>Same</i>	–	Diffusion
<i>Different</i>	Diffusion	Less diffusion

Diffusion across issues and governments

Table 5 summarizes our point that institutional diffusion will occur at varying frequencies within the set of situations marked by problem similarity and past effectiveness. We expect that institutional diffusion will be much less likely to occur where both issue-area and participating government are different. However, when either issue area or participating government is the same, we expect institutional diffusion to be an option, provided that the institutional characteristic in question has demonstrated its effectiveness and subject to the political constraints mentioned above and discussed further in the third section of this article.

Since environmental issue-areas differ along multiple dimensions, the greater the difference between two issue-areas in the national interests and structural characteristics they involve, the less applicable a particular institutional innovation may seem to governments seeking to solve an environmental problem.

To illustrate, consider that both water quality and water quantity represent upstream–downstream issues along transboundary river systems because actions taken by an upstream state may modify the quantity and quality of river water flowing through their territory, limiting or complicating its use in the local communities of downstream states.³⁴ This means that upstream states have an asymmetrical advantage over downstream states within the issue-areas of water quantity and water quality management. However, regulating quality and quantity requires entirely different institutional arrangements. Water quality management requires domestic regulations by the upstream state that limit land-based and point sources of river pollution. Fundamentally, this entails placing regulations on domestic industries that cause river salination and other contamination. Water quantity management requires fewer regulations on heavy industry. Instead, it concerns a broader scope of parties because river diversion and hydroelectric power have broad consequences for the general public in upstream states. Since the stakeholders are different and the responses needed to stop the environmental problem are different, managing water quantity and water quality issues requires different institutional responses, despite the similarity in their problem structures.

Thus, even problem structures that share broad commonalities may vary greatly at a more fine-grained level. The more critical these differences are for attaining key governmental objectives and for distributional concerns, the more

³⁴ Thomas Bernauer, 'Managing international rivers', in Oran Young, ed., *Global governance: drawing insights from the environmental experience* (Cambridge, MA: MIT Press, 1996), pp. 155–95.

governments will view institutional arrangements in one issue-area as inapplicable to the other. As we have said, this does not preclude translating innovations from one issue-area to another with some modification. It does, however, reinforce the point that institutional diffusion will most often occur when a present situation in which regulation is demanded closely resembles one in which an innovation was implemented.

The politics of diffusion: state interests and power, ideas, private interests

As we have noted, a functional analysis focused on mimetic diffusion makes stringent and unrealistic assumptions, omitting three important elements of politics: (1) the impact of state interests and power, defined as the capability to get others to do what they would not otherwise do; (2) the role of ideas in general and ideology in particular; and (3) the role of private interests. In a short article we cannot explore in depth these other explanations for diffusion, but it is important nonetheless to indicate what some such explanations might be.

State interests and power

Different institutional arrangements are likely to have different implications for state interests. As a result, institutional diffusion in environmental governance is likely to be affected by the exercise of power, based on asymmetrical patterns of interdependence, as states seek to promote their preferred institutions.³⁵ Since institutional arrangements serve as the 'rules of the game' under which parties interact in a given issue-area, there may be quite a bit at stake. That is, governments have a strong incentive to exercise power in the institutional design process because institutional outcomes often have important consequences for different domestic stakeholders and for national wealth over extended periods. States may therefore use power in the institutional design process to adopt prior innovations or prevent unwanted institutions from being adopted, in line with their domestic politics and national interests. If superior options for powerful players are available, focal points provided by existing institutions may not attract the support of a winning coalition even if they are Pareto-superior to the status quo. Conversely, as Daniel Drezner suggests, powerful states may use asymmetrical leverage to ensure that institutional designs mimic those of their preferred institutions, seeking to extend the range of institutional outcomes favourable to their interests.³⁶

Consider the origins of the Kyoto emissions trading mechanism and its links with the US sulphur dioxide programme. US participation in a climate change regime was viewed as politically and environmentally essential before and during the Kyoto conference, giving American negotiators leverage with which to secure

³⁵ In a pioneering article on institutional isomorphism, Paul DiMaggio and Walter Powell contend that coercion represents one source of organizational homogenization across private firms and institutions. See Paul J. DiMaggio and Walter W. Powell, 'The iron cage revisited: institutional isomorphism and collective rationality in organizational fields', *American Sociological Review* 48: 2, 1983, pp. 147–60.

³⁶ Daniel Drezner, 'Globalization and policy convergence', *International Studies Review* 3: 1, pp. 77–8.

agreement on emissions trading and 'joint implementation'. Having taken a firm diplomatic stand during the talks, the United States secured a degree of institutional flexibility in the Kyoto climate regime that satisfied one of its key requirements for participating in the agreement. That is, the Kyoto mechanisms made allowance for a diversity of domestic preferences towards global environmental protection and economic compliance costs.³⁷ They also reflected US negotiating power *vis-à-vis* European states, as the United States could have imposed negative externalities on others by remaining outside the climate change regime (as, in the end, actually happened). So in this case, American power promoted institutional diffusion.

Indeed, the United States is often in a contrarian position in global environmental negotiations and occasionally uses its influence to block attempts at diffusion by other negotiating blocs. For example, the United States has refused to accept the same design for a financing mechanism in the UN climate change regime that it had accepted under the ozone layer negotiations decades earlier. Rather, the US has insisted that most of the funds for adaptation projects come from private donors through multilateral mechanisms that it helps to design within the UNFCCC.³⁸ This means that the donor system for the proposed Green Climate Fund will differ considerably from the Multilateral Fund under the Montreal Protocol, in that private actor involvement will become essential to the Green Climate Fund, whereas the Multilateral Fund has operated through a state-centric process.

Ideas

Diffusion always takes place within the context of some set of prevailing ideas. For example, the appeal to other countries of the market-based institutions in the US sulphur dioxide programme can only be understood in the context of the attractiveness for a wide variety of governments of market-oriented arrangements during the 1990s. In a world of socialist or *dirigiste* states, such arrangements, even emanating from a powerful country, would have had little appeal. Countries with reasonable alternative options might reject institutions that contravene principles they espouse in national policy (as in, for example, European resistance to emissions trading before the Kyoto conference).

Another example of the role of prevailing ideas is provided by the FSC. In a statist environment, it would have been almost unthinkable for NGOs to take the lead in environmental regulation. Indeed, it is hard to imagine such an initiative before the proliferation of NGOs in areas such as human rights and environment that was so evident after 1980 and even more after the creation of the internet.

³⁷ Elizabeth R. DeSombre, *Domestic sources of international environmental policy: industry, environmentalists, and US power* (Cambridge, MA: MIT Press, 2000).

³⁸ Lorrae van Kerhoff, Imran Habib Ahmad, Jamie Pittock and Will Steffen, 'Designing the Green Climate Fund: how to spend \$100 billion sensibly', *Environment* 53: 3, 2011, pp. 18–31.

Private interests

Finally, private interests always play a role, in pluralist capitalist democracies, in shaping incentives for governments to adopt one institutional arrangement or another. To understand intergovernmental institutions, it is essential to understand the coalitions of private interests that support them. Consider once again the example of diffusion from the US sulphur dioxide programme to Kyoto. Corporations can adapt, and often profit from, market-based regulatory systems that facilitate trading—in these cases, of emissions permits. The creation of emissions markets can create new business for financial firms, and enables industrial firms to use financial instruments to hedge against uncertainty.³⁹ State-run economies would be less likely to be drawn to these arrangements, since these economies lack private interests to serve as advocates for them, and state regulators would be unlikely to share such enthusiasm.

One of our cases of non-diffusion also illustrates well the role of private interests. It was crucial to the successful negotiation of the Montreal Protocol that major firms producing ozone-depleting substances, such as DuPont, came to favour strict regulation.⁴⁰ Major greenhouse gas-emitting firms, including most of the major oil companies, were, by contrast, strongly opposed to strict limits on emissions of greenhouse gasses, and organized public relations campaigns to defeat efforts to impose such limits.⁴¹

A functional explanation of diffusion, however valuable, provides only a starting point for a fuller political analysis of the diffusion of international environmental institutions. Everything we know about the operation of international institutions indicates that politics is pervasive. But since widespread agreement is essential for the construction of international institutions in a post-hegemonic world, all proposals have to meet the 'functional test': that is, they need to provide benefits for all actors that could veto them. So applying functional theory is a useful 'first screen' to distinguish situations in which diffusion could occur from those in which it is very unlikely at best. However, the fact that a given instance of institutional diffusion passes the functional test is unlikely to be sufficient: actual instances of diffusion must also be consistent with configurations of state power and interests, prevailing ideas and, in many cases, private interests as well. A full explanation of institutional diffusion must include, in our view, a functional argument, but such an argument will not stand by itself.

³⁹ Jonas Meckling, *Carbon coalitions: business, climate politics, and the rise of emissions trading* (Cambridge, MA: MIT Press, 2011).

⁴⁰ Edward A. Parson, *Protecting the ozone layer: science and strategy* (New York: Oxford University Press, 2003).

⁴¹ Robert Falkner, *Business power and conflict in international environmental politics* (Basingstoke: Palgrave Macmillan, 2008).

Conclusion: implications for environmental governance

There is considerable variation in institutional diffusion on global environmental issues. When diffusion occurs, it often involves some degree of mimesis, which depends for its realization on similarities of problem structure, actors and issues, and on prior effectiveness—conditions that can be explained broadly in functional terms. We expect a cogent functional rationale to be a necessary but not sufficient condition for institutional diffusion. In the real world of politics, state interests and power will be important. Furthermore, the ideational context may be more or less conducive to diffusion, and private interests can play a role in supporting or inhibiting it.

To evaluate these arguments, a systematic research strategy would first need to consider the full set of operative institutions for environmental regulation, both internationally and domestically. These institutions and the innovations they often embody represent potential starting points for institutional diffusion. Significant departures from institutional arrangements, when implemented in a given regulatory context, may or may not spur diffusion. A strategy for evaluating our theoretical expectations would require both descriptive and causal inference. It would require cataloguing which innovations diffused and where they diffused to, and then analysis of which innovations diffused only marginally or not at all. It would also require description of the conditions under which diffusion occurred and the factors that spurred those processes. Our functional argument would be falsified if institutional innovations that had proved ineffective were often applied to other regulatory settings, as it would if there were a tendency for successful innovations to be applied to other regulatory settings marked by different problem structures, or if innovations diffused regularly across both issue-areas and participating governments. And even if our functional argument survived these tests, it would not constitute a sufficient explanation of diffusion, since the political factors discussed in the preceding section will surely play an important role.

The Rio Conference in 1992 was an example of diffusion, having followed the Stockholm Conference 20 years earlier as the first major global environmental conference. Looking forward, institutional developments following the Rio+20 conference in June 2012 will offer an empirical domain for evaluating our theoretical expectations regarding institutional diffusion, as the conference may produce a combination of changes and continuity in global environmental institutions. Although the specified goals of the Rio+20 conference have evolved over time, it may produce new approaches to international environmental regulation that depart sharply from prior practices. But if, as we expect, institutional diffusion remains relevant, some of the institutional forms that emerge will carry the distinctive markings of prior experiences.

