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Globalization and Environmental Stewardship: A Global Governance Perspective

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A Handbook of Globalisation and Environmental Policy, Second Edition

National Government Interventions in a
Global Arena

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19. Globalisation and Environmental Stewardship: A Global Governance Perspective

Daniel Esty and Maria Ivanova

SUMMARY

In this chapter, we disaggregate the impact of globalisation on the environment into economic, regulatory, information, and pluralisation effects. We complement this structure with an analysis of how national and global environmental policies affect globalisation. We then argue that there is a need for a revitalised governance regime to organise and sustain international environmental cooperation, and propose a reform of existing governance structures for environmental stewardship on a functional basis. We suggest the creation of a global environmental mechanism to fulfil three core functions necessary at the global level: provision of environmental information and assessment, policy development, and country-level support. To this end, the global environmental mechanism will comprise three elements: an information clearing-house, a technology clearing-house, and a global environmental contracts forum. We conclude that a 'light' institutional architecture relying on reconfigured existing institutions, global public policy networks, and modern information technologies offers the potential of improved results and greater institutional legitimacy because of its response speed, flexibility, cost-effectiveness, and potential for broader public participation.

INTRODUCTION

Globalisation has ushered in an era of contrasts, one of fast-paced change and persistent problems. It has spurred a growing degree of interdependence among economies and societies through transboundary flows of information, ideas, technologies, goods, services, capital, and people. In so doing, it has challenged the traditional capacity of

national governments to regulate and control markets and activities. The rapid pace of economic integration, with its interlinked world markets and economies, requires a degree of synchronisation of national policies across a number of issues. One dimension of this coordination concerns the natural environment, from shared natural resources such as fisheries and biological diversity to the potential for transboundary pollution spillovers across the land, over water, and through the air. We now understand that governance approaches that are bounded by the traditional notion of national territorial sovereignty cannot protect us from global-scale environmental threats. An effective response to these challenges will require fresh thinking, refined strategies, and new mechanisms for international cooperation.

In this chapter, we address the relationship between globalisation and the environment, seeking to answer four key questions: (1) How does globalisation affect the environment? (2) Conversely, how does national environmental regulation affect globalisation, particularly economic integration? (3) When is a degree of international cooperation useful or even necessary? (4) What institutional structure would best allow us to manage interdependence and the opportunities that globalisation has the potential to provide?

Globalisation can have both positive and negative environmental consequences. The same forces can exacerbate existing environmental problems and create new ones, as well as run down stocks of non-renewable natural resources. Economic integration and trade liberalisation can generate new resources that foster investments in environmental protection as well as faster and broader dissemination of pollution control technologies and new policy ideas.¹ Environmental choices can, likewise, shape the path of globalisation. National regulatory choices may act as barriers to liberalised trade, or they may trigger a convergence towards harmonised international standards.² The broad range of 'trade and environment' disputes at the World Trade Organization (WTO) – over beef hormones, asbestos regulation, genetically modified food, shrimp fishing, and endangered sea turtles, to name a few – highlights the dynamic complexity of these issues. For policy-makers, the core challenge lies in finding an appropriate mix of competition and cooperation, market forces and intervention, and economic growth and environmental protection.³

Brandenburg and Nalebuff call such an appropriate mix of competition and cooperation 'co-opetition', arguing that it combines the strengths of

¹ Anderson et al., 1999; Jobes, 2003; Speth, 2003.

² Esty, 1994; Rodrik, 1997; Boisrobert et al., 2010.

³ Esty and Geradin, 2001.

both approaches.⁴ Geradin and McCahery further develop the rationale for 'regulatory co-opetition',⁵ stressing that it must both reflect and parallel the world's diversity and complexity. They make the case for a mix of competition and cooperation, not only among governmental actors but also between government and non-governmental organisations (NGOs) – contending that a mixture of competitive pressures and a certain degree of cooperation among the multiple participants in the regulatory process promises systematically improved outcomes.

To maximise globalisation's upside potential, a fundamental reform of global governance structures in general, and of the international architecture for environmental cooperation in particular, will be required. Building greater environmental sensitivity into multilateral trade and financial institutions is necessary but not sufficient. An equally broad-scale reform of the global environmental governance architecture is needed. We propose the creation of a global environmental mechanism to facilitate efforts to advance dissemination of information, 'best practices' in policy-making, and new technologies; manage global-scale environmental risks; promote sound management of the global commons; and support bargaining, negotiation, and contracts.

EFFECTS OF GLOBALISATION ON THE ENVIRONMENT

Globalisation presents a mixed blessing for the environment. It creates economic opportunities, but also gives rise to new problems and tensions. By increasing the volume and decreasing the cost of information and communications, globalisation also offers expanded access to knowledge, new mechanisms for participation in policy-making, and the promise of more refined and effective modes of governance. Understanding this array of economic, regulatory, information, and pluralisation effects is essential if one is to make sense of globalisation's impact on the environment.

Economic Effects

Environmental impacts of expanded economic growth and trade can be understood in terms of scale, income, technique, and composition effects. Scale effects refer to increased pollution and natural-resource depletion

⁴ Brandenburg and Nalebuff, 1996.

⁵ Geradin and McCahery, 2005, building on Esty and Geradin, 2001, calling for regulatory 'co-opetition'.

due to increased economic activity and greater consumption. Income or wealth effects appear when greater financial capacity results in greater investment in environmental protection and new demands for attention to environmental quality. With higher income, we observe two other, related phenomena: technique and composition effects. Technique effects arise from tendencies towards cleaner production processes as wealth increases and, as trade intensifies, better access to new technologies and environmental best practices. Composition effects take place as the economic base evolves towards a less-pollution-intensive high-tech and services-based set of activities. The overall environmental impact of economic growth depends on the net impact of these four effects. If the income, technique, and composition effects overwhelm the negative scale effect of expanded economic activity, then the impact of growth will ultimately be positive. But in the early stages of industrialisation, it may well be that environmental conditions deteriorate.

The precise shape, duration, and applicability of the resulting inverted U-shaped environmental Kuznets curve generated considerable debate in the 1990s.⁶ The critical income level at which pollution begins to diminish is estimated to be about 5,000 US dollars (USD)/year per capita.⁷ In trying to separate out the various environmental effects of economic growth at this crucial point on the curve, it was found that a 1 per cent increase in the scale of economic activity raises pollution concentrations by 0.25-0.50 per cent, but the accompanying increase in income drives concentrations down by 1.25-1.50 per cent via a technique effect, resulting in improved conditions overall.⁸

Though the environmental Kuznets curve has become somewhat of a standard feature in environmental policy, its validity has been questioned. Studies have shown that expanded trade and economic activity may worsen environmental conditions.⁹ Carbon dioxide emissions do not, for instance, appear to fall at any known income level.¹⁰ Some authors therefore challenge the 'flimsy' statistical foundation of the environmental Kuznets curve,¹¹ pointing to evidence of developing countries successfully

⁶ Antweiler et al., 2001; Grossman and Krueger, 1995; Selden and Song, 1994; Shafik, 1994. In effect, the goal is to shorten the length and flatten the amplitude of the environmental Kuznets curve, which represents the path taken by countries undergoing economic development. It is an inverted U-shaped curve illustrating that pollution will increase during early stages of development, level off, and then decrease after a certain income threshold has been reached.

⁷ Grossman and Krueger, 1995.

⁸ Antweiler et al., 2001.

⁹ Esty, 2001.

¹⁰ Dua and Esty, 1997; Moomaw and Unruh, 1997.

¹¹ Stern, 2004: 1419.

addressing environmental issues without having to wait for corresponding increase in per capita gross domestic product (GDP). As David Stern argues: 'the statistical analysis on which the environmental Kuznets curve is based is not robust. There is little evidence for a common inverted U-shaped pathway that countries follow as their income rises.'¹²

Economic theory suggests that the free market can be expected to produce an efficient and welfare-enhancing level of resource use, production, consumption, and environmental protection if the prices of resources, goods, and services capture all of the social costs and benefits of their use.¹³ However, when private costs – which are the basis for market decisions – fail to include social costs, market failures occur, resulting in allocative inefficiency in the form of suboptimal resource use and pollution levels. Market failures are a hallmark of the environmental domain. Many critical resources such as water, timber, oil, fish, and coal tend to be underpriced. Ecosystem services such as flood prevention, water retention, carbon sequestration, and oxygen provision often go entirely unpriced. Because underpriced and unpriced resources are overexploited, economic actors are often able to ignore part or all of the environmental costs they generate. Globalisation may magnify the problem of mispriced resources and the consequent environmental harms.

Regulatory Effects

A primary goal of trade liberalisation is the reduction of barriers to market access. Thus, trade agreements often include 'disciplines' on how the parties will regulate. Some environmental advocates decry this loss of regulatory sovereignty.¹⁴

Perhaps more importantly, free trade promotes competition. Increased competitive pressure may manifest itself in industrial or governmental efforts to reduce pollution-control compliance costs, which might be welfare-enhancing or welfare-reducing. The prospect of a 'regulatory race to the bottom', in which jurisdictions with high environmental standards relax their regulatory regimes to avoid burdening their industries with pollution-control costs higher than those of competitors operating in low-standard jurisdictions remains a worry.¹⁵ Several studies over the past 15 years show, however, that a 'race to the bottom' is unlikely and, instead,

¹² Stern, 2004: 1435. For other critical discussions of the environmental Kuznets curve, see Dasgupta et al., 2002; Harbaugh et al., 2002, and Mills and Waite, 2009.

¹³ Anderson, 1992, 1998; Panayotou, 1993.

¹⁴ Wallach, 2001-2002; Esty and Winston, 2009.

¹⁵ Esty, 2001; Klevorick, 1996.

that a partial 'race to the top' may be observed.¹⁶ As Urpelainen suggests, industrialised countries (i.e., the jurisdictions with stricter regulatory standards) benefit from regulation since their relative competitiveness increases in regulated markets. They gain from avoiding downward convergence of standards, and the result is a pattern of regulatory cooperation rather than competition.¹⁷ Instead of a race to the bottom, a partial race to the top (i.e., an upward harmonisation of standards) occurs because many industrialising countries reliant on export-led growth stand to gain from reduced negative externalities of economic expansion, and producers are vying for access to high-standard jurisdictions. Finally, powerful industrialised countries with high regulatory capacity benefit from a global expansion of regulation and standard harmonisation.

While there is indeed little evidence that environmental standards are actually declining, the concern about globalisation's influence on environmental policies is about the more subtle ways in which competitive pressures can lead to a shift away from optimal environmental policies.¹⁸ Political rhetoric about the danger of job losses because of industry's flight to China, India, or other emerging economies serves to at least slow, if not reverse, the development of new standards in industrialised countries. The outcome may well be a 'political drag' which results in weaker environmental laws than might otherwise have been adopted and, perhaps more importantly, lax enforcement of existing rules or standards.¹⁹ In addition, the upward harmonisation logic applies only to product standards. Standards for production processes or methods (PPMs) are not subject to the same market pressures.

In an interdependent world, production-related externalities cannot be overlooked. Semiconductors produced using chlorofluorocarbons (CFCs), which contribute to the destruction of the ozone layer, should be treated as contraband. Where international environmental agreements are in place, as with the Montreal Protocol regulating the use of ozone-depleting substances, a recognised standard is available. In such cases, trade rules should be interpreted to reinforce the agreed-upon standards. Recrafted trade principles and WTO rules that accept the legitimacy of environmental controls aimed at transboundary externalities would make global-scale trade and environmental policies more mutually reinforcing and reduce the risk of the trade regime providing cover for those shirking their share of global environmental responsibilities.

¹⁶ Vogel, 1994; Drezner, 2001; Heichel et al., 2005; Urpelainen, 2010.

¹⁷ Urpelainen, 2010. See also Vogel, 1994.

¹⁸ Blair, 2008.

¹⁹ Esty and Geradin, 2001.

Information Effects

One of the key features of globalisation is the expansion of communication networks across the globe. The increasing speed and decreasing cost of communication have virtually eliminated the traditional concept of distance. The Information Age has thus transformed space and time, drawing the world into networks of global communication, though some parts are more tightly linked than others.²⁰ This communication revolution has dramatically increased the intensity of national interdependence, fomenting a greater sense of international community and a foundation for shared values.²¹ In turn, the incipient sense of a world community provides citizens with a basis for demanding that those with whom they trade meet certain baseline moral standards, including a commitment to environmental stewardship. As economic integration broadens and deepens, and information about one's partners becomes more readily available, what citizens feel should be encompassed within the set of baseline standards tends to grow. Increased access to data and information on economic and environmental performance allows for faster problem identification, better issue analysis, and quicker trend spotting.²²

An example of the importance of information disclosure is found in the Environmental Performance Index (EPI) produced by the Yale Center for Environmental Law and Policy and by the Center for International Earth Science Information Network at Columbia University.²³ The 2010 EPI uses rankings covering 25 pollution-control and natural-resource-management metrics,²⁴ and tracks trend data in environmental performance in 163 countries. The rankings illustrate, on an issue-by-issue basis, who has succeeded and who has fallen short in reaching established environmental policy goals. Such tools facilitate both the identification of best policy practices and the dissemination of environmental information. The 2010 EPI also identifies drivers of policy success and shows the importance of using quantitative tools in the decision-making process, as it enables policy-makers to benchmark progress. It is also valuable in

²⁰ Esty, 2004.

²¹ Thompson, 2003.

²² Esty, 2004; Esty and Rushing, 2006.

²³ Emerson et al., 2010.

²⁴ The metrics are environmental burden of disease, access to drinking water, access to sanitation, urban particulates, indoor air pollution, sulphur dioxide emissions, nitrogen oxide emissions, volatile organic compound emissions, ozone exceedance, water quality index, water stress, water scarcity index, biome protection, critical habitat protection, marine protected areas, growing stock, forest cover, marine trophic index, trawling intensity, pesticide regulation, agricultural water intensity, agricultural subsidies, greenhouse gas emissions per capita, electricity carbon intensity, and industrial carbon intensity.

evaluating the strengths and weaknesses of existing policies. Presented in this way, environmental information can aid the identification of leaders and laggards in the international arena relative to various environmental criteria, and spur not only competition but also cooperation and improved performance among nations, companies, or even communities. For example, the 2010 EPI reports that several countries have expressed some degree of dissatisfaction with their score card and have been motivated to improve their environmental efforts.

Information in and of itself is not, however, necessarily beneficial. Information overload could lead to a cacophony of voices in the policy realm and result in paralysis instead of action. Such risks need to be kept in mind as the volume of internationally shared information continues to increase, requiring appropriate devices for sifting through and filtering relevant and accurate information.

Pluralisation Effects

Intensified interaction in the economic and political spheres coupled with rapidly diminishing costs of communication has increased the number and diversity of participants in global networks. While some would argue that globalisation has led to homogenisation because actors tap into the same types of resources, exerting an isomorphic pressure,²⁵ there is also a clear pluralisation trend. In the economic sphere, the multitude of actors (and thus competitors) has led to homogenisation toward certain common characteristics (coffee shops everywhere must compete with Starbucks). In the environmental field, however, the dramatic growth in the number of actors has led to pluralisation as numerous NGOs have heightened their levels of activity and brought in a multitude of voices that do not necessarily merge into one. In 1990, there were about 6,000 international NGOs. By the year 1996, that number had reached 26,000.²⁶ In 2000, estimates suggest that there were over 40,000 active international NGOs,²⁷ and that number has kept growing. What is particularly important about these developments is not the proliferation of NGOs but their new ways of networking and mobilising their memberships to change global policies and politics. The increased access to the policy-making process at both the national and international levels has allowed NGOs to reshape the institutional and policy landscape. An elaborate organisational or institutional

²⁵ Meyer et al., 1997.

²⁶ *The Economist*, 1999.

²⁷ Anheier et al., 2001.

infrastructure is no longer necessary for an entity to have a global reach and global impact.

With the rise in social media networks and outlets, transparency, participation, and democratisation have also increased, providing a broader constituency of concerned groups and individuals with access to global decision-makers. While national governments remain central to global-scale policy-making, many new actors now play a role and the governance process has become much more complex.²⁸ For example, the Landmine Treaty resulted from an internet-based campaign started in 1991 by several NGOs and individuals. The Treaty has now been ratified or acceded to by 156 countries.²⁹ An NGO network, representing over 1,100 groups in over 60 countries, is working locally, nationally, regionally, and internationally to implement the ban on antipersonnel landmines. The significance of NGOs as actors on the global stage was recognised in 1997, when the International Campaign to Ban Landmines and its coordinator, Jody Williams, received the Nobel Peace Prize³⁰ and then again in 2004 when Professor Wangari Maathai, leader of the Greenbelt movement, a Kenyan NGO, received the Nobel Peace Prize for her efforts to restore forests and ecosystem services in Africa.

The downside of pluralisation is that ability to participate in the policy process remains asymmetrical. Constituencies start out with unequal resources, and the influence of special interests – which are often well financed and organised – may be magnified. Globalisation by no means implies the end of politics. Quite to the contrary, power relations remain important and mechanisms for levelling the playing field become increasingly necessary.

ENVIRONMENTAL EFFECTS ON GLOBALISATION

Just as globalisation will shape environmental protection efforts, so may environmental choices affect the course of globalisation, particularly efforts to liberalise trade and investment flows. At one extreme, a rigid harmonisation of policy approaches and regulatory standards could run roughshod over diverse environmental circumstances, resource endowments, and public preferences.³¹ At the other extreme, uncoordinated national environmental policies might become non-tariff barriers to trade

²⁸ Slaughter, 2004.

²⁹ <http://www.icbl.org>.

³⁰ ICBL, 2004.

³¹ Bhagwati, 1993, 2000, 2004.

that obstruct efforts to open markets. In these ways, national-level environmental policies may influence international action. Similarly, ecological realities may require policy coordination and collective action on the global scale.

National Activities with International Effects

National environmental performance may have international impacts. In an increasingly interconnected world, environmental harms (such as greenhouse gas emissions) left unattended at the local and national levels may result in global-scale problems (such as sea level rise, increased intensity of storms, and changed rainfall patterns that may come to pass as a result of climate change). The failure to address such spillovers of harm creates a risk for the international economic system of being weighed down by market failures. Transboundary pollution spillovers, which result in 'super externalities', are especially difficult to manage.³² The need to bring multiple countries together in a common response represents a much more difficult problem to address than national-scale environmental protection. As with any global public good, where costs are borne locally and benefits spread across the world, no single jurisdiction has an incentive to regulate such harms optimally. In the case of regular externalities (i.e., harms within one nation), there are many reasons why governments may not optimally regulate emissions or other harmful practices, but at least they have an incentive to do so in the face of the welfare losses of their own citizens. When harms span multiple jurisdictions or even the entire world, there is an increasing likelihood that the government whose facility is causing the negative impact will choose not to act because its own cost-benefit calculus does not justify intervention.

Tensions are also likely to occur when national-scale regulatory policies differ widely among countries that are closely integrated economically. Deeper economic integration makes countries more sensitive to the regulatory choices and social policies of their trade partners. For instance, in the 1970s, when China's trade with the United States (US) totalled less than 1 billion USD a year, few US citizens had reason to care about China's labour or environmental policies. Today, as China emerges as a major trade partner and competitor and US-China trade has increased to 220 billion USD in 2009, these policies are subject to much greater US interest and concern. A key focus of trade policy-making thus centres on non-

³² Dua and Esty, 1997.

tariff barriers to trade and the need for a 'level' playing field in the global marketplace.

Because many domestic regulations could act as non-tariff trade barriers, trade agreements now routinely include market-access rules and disciplines that create a framework for national regulation. Public health standards, food safety requirements, emissions limits, labelling policies, and waste management and disposal rules – all national measures – may shape the flow of international trade. For example, the import ban of the European Union (EU) on genetically modified food led to an 80 per cent decrease in US corn exports to Europe over a five-year period and strenuous US objections to the EU treatment of genetically modified food.³³ Thus, while in 1998 the US exported 63 million USD worth of corn to the EU, exports decreased down to 12.5 million USD in 2002. Similarly, Venezuela objected to the discriminatory approach of the reformulated gasoline (petrol) provisions of the US Clean Air Act of 1990 and won a WTO dispute settlement case restoring its access to the US gasoline market.³⁴ From the 'tuna/dolphin' case³⁵ of the early 1990s to the 'shrimp/turtle' dispute in 2001,³⁶ the number of trade-environment flash points has continued to grow. As noted earlier, environmentalists fear that liberalised

³³ US Trade Representative, 2003.

³⁴ In the 'Reformulated Gasoline' case, Venezuela and Brazil brought a complaint against the US alleging that the 'Gasoline Rule', promulgated by the US Environmental Protection Agency (EPA) under the Clean Air Act, which excluded importers from exercising two alternatives for determining the appropriate fuel content that were available to domestic refiners, violated the General Agreement on Tariffs and Trade (GATT) as an unjustifiable barrier to trade. In 1996, the Appellate Body of the WTO determined that the 'reformulated' gasoline rule did violate the GATT as it subjected Venezuelan and Brazilian refiners to potentially more stringent requirements for fuel emissions than domestic refiners and was, therefore, in violation of Article XX exceptions. Following the Decision, the countries agreed on a 15-month phase-out of the illegal regulation.

³⁵ In the 'tuna/dolphin' case, US import restrictions on tuna caught with unsafe nets and techniques were struck down under the GATT rules as an illegal barrier to trade. Under the Marine Mammals Protection Act of 1972, the US restricted the importation of tuna caught using methods that killed dolphins. The restrictions effectively imposed a barrier to trade on tuna caught in Mexico as a result of the ban on such importation. Mexico successfully argued that the ban served as an illegal barrier to trade under the GATT and that the US could not extraterritorially regulate in the name of the environment.

³⁶ In 1996, the US Court of International Trade ordered the prohibition of shrimp importation from all countries that had not adopted harvesting methods comparable to the US methods, which included turtle exclusion devices to prevent further mortality of endangered sea turtles. India, Malaysia, Pakistan, and Thailand brought issue with these Guidelines at the WTO. In 2001, upon Appellate review, the WTO issued the ruling in the 'shrimp/turtle' case, upholding, for the first time in GATT history, unilateral trade restrictions to conserve extraterritorial natural resources. The restrictions were upheld under the General Exceptions in GATT Article XX. The outcome was distinguished from that in the 'tuna/dolphin' dispute on the grounds that sea turtles had been listed by the United Nations (UN) as threatened with extinction.

trade might make it harder for high-standard countries to keep their stringent environmental requirements in the face of market access demands from trade partners.

The essential difficulty lies in separating legitimate environmental standards from protectionist regulations advanced under the guise of environmental protection.³⁷ Few would argue, for example, that emission-control standards for cars are an unwarranted barrier to trade. However, the fear of protectionism in an environmental disguise is not unfounded and needs to be addressed, particularly if developing countries are to retain confidence in the fairness of the international trade system. A functional international economic system cannot be attained unless there are clear rules of engagement for international commerce, including environmental provisions.

Global Environmental Policy Coordination

Globalisation is, in part, an ecological fact. There exist a series of environmental challenges that span multiple countries and even the globe. Polluted waters, collapsing fisheries, invasive species, and the threat of climate change are all realities that have been exacerbated by globalisation. But ecological realities also affect the pace and pattern of globalisation. Scarce environmental resources (such as fresh water) shape countries' perceptions of their independence or interdependence and, consequently, influence their economic and political interactions within the global community. The value that citizens around the world place on nature and biodiversity within foreign jurisdictions may spur international political pressures that limit a country's economic and regulatory choices. Protection of the shared resources of the global commons (including the oceans and the atmosphere) provides a rallying point for NGOs aiming to promote worldwide collective action. Increased understanding of the interdependence of ecological systems contributes to establishing a more robust global environmental regime.

Clearly, the primary responsibility for environmental protection rests with national governments and local communities. But some problems are inescapably regional or global in scope and cannot be addressed without international cooperation. Yet, incentives to pursue behaviour that is individually rational but collectively suboptimal are especially strong with regard to the depletion of natural resources, which may be seen as belonging to everybody and nobody. It is economically rational for a fisherman, for example, to try to maximise his personal gain by catching as many fish

³⁷ Esty, 1994.

as possible as quickly as possible. Collectively, however, such a strategy leads to overexploitation of the resource and a 'tragedy of the commons', leaving the entire fishing community worse off than if it had found a cooperative arrangement to manage the fishery on a sustainable basis. When extended to the global scale, the problem becomes even more acute and intractable in the absence of clear rules and institutions ensuring sustainable resource management. Such global-scale issues require responses aggregated beyond the level of national jurisdictions or, at the very least, coordinated national action.

While not strictly necessary, international cooperation is helpful in addressing a set of common problems encountered locally all across the globe and thus of concern to policy-makers around the world. These problems (control of air and water pollution, waste disposal, etc.) should be dealt with by local or national authorities. There is no inherent need for global-scale cooperation. But the fact that many countries face problems in common creates another logic for cooperation: the potential to gain from sharing data, information, and policy experiences. Comparative analysis often helps to illuminate issues and highlight best practices – policies and technologies – to be deployed in response. To the extent that problems require substantial scientific or technical analysis, cooperation may also generate economies of scale in data collection, analysis, and other research functions which both benefit from globalisation and contribute to a deepening of interconnectedness and interdependence.

GLOBALISATION AND GLOBAL GOVERNANCE

Without effective international-scale governance, globalisation may intensify environmental harms wherever national regulatory structures are inadequate.³⁸ In strengthening competitive pressures across national borders, economic integration may help consumers by lowering prices, improving service, and increasing choice.³⁹ But these same pressures at times threaten to overwhelm the regulatory capacities of national governments and thus necessitate intergovernmental coordination of domestic policies and cooperative management of the global commons. As shown above, some problems are local and can best be addressed on that scale. But even in these cases, there is a clear advantage of learning from other countries and localities that have successfully addressed similar issues. In

³⁸ Nordstrom and Vaughan, 1999; Thompson and Hirst, 2001.

³⁹ Bhagwati, 1993, 2004.

other cases, the problems are so inextricably international that a coordinated multi-country response is required. This response, however, must always be backed up by effective action at the national and local levels.⁴⁰

Theory suggests that the solution to this policy dilemma lies in a structured programme of collective action. But overcoming the collective action problem is especially difficult in the international realm where there is no Leviathan or overarching authority. And while the number of beneficiaries and potential contributors to a global public good may be much larger than on the national scale, so too is the number of potential contributors to a public 'bad'. The spatial and temporal distribution of causes and effects makes it hard to identify those who fail to cooperate. Moreover, in the absence of an international authority, even if defectors were detected, there are scant means of discipline and sanction. The problem, therefore, is one of organising and maintaining cooperation. Without institutional support, efforts to promote collective action tend to degrade towards what is called in game theory a 'lose-lose' situation or 'Nash equilibrium'. The situation must be converted from one in which decisions are made independently, based on narrow self-interest, to one in which actors adopt cooperative solutions serving a broader, common interest.⁴¹

The traditional policy prescriptions – a set of taxes or subsidies to internalise externalities – cannot be easily applied to a multijurisdictional context with a fragmented institutional structure. Successful intervention requires some mechanism for promoting collective action.⁴² Fragmentation, gaps in issue coverage, and even contradictions among different treaties, organisations, and agencies with competing responsibilities have undermined effective, results-oriented action in the domain.⁴³ As Charnovitz pointed out,⁴⁴ '[l]ike a city that does not have zoning ordinances, environmental governance spreads out in unplanned, incongruent, and inefficient ways'. A pervasive lack of data, policy information, and transparency adds to the challenge. An institutional structure is necessary that can provide: the data foundation needed for good environmental decision-making; the capacity to gauge risks, costs, benefits, and policy options comparatively; a mechanism to exert leverage on private and public resources deployed at the international level; and means to improve results from global-scale environmental spending and programmes.

⁴⁰ Kaul et al., 1999; Zedillo and Thiam, 2006.

⁴¹ Ostrom, 1990.

⁴² Baumol and Oates, 1988.

⁴³ Esty and Ivanova, 2002a: 182-188; Ivanova and Roy, 2007; Inomata, 2008.

⁴⁴ Charnovitz, 2002: 361.

Environmental and Economic Governance: Whose Reform?

While the United Nations Environment Programme (UNEP) lies at the centre of the international environmental regime, global environmental governance falls within the mandate of multiple organisations in the UN system. Hampered by a difficult mandate, a modest budget, and limited political support, UNEP competes with more than a dozen other UN bodies, including the Commission on Sustainable Development (CSD), the UN Development Programme (UNDP), the World Meteorological Organisation (WMO), and the International Oceanographic Commission (IOC) on the international environmental scene. Adding to this multiplicity are the independent secretariats to numerous conventions, including the Montreal Protocol (ozone-layer protection), the Basel Convention (hazardous-waste trade), the Convention on International Trade in Endangered Species (CITES), and the Climate Change Convention, all contending for limited governmental time, attention, and resources.⁴⁵

The existing international environmental system has failed to deal adequately with the priorities of both developed and developing countries. The proliferation of multilateral environmental agreements has placed an increasing burden of collective obligations and responsibilities on member states. The toll on developing countries has been especially heavy, as little assistance in the form of financing, technology, or policy guidance has been forthcoming. The inadequacy and dispersion of the existing financial mechanisms – scattered across the Global Environment Facility (GEF), UNDP, World Bank (WB), and separate funds such as the Montreal Protocol Finance Mechanism, and the numerous climate change funds⁴⁶ – reinforce the perception of a lack of seriousness in the North about the plight of the South. Furthermore, fundamental principles of good governance such as participation, transparency, and accountability are still at issue in many of the institutions with environmental responsibilities.⁴⁷ These procedural shortcomings undermine the legitimacy of the system as a whole.

In the absence of a functioning global environmental management system capable of addressing the growing number of international environmental issues, environmental groups have directed efforts towards the reform of international economic bodies, including the WB and the WTO. The WTO has been of particular interest, as it has assumed responsibility

⁴⁵ Ivanova and Roy, 2007; Inomata, 2008; Ivanova, 2010.

⁴⁶ The newly created climate change funds include HSBC's GIF Climate Change Fund, Schroder's Global Climate Change Fund, and Deutsche Bank's DWS Climate Change Fund.

⁴⁷ Esty, 2006.

for integrating the policy realms of environment and trade and, given its influence over domestic policy, offers a potential tool for far-reaching environmental measures. Indeed, dialogue with the environmental community has become more consistent and more diverse, especially under the leadership of Pascal Lamy. Although the WTO exhibits significant weaknesses in its governance processes, such as the domination of its Committee on Trade and Environment by trade experts and limited expertise regarding the impact of trade on environmental policy,⁴⁸ it has gone a long way to opening up discussions of divergent points of view.

The push for a more robust policy dialogue has come from a number of directions. The environmental community, free traders, and developing countries have contested the role of the WTO as the principal forum for the resolution of trade and environment concerns. Environmentalists perceive the WTO as an organisation charged narrowly with the promotion of trade liberalisation and argue that any attempt to mainstream environmental issues within the WTO inevitably privileges economic concerns over the environment. Free-traders, on the other hand, regard the WTO as an inappropriate forum for environmental issues, which they see as burdening the trade regime. Developing countries, too, see the inclusion of environmental rules among the responsibilities of the WTO as a complication and a threat,⁴⁹ potentially creating an excuse for protectionism and the exclusion of Southern goods from Northern markets. Nevertheless, discussion is taking place within the WTO, and pressure to 'green' the organisation has resulted in a number of notable reforms.⁵⁰

Recognition of the WTO's lack of capacity for addressing environmental issues, and the undermining of its efficacy and legitimacy whenever the organisation is forced to make decisions that go beyond the scope of its trade mandate and expertise, have led a number of trade experts to call for the creation of a more robust environmental governance structure. Two of the former WTO directors-general, Renato Ruggiero and Supachai Panitchpakdi, explicitly urged for the creation of a World Environment Organization to help focus and coordinate worldwide environmental efforts. Pascal Lamy, the current WTO Director-General, has also expressed concern over the lack of coherence in the international system and the relative imbalance of power with the strong WTO dispute resolution mechanism and no similar counterpart for environmental or other issues. In 2009, French President Nicolas Sarkozy and German Chancellor Angela Merkel issued a joint call for the creation

⁴⁸ Esty, 1999a, 1999b.

⁴⁹ Williams, 2001; Wade, 2003.

⁵⁰ Wofford, 2000; Weinstein and Charnovitz, 2001; Lamy, 2007.

of a World Environment Organization.⁵¹ This built on previous proposals for such an organisation, dating back as far as 1997, when German Chancellor Helmut Kohl – on behalf of the governments of Germany, Brazil, Singapore, and South Africa – suggested the creation of a World Environment Organization, and 2002, when French President Jacques Chirac and Prime Minister Lionel Jospin urged for a World Environment Organization that would bring greater balance to a multilateral system excessively focused on the economy. The reasoning behind the proposals for such a global environmental organisation is grounded in the need to balance successful reform of the trade and finance system with an equally rigorous and fundamental reform of the global environmental architecture.

GOVERNANCE ALTERNATIVES

Collective action in response to global environmental challenges continues to fall short of public needs and expectations as a result of the deep-seated weakness of the existing institutional architecture. The question, therefore, is not whether to revitalise the global environmental regime, but how. The integrated and interdependent nature of the current set of environmental challenges contrasts sharply with the nature of the institutions we rely upon for solutions. These institutions tend to be fragmented and poorly coordinated, with limited mandates and impenetrable decision-making processes.⁵²

Shifting from a 'prisoner's-dilemma' world of free-riding and lose-lose outcomes to one where reciprocity is recognised and collaboration understood will require careful institutional realignment. We need an approach that acknowledges the diversity and dynamism of pollution control and natural resource management problems and recognises the need for specialised responses.⁵³ The multifaceted nature of the environmental challenge requires a multilayered institutional structure that can address issues on various geographic scales and with a variety of policy tools. Perhaps somewhat surprisingly, this is not a new idea. The founders of the global environmental governance system outlined the blueprint for the institutional architecture based on the principle that form should follow function.⁵⁴

⁵¹ Prestigiacomo and Michuki, 2009.

⁵² Inomata, 2008.

⁵³ Esty and Ivanova, 2002b.

⁵⁴ Ivanova, 2009.

Functions at Various Levels of Governance

We argue that there is a spectrum of global governance responses ranging from very light to fairly robust. Amenable to a regime at the light end of the spectrum lie problems that are local in scope but can be found around the world (local water and air pollution, for example). As we move towards the more demanding side of the spectrum, regional issues such as international water-bodies pollution or regional fisheries management arise. At the most difficult end of the spectrum are issues that require a strong structure of global collaboration (such as climate change, ozone layer depletion, and ocean pollution). A number of functions need, therefore, to be performed by different institutions at the various levels of governance.

When dealing with global-scale problems, institutions need to possess several capacities, including the ability to identify and define problems, raise awareness about them in various forums, draft rules and create norms for behaviour leading to the solution of these problems, formulate policy options, facilitate cooperative actions among governments and other actors, finance and support activities, and develop management systems. As elaborated below, we see an information clearing-house, a technology clearing-house, and a policy and contracts forum as central elements to the effective functioning of a global regime for the resolution of environmental problems. Global institutions also have an important role to play when the problems are primarily national in scale. They can serve as facilitators of information and knowledge exchange, promoting learning across contexts and among actors. The exchange of data, best practices, policies, and approaches could be an important tool in problem-solving at the national level.

National governments, however, remain the primary actors charged with regulatory and enforcement powers to solve environmental problems. Functions such as standard-setting, policy formulation, compliance monitoring, and evaluation are among their responsibilities. When the problems are of a global character, national governments are again key actors. Implementation of multilateral agreements is ultimately their responsibility. They also engage in information-sharing and exchange in the process of arriving at agreement on the global problems to be addressed, the policies necessary for their resolution, and the actions to be undertaken domestically.

An effective response to both the common elements of national problems and the special demands of transboundary issues requires a deft and agile structure able to hone in on the nature of problems and produce the right scale of activity while promoting worldwide cooperation. There is no silver bullet. Various institutional and organisational designs are pos-

sible. We believe that the best strategy centres on a new environmental mechanism at the global level. Conceptually, an effective international environmental organisation would fundamentally need to focus on promoting collective action on the international scale. Practically, it would have to offer the chance to build a coherent and integrated environmental policy-making and management framework that addresses the challenges of a shared global ecosystem.⁵⁵

We see three core capacities as essential: (1) provision of adequate data and information that can help to characterise the problems to be addressed, reveal preferences, and clarify reciprocity; (2) creation of a policy 'space' for environmental negotiation and contracts – particularly with regard to transboundary issues; and (3) sustained support for national efforts to address issues of concern and significance. We identify data collection, monitoring, and scientific assessment as central in the information domain. A mechanism for rule-making, contract creation, and dispute resolution is essential to ensuring cooperative solutions. The continual development of technical, financial, human, and institutional capacities for addressing diverse challenges is another critical function requiring effective institutional mechanisms at the global level.

At present, various institutions and agencies ostensibly have many of the identified capacities. But the reality often falls short of the promise. And some are flagrantly absent. For example, a host of international organisations, scientific research centres, national governments, and environmental convention secretariats are carrying out data collection, scientific assessment, financing, and technology transfer with little coordination across jurisdictions. Compliance monitoring and reporting are unsystematic, scattered, and largely informal. The participation of non-state actors requires further structural elaboration and institutionalisation, along with procedures for rule-making. A forum for issue linkage, bargaining, and contracts, as well as a dispute resolution mechanism, is lacking. A more robust policy space for the environment is necessary to sustain efforts at environmental advocacy within the broader system of global governance and to ensure that environmental concerns are integrated into sustainable development policies.

Building on the expertise and capacities of existing institutions and creating new mechanisms where functions are not currently performed, we see three institutional elements as central to a successful global environmental system. A Global Information Clearing-House might represent a first step towards improved global environmental governance,

⁵⁵ Esty and Ivanova, 2002b, 2003.

through provision of comparable data on environmental quality, trends, and risks. The coordination of existing institutional mechanisms for data collection, scientific assessment, and analysis might attract broad-based support. A Global Technology Clearing-House, focusing on information sharing, performance measurement and benchmarking, and dissemination of best practices, might also be launched as an early initiative with likely broad appeal. With competence established in these areas, a Global Environmental Contracts Forum might be initiated with the capacity for rule-making and facilitation of burden sharing. Progressive development over time, as the new system proves its capacity and value, is likely to make any reform strategy more acceptable to nations reluctant to yield responsibility or control to any global entity.

Global Environmental Information Clearing-House

Better environmental data and information make it easier to identify problems and trends, evaluate risks, set priorities, establish policy options, test solutions, and encourage technology development.⁵⁶ A global information clearing-house providing timely, relevant, and reliable data on environmental issues and trends could transform the policy-making process on the global scale. Better data, science, and analysis could shift assumptions, highlight preferences, and sharpen policies. In the case of acid rain in Europe, for example, knowledge of domestic acidification damage allowed for refined policies that triggered emission reductions in several countries.⁵⁷ Simply put, data can make the invisible visible, the intangible tangible, and the complex manageable.

Information on how others are doing in reducing pollution and improving resource productivity tends to stimulate competition and innovation. Comparative performance analysis across countries – similar to the national PROPER scheme in Indonesia⁵⁸ – could provide much greater transparency, reward policy leaders, and expose laggards.⁵⁹ Just as knowledge that a competitor in the marketplace has higher profits drives executives to redouble their efforts, so evidence that others are outperforming one's country on environmental criteria can sharpen the focus on opportunities for improved performance. The attention and action

⁵⁶ Esty, 2002, 2004.

⁵⁷ Levy, 1993.

⁵⁸ PROPER (Program for Pollution Control, Evaluation, and Rating) is Indonesia's innovative programme for reducing pollution by rating and publicly disclosing the environmental performance of industrial facilities.

⁵⁹ Afsah et al., 2000.

that the Environmental Performance Index discussed above has generated demonstrates this potential.

Data-gathering should primarily be the function of local or national organisations. But a central repository for such information and a mechanism for making the information publicly available could generate significant economies of scale, efficiently generate relevant comparisons, and expose slack performance.⁶⁰ An information clearing-house would not centralise science policy functions, but create a central source for coordinating information flows among the institutions responsible for performing the scientific aspects of policy-making.

Global Environmental Technology Clearing-House

Globalisation is fuelled by, and plays a central role in, the diffusion of technologies. Technological advances are often the key to environmental gains. However, industrialised countries dominate the technology market and the generation of innovations. Some technologies and their environmental features may, therefore, be inappropriate for the economic and environmental circumstances of less developed countries.

Most multilateral environmental agreements contain provisions related to technology transfer as part of the incentive packages for developing countries to meet their obligations under the conventions. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Montreal Protocol on the Ozone Layer, the Convention on Biological Diversity, the Framework Convention on Climate Change and its related Kyoto Protocol all cite technology transfer as a critical method for achieving concrete environmental improvements. Agenda 21 also underscores the importance of technology transfer to sustainable development. The existing strategies for technology transfer, however, have been less than fully effective.

A new mechanism to bring technologies to developing countries must be part of any strategy to improve international environmental policy results. Establishing such a mechanism, however, presents a significant challenge. Most technologies are owned by private companies rather than governments. So some efforts need to be put into structuring incentives to engage the business world in driving innovation and in problem-solving and motivating the private sector to disseminate technological advances optimally. Incentives can include clear price signals, regulatory pressure and predictability, funding for public goods, and more carefully-crafted rules.

⁶⁰ Chayes and Handler Chayes, 1995.

Empirical evidence shows that the few gains that have been available from such cooperative arrangements have indeed been significant and beneficial for the environment.⁶¹ For example, the technology panel convened under the Montreal Protocol to report on the availability of CFC substitutes and the feasibility of larger production cuts generated new knowledge and new commercial opportunities for CFC reduction in a highly collaborative process.⁶² Most technologies, however, are owned by private companies rather than governments. So some efforts need to be put into structuring incentives to motivate the private sector to disseminate technological advances optimally. Incentives can include clear price signals, regulatory pressure and predictability, and rules and standards.

The energy sector provides perhaps the most promising opportunity for technological breakthroughs with huge environmental impact. The creation of the International Renewable Energy Agency (IRENA) in 2009 underscores the importance of international mechanisms to ensure business and government innovation and support a coordinated approach among the agencies in the UN system. Seeking to foster a more targeted business contribution to the energy challenges of many countries (developed and developing countries alike), IRENA will offer energy-related information and knowledge, analyse and disseminate current renewable-energy practices, including policies and incentives, available technologies, and examples of best operational practices. This new international body could foster a potentially symbiotic relationship between business and the UN, holding the promise of addressing global environmental concerns while directly addressing development challenges.⁶³

An effective environmental technology clearing-house would guide nations towards the use of appropriate technologies, support North-South partnerships, and provide a forum for coordinating financial assistance to developing countries. It would contain information on best practices around the world and facilitate technology development and continuous learning.

Global Environmental Contracts Forum

Successful responses to transboundary environmental problems depend on effective international agreements. To be workable, any such agree-

⁶¹ For an analysis of technology transfer as a means of successful integration for developing countries into the global economy, see UNCTAD, 2003.

⁶² Parson, 1993.

⁶³ For a discussion of the relationship between business and the United Nations, see Ivanova et al., 2007.

ment must equitably distribute the burden of international collective action. Developing countries will often need support, subsidies, and other incentives to encourage their efforts to internalise externalities. In the past, issue linkage has been avoided in favour of lowest-common-denominator programmes in the absence of funding to support those least well positioned to act. Yet, there would be great value in a forum for the facilitation of international contracts on the environment that improve quality and result in positive cash flows to custodians of environmental assets.⁶⁴

A global environmental contracts forum could act as a catalyst for action, facilitating financial discussion among countries or private entities. A government in one country might, for example, negotiate a deal to preserve a particular natural resource in another country in return for a sum of money or other policy benefits. Brazil might, for instance, commit to certain limits on development in the Amazon Basin in return for guaranteed access to EU and US markets for its orange juice. The forum would also need to provide mechanisms for monitoring, reporting, verification, financial transfers, and dispute settlement.

Institutional Design

In designing a new global environmental architecture, form should follow function. The institutional architecture we envision would neither add a new layer of international bureaucracy nor create a world government. Quite to the contrary, it should entail consolidation of the existing panoply of international environmental institutions and a shift towards a more modern 'virtual' environmental regime. We envision a 'light' institutional structure, whose primary role would be to promote cooperation and achieve synergies across the disparate multilateral environmental agreements and other international institutions with environmental roles. A global environmental mechanism would comprise all three institutional clearing-houses suggested above, though it would not require that they all be created at once.

At the centre of our proposal lies a global public policy network drawing in expertise from around the world on an issue-by-issue basis. Much work today suggests that we must complement the traditional governance system with innovative elements of networked governance: 'collective decision making characterized by a trend for a wider range of participants to be seen as legitimate members of the decision-making process in the

⁶⁴ Whalley and Zissimos, 2002.

context of considerable uncertainty and complexity'.⁶⁵ The advantages of these open, flexible, and transparent structures include enhanced learning, more efficient use of resources, increased capacity to plan for and address complex problems, greater competitiveness, and better services.⁶⁶ By utilising the resources of national governments, NGOs, private-sector enterprises, business and industry associations, think-tanks, research centres, and academic institutions on an 'as needed' basis, the global environmental mechanism we envision would have far broader issue expertise and analytic capacity than the existing environmental regime. Such a system for advancing international environmental agenda-setting, analysis, negotiation, policy formulation, implementation, and institutional learning would be more flexible, cost-effective, fleet-footed, and innovative. The benefits of such a structure are increasingly clear. Global public policy and issue networks respond to an ever more complex international policy environment, taking advantage of Information Age communication technologies to draw in relevant expertise, analyse problems from multiple perspectives, and build new opportunities for cooperation.

Streamlining the environmental system would be especially beneficial to the South. In particular, a single venue for negotiations and international coordination would make it much easier for the overstretched environment ministries of the developing world to monitor the spectrum of environmental issues at play and to contribute to the global-scale debate, even with a relatively small international policy-making team.⁶⁷ There would be no need to traipse around the world trying to keep up with an ever more extensive list of separate bodies and meetings. A network approach, drawing in diverse perspectives and expertise and using the internet, could facilitate greater developing-country participation in the international policy-making process.

Who will pay for global-scale environmental problem-solving stands out as a matter of particular importance to developing countries. Globalisation, as noted above, puts increasing pressure on national governments to become more competitive in the global marketplace. Expending scarce financial resources for environmental protection is, therefore, often regarded as counterproductive by developing countries, especially if there is no urgent demand from domestic constituencies. By placing the principle of common but differentiated responsibilities at the centre of the new mechanism, along with a real forum for negotiations and

⁶⁵ Stoker, 2006: 41. See also: Reinicke, 1998; Reinicke and Deng, 2000; Rischard, 2002; Witte et al., 2003; and Meuleman, 2008.

⁶⁶ Provan and Kenis, 2007: 229.

⁶⁷ Biermann, 2002; Biermann and Bauer, 2005.

contracts, efforts to strike a fair balance of rights and responsibilities with regard to transboundary environmental issues might meet with increased success. A more carefully considered and coherent set of international environmental standards would also alleviate fears in the South that the industrialised world seeks to impose unreasonably high standards – and perhaps trade penalties for non-compliance – on developing countries, all of whom have many competing demands for limited public resources. Moreover, mechanisms to support technology transfers and to subsidise developing countries' environmental initiatives in pursuit of global environmental goals would help to alleviate North-South tensions.

A related question concerns the values to be promoted in a strengthened international environmental regime. It is essential that a global environmental mechanism be a transparent and inclusive forum that seeks to build consensus on a basis that respects the diversity of views across the world. Properly managed public policy networks create 'virtual public space' that is easier to enter than the established physical forums where decisions are currently made.⁶⁸ An Information Age set of outreach mechanisms heavily reliant on social media could also decrease the distance between decentralised constituencies and global decision-makers, making it easier to insert into the policy process the broad array of values, perceptions, and perspectives that are now often overlooked or incompletely considered. At the same time, these mechanisms would facilitate public understanding of the issues addressed and decisions made on the global scale.

CONCLUSION

Both economic and ecological interdependence require rigorous national policies and effective international collective action. Our increasingly globalised world makes new thinking about international environmental cooperation essential, both in its own right and to undergird further economic integration. An extraordinary mix of political idealism and pragmatism will be required to coordinate pollution control and natural resource management policies on a worldwide basis across diverse countries and peoples, political perspectives and traditions, levels of wealth and development, and beliefs and priorities. But the gains to be achieved go beyond the environmental domain. Indeed, coordinated pollution-control strategies and natural-resource management standards provide an important set of ground rules for international commerce, serve as an essential

⁶⁸ Streck, 2002.

bulwark against market failure in the international economic system, and make it more likely that globalisation will yield broad benefits.

It is time to recraft the environmental system, aiming for a new, forward-looking, sleeker, and more efficient architecture that will better serve environmental, public, and business needs. A new global environmental system need not compete with efforts to strengthen national pollution control and natural resource management programmes. It should, in fact, reinforce such efforts and effectively respond to country needs.⁶⁹ Success in the environmental domain depends on a multitier governance structure supporting vibrant efforts on the local, national, and global scales. The logic of a global environmental mechanism is straightforward: a globalising world requires thoughtful and modern ways to manage interdependence. The world community would benefit from a systematic mechanism to promote environmental cooperation in the international arena, a recognised forum for national officials and other stakeholders to debate and address global-scale issues, and an institutional mechanism designed to make economic progress and environmental protection mutually reinforcing.

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⁶⁹ UNEP, 2009; Ageyo and Ivanova, 2009.

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PART IV

Public-Private Interactions

