Globalization and Environmental Protection: a Global Governance Perspective

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SUMMARY

In this chapter, we disaggregate the impact of globalization on the environment into economic, regulatory, information, and pluralization effects. We complement this structure with an analysis of how national and global environmental policies affect globalization. We then argue that there is a need for a revitalized governance regime to organize and maintain environmental cooperation at the global level. Such a global environmental mechanism (GEM) would provide a new model for collaboration, overcoming the shortcomings of existing bodies. The GEM’s core elements would be (1) a global information clearinghouse that provides a data and analytic foundation for environmental decision-making at the global, national, regional, and local scales, (2) a global technology clearinghouse to highlight tools and strategies for improved pollution control and natural resource management, and (3) a global environmental bargaining forum that would provide a catalyst for international negotiations. We conclude that the GEM approach with a ‘light’ institutional architecture that relies on global public-policy networks and modern information technologies offers great promise because of its response speed, flexibility, cost-effectiveness, and potential for broader public participation – all leading to improved results and greater institutional legitimacy.

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 has led to interconnected world markets and economies, requiring a degree of synchronisation of national policies across a number of issues. One dimension of this coordination concerns the 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 manage interdependence and foster the opportunities that globalisation has the potential to provide?

Globalisation can have both positive and negative environmental consequences. But the same forces can exacerbate existing environmental problems and create new ones, as well
running down stocks of non-renewable natural resources. Economic integration and trade liberalization can generate new resources that permit investments in environmental protection as well as faster and broader dissemination of pollution control technologies and new policy ideas. Environmental choices can likewise shape the path of globalization. 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 recent ‘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 policymakers, the core challenge lies in finding an appropriate mix of competition and cooperation, market forces and intervention, and economic growth and environmental protection.\(^4\)

To maximize globalization’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 insufficient. An equally broad-scale reform of the global environmental governance architecture is needed. We propose the creation of a Global Environmental Mechanism (GEM) to facilitate efforts to manage global-scale environmental risks; support bargaining and negotiation; promote sound management of the global commons; and advance dissemination of information, ‘best practices’ in policy-making, and new technologies.

**EFFECTS OF GLOBALISATION ON THE ENVIRONMENT**

Globalization 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, data, and communications, globalization also offers expanded access to knowledge, new mechanisms for participation in policymaking, and the promise of more refined and effective modes of governance. Understanding this array of effects – economic, regulatory, information, and pluralization – is essential if one is to make sense of globalization’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 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

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\(^1\) Dua and Esty, 1997. 
\(^2\) Anderson et al., 1999; Jobes, 2003; Speth, 2003 
\(^3\) Esty, 1994; Rodrik, 1997; Vogel, 1994. 
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 industrialization, it may well be that environmental conditions deteriorate.

The precise shape, duration, and applicability of the resulting inverted U-shaped environmental Kuznets curve has generated considerable debate. Grossman and Krueger found the critical income level at which pollution begins to diminish to be about $5000/year per capita GDP. In trying to separate out the various environmental effects of economic growth, Antweiler, Copeland, and Taylor found that, a 1 per cent increase in the scale of economic activity raises pollution concentrations by 0.25 to 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. It appears, however, that expanded trade and economic activity may worsen environmental conditions in other circumstances. Carbon dioxide emissions do not, for instance, appear to fall at any known income level.

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. 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**

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5 Antweiler et al., 2001; Esty, 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.
9 Dua and Esty, 1997.
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.

Perhaps more importantly, freer trade promotes competition. Increased competitive pressure may manifest itself in industry or governmental efforts to reduce pollution control compliance costs. This political dynamic could trigger 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. While there is little evidence that environmental standards are actually declining, the concern is not literally about a race to the bottom, but rather about a race toward the bottom that translates into suboptimal environmental standards, at least in some jurisdictions. Ample evidence exists to support the existence of a regulatory dynamic in which standards are set strategically with an eye on the pollution-control burdens in competing jurisdictions. The outcome may well be a ‘political drag’ which results in weaker environmental laws than might have otherwise been adopted and, perhaps more importantly, lax enforcement of existing rules or standards.

But, diverse national circumstances generally make uniform standards less attractive than standards tailored to local conditions and preferences. But not always. Divergent standards across jurisdictions may impose market access barriers on traded goods that exceed any benefits obtained by allowing each jurisdiction to maintain individualized requirements. In some cases, producers vying for access to high-standard jurisdiction will drive upward harmonization (a ‘race to the top’). But this 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 recognized standard is available. In such cases, trade rules should be interpreted to reinforce the agreed-upon standards. Recrafted trade principles and World Trade Organization (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.

**Information Effects**

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One of the key features of globalization is the expansion of communication networks across the globe. The increasing speed and decreasing cost of communication has 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.\textsuperscript{16} This communication revolution has dramatically increased the intensity of national interdependence, fomenting a greater sense of international community and a foundation of shared values.\textsuperscript{17} 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.\textsuperscript{18}

Increased access to data and information on economic and environmental performance allows for faster problem identification, better issue analysis, and quicker trend spotting. It can also aid the identification of leaders and laggards in the international arena relative to various environmental or social criteria and spur competition (and thus improved performance) among nations, companies, or even communities. 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 and appropriate devices for sifting through and filtering relevant and accurate information become necessary.

**Pluralization 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. This ‘pluralization’ is evident in the exponential growth in governmental and non-governmental organizations (NGOs), their heightened levels of activity, and their increased access to the policy-making process at both the national and international levels. In 1990, there were about 6,000 international NGOs. By the year 2000, that number had reached 26,000.\textsuperscript{19} An elaborate organizational or institutional infrastructure is no longer necessary for an entity to have a global reach.

With global interconnectedness on the rise, transparency, participation, and democratization 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.\textsuperscript{20} For example, the landmine treaty resulted from an internet-based campaign started in 1991 by several NGOs and individuals. Today, the treaty has been ratified or acceded to by 141 countries. An NGO network, representing over 1,100 groups in over 60 countries, are now working

\textsuperscript{16} Esty, 2004.
\textsuperscript{17} Thompson, 2003.
\textsuperscript{18} Dua and Esty, 1997; Rodrik, 1997.
\textsuperscript{19} Keohane and Nye, 2003.
\textsuperscript{20} Slaughter, 1997.
locally, nationally, regionally, and internationally to implement the ban on antipersonnel landmines. The significance of NGOs as actors on the global stage was recognized in 1997, when the International Campaign to Ban Landmines and its coordinator, Jody Williams, received the Nobel Peace Prize.21

The downside of pluralization 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 organized – may be magnified. Globalization by no means implies the end of politics. Quite to the contrary, power relations remain important and mechanisms for leveling the playing field become increasingly necessary.

ENVIRONMENTAL EFFECTS ON GLOBALISATION

Just as globalization will shape environmental protection efforts, so may environmental choices affect the course of globalization, particularly efforts to liberalize trade and investment flows. At one extreme, a rigid harmonization of policy approaches and regulatory standards could run roughshod over diverse environmental circumstances, resource endowments, and public preferences.22 At the other extreme, uncoordinated national environmental policies might become non-tariff barriers to trade 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 the global warming sea level rise, increased intensity of wind storms, and changed rainfall patterns that may come to pass as a result of climate change. The failure to address such spillover 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",23 are especially difficult to manage. 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.

23 Dua and Esty, 1997.
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) totaled less than US$1 billion a year, few US citizens had reason to care about China’s labor or environmental policies. Today, as China emerges as a major trade partner and competitor – and US-China trade had increased almost 100-fold to US$92 billion in 2002 – these policies are subject to much greater American interest and concern. A key focus of trade policymaking thus centers on non-tariff barriers to trade and the need for a ‘level’ playing field in the global marketplace.24

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, labeling policies, and waste management and disposal rules – all national measures – may shape the flow of international trade. For example, the EU import ban on genetically modified foods has led to a 55 per cent decrease in US corn exports to Europe over the past five years and strenuous US objections to the EU treatment of GMO food.25 Similarly, Venezuela objected to the discriminatory approach of the reformulated gasoline provisions of the US Clean Air Act of 1990 and won a WTO dispute settlement case restoring its access to the US gasoline market.26 From the ‘Tuna/Dolphin’ case27 of the early 1990s to the recent ‘Shrimp/Turtle’ dispute,28 the number of trade-environment flash points has continued to grow. As noted earlier,

26 In the ‘Reformulated Gasoline’ case, Venezuela and Brazil brought a complaint against the US alleging that the ‘Gasoline Rule’, promulgated by the 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 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.
27 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 GATT and that the US could not extraterritorially regulate in the name of the environment.
28 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 is contrary to that in the ‘Tuna/Dolphin’ dispute as sea turtles had been listed by the United Nations as threatened with extinction.
environmentalists fear that liberalized 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. 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. The smooth functioning and efficiency of the international economic system cannot be maintained unless there are clear rules of engagement for international commerce, including environmental provisions.

**Global Environmental Policies**

Globalization 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 globalization. But, ecological realities also affect the pace and pattern of globalization. Scarce environmental resources, such as 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 – the oceans, the atmosphere, etc. – provides a rallying point for NGOs aiming to promote worldwide collective action. Increased understanding of the interdependence of ecological systems contributes to establish 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 behavior that is individually rational but collectively suboptimal are especially strong with regard to the depletion of natural resources, which at once may be seen as belonging to everybody and nobody. It is rational for a fisherman, for example, to try to maximize his personal gain by catching as many fish 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 a 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 attacking a set of common problems encountered locally all across the globe and thus of concern to policy-makers the world over. These problems – including 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 a problem 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 a problem requires substantial scientific or technical analysis, cooperation may also generate economies of scale in data collection, analysis, and other research functions both benefiting from globalization and contributing to a deepening of interconnectedness and interdependence.

GLOBALISATION AND GLOBAL GOVERNANCE

Without effective international-scale governance, globalization may intensify environmental harms wherever national regulatory structures are inadequate.\(^2^9\) In strengthening competitive pressures across national borders, economic integration may help consumers by lowering prices, improving service, and increasing choice.\(^5^0\) 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 managed to address similar issues. In 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.\(^3^1\)

Theory suggests that the solution to this policy dilemma lies in a structured program of collective action. But overcoming the collective-action problem is especially difficult in the international realm. 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 organizing and maintaining cooperation. Absent institutional support and efforts at collective action tend to degrade towards what is called in game theory a lose-lose 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.\(^3^2\)

The traditional policy prescriptions – a set of taxes or subsidies to internalize externalities – cannot be easily applied to a multi-jurisdictional context with a fragmented institutional structure. Successful intervention requires some mechanism for promoting collective action.\(^3^3\) Fragmentation, gaps in issue coverage, and even contradictions among different

\(^3^0\) Bhagwati, 1993.
\(^3^1\) Kaul et al., 1999.
\(^3^2\) Ostrom, 1990.
\(^3^3\) Baumol and Oates, 1988.
treaties, organizations, and agencies with competing responsibilities have undermined effective, results-oriented action in the domain.\textsuperscript{32} As pointed out by Charnovitz,\textsuperscript{35} ‘[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, information, and policy 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-sector and governmental resources deployed at the international level; and means to improve results from global-scale environmental spending and programs.

**Environmental and Economic Governance: Whose Reform?**

While the UN Environment Program (UNEP) lies at the centre of the environmental regime, international environmental governance falls within the mandate of multiple organizations in the United Nations (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, the UN Development Program (UNDP), the World Meteorological Organization (WMO), and the International Oceanographic Commission on the international environmental scene. Adding to this fragmentation 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, and the Climate Change Convention, all contending for limited governmental time, attention, and resources.

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, UNDP, World Bank, and separate funds such as the Montreal Protocol Finance Mechanism – reinforces 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. 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 World Bank and the WTO. The WTO has been of particular interest as it has assumed responsibility for integrating the policy realms of environment and trade. Although the WTO has a Committee on Trade and Environment that has been meeting

\textsuperscript{32} Esty and Ivanova, 2002a.
\textsuperscript{35} Charnovitz, 2002.
for a number of years, the WTO dialogue has been dominated by trade experts, has demonstrated little understanding of the impact of trade on environmental policy, and has almost nothing in the way of results to show for its efforts.\textsuperscript{36} The role of the WTO as the principal forum for the discussion and resolution of trade and environment concerns has been contested by both the environmental community and developing countries. Environmentalists perceive the WTO as an organization charged narrowly with the promotion of trade liberalization 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,\textsuperscript{37} 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 organization has resulted in a number of notable reforms\textsuperscript{38}.

Recognition of the WTO’s lack of capacity for addressing environmental issues and the undermining of its efficacy and legitimacy whenever the organization 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. The former WTO Director-General, Renato Ruggiero, and the current Director-General, Supachai Panitchpakdi, have both urged for the creation of a World Environment Organization to help focus and coordinate worldwide environmental efforts. During the World Summit on Sustainable Development in 2002, French President Jacques Chirac called for the creation of a Global Environmental Organization that would bring greater balance to a multilateral system excessively focused on the economy. Similar calls have come from Mikhail Gorbachev, Lionel Jospin, The Economist magazine, and others.\textsuperscript{39} It is becoming increasingly clear that successful reform of the trade and finance system needs to be coupled with an equally rigorous and fundamental reform of the global environmental regime.

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 revitalize 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.

\textsuperscript{36} Esty, 1999.
\textsuperscript{37} Williams, 2001.
\textsuperscript{38} Wofford, 2000.
\textsuperscript{39} For the text of the speeches, see Jospin, 2002; Panitchpakdi, 2001; Ruggiero, 1998. For arguments in favor of a World/Global Environment Organization, see Biermann, 2000; Charnovitz, 2002; Esty, 1994, 2000a, 2000b; Runge, 2001; Whalley and Zissimos, 2001. For the opposing view, see Juma, 2000; and Von Moltke, 2001.
Shifting from a prisoners’-dilemma world of free-riding and lose-lose outcomes to one where reciprocity is recognized 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 recognizes the need for specialized responses. The multi-faceted nature of the environmental challenge requires a multi-layered institutional structure that can address issues on various geographic scales and with a variety of policy tools.

**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 likely require a strong structure of global collaboration (climate change, ozone layer, ocean pollution). A number of functions need therefore to be performed at the various levels of governance by different institutions.

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 behavior 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 will be elaborated below, we see an information clearinghouse, a technology clearinghouse, and a policy forum as central elements to the effective functioning of a global regime for 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 institutions also have roles to play, both at domestic and global levels of governance. National governments 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.

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40 Esty and Ivanova, 2002b.
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 problem and produce the right scale of activity while promoting worldwide cooperation. There is no silver bullet. Various institutional and organizational designs are possible. We believe that the best strategy centers on a new environmental mechanism at the global level. Conceptually, a global environmental mechanism (GEM) would fundamentally need to focus on promoting collective action on the international scale. Practically, it offers the chance to build a coherent and integrated environmental policy-making and management framework that addresses the challenges of a shared global ecosystem.43

We see three core capacities as essential: (1) provision of adequate data and information that can help to characterize the problems to be addressed, reveal preferences, and clarify reciprocity; (2) creation of a policy ‘space’ for environmental negotiation and bargaining; 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 forum for issue linkages and bargaining, a mechanism for rule-making, and a dispute-settlement framework are 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 organizations, scientific research centers, 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 institutionalization along with procedures for rule-making. A forum for issue linkage, bargaining, and trade-offs as well as a dispute-settlement 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 Clearinghouse might represent a first step towards improved global environmental governance 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 Clearinghouse, 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 Bargaining 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 governance-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. A global information clearinghouse 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. 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 Indonesia – could provide much greater transparency, reward policy leaders, and expose laggards. Just as knowledge that a competitor in the market place has higher profits drives executives to redouble their efforts, evidence that others are outperforming one’s country on environmental criteria can sharpen the focus on opportunities for improved performance. The attention that the Yale-CIESIN-World Economic Forum Environmental Sustainability Index has generated demonstrates this potential.

Data-gathering should primarily be the function of local or national organizations. 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. An information clearinghouse would not centralize science policy functions but create a centralized source for coordinating information flows among the institutions responsible for performing scientific aspects of policy-making.

Global Environmental Technology Clearing-House

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46 PROPER (Program for Pollution Control, Evaluation, and Rating) is Indonesia’s innovative program for reducing pollution by rating and publicly disclosing the environmental performance of industrial facilities.
47 Afash et al., 2000.
48 Seelye, 2002; Yeager, 2002; see www.yale.edu/envirocenter for more on the Environmental Sustainability Index.
50 UN University, 2002.
Globalization is fuelled by and plays a central role in the diffusion of technologies. Technological advances are often the key to environmental gains. However, industrialized 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 have, however, been less than 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.

The empirical evidence shows that the gains from such cooperative arrangements have indeed been significant and beneficial for the environment. 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. Most technologies are, however, owned by private companies not governments. So some effort need to be put into structuring incentives to motivate the private sector to disseminate technological advances optimally. An effective environmental technology clearinghouse is thus not only necessary but also possible. It could 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 Bargaining Forum**

Successful responses to global-scale environmental problems depend on effective international agreements. To be workable, any such agreement must equitably distribute the burden of international collective action. Developing countries will often need support, subsidies, and other incentives to encourage their efforts to internalize externalities. In the past, issue linkage has been avoided in favor of lowest-common-denominator programs in the absence of funding to support those least well positioned to

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51 Chernow and Esty, 1997.
52 Karlsson, 2002.
53 For an analysis of technology transfer as a means of successful integration in the global economy for developing countries, see UNCTAD, 2003.
54 Parson, 1993.
act. As Whalley and Zissimos argue, there would be great value in a forum for the facilitation of international deals on the environment that improve quality and result in positive cash flow to custodians of environmental assets.

A global bargaining 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 in return for guaranteed access to European and US markets for its orange juice. The forum might also provide mechanisms for verification, financial transfers, and dispute settlement.

**Moving Forward**

In designing a new global environmental architecture, form should follow function. We envision a ‘light’ institutional superstructure providing coordination through a staff comparable in size and quality to the WTO secretariat in Geneva. The secretariat’s primary role would be to promote cooperation and achieve synergies across the disparate multilateral environmental agreements and other international institutions with environmental roles. A properly designed structure would provide a counterpart as well as a counterweight to the WTO and an alternative forum for addressing tensions over divergent environmental values and approaches. The GEM we envision would neither add a new layer of international bureaucracy nor create a world government. Quite to the contrary, movement towards a GEM should entail consolidation of the existing panoply of international environmental institutions and a shift towards a more modern ‘virtual’ environmental regime.

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. By utilizing the resources of national governments, NGOs, private-sector enterprises, business and industry associations, think tanks, research centers, and academic institutions on an ‘as needed’ basis, the GEM would have far broader issue expertise and analytic capacity than has 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, analyze 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 thoughtfully to the

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56 Reinicke, 1998; Reinicke and Deng, 2000; Rischard, 2002; Witte et al., 2003.
global-scale debate even with a relatively small international policy-making team.\textsuperscript{57} 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. Globalization, 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 bargaining and trade-offs, 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 industrialized 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 subsidize 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 GEM be seen as 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 fora where decisions are currently made.\textsuperscript{58} An Information Age set of outreach mechanisms could also decrease the distance between decentralized 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 globalized 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, beliefs and priorities. But the gains to be achieved go beyond the environmental domain. Indeed, coordinated

\textsuperscript{57} Biermann, 2002.
\textsuperscript{58} Streck, 2002.
pollution control strategies and natural-resource-management standards provide an important set of ground rules for international commerce, serve as an essential bulwark against market failure in the international economic system, and make it more likely that globalization will yield broad benefits.

It is time to re-engineer the environmental regime, aiming for a new, forward-looking, sleeker, and more efficient architecture that will better serve environmental, governmental, public, and business needs. A new global environmental system need not compete with efforts to strengthen national pollution control and natural-resource-management programs. It should, in fact, reinforce such efforts. Success in the environmental domain depends on a multi-tier governance structure supporting vibrant efforts on the local, national, and global scales.

The logic of a GEM is straightforward: a globalizing 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 recognized 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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