Institutions for the Earth

Article *in* Environment: Science and Policy For Sustainable Development · May 1992

DOI: 10.1080/00139157.1992.9932558

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Institutions for the EAR

Promoting International Environmental Protection

The United Nations Conference on Environment and Development (UNCED), to be held in Rio de Janeiro this June, will be the world's most comprehensive organized response to international environmental degradation. UNCED delegates will seek to adopt conventions on greenhouse gases and biodiversity; to enunciate in an "Earth Charter" the principles by which humans should conduct themselves in relation to the environment; to adopt a program of action, called Agenda 21, to implement the Earth Charter; and to develop a set of institutional and financial arrangements to support such measures.

However, many critics are skeptical of the ability of national governments to solve the problems on UNCED's agenda. Because governments are ultimately concerned with protecting national security and maintaining economic growth, they may be incapable of adequately addressing the fundamental problems that have given rise to the environmental agenda. Thus, these critics argue, as long as governments protect national interests and refuse to grant significant powers to supranational authorities, the survival of the planet is in jeopardy.[1]

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By Marc A. Levy, Peter M. Haas, and Robert O. Keohane

The skeptics are right to warn that the planet's ecosystem is in danger and that its protection will require modifications in traditional interpretations of state sovereignty. But development of a world government is not around the corner. Organized international responses to shared environmental problems will occur only through cooperation among states, not through the imposition of a supranational authority over them. Intergovernmental cooperation has achieved a number of major successes over problems that earlier seemed as daunting as does UNCED's present agenda. Such problems as the spread of cholera, the slave trade, and atmospheric testing of nuclear weapons were all successfully managed against great odds with the help of international institutions. Here, *institutions* will be defined as persistent and connected sets of rules and practices that prescribe behavioral roles, constrain activity, and shape expectations. The focus here is on institutions that consist of organizations and constellations of organizations. Activities for which the rates of anthropogenic releases of pollutants to the environment have decelerated since 1955—for example, sulfur, lead, and carbon tetrachloride emissions—are also areas for which international environmental institutions were developed and applied.[2]

The international community's ability to preserve the quality of the planet

for future generations depends upon international cooperation. Successful cooperation, in turn, requires effective international institutions to guide international behavior toward sustainable development.

But how can international institutions, which necessarily follow the principle of state sovereignty, contribute to the solution of difficult global problems? What are the sources of effectiveness for institutions that lack enforcement power? A recently completed research project at Harvard University attempted to answer these questions by analyzing the factors influencing organized responses to seven international environmental problems: oil pollution from tankers, acid rain, stratospheric ozone depletion, pollution of the North and Baltic seas, mismanagement of fisheries, overpopulation, and misuse of agricultural chemicals.[3] (Summaries of these seven case studies may be found on pages 15, 16, 17, 29, 30, and 31). In an analysis largely based on concepts and methods drawn from political science, the Harvard investigators identified the roles played by international environmental institutions in attempting to solve these problems. The researchers focused on institutional effectiveness, specifically whether the international institutions had a positive contribution to the treatment of the shared problems.

The establishment of truly effective international environmental institutions would improve the quality of the global environment. However, much of this activity is relatively new, and none of the studies on the seven issues has produced good direct data about changes in environmental quality as a result of international institutional action. Therefore, the researchers focused on the observable political effects of institutions, in addition to their direct environmental impacts.[4] This is not just a case of looking where the light is brighter. For international institutions to make a difference in the environment, they must spawn political change, and it is therefore appropriate to judge them according to how well they do so.

Effective institutions can influence the political process at three key points in the environmental policy-making and policy implementation process: by contributing to more appropriate agendas and reflecting the convergence of political and technical consensus about the nature of environmental threats; by contributing to more comprehensive and specific in-

ternational policies agreed upon through a political process whose core is intergovernmental bargaining; and by contributing to national policy responses that directly control sources of environmental degradation. Although effectiveness in setting agendas and in international policy formulation is a facilitating condition, effectiveness in national policymaking is a necessary condition for improvement of environmental quality through the actions of international institutions.

The studies at Harvard reveal four types of national policy responses. Some countries simply avoid international obligations by failing to sign treaty commitments. Others accept commitments but fail to live up to them. A third group accepts commitments and achieves compliance. Finally, a fourth group surpasses the explicitly required obligations. Effective institutions nudge countries further along this continuum of commitment and compliance.

Countries that fall into the first two categories may be called laggards because they typically possess much weaker environmental measures than do others. The economic costs of strengthening these measures may be high, and noncompliant laggards may have agreed to regulation only reluctantly. Laggard countries may support collective policies even though they do not have the scientific, technical, or administrative capacity to implement the rules and may hope that "joining the club" would entitle them to receive assistance.

Countries in the latter two categories, or "leaders," willingly sign and comply with treaty commitments and often exceed these commitments. Leaders commonly possess more advanced domestic environmental policies and also are often subject to more intense domestic political pressures than are laggards. This was the case with U.S. leadership in the ozone and population case studies. Leaders are often motivated simply by being the first to suffer environmental damage, though being first frequently means being the most severely affected, as was the case for acid rain in Sweden and Norway and marine oil pollution off the coast of Britain. Domestic pressure, advanced policies, and disproportionate damage all give leaders higher levels of motivation and political capacity to effect change than others have. In the seven case studies, these differences prompted leaders to promote institutional solutions to environmental problems.[5]

Based on an examination of the political consequences of international environmental institutions, the Harvard research team formulated tentative general propositions and specific lessons for leaders and designers of international institutions who wish to use international organizations and regulations to improve the quality of the natural and human environment. The case studies reveal three distinctive functions of international environmental institutions: to promote concern among governments; to enhance the contractual environment by providing negotiating forums and creating ways to disseminate information; and to build national political and administrative capacity. These three functions dominate the attention of effective institutions. On the other hand, there is little evidence that international organizations enforce rules. Indeed, in the case studies, monitoring environmental quality and national policy measures was a far more influential institutional activity than was direct enforcement, and promoting re-evaluation of state interests was more effective than was forcing behavior against a state's interest.[6]

Institutions can also serve as magnifiers of public pressure when they foster competition among governments to be more pro-environmental.

International Environmental Institutions

International environmental institutions can be considered to be responses to problems caused by inadequate responses by governments, acting without institutional support, to environmental threats. The inadequacy of governmental responses derives principally from three major factors: low levels of concern about the environmental threat, lack of capacity to manage it, and the inability to overcome problems of collective action. Institutions that help improve the quality of efforts to protect the environment—in other words, effective institutions—help to overcome each of these factors.

Increasing Governmental Concern

For each of the case studies, there were periods when some governments were motivated to solve an environmental problem but were unable to overcome the central bottleneck created by the fact that their concern was not shared by other governments. In such cases, it is unrealistic to expect institutions to promulgate effective regulatory rules; the laggard states will either block rules or insist on weak rules.

Institutions are not powerless in such settings, however, and several ways exist by which they can boost concern within laggard states. In cases where a laggard state's lack of con-

cern was due to a misunderstanding of its own interests, normative pronouncements (to reduce transborder air pollution or to stop destroying the ozone layer) accompanied by collaborative scientific reviews sometimes contributed to a shift from low to high concern. The collaborative reviews of scientific evidence under the Vienna convention and Montreal protocol on protecting the ozone layer clearly played a major role in the increased concern of several governments for the problem of stratospheric ozone depletion (see the box on this page).

Institutions can also serve as magnifiers of public pressure when they foster competition among governments to be more pro-environmental, as was seen in the Baltic Sea and North Sea Ministerial Conferences, in further ozone negotiations, and in acid rain "tote-board diplomacy" (see the box on page 16). Under these circumstances, international institutions were important sounding-boards for politicians in a competitive game to impress the public. Although intergovernmental organizations are almost always extremely reticent to criticize governments, nongovernmental organizations (NGOs) do not face such constraints. NGOs typically play an active role, using information from formal international meetings and public statements made by governmental officials to embarrass and criticize a country's national policy. Under these conditions, each international institution is part of a complex network of governments, international institutions, nonprofit NGOs, mass media, and industry groups, in which public pressure may overwhelm industries' and governments' resistance.

International institutions can focus normative pressure on states, as well. When international principles and norms have been agreed upon, they may acquire legitimacy as intrinsically valuable premises rather than as contestable reflections of interest-based compromises. Just as the United Nations Educational, Scientific and Cultural Organization in the 1970s offered many resolutions under the theme "the collective legitimation of the world's doers of good or the delegitimation of its doers of evil," international environmental institutions can legitimize or delegitimize state practices.[7]

Institutions can also have an impact on how nations express their concern at the international level. International institutions that have open procedures for setting agendas may enable weak states or groups of states to put issues on the international agenda in ways that cannot be ignored by others. Furthermore, by providing established leadership roles, international organizational arrangements may allow proponents of action to have greater influence than they would have in a disordered international system. Thus, domestic concern about environment issues may be magnified at the international level, and it may be more feasible to mobilize coalitions for policy change because of the institution. The Convention on Long Range Transboundary Air Pollution is a good example.

Institutions can also increase concern by facilitating the linking of issues. A laggard state may have little concern for an environmental problem, but if an institution helps link the environmental problem to other issues that are of concern, then the laggard may lose its reluctance. Such a link is direct in the case of material incentives, such as financial aid, the transfer of technology to developing countries and those in Eastern Europe, or the trade sanctions in the Montreal protocol. The link can also

STRATOSPHERIC OZONE AND CFCs

By Edward A. Parson

Three sets of international agreements now control chlorofluorocarbons (CFCs), known since the 1970s to threaten the Earth's ozone layer: the 1985 Vienna convention, a weak "framework" agreement lacking concrete controls; the 1987 Montreal protocol, which cut production of CFCs by 50 percent; and the 1990 amendments to the protocol that phase out CFCs and other chemicals and help fund developing countries to comply. More than 70 countries have joined the fight to cut CFCs, and world CFC use is down by more than 20 percent, far ahead of the control schedule.

This remarkable achievement, widely lauded as the most successful case of environmental diplomacy to date, was driven by three factors: evolving scientific understanding, strong national leadership at key points, and international institutions that structured and, at times, advanced deliberations among nations.

International institutions advanced the CFC phaseout process in three ways. First, international experts provide a widely credible forum for disseminating information that prompted concern about CFCs and increased confidence in the feasibility of eliminating them. Indeed, scientific and technical panels in 1989 were so effective that the 1990 phaseout agreement was achieved essentially without difficulty. Second, continuing CFC phaseout negotiations facilitated coordination of proposed control measures, which increased concerned governments' confidence that their own costly measures would be reciprocated and that they would be able to craft incentive-changing measures to bring less concerned governments into the treaty. Third, international measures adopted in 1990 increase the capacity of both developing and industrialized nations to achieve their phaseout goals. For developing countries, funds are available to subsidize investments in CFC alternatives. For all nations, international bodies provide for rapid sharing of information on new technical options.

However, this case of successful environmental diplomacy holds sobering lessons. The CFC phaseouts now seem to represent the right measures too late and may be insufficient to avert serious ozone loss.

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be less direct, as when governments exert diplomatic pressure within the context of an environmental institution, raising the prospect that life may be made difficult for the laggard in other areas if the country does not comply. Institutions help increase such diplomatic pressure, both by publicizing a laggard's opposition and by creating the opportunity to form international coalitions explicitly designed to put pressure on laggards. In the cases of stratospheric ozone and acid rain, pro-environmentalist "clubs" explicitly formed to exert pressure on opponents of emerging institutional rules. Other times, less formal international coalitions emerged, as in the cases of the pesticide trade (see the box on page 17) and pollution in the North and Baltic seas (see the box on page 29).

Enhancing the Contractual Environment

The degree of concern that a government expresses about an international environmental problem reflects not only its view on the issues but also its calculations of both the feasibility of such action and the action's costs and benefits. Thus, concern is partly a function of the other two crucial factors: the nature of the contractual environment and a state's capacity. If levels of effective communication among states and their ability to make credible commitments to each other are low, it may seem futile to raise new issues for the international agenda. Environmental institutions, however, can enhance the quality of the contractual environment and thus facilitate the creation and maintenance of international agreements. Institutions create bargaining forums in which information is shared and thus reduce the transaction costs of negotiating agreements. Institutions that create ongoing negotiating processes help make commitments more credible by ensuring regular interaction among participants on the same set of issues.

Another way institutions can facilitate agreements is to provide monitoring and verification services. Frequently, uncertainty regarding the future actions of other countries can restrain otherwise willing countries from accepting mutual constraints. Monitoring by an institution can help overcome this obstacle in three ways: by measuring aspects of environmental quality; by observing potential sources of pollution, such as oil tankers; and by monitoring national policy. Institutions can also serve as a scapegoat, enabling governments to transfer blame for costly adjustment measures and, thus, lessen the domestic political cost of carrying out actions that are unpopular though beneficial.

Every institution that was studied monitored aspects of environmental quality, either directly or in conjunction with independent scientific laboratories. Although many of the institutions also gathered data on the activities of potential sources of pollution, only the acid rain-monitoring program was able to validate national reports more or less independently; every other such program relied solely on national reports of behavior. In spite of countries' ability to falsify their own national reports (secretariats never challenge the reports), governments value them. In situations where public interest is high, NGOs and domestic bureaucracies that want more effective action can use the information in the reports to apply public or intragovernmental pressure on the government in question to make it live up to its promises. In

ACID RAIN IN EUROPE

By Marc A. Levy

In Europe, air pollution from one country crosses borders to kill fish and trees and corrode buildings and monuments in neighboring countries. European governments have responded to this situation by collaborating within the 1979 Geneva Convention on Long-Range Transboundary Air Pollution (LRTAP), as well as by taking measures within the European Community and at the national level.

Because LRTAP was associated with détente negotiations, all the appropriate states are members and participate actively in its joint research programs, which appear to have helped resolve many scientific disputes. When LTRAP was created, only 2 of its 30 members thought acid rain was a problem. Now they all are in the midst of an ambitious plan to develop strict regulatory protocols to lessen acid rain. If the plan is followed successfully, it will result in one of the world's most innovative institutional responses to international environmental hazards.

The protocols that have been adopted to date, which call for specific reductions of sulfur dioxide, nitrogen oxides, and volatile organic compounds, have a mixed record of success, however. Few states have adjusted their national policies to respond to the protocols, and there is both nonparticipation and noncompliance on the part of some large polluters. The former Soviet Union and the United Kingdom are likely exceptions, however, because, though they are among the biggest polluters in Europe, they seem to have take pollution abatement measures influenced by the sulfur protocol.

LRTAP's success is a function not of its consensus-building and rule-making activities individually but of the way it has integrated the two functions. LRTAP was initially established as a weak institution oriented toward scientific research because, at the time, governments were reluctant to take action and scientists were uncertain about appropriate response. Governments did not feel threatened by LRTAP, even as its scientific working groups resolved the uncertainties in favor of taking action. Governments now accept the need for action.

If the present protocols are considered only as regulatory rules, they are weak and ineffective. However, they serve a vital role in magnifying pressure on recalcitrant states, in keeping the consensus-building activities high on governments' agendas, and in assisting domestic environmental allies of action. This process can be called "tote-board diplomacy," by which a collective standard (such as a 30-percent reduction in sulfur dioxide emissions) is held up publicly and countries that fail to agree are subject to collective pressure.

terms of national policies, international institutions are also dependent on national reporting. However, in this area, even though states could misrepresent their policies in national reports, governments seem to value the exchange of information for its role in reducing uncertainty and in promoting public scrutiny.

For issues about which concern is very high, a nation's ability to monitor violations may not be essential for cooperation. Nations around the North and Baltic seas undertook significant new policy measures despite the lack of well-funded and integrated monitoring systems for either compliance or environmental quality. Monitoring arrangements for compliance with the Montreal protocol still have loopholes, are based on awkward economic proxies for actual environmental emissions, and do not generate prompt identification of violations. For example, the major industrialized countries appear to have incentives to reduce production of ozone-depleting chemicals that are so strong that they are satisfied with weak verification measures, and their concern about noncompliance is low.

Sometimes, however, monitoring is essential. Because systematic monitoring of oil tankers at sea is impractical, controls on vessel-source pollution only became effective when equipment regulations—which could easily be monitored—replaced discharge rules as the principal means of regulation (see the box on page 29). Prior to the adoption of exclusive economic zones in the late 1970s, the ability of fishing fleets to escape detection created a climate of distrust that contributed to the failure of collective efforts to manage fish stocks.

Enhancing the contractual environment is most relevant for international commons problems, where regulatory rules specifying mutual restraints are the dominant focus of bargaining. But, surprisingly, actions that are meant to improve the contractual environment are also relevant for national environmental problems, where mutual restraints are not an issue. The prior informed consent rules associated with pesticide trade, for example, are not intended to solve a commons problem but to assist national responses to the problem in developing countries. The rules provide points of accountability within national governments that may enable concerned groups within society and within governments of pesticide-importing countries to make exact commitments, to pressure for more effective controls on pesticide availability and use, to monitor compliance, and to apply strategies of reciprocity. In general, institutional activities that enhance the contractual environment can facilitate the negotiation of norms and principles governing national problems, as well as those operating at an international level for

(continued on page 29)

MANAGING PESTICIDE USE IN DEVELOPING COUNTRIES

By Robert L. Paarlberg

Safe use of pesticides is an increasingly difficult problem for developing countries in Asia, Africa, and Latin America. Although international institutions do not reach into the remote rural settings where this problem is most acute, they have nonetheless found ways to play a constructive role. For example, special agencies led by the UN Environment Programme (UNEP) have recently played a role in forcing governments to show greater concern for pesticide issues. In turn, UNEP was prodded into playing this role by nongovernmental organizations, such as the Pesticide Action Network, and by some developing country officials within its own governing board. One conspicuous result has been a joint effort by UNEP and the Food and Agriculture Organization (FAO) to tighten existing standards on international sales of pesticides. The prevailing standard for sales, favored by industrialized countries, had been a "notification only" approach. This has now been supplanted by a more demanding standard of "prior informed consent" (PIC). When UNEP adopted this change, previously disengaged governments—especially the U.S. government—began showing enough concern to endorse and join the process.

UNEP and FAO have also contributed to pesticide safety by enhancing the contractual environment for policymaking. The joint meetings between UNEP and FAO for the purpose of adding PIC to FAO's somewhat weak code of conduct on pesticides provided a unique setting in which normally antagonistic farm and environmental interests were able to bargain effectively. The expanded FAO code that emerged from these meetings is still unsatisfying to most environmentalists, in part because the code is still strictly voluntary. Nonetheless, these environmentalists were able to use the standards contained in the code to shame the private agrichemical industry into more responsible behavior. The PIC procedure now contained in the code is important because it promises to expand this informal accountability system by designating national authorities within developing countries to make better informed and more widely publicized decisions on pesticide importation policy.

Pesticide issues also confirm, somewhat indirectly, the key role international institutions must play in building national environmental policy capacity. Safe use of pesticides is difficult in the developing world, partly because these regions lack research, agricultural development programs, and administrative and regulatory capacity. FAO and UNEP have tried to address these deficits, through publications, model national registration schemes, and field training programs. Unfortunately, however, these capacity deficits are too great to be corrected easily through the relatively small-scale programs of the UN special agencies. Only the larger and better endowed international development assistance institutions—particularly the World Bank—can adequately address this problem. The World Bank's continuing reluctance to perform this role, however, is standing in the way of improved institutional effectiveness in pesticide use.

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commons problems.

Regulations do more than regulate—they help generate political concern, they set normative standards, they communicate intensity of preferences, and they legitimize financial transfers that might otherwise be termed *bribes* or even *blackmail*. This dual role of regulatory rules explains why so many international institutional responses to environmental problems have been regulatory in nature. With the exception of population, regulatory standards were set (though not always formally enshrined in international law) in each of the case studies investigated by the researchers, even when it was clearly impossible or unrealistic for many states to apply them.[8]

Increasing National Capacity

For collective principles, norms, and rules to be promulgated and implemented, it is not sufficient for governments to be concerned only about environmental problems and for the contractual environment to be reasonably benign. Governments must also have the technical capacity to negotiate meaningful regulations that take into account both environmental realities and the political and economic incentives facing governments, firms, and other organizations that affect environmental quality. After

POLLUTION CONTROL FOR COUNTRIES OF THE BALTIC AND NORTH SEAS

By Peter M. Haas

Since the early 1970s, the countries that border the North Sea and Baltic Sea have tried to coordinate their policies to control marine pollution: The Oslo Commission was established in 1974 to control marine dumping in the North Sea; the Paris Commission was established in 1978 to control land-based sources of pollution in the North Sea; the Helsinki Commission was developed in 1980 to control all sources of marine pollution in the Baltic Sea; the North Sea Ministerial Conferences began in 1984; and the Baltic Ministerial Conferences began in 1988. Together, these institutions form a single policy system for the protection of the Baltic and the North seas. Within this system, the countries have successfully developed and applied a growing number of measures to control specific sources of marine pollution. Since 1978, 58 decisions, recommendations, and agreements have been adopted for the North Sea, and 112 have been adopted for the Baltic.

Until 1987, these measures were developed and applied on a substance-by-substance basis, leading to a disorganized and incoherent set of policy efforts. Some substances were regulated according to common emission standards and others by common ambient standards. Although such an approach reflected scientific consensus about environmental capacity, it was slow and unwieldy. Moreover, because they received little public scrutiny and were subject to high industrial influence, many decisions were delayed or were subject to standards that merely satisfied a least-common-denominator approach (acceptable to the most recalcitrant government).

Institutional change contributed to more forceful environmental protection. Following the establishment of the Ministerial Conferences and the spread of environmental concern in the region, international efforts became much more vibrant and stringent. Across-the-board reductions of 50 percent were established for 37 significant pollutants, and 70 percent reductions for dioxins, mercury, cadmium, and lead emissions are required by 1995. Because the institutions amplified and refracted domestic environmental concern, many countries have accelerated or broadened national programs for pollution control. Combined with mounting domestic environmental concern, the high profile North Sea Ministerial Conferences made it difficult for environmental ministers from laggard countries to oppose environmental measures proposed by leader countries.

INTENTIONAL OIL POLLUTION OF THE OCEANS

By Ronald B. Mitchell

For most people, oil pollution conjures up images of tanker accidents, such as the wreck of the *Exxon Valdez* in Alaska in 1989. Yet daily intentional discharges by tankers introduce millions of tons of oil residues into the oceans each year. Although control efforts started in 1926, it was not until the early 1980s that the many international conventions and negotiations within the International Maritime Organization began to reduce intentional oil discharges. The conventions succeeded by making agreements easier to keep and by supplementing unenforceable discharge standards with easily verifiable and sanctionable requirements to install specific equipment that reduces the oil residues. Tanker owners have complied with these equipment rules and, as a result, have significantly reduced their discharges, even when they could not expect to recover the loss in capital investment.

The success of equipment standards, however, improved compliance with discharge standards or urged governments to provide receptacles for oil residues. In fact, international efforts did little to increase concern about oil pollution or the capacity of states to enforce or comply with treaty rules. Stronger rules did not occur until the negotiating governments changed their positions: stringent U.S. proposals backed by threats of unilateral action as public environmentalism grew; European state support backed by public concern evoked by several major tanker accidents; and developing country support, out of environmental concern and a desire to enhance their international position. Only this combination of factors allowed governments to overcome the resistance of the oil and shipping industries to the equipment requirements necessary to reduce intentional discharges.

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such regulations have been specified and agreed on, the burden of action shifts to national responses, which are often inhibited by low political, legal, and administrative capacity. Leaders of weakly institutionalized states who want to conform to international norms and principles and to comply with regime rules may lack the political legitimacy or the loyalty of competent and honest bureaucracies necessary to develop and implement domestic initiatives. International regulations create an external demand for effective domestic action, and international coalitions, including NGOs, may prompt increasing internal demand as well. However, severe constraints may exist on the ability of the state to supply effective policy. When this problem becomes serious, international institutions can play an important role in helping to increase domestic capacity, sometimes by transferring resources to weak governments in the form of technical assistance or outright aid and, in other instances, by creating interorganizational networks that serve as catalysts and facilitators. Capacity building is particularly important for developing countries and the new Eastern European democracies, whose administrative and political abilities are generally limited by a lack of resources.

Technical assistance from international institutions is common. Many institutions offer training programs, policy-relevant information, and research grants to help weak governments create stronger policy programs. Typically, such programs are operated under the auspices of an international institution. In many of the cases studied, such programs helped weaker states improve their ability to develop and implement effective measures to protect the environment. For instance, the ozone fund enables less developed countries to find alternatives to chlorofluorocarbons (CFCs); family-planning experts help mothers in developing countries control population growth (see the box on this page); technical assistance from the UN Food and Agriculture Organization helps national pesticide registrars and promotes integrated pest management; and fishery commissions train national fisheries managers (see the box on page 31). Institutions contributed to building private-sector capacity, as well. Fisheries commissions trained private fishermen as well as state managers. The International Maritime Organization's training seminars help educate ship captains in applying international and national environmental measures to their routine operations.

In addition to such familiar aid roles, international environmental institutions have developed networks with other agencies with related operational programs, such as the World Bank, various regional development banks, and the UN Development Programme. It is revealing that, in the case of marine oil pollution, where coalitions with operational organizations are absent, virtually no increase occurred in relevant developing countries' capacity to enforce or comply with treaties.

Therefore, effective international institutions tailor their activities according to the specific political obstacles they face. The relationships between international environmental policy, institutional achievements that increase successful management, and functional activities associated with these achievements are indicated in Table 1 on page 32. Of course, increasing governmental concern, enhancing the contractual environment, and building state capacity are not strictly sequential activities, but they interact with one another synergistically. In other words, reinforcing one is likely to strengthen others, though weakness in one activity may drain another. Effective institutions will address these interactions with sophisticated strategies operating at multiple levels. The weak technical capacity of participating states, for example, may inhibit expressions of concern because governments that are technically ignorant are likely to take abstract, principled stands and may be reluctant to discuss specific costs and benefits for fear of being unable

INTERNATIONAL POPULATION INSTITUTIONS

By Barbara B. Crane

Rapid population growth in developing nations led to the creation, in the mid 1960s, of new international population programs in the United Nations, the World Bank, and bilateral assistance agencies. Donor governments from Western industrialized countries also funded the work of voluntary agencies, such as the International Planned Parenthood Federation. The primary objective of these programs has been to facilitate the spread of family planning. Over time, the programs have evolved into a network of international population institutions (IPIs) that support demographic and contraceptive research, policy formulation, and provision of training, services, and commodities for family planning programs. IPIs have become increasingly effective in strengthening the capacity of developing countries to adopt national population control policies and to implement family-planning programs, which has helped to accelerate fertility decline in a wide range of socioeconomic settings. IPIs have been effective because of their high degree of autonomy in decisionmaking, the availability of grants, and their ability to cooperate closely both with each other and with their counterparts in developing countries. In recent years, a stronger global coalition among population and environmental groups has helped to strengthen public support for IPIs, especially in donor countries. Moreover, how IPIs work with other relevant constituencies, such as women's groups, to address critical service-delivery issues will do much to shape their future growth and effectiveness.

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INTERNATIONAL FISHERIES MANAGEMENT

By M. J. Peterson

Ocean fisheries can be regulated by allocating access to fish and by avoiding overfishing and overinvestment in fishing equipment. An international fisheries management system was organized to prevent overfishing, which was easier to define and raised fewer political problems than did directly addressing overinvestment. This system gives fisheries management an environmental focus and means that the success or failure of policy can be judged by the relative availability of steady fish stocks.

Before 1977, ocean fisheries were open-access, common-pool resources because of the traditional freedom to fish on the high seas. Although governments sought to coordinate their management efforts through joint regulatory commissions, the open-access rule created a highly contentious contractual environment in which each state sought to avoid having to adjust its fishing effort. The joint commissions lacked either the authority or the monitoring capacity to alter that environment. As a result, the international commissions' success remained very limited, even though concern existed and capacity, in the form of better fisheries science, was increasing.

The potential for preventing overfishing increased when the contractual environment was transformed in the mid 1970s. The exclusive economic zone, accepted gradually by all states during the 1970s, gave coastal states the authority to allocate fish catches within their zones, which accounted for about 90 percent of the resource. International commissions became responsible only for fisheries when stocks were found partly within or outside the 200-mile limit, while a group of UN-sponsored regional advisory commissions became major contributors to increasing the regulatory capacities of developing states. Management of fish stocks has improved, though many experts believe that government could improve it further by adopting different forms of national regulation. Today, international institutions are significant mainly as mechanisms for helping to maintain concern and build developing state capacity.

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to evaluate others' arguments. And when a government prepares a national policy response, problems of low concern may re-emerge. It may turn out that some regime members had enough concern to accept mutual commitments but had insufficient concern to make the necessary domestic adjustments. Or domestic political opponents who had been uninvolved during the negotiation of international rules may become more formidable obstacles once domestic adjustment measures are deliberated. If problems of low concern emerge during this phase, the networks formed by international environmental institutions can increase the influence of their domestic allies by providing them with information or by mobilizing transnational coalitions to influence their governments.

There are additional complex links that the research team did not explore systematically, such as the availability of technological options, which also enhanced institutional effectiveness. More aggressive international actions for protecting the ozone layer, for controlling acid rain, for protecting regional seas, and for controlling oil pollution from tanker operations were all facilitated by the availability of technological options that made such objectives appear feasible. However, technological change is partly a function of institutional influences and partly autonomous. Technology has been both a contributing cause and a consequence of institutional effectiveness. Corporate decisions to invest in new technologies are driven in part by signals from institutions regarding future market opportunities. For instance, although progress in the ozone case after the Montreal protocol was made easier by the creation of possible CFC substitutes, the availability of such commercial substitutes was itself the consequence of prior research and development decisions by the major producers, who had accurately perceived in the early 1980s that such products might become marketable if CFCs turned out to have negative environmental effects.

In the course of carrying out this study, the researchers have become increasingly aware of the effects that international negotiations and the evolution of international institutions can have on the availability of new technologies relevant to environmental problems. Technology arises in response to anticipated economic demands and is conditional on the state of scientific knowledge and its underlying technical capabilities. Anticipated economic demand, as in the case of CFCs, is, to a considerable extent, the result of anticipated environmental regulation. An important issue in considering international environmental regulation is the degree of elasticity of the underlying technology. If increased demand, fostered by regulation, is likely to bring a valuable new technology into being, the case for regulation is strengthened. Conversely, if no such technology seems feasible, the costs of regulation may be very high.

Advice to the New Secretary-General

What are the implications of these findings for those who wish to build effective international environmental institutions? Because only a small number of cases (which were not scientifically chosen) have been studied, definitive judgments cannot be offered on the entire range of practical questions being debated in the UNCED process. Nonetheless, certain conclusions emerge quite strongly.

Build Environment-Centered Coalitions

The most general lesson that can be drawn from the case studies is that the most significant roles of international institutions—such as magnifying concern, facilitating agreement, and building capacity—do not require

TABLE 1
HOW INTERNATIONAL ENVIRONMENTAL INSTITUTIONS BOOST GOVERNMENTAL CONCERN, THE CONTRACTUAL ENVIRONMENT, AND STATE CAPACITY.

Roles of institutions	Institutional activities
Increase governmental concern	Facilitate direct and indirect links Create, collect, and disseminate scientific knowledge Create opportunities that magnify domestic public pressure
Enhance contractual environment	Provide bargaining forums that reduce transaction costs and create an iterate decisionmaking process Conduct monitoring of environmental quality, national environmental performance, and national environmental policies Increase national and international accountability
Build national capacity	Create interorganizational networks with operational organizations to transfer technical and management expertise Transfer financial assistance Transfer policy-relevant information and expertise through workshops and training programs Boost bureaucratic power of domestic allies

large administrative bureaucracies. Indeed, running such a bureaucracy may divert leaders of international organizations from their most important tasks, which are quintessentially political: to create and manipulate dynamic processes by which governments change conceptions of their interests and to mobilize and coordinate complex policy networks involving governments, NGOs, subunits of governments, and industrial groups, as well as a variety of international organizations that have different priorities and political styles.

In so far as capacity needs to be built, international environmental organizations should first seek to make operational arrangements with other international organizations, thus building mutually reinforcing networks and coalitions rather than establishing competing bureaucracies. Indeed, keeping the size of secretariats small forces them to build bridges to other groups and develop networks rather than hierarchies. A reputation for competent professionalism may induce others to cooperate as well.

The case studies reveal that a variety of environment-centered coalitions can be effective. Institutions can help create and nurture coalitions among like-minded governments, among action-oriented groups within other institutions and organizations, among supportive NGOs, and among environmental protection ministries. Institutions commonly perform better when environmental ministries serve as lead agencies in their deliberations. Although some responses are beyond an institution's control, institutional architects may have some influence over the shape of supporting coalitions.[9]

Foster Open-Ended Knowledge Creation

Environmental institutions are typically constructed to deal with problems that are not well understood. The only reliable knowledge, when institutions are created, is that current understanding of the problem will be obsolete in 10 or 20 years. Hence, the rules and organizations that comprise institutions should not codify existing knowledge in rules that are difficult to change, but should, on the contrary, foster an open-ended process of knowledge creation.

Such a process would require routine scientific monitoring of the environment, and universal circulation of information should be encouraged. Monitoring should be nonpartisan and untainted by national concerns, to offset suspicions that such activities are politically controlled or are a disingenuous way to promote an economic advantage. Monitoring should be conducted through direct contracts with international organizations to guarantee insulation from national policy agendas but should be performed by national scientists because governments typically pay closer attention to the findings of their own scientists. The provision of information should be indirect rather than formal and institutionalized to eliminate distributional bargaining, government censorship and control, and myopia in reporting.[10] Also, information should be made available frequently and promptly. The United Nations Environment Programme (UNEP) could serve as a clearinghouse for such information. A particularly timely and effective means of information diffusion is the UNEP executive director's annual state of the environment report.

Institutions should also monitor and publicize state environmental policies. Secretariats should be authorized to gather information regarding their governments' actual environmental protection measures and to report this information to NGOs and other domestic groups. In this way, UNEP could provide information for less developed countries and governments that are not able to emulate this role themselves. Furthermore, this function, combined with its environmental monitoring role, would be useful for UNEP in the post UNCED order. The Organization for Economic Cooperation and Development (OECD) is already playing this policy review role among advanced industrial countries and is seeking to extend it to the new regimes of Eastern Europe.

In addition to monitoring governments, institutions can help promote the widespread development of scientific knowledge concerning the various causes of environmental damage and the various consequences of suspected pollutants. Without institu-

tional intervention, knowledge that is relevant to policymaking is limited to those nations that are active in scientific research. Institutions can help speed up the diffusion process by establishing multinational assessment panels, working groups, and collaborative research programs. Such international, knowledge-based groups can often make effective use of innovative transnational experts, such as those at the International Institute for Applied Systems Analysis, the International Council of Scientific Unions, and the International Union for Conservation of Nature and Natural Resources, in ways that national efforts cannot.

National political agendas should focus on environmental harm rather than on particular pollutants. For instance, the fact that the Vienna convention did not mention CFCs by name was considered a failure by some activists; in fact, the opposite is true. Agendas that focus on harm rather than on pollutants encourage increasing knowledge, rather than limiting it, and make possible a broadening regulatory scope, which, as the case of the diminishing ozone layer indicates, can be a matter of human survival. Although the acid rain regime was prompted by concern over acidified lakes and damaged forests, it followed an agenda that encouraged consideration of any environmental harm from a pollutant that crossed national borders. The furor over acid rain has fostered considerable knowledge about a variety of pollutants, some of which have no role in acidification of lakes and forests. By contrast, the International Convention on the Prevention of Pollution from Ships (MARPOL) set very limited agendas, and most progress in building knowledge about marine pollution has occurred in spite of, rather than because of, the institution.

Move from Principles to Rules

None of the institutions in the study was successful from the outset, though some eventually became so. In fact, most international environmental institutions were first considered to be disappointing by their creators. But there is cause for optimism even for inauspicious beginnings, and effective institutions must seize the opportunities for expanding the consequences of their activity.

Effective institutions begin with commitments "merely" to norms and principles and either lack regulatory rules or possess only very weak ones. This is exactly as it should be. If states waited to form institutions until there was enough concern and scientific understand to adopt strong rules, they would wait much too long. Institutions are needed early on to help create the conditions that make strong rules possible.[11]

To switch from principles to rules, institutions must create a dynamic process of negotiation in which interests are discussed, possibilities for joint regulations are explored, and reasons for concern are investigated. Such a process serves as a focal point for action and permits the various coalition-building processes already discussed to develop at their own rates. Such a process also puts the elements of an effective institutional response into place piece by piece.

Many of the mechanisms that facilitate adoption of effective rules and national implementation of joint rules are time consuming to create. A major advantage of an ongoing negotiation process that strives to move from principles to rules is that it helps lay the groundwork for effective rulemaking. When major crises occur, an institution that has laid the groundwork with facilitating mechanisms will be much better positioned to seize the opportunity to lock in strong rules than is an institution that is waiting to put together a comprehensive package. The discovery of the ozone hole in 1987, for example, would not have galvanized a rapid response if it were not for the procedural mechanisms established by the Vienna convention and Montreal protocol.

An evaluation of policy measures must be sensitive to the political process of moving from principles to rules, as well as to issues of economic efficiency and ethics. For example, it is easy to be critical of across-the-board percentage reductions, which are commonly employed at an early stage in international environmental regulation. Such cuts are unlikely to be economically efficient because they do not target the worst polluters, who could attain the greatest im-

provements at the lowest cost. Also, because such cuts discriminate against governments that have already taken environmentally sound measures, they are not fair. And expectations of similar across-the-board cuts in the future could lead governments to refrain from taking early unilateral action to reduce environmental damage. Yet the political virtue of such across-the-board cuts is that the severity of required reductions is likely to correlate with the intensity of domestic support for environmental actions. In other words, the political support for pollution control is greatest in those countries that have reduced emissions most. Thus, for all their drawbacks, across-the-board cuts may facilitate building initial coalitions that support policy regulation, which more efficient or fair rules could foreclose.

The difficulty of reaching an internationally coordinated political solution to global warming is exacerbated by the unprecedented high costs of adjustment.

Build National Capacity

Finally, it is necessary to appreciate the importance of building political and administrative capacity within both the state and civil society. When they are effective, international environmental institutions are not merely rule-making bodies. They are also vehicles for transferring skills and expertise and for empowering domestic actors to solve domestic problems of international importance.

Institutions should foster capacity building by providing policy-relevant information that can be used by government allies to develop better programs and to justify their actions to domestic opponents. The information also can be used by private organizations, such as NGOs, to pressure governments to adopt improved regulatory practices. That capacity building is often a necessary condition for effectiveness is another reason for environmental institutions to begin by establishing norms and principles and move toward establishing rules. Often the initial norms and principles, even though they fail to alter state behavior directly through binding rules, set in motion a process that builds domestic capacity in member governments. When conditions become right for binding rules, the capacity is in place to implement them effectively. In the acid rain regime, the governments of Eastern Europe emerged from the Cold War with more sophisticated air pollution policy infrastructures than they would have had if they had not participated in international environmental institutions. This is a striking effect, given the antipathy of the communist regimes to environmental protection.

Contemporary Greenhouse-Gas Negotiations

Some of the research team's findings are relevant to the current international negotiations on greenhouse gases. These negotiations can be traced back to the concern over greenhouse-gas emissions and global climate change first expressed at the 1979 World Climate Conference. In an October 1985 meeting in Villach, Austria, scientists from UNEP, the World Meterological Organization (WMO), and the International Council of Scientific Unions concluded that the threat of a greenhouse warming was real and called for cuts in carbon dioxide emissions. The conferees established the Advisory Group on Greenhouse Gases composed of two representatives from each of the three organizations. The advisory group organized two scientific and expert workshops in 1987 that drafted reports on the extent of the problem of global warming and called for an "intergovernmental mechanism" in response. Three working groups submitted reports to the 1988 Toronto conference on the changing atmosphere and the implications for global security, which called for 20-percent reductions in overall carbon dioxide emissions by the year 2000.

The Intergovernmental Panel on Climate Change (IPCC) was created in November 1988 in response to the lessons learned from the ozone talks, where independent scientists had strongly shaped the agenda. The governments kept negotiations about greenhouse gases out of the hands of scientists, who had already caused a lot of political consternation at Villach and Toronto. Although IPCC was administered by UNEP and WMO, the panel's scientists were chosen and briefed by government officials, and the final reports of three IPCC working groups, released in August 1990, were closely edited to ensure that the scientists did not pursue agendas that are potentially threatening to broader national interests. In December 1990, the United Nations General Assembly moved the focus of authority from the IPCC to a newly created Intergovernmental Negotiating Committee (INC) with its own secretariat. Many delegates were tired of being browbeaten by UNEP's executive director Mostafa Tolba at UNEP-sponsored meetings, and they designed the greenhouse-gases institutions to avoid a repetition of that process.

To date, INC has met four times,

but talks have been disappointing because countries are deadlocked. At the September 1991 meeting in Nairobi, for example, it was proposed that the meeting follow a procedure known as "pledge and review," in which delegates would present and discuss their national measures, but this format was discarded after a week. The United States continues to argue that science does not yet support the need for rapid responses and still opposes any emission controls. All other OECD countries have announced a willingness to restrict emissions, and many European governments have already announced unilateral plans to stabilize or reduce their national carbon dioxide emissions. Many developing countries seek a concessionary transfer of technology to enable them to reduce their greenhouse-gas emissions cost effectively. The difficulty of reaching an internationally coordinated political solution to global warming is exacerbated by the unprecedented high costs of adjustment. These costs exacerbate concerns about countries benefiting and not cooperating and make governments highly sensitive to imposing new adjustment costs on the politically powerful transportation, manufacturing, and energy sectors of their economies, particularly during a period of recession. The scientific understanding of the problem remains fragmentary and incomplete, and public awareness, particularly in the United States, remains weak and poorly informed.

Such conditions pose a daunting challenge to those concerned with applying institutional lessons to this particular commons problem. Specifically, the strategy of taking problems one at a time, within separate issue areas, does not seem appropriate. Greenhouse-gas emissions are caused by a wide array of human activities that cannot be treated in isolation. Consequently, harder political and economic choices must be made, and much broader and more intense opposition can be expected because virtually all groups in the world will be asked to make sacrifices. Thus, no rapid action to reduce greenhouse-gas emissions is likely.

Some suggestions, based on the team's findings, may nevertheless be offered. Publicity and public education could increase domestic concern, prompting greater demand for international action, particularly in such laggards as the United States. Autonomous, nonpartisan scientific advice from a group such as a reconstituted Advisory Group on Greenhouse Gases could help provide information that is not politically suspect and thus provide the scientific basis for convergence of views and for eventual monitoring of any agreements that might emerge. Because many Western European governments have already adopted brave targets for carbon dioxide reductions, a well-publicized "pledge-and-review" process could shame others into making pledges and initiating policy processes at

home. Capacity-building techniques are unlikely to have a significant impact on industrialized countries, such as the United States, but could help rapidly industrializing countries and the countries in transition in Eastern Europe to reduce greenhouse-gas emissions.

Sovereignty

Sovereignty remains the legal cornerstone of the environmental order.[12] States are, if anything, reinforced in their legal authority to make decisions for the environment. All significant actions analyzed in this study have stressed national regulatory action on behalf of the environment. The skeptic might ask, "Is it possible to mitigate environmental problems without changing the underlying political and economic factors responsible for environmental degradation?"

Rather surprisingly, the answer seems to be "yes." Discrete, reformist, institutionalist measures have been effective at improving environmental quality in several of the cases studied. Although international institutions have not been integrated in a systematic way, their efforts have complemented each other better than one might have expected. For instance, although the International Maritime Organization deliberately focused entirely on oil pollution from tankers, other institutions were designed to deal with additional sources of marine pollution. Land-based sources of pollution and nonvessel sources of coastal pollution were treated by UNEP and by the Baltic Sea and North Sea institutions. UNEP and the Food and Agriculture Organization have worked together remarkably well on issues of chemical pesticides.

The achievements of international environmental institutions do not stem from large bureaucratic operations or the use of effective enforcement powers. On the contrary, such international institutions are extremely weak, in terms of budgets and authority. Their impact comes from performing three catalytic functions: increasing governmental concern, enhancing the contractual environment, and increasing national political and administrative capacity. International institutions, led by savvy executives who tailor their actions to overcome political obstacles, can design arrangements that increase the probability of achieving effective results in accord with the "art of the possible."

Although the nation-state remains the sole legitimate source of public policy, the range of legitimate policy options has shifted. People in advanced countries have demanded that their governments accept the responsibility for a clean environment, in addition to the responsibility of keeping prices stable and insuring economic growth and full employment. States with environmentally mobilized publics were the most fervent supporters of emission reductions in the Baltic Sea and North Sea cases. It is still too soon to appreciate or examine the extent of such a change in national motivations, but the people and governments of such states surely will continue to press for such arrangements on a widening set of environmental issues. International institutions must be designed and applied to allow motivated actors to heighten environmental concern, to solve problems of collective action, and to build and spread national capacity. These political changes are necessary to protect the natural environment upon which humans depend.

ACKNOWLEDGMENTS

The authors wish to thank Abram Chayes, Antonia Handler Chayes, William C. Clark, Barbara B. Crane, David Fairman, Ernst B. Haas, Ronald B. Mitchell, Robert L. Paarlberg, M.J. Peterson, Peter Sand, Larry Susskind, Oran Young, and David Victor for their helpful comments on earlier versions of this article. The authors also wish to thank participants at seminars presented by Robert O. Keohane at the Stanford University department of political science, John F. Kennedy School of Government, and the International Institutions Program of the Center for International Affairs at Harvard.

NOTES

1. See, for example, J. T. Mathews, "Redefining Security," *Foreign Affairs* 68, no. 2 (Spring 1989):174; and L. K. Caldwell, *International Environmental Policy: Emergence and Dimensions*, 2nd revised edition (Durham, N.C.: Duke University Press, 1990). See also C. Black and R. Falk, "Introduction: The Structure of the International Environment," *The Future of the International Legal Order*, vol. 4 (Princeton, N.J.: Princeton University Press, 1972), ix; D. Newsom, "The New Diplomatic Agenda: Are Governments Ready?" *International Affairs* 65, no. 1 (Winter 1988/1989); and *Financial Times*, 13 March 1989.

2. R. W. Kates, B. L. Turner II, and W. C. Clark, "The Great Transformation," *The Earth As Transformed by Human Action* (Cambridge, England: Cambridge University Press, 1990), 8. See also J. G. Speth, "Environmental Pollution," in *Earth '88: Changing Geographic Perspectives* (Washington, D.C.: National Geographic Society, 1988).

3. P. M. Haas, R. O. Keohane, and M. A. Levy, eds., *Institutions for the Earth: Sources of Effective International Environmental Protection* (Cambridge, Mass.: MIT Press, forthcoming).

4. This operationalization is meant to be compatible with that of M. A. Levy, G. Osherenko, and O. R. Young, "The Effectiveness of International Regimes: A Design for Large-Scale Collaborative Research" (Discussion paper, Institute for Arctic Studies, Dartmouth College, Hanover, N.H., 4 December 1991).

5. For a more general discussion of leadership, see O. R. Young, "Political Leadership and Regime Formation: On the Development of Institutions in International Society," *International Organization* 45, no. 3 (Summer 1991):281–308.

6. See A. Chayes and A. Handler Chayes, "Compliance Without Enforcement: State Behavior Under Regulatory Treaties," *Negotiation Journal* 7 (July 1991):311–30.

7. J. P. Sewell, "UNESCO: Pluralism Rampant," in R. W. Cox and H. K. Jacobson, eds., *The Anatomy of Influence: Decision Making in International Organization* (New Haven, Conn.: Yale University Press, 1973), 149. The concept of collective legitimation was first developed by I. L. Claude, *The Changing United Nations* (New York: Random House, 1967).

8. Whether reliance on command-and-control regulations, rather than on market-based incentives, is somehow necessitated by the nature of international politics or, instead, represents a failure of policy imagination is an issue that the authors did not explore.

9. For a useful discussion, see J. K. Sebenius, "Negotiating a Regime to Control Global Warming," in R. E. Benedick et al., *Greenhouse Warming: Negotiating a Global Regime* (Washington, D.C.: World Resources Institute, 1991), 69–98.

10. M. K. Tolba, "Building an Environmental Institutional Framework for the Future," *Environmental Conservation* 17, no. 2 (Summer 1990); E. L. Miles, "Science, Politics and International Ocean Management," *Policy Papers in International Affairs*, no. 33 (Berkeley, Calif.: Institute of International Studies, 1987).

11. A similar point is made by A. Chayes in "Managing the Transition to a Global Warming Regime or What to Do 'til the Treaty Comes," in R. E. Benedick et al., 61–68, note 9 above.

12. See R. O. Keohane, "Sovereignty, Interdependence and International Institutions," working paper no. 1 (Cambridge, Mass.: Center for International Affairs, Harvard University, February 1991). See also P. M. Haas, *Saving the Mediterranean: The Politics of International Environmental Cooperation* (New York: Columbia University Press, 1990); and P. M. Haas and T. Sungen, "The Evolution of International Environmental Law," in N. Choucri, ed., *Global Environmental Accords* (Cambridge, Mass.: MIT Press, forthcoming).