Annu. Rev. Environ. Resour. 2006. 31:297–325
doi: 10.1146/annurev.energy.31.042605.135621

First published online as a Review in Advance on July 5, 2006

ENVIRONMENTAL GOVERNANCE

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Key Words climate change, cogovernance, decentralization, ecosystem degradation, globalization, market

■ **Abstract** This chapter reviews the literature relevant to environmental governance in four domains of scholarship: globalization, decentralization, market and individual incentives-based governance, and cross-scale governance. It argues that in view of the complexity and multiscalar character of many of the most pressing environmental problems, conventional debates focused on pure modes of governance–where state or market actors play the leading role–fall short of the capacity needed to address them. The review highlights emerging hybrid modes of governance across the state-market-community divisions: comanagement, public-private partnerships and social-private partnerships. It examines the significant promise they hold for coupled social and natural systems to recover from environmental degradation and change and explores some of the critical problems to which hybrid forms of environmental governance are also subject.

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INTRODUCTION

The Millennium Ecosystem Assessment, perhaps the most ambitious and extensive examination of the state of Earth's ecosystems, outlines what might reasonably be expected to happen to them under different future scenarios (1). Its

conclusions are pessimistic; the changes required to address the declining resilience of ecosystems are large and currently not under way. It ends with a discussion of the types of responses that can lead to sustainable management of ecosystems. Ostensibly, only the first of these responses focuses directly on institutions and governance—the subject of this review. Others concern economics and incentives, social and behavioral factors, technology, knowledge and cognition, and decision-making processes. Although some of these other responses may seem unrelated to environmental governance, in reality, the effectiveness of every single one of them depends on significant changes in existing strategies of environmental governance.

Our chapter reviews the literature on environmental governance to examine how different approaches have attempted to address some of the most pressing environmental challenges of our time: global climate change, ecosystem degradation, and the like. We find that a significant proportion of this literature has tended to emphasize a particular agent of environmental governance as being the most effective—typically market actors, state actors and, more recently, civil society-based actors such as nongovernmental organizations (NGOs) and local communities.

Today, a broad array of hybrid environmental governance strategies are being practiced, and it has become clear that seemingly purely market-, state-, or civil society-based governance strategies depend for their efficacy on support from other domains of social interactions. Our discussion examines the importance of spatial and institutional scales to environmental governance, focusing especially on emerging hybrid forms. Of significant interest to our review are (*a*) soft governance strategies that try to align market and individual incentives with self-regulatory processes and (*b*) cogovernance, which is predicated on partnerships and notions of embedded autonomy across state-market-society divisions (2, 3). These innovations in environmental governance can potentially be extended to engage multiple types of environmental problems and conflicts.

DEFINING ENVIRONMENTAL GOVERNANCE

For the purposes of this review, environmental governance is synonymous with interventions aiming at changes in environment-related incentives, knowledge, institutions, decision making, and behaviors. More specifically, we use "environmental governance" to refer to the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes. Governance is not the same as government. It includes the actions of the state and, in addition, encompasses actors such as communities, businesses, and NGOs. Key to different forms of environmental governance are the political-economic relationships that institutions embody and how these relationships shape identities, actions, and outcomes (4–6). International accords, national policies and legislation, local decision-making structures, transnational institutions, and environmental NGOs are all examples of the forms through which environmental

governance takes place. Because governance can be shaped through nonorganizational institutional mechanisms as well (for example, when it is based on market incentives and self-regulatory processes), there is no escaping it for anyone concerned about environmental outcomes. Environmental governance is varied in form, critical in importance, and near ubiquitous in spread.

To investigate emerging trends in environmental governance in a way that is both sufficiently general for a review and reflects ongoing changes in the world of governance, we focus on four themes around which some of the most interesting writings on environmental governance cluster. The ensuing discussion first reviews the scholarship on globalization, decentralized environmental governance, market- and individual-focused instruments (MAFIs), and governance across scales to uncover how the conventional roles and capacities of important actors and institutions are getting reconfigured. This discussion leads us to a framework through which approaches to environmental governance and the terrain of environmental governance can usefully be explored. We apply insights from this framework to two sets of consequential environmental problems: global climate change and ecosystem degradation. We identify important limitations of hybrid forms of environmental governance and conclude with a discussion of some of the implications of ongoing developments related to environmental governance.

THEMES IN ENVIRONMENTAL GOVERNANCE

The four themes upon which we focus below—globalization, decentralized environmental governance, market- and individual-focused instruments, and governance across scales—are among the most important emerging trends that are shaping environmental governance. They are generating pressures for innovative ways to address environmental and natural resource crises and challenging existing forms of governance. They are emblematic of the possibilities present in efforts to engage seriously with environmental problems, and their shortcomings are a reason to be concerned about the extent to which environmental actors have the capacity to deal with worsening environmental dilemmas. Although we treat each of these themes distinctly below, it goes without saying that there are close, perhaps even causal, connections among them, even if a review permits only speculation about how they may be related.

Globalization and Environmental Governance

Globalization describes an interconnected world across environments, societies, and economies. Multiplicity, diversity, interdependence, and flows of influence and materials are common themes associated with globalization even if there is significant disagreement about its definition, implications, impacts, and usefulness as a concept (7–10). (See References 11–13 for definitions and implications of globalization.)

From an environmental perspective, globalization produces both negative and positive pressures on governance. Economic globalization produces tremendous impacts on environmental processes at the local, regional, national, and global levels. By integrating far-flung markets and increasing demand, globalization may intensify the use and depletion of natural resources, increase waste production, and lead to a "race to the bottom" as capital moves globally to countries and locations that have less stringent environmental standards (14–17). Most free trade regimes—facilitated by and assisting globalization—provide limited or inadequate environmental provisions and insufficient safeguards for their enforcement (18–20). Analogously, despite evidence of the negative effect of international trade on carbon-dioxide emissions, it remains uncertain how economic provisions of trade agreements such as those of the World Trade Organization (WTO) intersect with the goals of climate regimes such as the Kyoto Protocol (15). Additionally, the global flow of energy, materials, and organisms through the environment, which Clark labels "environmental stuff," "couples the actions of people in one place with the threats and opportunities faced by people long distances away" (21, p. 86).

By broadening the range of problems national governments are called upon to address, globalization strains the resources of nation states at the same time as it may contribute to socioeconomic inequalities. These pressures can ultimately enhance levels of vulnerability to climate change and other environmental threats (22). Finally, neoliberal policy reforms associated with globalization may complicate the efficacy of state action by shifting power to alternative actors and levels of decision making through decentralization and privatization as well as through the use of MAFIs (see below).

Observers of globalization also argue in favor of its potentially positive impacts on economic equity and environmental standards through a virtuous circle and the diffusion of positive environmental policy initiatives. Clearly, the globalization of environmental problems has contributed to the creation and development of new global regimes, institutions, and organizations dedicated to environmental governance. More efficient use and transfer of technology, freer flow of information, and novel institutional arrangements based on public-private partnerships have the potential to contribute positively to environmental governance (23, 24).

Globalization can also enhance the depth of participation and the diversity of actors shaping environmental governance. For instance, the globalization of social action through international environmental groups expands the role of social movements, so that they can produce deep social changes across national boundaries instead of being limited to negotiations with governments within a nation state (25). By introducing new ways of organizing, interacting, and influencing governmental processes, globalization can help increase the social and political relevance of nonstate actors such as NGOs, transnational environmental networks, and epistemic communities—defined as networks of knowledge-based expertise (26). Finally, more accessible and cheaper forms of communication improve access to knowledge and technology and enhance the rate of information exchange, speeding up the dissemination of both technological and policy innovations (21–24).

The analytical argument for global environmental governance lies in the "public bads" implications of processes and outcomes related to environmental problems. Ozone depletion, carbon emissions, and climate change cannot be addressed by any single nation. Global cooperation and institutional arrangements are therefore necessary to address them. Historically, this conceptualization of environmental problems and their solutions meant that nation states were viewed as the appropriate agents of environmental action (27, 28), and international regimes as the appropriate governance mechanism.

Writings about international regimes have tended to cluster around two significant foci: understanding, measuring, and comparing the effectiveness of regime performance (29, 30) and exposing their inherent democratic deficit (31). There are three main aspects to the democratic deficit of international environmental regimes. First, countries participating in the negotiating process may not be democracies. Second, limited participation from nonstate actors (with the exception of large NGOs and at times epistemic communities); the unequal distribution of power, knowledge, and resources among the participant countries; and the ability of some powerful countries to impose their preferences may undermine the capacity of certain participants to make much of an impact on final outcomes. Additionally, the opaque character of the negotiation process itself strengthens the perception that international regimes and negotiations within the scope of multilateral organizations are driven by the more powerful actors (9, 30, 32). Finally, most international environmental agreements lack effective enforcement, especially when the more binding provisions in an agreement are at stake (33, 34).

The failure of state-centered international regimes to address many of the most pressing global problems successfully prompted a search for new institutions, partnerships, and governance mechanisms. A more inclusive global environmental governance paradigm holds the promise not only of innovative governance strategies, but also of expanded cooperation among social actors that may have been previously outside the policy process: corporate interests, social movements, and nongovernmental organizations (21, 35). The fragmentary nature of the sources of complex environmental problems, such as global climate change, and the reluctance or inability of nation states to regulate the sources of these problems, means that nonstate actors and organizations may be able to play an essential role in mobilizing public opinion and generating innovative solutions (36). It is for this reason that scholars of environmental governance such as Haas have proposed multilevel, nonhierarchical, information-rich, loose networks of institutions and actors as an alternative to ineffective state-centric international regimes (37–39).

These new international environmental governance mechanisms are viewed as being superior along a number of dimensions: (*a*) integrating scientific, technological, and lay knowledge and at quickly relaying information; (*b*) providing sufficient redundancy and flexibility in functional performance; (*c*) gaining the involvement of multiple actors; (*d*) recognizing that the relationship between international regimes and nonstate actors is fundamental to address economic and environmental changes; (*e*) identifying modalities of cooperation that go beyond

legal arrangements; (*f*) working across scales to develop cooperation and synergy to solve common problems; and (*g*) promoting social learning and compromise seeking. However, these mechanisms may also fail to limit the negative externalities emerging from lack of implementation capacity. Their characteristic reliance on decentralized action and interdependent coordination and their lack of instruments to deal with system disruption and unanticipated systemic effects mean that major environmental problems may be difficult to address directly and efficaciously through them (40, 41).

Decentralized Environmental Governance

Climate change, globalization, recent sociopolitical transformations, and the challenges they pose for environmental processes have been the major concerns occupying many of the scholars who have written and talked about environmental governance. Indeed, for many interested in environmental governance, it is synonymous with what happens on the international or the global stage (42). However, it is at least equally correct that some of the most important contemporary changes in environmental governance are occurring at the subnational level and relate to efforts to incorporate lower-level administrative units and social groups better into formal processes of environmental governance. It is perhaps only a matter of historical record today, but the landscape of natural resource management has undergone a breathtaking shift since the colonial period and its immediate aftermath. Until as recently as the late 1970s and early 1980s, those concerned about loss of biodiversity, soil erosion, desertification, deforestation, decline of fisheries, and other such environmental phenomena used to call for more elaborate and thoroughgoing centralized control. Indeed, the elaborate forms of coercive control that marked governance arrangements for most natural resources continued with little change between the colonial and the postcolonial period. State bureaucratic authority appeared to many policy makers and academic observers as the appropriate means to address the externalities associated with the use of environmental resources. Centralized interventions were therefore essential to redress resulting market failures (43, 44) (for a review of relevant claims, see References 45 and 46).

A loss of faith in the state as a reliable custodian of nature has accompanied the analogous loss of faith in states as effective managers of the economy (47, 48). The reasons for the shift away from centralized forms of governance also have to do, however, with very real forces of change, among them the fall of economies relying on centralized control. Economic pressures on states, resulting both from greater integration of economic activities across national boundaries and a decline in aid flows, have been supplemented by fiscal crises in many developing countries (49). Many nation states no longer have the resources to manage their environments. At the same time, as emerging economic forces have challenged the political and economic capacities of nation states, a shift toward more democratic political processes throughout much of the developing world has facilitated the move toward alternative forms of governance whose effectiveness depends on

higher levels of participation and greater involvement of citizens in processes of governance.

In addition, extensive research by scholars of common property and political ecology, emphasizing the capacity of communities and other small-scale social formations to manage resources, has provided the intellectual grounds for a shift toward comanagement, community-based natural resource management, and environmental policy decentralizations (50–54). It has done so by demonstrating that forms of effective environmental governance are not exhausted by terms such as "state" and "free market institutions" and that users of resources are often able to self-organize and govern them. By identifying literally thousands of independent instances of enduring governance of resources and at the same time highlighting arenas in which external support can improve local governance processes, scholars of common property and political ecology have helped prepare the ground for decentralized environmental governance.

Since the mid-1980s, decentralization of authority to govern renewable resources such as forests, irrigation systems, and inland fisheries has gathered steam. Indeed, it has become a characteristic feature of late twentieth and early twenty-first century governance of renewable resources, even if nonrenewable resources continue to be held by state authorities in a tightfisted grip (55–58). As Hutchcroft (59) suggests, "The decentralization of government functions is 'the latest fashion (60),' or at least 'a fashion of our time (61).' " Three distinct justifications for decentralization of environmental governance are available. It can produce greater efficiencies because of competition among subnational units; it can bring decision making closer to those affected by governance, thereby promoting higher participation and accountability; and finally, it can help decision makers take advantage of more precise time- and place-specific knowledge about natural resources.

National governments across the developing world have advanced strong claims about the imperative to establish and strengthen partnerships in which local administrative and organizational arrangements complement or substitute for more central efforts to govern environmental resources (62–64). In many cases, they have backed these claims with changes in renewable resource policies. Whether these changes have occurred because of the alleged advantages of decentralized governance or because of the significant flows of aid funds tied to decentralized governance is difficult to judge. But the shift in favor of decentralization has brought alternative means and new political claimants to the fore in the process of governance as nation states attempt to reclaim governance through partnerships with local organizations.

Indeed, the vast literature on decentralized environmental governance contains many different conclusions regarding the nature and depth of the changes that have occurred since the 1980s. Positions adopted by the participants range from those for whom nothing much has changed (65, 66) to those who see the world of governance to have undergone a major transformation with decentralization (67–69). Much of the debate's heat is explained by the variations in the regional focus and the organizational affiliations of those involved. Because there is

enormous patchiness in the reforms different countries have undertaken, indeed even within countries in the case of federal polities, the geographical focus of analysis often leads to different conclusions about the meaningfulness and effectiveness of institutional reforms (70). Similarly, those belonging to organizations involved actively in reforms tend to assess them more positively in comparison to outside observers and academic analysts.

When successful, decentralized governance of natural resources can be seen as effecting at least three sets of changes in the political relationships through which human beings relate to resources (71). The first set of changes concerns how decision makers in lower-level units in a territorial-administrative hierarchy relate to those at higher levels (72). Indeed, much of the existing literature on decentralized governance focuses precisely on this aspect of ongoing changes. A second set of issues is linked with the ways local decision makers relate to their constituents. This aspect of the decentralization of environmental governance has been researched extensively in writings on local resource management, especially by scholars of the commons. However, a third aspect of decentralized governance—alterations of the subjective relationships of people with each other and with the environment as part of changing relationships of power and governance—is also crucial to understand outcomes, an issue that has received far less attention than the preceding two aspects of environmental governance (6).

Contemporary efforts at decentralized environmental governance, like those in earlier periods, aim to make the exercise of control both more thorough and more economical. Decentralization disperses multiple points of political leverage throughout an administrative structure and makes them available to central decision makers (73, 74). It does so by encouraging the systematic creation of legal codes and performance standards that are specified through the exercise of legislative or executive authority. Adherence to these codes and standards is the price of inclusion in decision-making processes. Paradoxically perhaps, decentralization appears to be perfectly compatible with the existence of centralized authority when formal inclusion in decision-making processes occurs together with a clear delineation of spheres of authority within which local actors are supposed to operate. In addition to helping effect fiscal economies, decentralization also serves political and strategic considerations to the extent that dissatisfaction with governance can find local points of authority against which to protest instead of engaging centralized authority.

Contemporary decentralized environmental governance is different from earlier attempts at decentralization of authority in two critical ways. For the most part, earlier efforts in the form of indirect rule in colonial south Asia and Africa and community development programs in the postcolonial developing world relied on existing authority structures and incorporated them into the formal process of the exercise of authority. In contrast, decentralized environmental governance, especially at the local level, has been built upon new organizational entities such as community-based user groups and has established new lines of institutionalized authority. An even more striking difference that characterizes contemporary

environmental governance is the way it conceptualizes individual citizens and their responsibilities. By focusing on the incentives that prompt individuals to participate in new institutional arrangements to govern the environment, present day decentralization processes help produce the very individual subjects they require for their effective functioning. The rhetoric of capacity building, local knowledge, and individual rationality is a lynchpin of decentralized environmental governance (6). Ongoing changes in subnational environmental governance hold intriguing possibilities for reshaping the future landscape of political decision making related to the environment. Therefore, further research on environmental policy decentralization holds great promise both for furthering the insights that work on common property institutions has produced and for enhancing the involvement of local decision makers in new forms of environmental governance.

At the same time, it is worth highlighting that ongoing changes are not just an occasion for optimism that less powerful human agents may come to exercise greater voice in how they and their resources are governed. There is also room for cynicism that decentralization policies have typically been motivated by powerful state actors to enhance their own political positions. Without effective safeguards against arbitrary exercise of localized power and clear relations of accountability, decentralization may lead to forms of regulation even more suffocating than those encouraged by more centralized control. The contingent outcomes of contemporary shifts in governance, therefore, depend crucially on the ways local actors mobilize and establish alliances across sociopolitical and administrative scales of governance (64, 75).

Market- and Agent-Focused Instruments

The decline of the state since the 1970s as the prime agent of environmental governance has also propelled market and voluntary incentives-based mechanisms to the fore. Instead of relying on hierarchically organized, regulatory control or even purely participatory structures, MAFIs aim to mobilize individual incentives in favor of environmentally positive outcomes through a careful calculation and modulation of costs and benefits associated with particular environmental strategies. They differ from more conventional regulatory mechanisms along a number of dimensions, including the source of their legitimacy and authority. Cashore (76) suggests that the strength of these instruments lies in their utilization of market exchanges and incentives to encourage environmental compliance.

MAFIs encompass a broad range: ecotaxes and subsidies based on a mix of regulation and market incentives, voluntary agreements, certification, ecolabeling, and informational systems are some of the major examples. At the national level, the popularity of these instruments and frameworks has increased quickly, even if their adoption and implementation can be differentiated by sector and geography rather than being uniform (23, 77). Their popularity seems to relate to a general dissatisfaction with old policy instruments; the influence, transfer, and diffusion of emerging governance paradigms based in neoliberal institutionalism and free

trade agreements; and the need for market innovations that keep national economies competitive in a globalizing world (23).

Energy taxes, tradable permits, voluntary agreements, ecolabeling, and certification were introduced as early as the 1960s in a number of western countries (23, 78). However, their adoption has gathered steam especially since the 1990s (24). These instruments are founded upon the bedrock of individual preferences and assumptions about self-interested behavior by economic agents. A strong claim advanced in their favor is their superiority in terms of economic efficiency related to implementation. Although an emerging literature focuses on the extent to which process-oriented evaluative criteria such as popularity, responsiveness, legitimacy, transparency, and accountability may also be associated with market incentive-focused instruments, the extent to which they meet these criteria needs much greater exploration (39, 76).

Environmental taxes of different kinds are among the more common market-based instruments aimed to alter environmental actions of agents (by changing the costs and benefits of environmental choices). Over time, a number of countries have adopted a sophisticated mix of different kinds of ecotaxes as well as distinct policy positions about allocation of revenues generated from such taxes (23). Taxes on commodities and services, such as energy, nutrients used in agriculture, or tourism, are enacted in the belief that existing markets do not fully incorporate the externalities associated with the production and use of these commodities and services and that taxes are an effective mechanism to raise revenues to offset damages associated with the overexploitation of underpriced resources. Similarly, tradable permits are based on the idea that some ecosystem services, such as clean water and air, are not priced fully by existing markets. In such situations, incentives for conservation and economic efficiency of allocation can be improved through economic exchange only if appropriate legal and institutional arrangements are in place and polluters pay a tax on their polluting activities. The resulting markets for some kinds of emissions can reach significant proportions: the total value of trading in carbon markets, according to some recent estimates, may reach 10 to 40 billion dollars by 2010 (1).

Voluntary agreements are negotiated to meet environmental targets regarding, for example, lower waste generation and emissions or higher energy efficiency. Industry and corporate actors often pursue such voluntarily imposed targets as a strategy to preempt legal regulation. It can therefore be argued that the shadow of law is crucial to their emergence and effectiveness (79). Indeed, some researchers of voluntary environmental compliance have argued that without leadership by state agencies, voluntary agreements will produce anemic results at best (80). Others such as Ruggie (35) suggest that the irony of the current reliance on corporate actors to implement environmental sustainability lies in the fact that "the corporate sector, which has done more than any other to create the growing gaps between global economy and national communities, is being pulled into playing a key bridging role between them. In the process, a global public domain is emerging, which cannot substitute for effective action by states but may help to produce it" (35, p. 95).

Primary sector commodities such as coffee, timber, and energy provide familiar examples of ecolabeling and certification schemes (81–83). Both ecolabeling and certification schemes are forms of voluntary agreements wherein producers agree to meet environmental standards related to production and marketing activities. Such standards may be the result of work by third party actors, an industry association, or even the government. The operation of these schemes hinges upon the idea that consumers are willing to express their preferences related to cleaner energy or greener products through their choices in markets and through a willingness to pay higher prices. Perceptions about environment-friendly preferences among consumers have led many corporations to adopt certification mechanisms and advertising campaigns that represent both real and cosmetic shifts in how corporate actors govern their environmental actions.

Some of the drivers of market-based policy instruments in the developed world are analogous to those motivating decentralized environmental governance in much of the developing world (84). Dissatisfaction with regulatory control by state agencies and the bureaucratization associated with their growth play an important role in the expansion of market incentives-based instruments and in their adoption across sectors and national boundaries (85). Difficulties in implementation of traditional regulatory instruments provide a partial explanation of the willingness of governments to experiment with market-oriented efforts. High costs of compliance with environmental regulations and increasing awareness of environmental issues among consumers are other parts of the explanation. Although many economists had argued for the economic superiority of market-based instruments as early as the mid-1960s and 1970s (86, 87), it is only recently that their application to environmental governance is becoming more widespread.

The schematic review of a range of different instruments of environmental governance based on market incentives and exchanges suggests that their success depends significantly on the internalization of positive environment preferences among relevant stakeholders, most importantly citizens and consumers (88), and effective leadership by governments. For example, in their comparative study across eight European Union countries, Jordan et al. (23) found that among the constraints to the implementation of MAFIs was the opposition of environmental policy actors (especially environmental movements) and other vested interests (such as energy-intensive industries). Other constraints to successful implementation are lack of expertise across policy systems, fear among corporate sectors about loss of economic competitiveness, and unequal distributional impacts because of ecotaxing schemes (e.g., fuel taxes). Not surprisingly, corporate and industry actors are less likely to adhere voluntarily to new environmental standards to the extent that they prove more costly in comparison to when such standards are absent or weak (89). Indeed, efforts to induce voluntary compliance by economically motivated actors have been found to be vulnerable to free-riding behavior when effective mechanisms to deter free riding are not in place. For example, in a study of the U.S. Environmental Protection Agency's WasteWise program, Delmas & Keller (90) found that organizations joining the program were likely

not to report their creation of waste unless there were private benefits to such reporting.

Other research, especially that focusing on corporate social responsibility, examines the extent to which environmentally oriented actions of market actors are tied to their expectations about consumer preferences—both those specific to their products and to "green preferences" more generally (91, 92). Citizen preferences expressed in the form of a greater willingness to purchase green products and policy environments in which superior environmental outcomes are prized are important drivers of the success of new MAFIs of environmental governance. These considerations suggest that the growing popularity of market incentives-based instruments should not lead to the conclusion that governance is replacing governments. A conclusion more broadly supported by existing evidence would be that there is a complex relationship between governments and governance: governments are the source of credible threats of regulatory action that would require costly compliance and such threats encourage the adoption of voluntary agreements on environmental standards. Government agencies also remain the monitoring authorities to which appeals regarding violations of environmental standards can be made.

Cross-Scale Environmental Governance

The multiscalar character of environmental problems—spatially, sociopolitically, and temporally—adds significant complexity to their governance (93–95). The implications of spatial scales for environmental governance are twofold. First, the decoupling across scales of the causes and consequences of environmental problems introduces major concerns about the unequal distribution of costs and benefits of environmental issues. For example, a problem such as global climate change may have been caused primarily by the major producers of greenhouse gases in the developed world, but many of their more dramatic effects will negatively affect low-emitting countries in the global south. The spatial distribution of environmental problems, such as acid rain, ozone depletion, and transboundary water pollution, transcends national borders and adds to the challenge of designing and implementing solutions (26). As mentioned above, the main strategy to address these issues has been international environmental regimes. Although more than 1700 multilateral and bilateral environmental agreements have hitherto been signed, their effectiveness is at best mixed (30).

Sociopolitically, cross-scale environmental problems affect and are affected by institutionalized decision making at local, subnational, national, and transnational levels. A common prescription to address the multilevel character of environmental problems is to design governance mechanisms across levels of social and institutional aggregation. Multilevel governance is intended to counteract the fragmentation that is characteristic of sectorally based decision making or, indeed, of decision making that is organized by territorial, social, and political divisions. The involvement of public-private networks in multilevel governance can enhance the representation of the diversity of interests that are affected by environmental

problems (39, 96). At the same time, the configuration of cross-scale governance strategies is also conducive to compromise seeking and social learning, often enabling less formal modes of decision making, greater transparency, and higher levels of representativeness (39).

Increasingly, cross-scale governance mechanisms are being shaped by nonstate actors including NGOs, transnational environmental organizations, intergovernmental and multilateral organizations, market-oriented actors (e.g., transnational and multinational companies), and epistemic communities (26, 97–101). These new actors both introduce innovative tools and mechanisms and positively shape power relations within the policy arena (31, 102), even if their transformative potential is contested (103).

The cross-temporal implications of environmental problems are especially severe because of two major obstacles to action: contempocentrism and uncertainty regarding cause and effect relationships involving long-term environmental changes. Contempocentrism, in part a consequence of high market discount rates, is the tendency to disregard the welfare of future generations and believe in the power of technology and technological change to take care of environmental degradation and scarcities. It means humans are likely to "spend" the environment now and discount the future heavily (33, 104). Coupled with the seeming high costs of action that will shift existing trajectories of economic development, the uncertainty surrounding the science of causes and effects of environmental degradation often leads to a "do nothing until we know more" attitude–strongly reflected in the contemporary policy positions of some nations that are the largest emitters of greenhouse gases. Many of the impacts of global climate change on humans and ecosystems are still undetermined, and the design and implementation of policies necessary to reduce emissions are both economically and politically quite costly.

THE TERRAIN OF ENVIRONMENTAL GOVERNANCE

The elaboration above of environmental governance-related changes and challenges involving four different themes shows that there are intriguing parallels across them despite the many (and expected) differences in how governance is becoming reconfigured as a result of globalization and decentralization. It also shows the increasing importance of cross-scale governance, market instruments, and individual incentives. Perhaps the most obvious of these parallels relates to the emergence of alternative institutional forms of governance. Some of the new forms of governance are innovative hybrids between the conventionally recognized social roles that markets, states, and, more recently, communities play. Others are the result of a clearer appreciation that the effectiveness of what was conventionally understood as a pure form of governance based in the market or the state may be the result of existing relationships among market, state, and civil society actors. Figure 1 presents a schematic structure to classify strategies of environmental governance as they are founded upon the actions of three different social mechanisms.

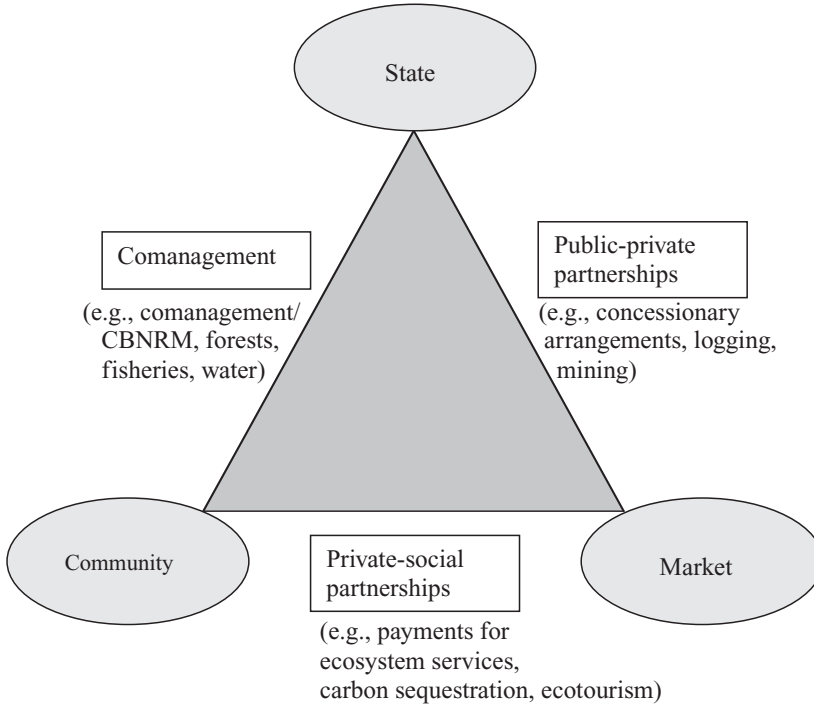

Figure 1 Mechanisms and strategies of environmental governance. Abbreviation: CBNRM, community-based natural resource management.

The triangle connecting state, market, and community constitutes the core of the figure. The emphasis in the figure on these social mechanisms is a reflection of early conversations related to the environment that viewed environmental governance strategies as being especially necessary to address the externalities stemming from the public goods nature of environmental resources and processes. To overcome these externalities, some writers saw state action as necessary; others, surmising that externalities could lead to market failure, advocated clearer definition of property rights to allow functioning markets to emerge (43, 105). Arguments advanced by scholars of the commons engaged these policy prescriptions and identified communities as a third potential locus of environmental governance (51). These efforts, championing state-, market-, and community-based governance strategies, were built around perceived strengths of the particular social arena or mechanism being considered: the capacity for action across jurisdictions backed by state authority; the mobilization of basic human incentives through market exchanges; and the deployment of solidaristic relationships and time- and place-specific knowledge embodied in communities (107).

In the past decade and a half, however, an exciting array of research has identified opportunities for more nuanced arguments regarding hybrid forms of

collaborations across the dividing lines represented by markets, states, and communities. The three major forms we identify in Figure 1—comanagement (between state agencies and communities), public-private partnerships (between state agencies and market actors), and private-social partnerships (between market actors and communities)—each incorporate joint action across at least two of the social mechanisms/arenas in the core triangle and correspond to scores if not hundreds of specific experiments in which constituent social actors find differing levels of emphasis. They simultaneously illustrate the dynamic and fast-changing nature of contemporary environmental governance. The emergence of these hybrid forms of environmental governance is based upon the recognition that no single agent possesses the capabilities to address the multiple facets, interdependencies, and scales of environmental problems that may appear at first blush to be quite simple.

The hope embodied in hybrid forms of environmental governance is evident in each case. They seek simultaneously to address the weaknesses of a particular social agent and to build upon the strength of the other partner. Thus, the involvement of market actors in environmental collaboration is typically aimed at addressing the inefficiencies of state action, often by injecting competitive pressures in the provision of environmental services. In the same vein, market actors are also viewed as enabling greater profitability in the utilization of environmental resources. The addition of community and local voices to environmental governance is seen as providing the benefit of time- and place-specific information that may help solve complex environmental problems and, at the same time, allow a more equitable allocation of benefits from environmental assets. Higher levels of participation by different stakeholders and the blessings of state authorities can help overcome the democratic deficit and lack of legitimacy often associated with market-focused instruments. Moreover, state actors, ostensibly, create the possibility that fragmented social action by decentralized communities and market actors can be made more coherent and simultaneously more authoritative.

A second obvious parallel across the discussion of the different themes related to environmental governance is that within hybrid strategies one can discern a mobilization of individual incentives that had initially been the core of market-oriented instruments and is now becoming increasingly common. Thus, contemporary cogovernance strategies, in contrast to their historic counterparts, focus on how the individual subject will respond to efforts at governance. Through such a calculation of individual responses, decentralized environmental governance aims to elicit the willing cooperation of those subject to the goals of governance (6, 108). The emphasis on willing cooperation has even prompted some scholars of incentive-based governance strategies to term them "governance without government" (109, p. 652).

In view of the extent to which an appeal to individual self-interest is a part of new environmental governance strategies, it is reasonable to conclude that a pervasive attempt to restructure agent-level incentives and attitudes toward the environment underpins governance instruments related to civil society-based solidarities, market-based policies, and voluntary compliance mechanisms (110, 111).

The same is true for public-private and social-private partnerships, each of which is enabled by a level of valorization of corporate entities and market actors that would have been quite unimaginable in the 1970s (112–114). Here, the logic of efficiency, which is the hallmark of capitalist organization of production, is also coming to colonize the goal of environmental conservation and sustainable development.

LIMITATIONS OF HYBRID GOVERNANCE STRATEGIES

The reconfiguration of environmental governance so that the state is no longer the only actor viewed as capable of addressing environmental externalities has many implications, but not all of them have found an easy acceptance among those concerned about environmental outcomes. The focus on individual incentives, the creation of new property rights and markets in relation to water or carbon, and the encouragement to the corporate sector (insofar as the policy environment enables more extensive public-private and social-private partnerships) have been construed by some scholars as moves toward increasing democratic deficit and higher levels of inequality in the allocation of environmental resources. Those who are able to exercise greater access and expertise in relation to these new mechanisms are more likely to derive greater benefits from them (66). Other scholars have expressed significant concerns about the likely results of market actors being incorporated in a more thoroughgoing manner into environmental governance, which Liverman (115), among others, has called the "commodification of nature." Greater efficiency in the utilization of natural resources, for many, is equivalent to higher rates of extraction and, thereby, brings up issues of intergenerational equity.

For scholars coming from a radical political economy perspective, there is no new approach to global environmental governance; rather, the supposed new mechanisms of governance are little more than a natural evolution of traditional regime politics because outsiders and disempowered groups continue to have little opportunity to participate in contemporary efforts at governance despite the greater incorporation of civil society actors (31). Here, the key differences between models of new global environmental governance and older conceptions of regime theory concern the role of and the importance accorded to members of global civil society, which is understood as a sphere of voluntary societal associations located above the individual and below the state as well as across state boundaries (31, 98). Ford (31) argues, for example, that the rhetoric of societal participation introduced by the Brundtland Report did little to change regime politics because it failed to democratize the negotiation process itself. New forms of global environmental governance, and their newly incorporated players, can be viewed simply as reflecting existing distributions of power rather than having changed anything fundamental. Indeed, global environmental governance is seen as being embedded in a neoliberal political economy, which is hegemonic in the neo-Gramscian sense that dominant power relations are maintained by consent as well as by coercion (31). In this sense, global environmental governance is part of a broader agenda of

corporate interests developed to promote economic globalization and to regulate what both NGOs and nation states do (116). In a world of weak states, deterritorialized action, and concentrated power, corporate interests and multilateral organizations can control and reframe environmental action as a means to legitimize their model of development (117). These dominant interests place greater weight on the problem-solving aspect of new instruments rather than on ameliorating the unequal power relations that the new system also continues to preserve. Indeed, actors who are mostly responsible for nature's degradation are defining the terms of environmental protection. "Governance from below," represented by the role of social movements and protests against organizations such as transnational corporations, the WTO, and the International Monetary Fund, is currently the only recognizable challenge, despite the risk that it too may be coopted (117).

In contrast, the inclusion of a wider array of social actors such as private and corporate interests is justified by the need to guarantee that veto players, whose "voice" or "exit" can jeopardize public action, agree with policy choices. The rationale is that if these elite actors are provided with a privileged space for participation, they will have no incentive to exert their veto power or obstruct the decision-making process. Moreover, the belief in the efficiency of market-led forms of governance to produce positive outcomes justifies compromising for the "greater good." Radical political economists, however, argue that this is hardly a justification for legitimacy (39) and that the mere inclusion of more social actors does not necessarily make governance systems more democratic (118). Although advocates of new forms of governance argue that their democratic deficit is no worse than that of traditional representative democracy (39), critics point out that they fail to meet normative models of deliberative democracy whose fairness is grounded in the equal participation of all stakeholders. The opacity of governance networks may prevent the mass public from identifying and evaluating the role of specific agents, such as experts who play prominent roles in the building of relevant issues and action agendas. For example, in cases of environmental issues with potentially catastrophic impacts (e.g., global climate change), the predominance of "less than democratic" expert politics is justified in the name of the urgency and severity of the problem.

MAFIs and multilevel governance frameworks may also have negative effects on policy capacity, specifically in relation to environmental problems. In multilevel governance systems, the "denationalization" of statehood, reflected empirically in the "hollowing out" of the national state apparatus, reorganizes old and new capacities territorially and functionally—but not always for the better (119). Indeed, globalization and subnational challenges have led to the emergence of a rescaled state that simultaneously transfers power upward to supranational agencies and downward toward regional and local levels (120), changing the way policy-making capacity is distributed. This transfer of power to different levels of decision making may have already negatively affected policy capacity of the modern state (121). Hybrid modes of environmental governance and emerging partnerships across conventional divisions suggest that the state is not the only, and perhaps not even the

most important, actor in governance (119). Yet, advocates of a bigger role for the state contend that, especially in cases where redistributive policy making becomes necessary (e.g., adaptation), it is unlikely that either the market or hybrid forms of governance will be able to accomplish much (122).

APPLICATIONS: CLIMATE CHANGE AND ECOSYSTEM DEGRADATION

The four themes we highlighted above and the framework for viewing emerging hybrid mechanisms of environmental governance are visible in the major problem areas related to the environment. Two significant arenas in which these themes and hybrid governance strategies are especially evident are global climate change and ecosystem degradation. An examination of these areas of environmental concern and crisis provides useful indications about the extent to which contemporary and emerging environmental governance approaches have the capacity to help address major problems.

Climate Change

Among the factors that challenge environmental governance structures, global climate change promises to be one of the most critical. As the need to design policies to respond to the negative impacts of climate change increases, more attention has been paid to emerging modes of environmental governance and to how they can increase the capacity of economic, social, and cultural systems to help humans mitigate and adapt to climatic change. Considering that climate is one of many stressors, the resilience of already overextended economic, political, and administrative institutions may decrease rapidly, especially in the more impoverished regions of the globe (22). Some signs of how environmental stresses may exacerbate governance challenges related to poverty, violence, and authoritarianism are already visible (1). Among the expected casualties of governance breakdown as a result of climate change may be economic growth, democratic institutions, and livelihood possibilities.

Responses to global climate change fall broadly into two main categories: those seeking to curb or stabilize the level of emissions of greenhouse gases into the atmosphere (mitigation) and those seeking to boost natural and human systems' resilience to prevent, respond, and recover from potential impacts of a changing climate (adaptation). Although at this point adaptation may be inevitable, its magnitude and range depends on how much mitigation is successfully implemented to prevent and avoid the most dangerous interference in the climate regime.

Many of the factors that make global climate change unique also make it complex. Global climate change is the quintessential multiscalar environmental problem; because greenhouse gases mix equally in the atmosphere, the costs of the negative effects of climate change are socialized at the global level, but the effects

are likely to be felt at the local level. The fragmented and highly politicized nature of the causes of climate change means that it is extremely difficult to assign blame and target offenders. Effective responses to climate change are likely to require a diversity of actors and organizations across the state-society divide. The high level of uncertainty still involving the definition of the magnitude and character of the impacts of climate change in different human and natural systems and the fact they might not be felt for years also make it a politically and financially costly problem (33). Finally, the differences among those causing climate change (large producers of greenhouse gases) and those likely to be more negatively affected by it, including the global poor and natural and biological systems, make it unique in terms of the distribution of costs and benefits and bring up a whole host of equity and environmental justice questions (123). For example, although mitigation actions are likely to fall upon countries and sectors mostly responsible for the production of greenhouse gases, such as polluting corporations and developed countries, adaptation will be realized mostly by affected groups such as the poor, living in less-developed countries, or agencies entrusted with the task of building generic adaptive capacity to climate change such as local governments, NGOs, and aid organizations. In the literature on adaptation, most efforts to compare differential vulnerability identify already stressed countries and regions in Africa and South Asia and small island states as the most vulnerable (124, 125), but the primary burden of mitigation falls on developed countries under international regimes to curb greenhouse gas emissions, such as the Kyoto protocol (127).

MITIGATION The Intergovernmental Panel on Climate Change (IPCC) defines mitigation of global climate change as "an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases" (128). Mitigation of greenhouse gas emissions has been organized at the international level primarily through the entering into force of the Kyoto Protocol and has been realized at the national level through regulation and implementation of new governance mechanisms across the public-private divide. Mechanisms to mitigate global climate change range from technological fixes to the design of institutions that curb carbon emission practices. Five categories of strategies to mitigate carbon emissions are available: energy conservation, renewable energy, enhanced natural sinks, nuclear energy, and fossil carbon management. Yet the magnitude, complexity, and urgency of the climate change problem suggest that the implementation of any or of a combination of these strategies would require tremendous amounts of financial, human, and political capital (129).

Not surprisingly, the lack of capacity of nation states to implement such strategies (exemplified by the lackluster accomplishments of Kyoto to date) (130), and the general lack of confidence that this capacity will improve dramatically in the near future, suggests that a broader array of hybrid modes of governance is necessary to address global climate change. Comanagement and public-private partnerships in the implementation of Kyoto's Clean Development Mechanism and social-private partnerships to develop community-based carbon sequestration

projects are a promising start (131, 132). Carbon taxes and joint development of fuel-efficient technology (e.g., FredomCAR, California Fuel Cell Partnership) are also examples of initiatives involving both public and private actors. Yet, despite the promise of effectiveness, many question the ability of hybrid modes of governance to address mitigation as fast and as broadly as necessary to defuse many of the most negative impacts of global climate change.

Already, in the implementation of mitigation policy, NGOs and businesses have played a particularly important role both in influencing the design and implementation of climate governance mechanisms. Although business interests have focused mostly on flexible mechanisms for carbon trading (see section on market-based mechanisms) and the pursue of fuel efficiency (in addition to playing an oppositional role to the implementation of emission-curbing strategies), NGOs have played a broader role in monitoring implementation and compliance of regulation, lobbying, raising equity issues, and providing scientific and technical knowledge (34, 127, 133, 134). One of the most effective ways NGOs have influenced the global climate change policy process has been through their role as knowledge producers and as members of information networks and epistemic communities seeking to affect the response process.

ADAPTATION The IPCC defines adaptation as an "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." Vulnerability in turn is "a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity" (128). Adaptive capacity, the third concept important to understand vulnerability to global climate change, is the "potential and capability to change to a more desirable state in the face of the impacts or risks of climate change" (135). It is the ability of a system to moderate and to adjust to global climate change-related damages. Adaptation policy considers the entitlements, assets, and resources that improve the capacity of this system to resist, cope, and recover from a given hazard.

To date, adaptive capacity indicators have been defined mostly at the national scale both because it is an appropriate level to make adaptation decisions and because it allows for comparison of vulnerability across countries (124). Although the reality of building adaptive capacity involves cascading decisions across scales and a diversity of private and public agents and organizations (136), because of the redistributive character of adaptive capacity building, the bulk of action is expected to fall over nation states (22).

At lower scales of government, global climate change critically intersects with decentralization not only in the assessment of different levels of vulnerability within countries but also in the design of policy to enhance adaptive capacity. For example, at the local level, vulnerability assessment (e.g., participatory vulnerability mapping) holds the promise of a more accurate understanding of the "character" of the vulnerability of specific social and human systems (137). At the global level, adaptation policy is influenced by the role that institutions such

as the United Nations Framework Climate Change Convention play in coordinating international action, advancing rationales for compensation, and preparing for future impacts (123, 138).

In sum, the panoply of governance strategies related to global climate change are clearly difficult to view as being centered on any single category of social agent as depicted in Figure 1. Although it might have been argued a decade ago that nation states are the only actors who can generate effective measures to address climate change, it is evident that, although their involvement is necessary, they are not adequate to perform the task by themselves. The willing cooperation of civil society and market actors and changes in individual level actions are critically important to the successful implementation of the set of governance strategies that might have some prospect of being effective.

Ecosystem Degradation

Like climate change, ongoing and fundamental alterations of the relationship between humans and ecosystems pose a complex set of multiscalar challenges for environmental governance. Ecosystems and their services are the basis upon which human lives and all human actions are founded; thus it is not surprising that when examining human impacts on the environment, the Millennium Ecosystem Assessment (MEA) focused on ecosystem services. In this section, we draw upon this comprehensive assessment of ecosystems to pursue our arguments about changing forms of environmental governance. The MEA (1) categorized the range of benefits available to humans from ecosystems into "*provisioning services* such as food, water, timber, and fiber; *regulating services* that affect climate, floods, disease, wastes, and water quality; *cultural services* that provide recreational, aesthetic, and spiritual benefits; and *supporting services* such as soil formation, photosynthesis, and nutrient cycling." This assessment concludes that humans have altered ecosystem services more comprehensively in the past half century than in any previous comparable period. Although these alterations in the relationships between humans and ecosystems have led to substantial net gains in economic development and well-being, 60% of ecosystem services are being degraded or used unsustainably. Not only are current use and management patterns unsustainable, they are increasing the likelihood of nonlinear and irreversible changes, such as disease emergence, fisheries collapse, alterations in water quality, and regional climate shifts. Finally, the costs of ongoing changes are being borne disproportionately by the poor, thereby contributing to growing disparities (1).

To address these changes, the MEA evaluates a range of potential responses and focuses especially on those that would (*a*) lead to institutional changes and governance patterns that can manage ecosystems effectively, (*b*) align market incentives better with the real costs of environmental services, (*c*) focus on particular social behavioral obstacles to better utilization of ecosystems, (*d*) promote more efficient technologies, (*e*) provide better knowledge about what is happening to ecosystems, and (*f*) improve the efficacy of environment-related decision making.

Throughout the discussion of these responses, it is evident that the authors of the MEA simultaneously define the terrain of environmental governance quite narrowly and extremely broadly. They identify a specific set of responses, those having to do with institutional and governance-related changes, as properly the domain of environmental governance. Such responses include the integration of ecosystem goals into existing sectoral strategies, for example, in the poverty reduction strategies encouraged by the World Bank, increased emphasis on international environmental agreements and target setting, and greater accountability of environmental decision making.

But they treat environmental governance too narrowly in restricting its scope to specifically institutional responses. In fact, the entire set of responses they identify in relation to markets, social behaviors, technological innovation, and monitoring capacity is contingent on changes in governance. Indeed, without comprehensive changes in contemporary national policies, the basis on which market exchanges are organized, and the incentives on which individuals act, there is little reason to think that the real costs of negative environmental outcomes will be incorporated into economic decision making. Similar arguments are not difficult to advance in relation to desired technological changes, social behaviors, or cultural processes. Although we may, in part as a result of a particular division of social-scientific labors, view the world as being divided into economic, social, political, and cultural domains, shifts in human actions in all of these domains require a reconfiguration of the costs and benefits of given actions. In the absence of changes introduced through shifts in governance patterns, there is little likelihood that humans will change their economic, political, social, or cultural behaviors.

Precisely because of the social interconnections across what we view as local, regional, national, and global levels and what we categorize as the economic, political, social, and cultural domains, successful environmental governance strategies will require heightened cooperation of many different actors across these levels and domains. Thus, not only is it the case that human beings will be able to introduce manageable changes in ecosystems only through significant transformations in environmental governance strategies, it is also very likely that successful outcomes will hinge on environmental governance approaches that are founded upon heightened cooperation involving all actors in all three social locations identified in Figure 1: market, state, and community.

CONCLUSION

Our review of the changing terrain of environmental governance has emphasized four elements. One, we suggest that environmental governance signifies a wide set of regulatory processes, not just international governance mechanisms and their impacts at the international level or just the state and its agencies at the national and subnational levels. Two, we highlight the hybrid, multilevel, and cross-sectoral nature of emerging forms of governance. Our review examines in particular

how environmental governance has changed since the 1960s. From a focus on specific agents of change such as state and market actors, advocates of effective environmental management came to view communities and local institutions as important actors to involve in governance. Especially in the past decade and a half, new sets of instruments of environmental governance have emerged. We identify three broad terms that denote these partnerships: comanagement as the form of collaboration between state agencies and communities, public-private partnerships between market actors and state agencies, and social-private partnerships between market actors and communities.

Three, we analyze how emerging forms of environmental governance that have become increasingly popular since the mid-1990s rely, on the one hand, on partnerships and, on the other hand, on the mobilization of individual incentives characteristic of market-based instruments of environmental regulation. Because they seek to gain the willing participation of a range of actors who would be subject to their regulatory effects, they are viewed by many observers as being amenable to more efficient implementation.

Greater efficiency in design and implementation of environmental governance instruments is undoubtedly a major concern of state authorities who may be under fiscal pressures and who may therefore find partnerships with market actors highly desirable. A partnership with private actors may also appear attractive to civil society actors and communities historically strapped for funding. However, a number of observers of changing environmental governance have raised concerns about the degree to which increasing recourse to market actors and processes undermines social goals related to higher levels of democratic participation, creates problems of unequal access to resources, and raises the specter of lack of accountability.

Finally, our review explores valid concerns about the unanticipated consequences of emerging forms of environmental governance. An ethical concern for democratic participation and more equitable outcomes in environmental governance is a welcome development when environmental governance mechanisms emphasize collaboration for greater efficiency. An exclusive focus on greater efficiency in emerging efforts at environmental governance, especially where natural resources are concerned, may yield the unanticipated outcome of increasing commodification of nature. The fact that human interventions in ecosystem processes are already leading to unsustainable use of more than 60% of ecosystems suggests that, together with greater efficiency, it is equally necessary to work toward restraint in human use of major ecosystems. The mobilization of individual incentives and their incorporation into innovative strategies of environmental governance is critical for efficient governance. However, effective environmental governance also requires the incorporation of knowledge about limits on aggregate levels of human activities that rely on high intensities of resource exploitation or lead to high levels of pollutant emissions. In designing and assessing strategies of environmental governance, it is critical therefore to focus not just on efficiency and equity, but also on criteria related to long-term sustainability and a concern for nature.

ACKNOWLEDGMENTS

In writing this review, we are indebted to many conversations and insights that proved instrumental in the development of our arguments. Jon Anderson, Charles Benjamin, Edwin Connorley, Benjamin Cousins, Aaron de Grassi, David Kaimowitz, James McCarthy, James Murombedzi, Ebrima Sall, Gill Shepherd, and Ann Thomas gave their time and ideas at short notice. Long-standing conversations with Jesse Ribot and Elinor Ostrom have shaped our arguments and views considerably, especially in relation to subnational forms of environmental governance. Comments from two anonymous reviewers and extensive responses from Duncan Macqueen on an earlier draft of the chapter are also gratefully acknowledged. Finally, we would like to thank Nate Engle for his careful reading of earlier versions of the chapter.

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Annual Review of Environment and Resources
Volume 31, 2006

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