



Property in Land and Other Resources

EDITED BY DANIEL H. COLE
AND ELINOR OSTROM



Foreword by Douglass C. North

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Edited by

Daniel H. Cole *and* Elinor Ostrom

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Foreword

As evidenced by the quality of the chapters in this volume, the study of property rights has come a long way in the past half century. The pioneering role of three major contributors to this progress should be acknowledged. Vincent Ostrom played a critical role in the development of property rights and institutions long before they were fashionable; he and Charles Tiebout did some spectacular early work on property rights. Herb Simon deserves acknowledgment as well because he forced economists to move beyond the narrow view and to think in broader terms about the issues that are of interest to us today.

Looking behind the issues and assumptions of the chapters that follow, we may consider some of the persistent and underlying problems that confront us: problems the basic sources of which underlie all explanations in the social sciences.

First our understanding of the external world is subjective. We have only our eyes, ears, nose, and feeling with which to interpret the world. Because our experiences are unique to each individual and only partially shared by others, the result is a complicated world. Our brains translate the communications from our senses and construct the elaborate framework that we use to interpret this world. This assertion is not unique or original to me. Friedrich Hayek said it in his book *The Sensory Order*, and one cannot help but be awed by his early understanding of the issues: he wrote the book as a graduate student in 1920, although it was not published until 1952. Hayek's intuitive understanding of how the mind and brain work in constructing an explanation of the external world has led to our evolving, but incomplete, explanations of the world around us. It is the cultural heritage of different societies that makes for the variety of explanations, and we have no simple way to resolve these differences. Conflicting understandings about the world around us, such as those between the Western world and the Islamic world, derive from the constructions of different cultures to account for the political/economic/social systems.

Second, the tools we use to translate understanding into a framework are institutions composed of formal rules, informal norms, and enforcement characteristics. Institutions are very blunt instruments to deal with very complex issues. Perhaps because the norms of behavior and the formal rules do not work or because enforcement is imperfect, the problems are still unresolved. Underlying the economic and social institutions must be a political framework. In order to understand that framework and how societies work, we need a theory of politics, which does not exist.

Third, time poses a thorny set of problems. It is necessary to take into account the culture of a society, including the beliefs and institutions that we inherit from the past that constrain our choice sets in the present and the future. Culture therefore embodies what we have brought up from the past that we build on in dealing with the present and the future. You must know where you have been in order to know where you are going. Another important aspect of time is that we are evolving, and that evolution poses serious limits on our understanding of the problems we will face in the future. In consequence, there are real limitations on the creation of a genuine dynamic theory of change because the problems down the road will be different from those we had in the past. We have only to look at the evolution of the financial structure in the crisis that began in 2007 to see how different that structure is from the past one. Financial theories inherited from earlier times cannot give us a complete understanding of future problems. One of the dilemmas that economists confront is that their models are derived from the past, but in many fundamental ways the future, while built on the past, is inherently new, unique, and different.

All of this makes for a real challenge in constructing explanations, and we have a long way to go to do better. The chapters that follow are a good beginning.

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Introduction

DANIEL H. COLE AND ELINOR OSTROM

This book stems from a conversation between the two editors in 2008 about a variety of new articles on the California gold rush that challenged or substantially revised the conventional economic history of the 49ers. According to that conventional history, the miners chose contracts over guns for organizing their camps and erected, through a kind of Hayekian spontaneous organization, efficient property institutions (Umbeck 1981). The new historical analyses revised or challenged this “naïve” theory by (1) positing that the miners shared mental models of the world based on similar legal-cultural backgrounds, which enabled them to solve collective-action problems in the mining camps (Zerbe and Anderson 2001); (2) claiming that the governance regimes of the mining camps were much more than simple systems of contractually agreed private ownership (Clay and Wright 2005); and (3) noting how egalitarian norms of fairness, as much as or more than commitments to property rights, explained the organization of the mining camps (McDowell 2002).

The editors initially contemplated organizing a small conference on these new theories and histories of the gold rush. Gregory Ingram, the president of the Lincoln Institute of Land Policy in Cambridge, Massachusetts, expressed interest in the conference idea, but thought the conference should be broader in conception. After further conversations and the Lincoln Institute’s offer to sponsor the conference and this book, the editors, along with Gregory Ingram and Yu-Hung Hong of the Lincoln Institute, organized a broader conference exploring the variety of property systems around the world and their implications for property theory (or theories). The gold rush remained part of the program, but it was no longer the focal point.

The conference, entitled “Evolution of Property Rights Related to Land and Natural Resources,” was held in Cambridge, Massachusetts, in September 2010. In addition to the panel on the gold rush, the conference featured an opening lecture by Douglass C. North; a keynote presentation by Þráinn Eggertsson; and panels on air, wildlife, land, water, and the global commons. In addition to the presenters and discussants represented in this volume, conference participants included Scott Barrett, Vicki Been, Lee Anne Fennell, the late David Getches, Gregory Ingram, Jan Laitos, and Thomas Schelling. The editors would like to thank all the participants for their enthusiastic discussions, as well as Yu-Hung Hong of the Lincoln Institute, who worked very hard to bring the conference and this book to fruition.

This book begins, like the conference, with two introductory chapters designed to set the stage for the contributions that follow. In chapter 1, Thráinn Eggertsson expands on his keynote address, “Opportunities and Limits for the Evolution of Property Rights Institutions.” He examines how assumptions of costly information and rational politics yield valuable tools for exploring the logic of institutions and institutional changes. After introducing some basics of the economics of property rights, Eggertsson explores six case studies from his native Iceland, where relatively simple and transparent institutions are ideal for identifying social regularities with general applicability. Those six cases cover a broad range, from feudal-like institutional structures that obstructed modernization of fishing technologies and led to widespread starvation in premodern Iceland to communal pastures in Iceland’s mountainous regions that still persist after more than one thousand years and to Iceland’s ongoing financial crisis and the recent political controversy over property rights in health records. Each of these cases illustrates concepts and topics in the current mainstream of new institutional economics (NIE). Eggertsson moves beyond the NIE mainstream to explore new directions stemming from work on social-choice theory showing how uncertainty and competing mental models of the world affect individual and social choices. As an example, Eggertsson examines the evolution of Iceland’s persistently controversial system of fisheries regulation based on individual transferable quotas (ITQs). This system has been highly influential around the world, but it seems to be on the brink of being dismantled in Iceland because of a lack of social fit, stemming in large part from its institutional design. That design (1) reflected a “hodgepodge of conflicting social theories,” which left the property status of ITQs ambiguous; and (2) resulted in huge windfall profits for the original recipients of fishing quotas, many of whom subsequently left Iceland, taking their profits with them. The design issues created both legal problems—the United Nations Human Rights Committee ruled in 2000 that Iceland’s method of initially allocating fishing quotas only to experienced vessels violated international human rights law—and large-scale public dissatisfaction with the system. Because of that dissatisfaction, the system is now in jeopardy, even though it produces wider social benefits and ecological benefits for fisheries, and despite the fact that current holders of quotas paid a great deal of money for them and are not reaping windfall profits. Eggertsson’s chapter provides an eye-opening introduction to the complex array of institutional design and implementation problems that confront efforts to conserve natural resources.

In chapter 2, Daniel H. Cole and Elinor Ostrom examine the current state of property theory relative to the impressive range, scope, and depth of recent social-scientific investigations into real-existing property systems. Property theory remains dominated by what Thráinn Eggertsson (1990, ch. 8) has called the “naïve” theory, according to which private property rights emerge and proliferate at some stage in a society’s socioeconomic development in order to reduce externalities, transaction costs, and overexploitation of scarce resources that otherwise would be subject to an inexorable “tragedy of the commons” (following Demsetz 1967; Hardin 1968). However attractive that naïve theory of property rights might be, the simplistic story it tells of a unilateral progression toward private property, resulting in optimal (or, at least, maximal) resource conservation, is not consistent with the

empirical evidence. We do, of course, find a great deal of private property virtually everywhere. In many cases, private property does successfully conserve resources over long periods of time. However, when we examine property systems around the world we find an almost bewildering variety of property systems in use, often involving complex admixtures of private, common, and public rights (and duties), which sometimes fail but often succeed in conserving resources over long periods of time. Neither the naïve theory of property nor any other existing theory explains the wealth of property systems found in the world. Thus, chapter 2 concludes with a call for more complex and realistic theories of property to keep pace with lessons from the social sciences.

In chapter 3, Karen Clay and Gavin Wright argue that the gold-mining camps of California had a more complex governance structure than economic historians have supposed. In some respects, the mining camps were canonical examples of the emergence of private-order property regimes, key elements of which were eventually codified in state and federal law (Umbeck 1981). However, the property rights created pursuant to the mining contracts (or codes) were far less secure than most other types of real property rights. Indeed, claim jumping became the most common method of acquiring a claim because of rules that often favored claim jumpers who would put the claims to more immediate use. In addition, Clay and Wright explore how the evolution of mining in nineteenth-century America fostered features that today are associated with a knowledge economy, including synergies between higher education and industry, federal support for scientific research and infrastructure, diffusion of codified forms of useful knowledge, and economic progress based on extension of the knowledge frontier. Thus, the conventional property rights story of the California gold-mining camps is only part (and perhaps not the most important part) of a larger tale about innovative advances in resource discovery, extraction, and processing that together created the world's leading national mining sector. This and the remaining chapters in this book are followed by commentaries from the scholars who discussed them at the conference. In this case, the Clay and Wright chapter is discussed by Peter Z. Grossman.

Chapter 4 presents another take on the California gold rush. Andrea G. McDowell compares that gold rush with others around the world and finds important common traits. She finds that the governance structure of California mining claims has been replicated in gold rushes in Australia, West Africa, South America, and Southeast Asia. That governance structure, she argues (consistently with Clay and Wright), has never involved the simple imposition of secure private property rights. Rather, gold-mining claims throughout the world have provided limited use rights, codified in local regulations. In each case, individuals have held small mining claims on condition of active use. Larger investors stay out of the gold region until surface mining by individuals is no longer profitable, so that capital can take advantage of superior technology, economies of scale, and lower wages. McDowell suggests that a system of individual mining claims will generally emerge under circumstances like those in California, that is, where there is a lot of gold near the surface that individual miners can reach with little capital investment. As mining becomes more difficult—for example, when collective action is required to work deeper shafts or to reach gold underlying river bottoms—the internal organization of mining teams begins to

vary from one gold rush to another. Indeed, from a comparative analysis, it appears that California mining companies were unusually democratic in their organization. However, surface mining claims at the height of gold rushes seem to be shaped less by local culture than by the physical proximity of gold to the surface. McDowell's chapter is discussed by Mark T. Kanazawa.

In chapter 5, Daniel H. Cole argues that, contrary to both the suppositions of some legal scholars and the theoretical underpinnings of regulatory takings doctrine, government regulations not only impose on existing private property rights but also vindicate and sometimes even create public, private, and/or common property rights. After examining conflicting common-law and Roman law rules relating to property rights in the atmosphere, Cole focuses on how assertions of state sovereignty and regulations combine to create Hohfeldian rights and duties respecting the atmosphere, where rights and duties were previously unclear or nonexistent. Cole's claim is supported by evidence from both civil aviation regulation and air-pollution control. Cole also addresses how regulations have created private property rights to pollute in emissions-trading programs (regardless of congressional assertions to the contrary). In some cases, assertions of public property via acts of sovereignty are a prerequisite for the allocation of private property rights, not just in the atmosphere, but also in other natural resources, such as marine fisheries. The chapter concludes with a discussion of normative implications for property theory generally and regulatory takings doctrine in particular. A more dignified treatment of public regulations that are designed to protect public rights would raise a serious question about which set of property rights should prevail in the several regulatory takings cases where privately owned lands meet publicly owned waters. That question cannot reasonably be answered, however, until more work is done on a theory (or multiple theories) of public property to complement existing theories of private and common property. Cole's chapter is discussed by Wallace E. Oates.

In chapter 6, Nives Dolšak examines the property-based approach to air-pollution control known as "cap-and-trade" and analyzes aspects of its institutional design and implementation, particularly monitoring and enforcement issues that determine its success or failure as an environmental protection tool. The first part of the chapter combines the institutional analysis and development (IAD) framework first developed by Elinor Ostrom (2011) with elements from the comparative transaction-cost literature. Dolšak derives a novel analytical framework consisting of three basic elements: (1) external factors, including biophysical characteristics of the resource, external regulatory environments, and characteristics of resource users; (2) rules regulating resource use and users; and (3) design features of the cap-and-trade market, including trading rules, permits, and transaction costs. External factors can easily affect the success of a cap-and-trade regime. For example, a large, highly dispersed resource may make it difficult (that is, costly) to monitor use and assess the effects of use on resource stock. Similarly, a cap-and-trade regime may be more easily monitored and enforced, when the number of resource users/permit holders is relatively small. Rules regulating resource use, in particular quota limits and the structure and security of permitting, can also affect the success of a cap-and-trade market. For example, if the allocation system is perceived as grossly unfair or

permits are insecure, the market may not take off. Constraints on, or high costs of, transferability may also hamper emissions markets.

In the second part of the chapter, Dolšak applies her framework to analyze several cap-and-trade programs (all from the United States), including the phasedown of lead in gasoline, early EPA emissions-trading programs, the Southern California Air Quality Management District's Regional Clean Air Incentives Market (RECLAIM), and the phaseout of ozone-depleting substances. Somewhat surprisingly, she finds that neither the spatial extent of the resource nor nonuniform effects of resource flows on resource stocks have had a significant impact on market performance under those various regimes. Meanwhile, transaction costs tend to fall over time. Thus, Dolšak concludes (with some caveats) that cap-and-trade programs may be applicable to a larger number of environmental problems than some critics have argued. Shi-Ling Hsu follows with a discussion of Dolšak's chapter.

In chapter 7, Jason F. Shogren and Gregory M. Parkhurst raise the question, who owns endangered species? The simple answer is that we all do. However, the authors note, that answer does not help us resolve the practical problem of ensuring the preservation of endangered species, especially the approximately 90 percent of those species whose critical habitats are on privately owned lands. Publicly owned endangered species on privately owned lands inevitably create a property regime conflict that federal agencies have attempted to defuse, to some extent, with safe-harbor and habitat-conservation plans. In addition, federal and state agencies, as well as non-governmental organizations, have offered funding in the form of grants, loans, case payments, and tax allowances to private landowners who engage in habitat-protection, enhancement, or restoration activities. Whether such funding constitutes implicit compensation for a taking of private land for endangered species preservation is not the central question for Shogren and Parkhurst. Instead, they are concerned with the quality of habitat for species preservation, stemming from uncoordinated land management decisions of multiple private owners when species require relatively large, contiguous parcels of land crossing multiple private boundaries. As the authors note, "voluntary compensation programs are not designed to address directly the biologist's concern that landowners may not coordinate conservation efforts to create a contiguous reserve that falls across property lines. . . ." What is required is an incentive mechanism that will induce voluntary participation in species preservation while, at the same time, creating the necessary spatial configuration for effective preservation. Shogren and Parkhurst offer, as a potential solution to this two-part problem, agglomeration bonuses (a.k.a., "smart subsidies"), which provide higher levels of compensation to private landowners who retire land adjacent to other parcels devoted to species habitat. An experimental test of the agglomeration bonus confirms that it is a potentially superior tool of habitat preservation. It is "more biologically efficient at creating contiguous conservation reserves than current status quo policies of compulsion and a simple flat fee subsidy." James Wilson comments on the Shogren and Parkhurst chapter.

In chapter 8, Bonnie J. McCay explores the privatization trend in marine fisheries policy and its implications for communities of fishers. After briefly discussing the larger framework of spatial enclosure, exemplified by expanded national

jurisdiction, marine protected areas, and territorial fishing rights, she focuses on the trend toward the creation of exclusive, transferable fishing rights, as exemplified in the Atlantic surf-clam fishery and individual transferable quotas (ITQs). ITQs have been promoted as tools not only for economic rationalization in overcapitalized fisheries, but also for enhanced stewardship. McCay reviews the literature and selected cases to assess their performance in relation to economic, social, and conservation goals in marine fisheries management. She finds that concerns about equity, as well as recognition that ITQs alone are generally incapable of achieving fishery-conservation goals, are leading to increased interest in the place of “community” in marine fisheries. In the United States this has led to catch-share allocations to communities and community-oriented groups, such as cooperatives and fishing associations. McCay examines several cases of community-based allocations and considers their usefulness as a tool for equitable and sustainable management of the marine commons. Anthony Scott discusses McCay’s chapter.

Chapter 9, by William A. Fischel, examines three broad themes in the evolution of zoning. The first theme is the persistence of localism in zoning despite numerous top-down attempts to reform zoning in the past three decades, including the affordable-housing movement, school-finance-equalization requirements, the environmental justice movement, “smart growth” initiatives, and regulatory takings litigation. Most state reform efforts have made nary a dent in local zoning. A few exceptional federal reform efforts, such as the Fair Housing Act and the Religious Land Use and Institutionalized Persons Act, are exceptions, but even their effects on local zoners have been modest. Indeed, Fischel argues that the chief consequence of all the reforms, taken together, has been to make local zoning more restrictive. The chapter’s second theme is a more personal reflection on how the author’s views of zoning have changed over the past quarter century, during which he has come to view zoning increasingly as a critical part of local government, and local government as an essential part of a federal system. His third and final theme is a “gingerly advanced” proposition that the evolution of zoning is comparable to that of the common law and thus deserves more serious attention from scholars than it has received. Robert C. Ellickson discusses Fischel’s chapter.

In chapter 10, C. Leigh Anderson and Richard O. Zerbe examine psychological aspects of property rights in the context of Native American land ownership. Specifically, they posit that a relevant concept of ownership derives from a sense of psychological entitlement, which depends not only on legal rights, but also on cultural and historical norms and expectations that give rise to a moral claim. Thus, moral claims underlie psychological entitlements. Those psychological entitlements, in turn, affect reference levels (the set of perceived rights from which one measures gains and losses) and potentially create valuation disparities (differences between willingness to pay and willingness to accept) across individuals with different moral claims over resources. In the absence of differing moral claims, those individuals could well value the resource identically. Applying their hypothesis to historical valuations of real property among Native American tribes, Anderson and Zerbe find that treaties, which focused on operational-level rights and economic valuation, presupposed reference points that failed to recognize the psychological entitlements many Native Americans held over the lands that were the subject of

those treaties. The Native Americans' psychological entitlement arose from complex entitlement structures with roots in spiritual and religious traditions that supported cooperative behavior on tribal lands, which were held as common property. The treaties imposed untimely transitions from common to private property that eroded psychological, and possibly economic, value through changes in the complexity of the structures that promoted cooperative behavior. John A. Baden comments on the Anderson and Zerbe chapter.

Richard A. Epstein, in chapter 11, examines the similarities and differences between the law of land and water in both private and constitutional law. He notes that the nature of the two resources differs such that exclusive rights for occupation usually constitute the best framework for analyzing land use disputes, while a system of shared, correlative duties works best for water. Once these baselines are established, an accurate rendition of the constitutional law issues requires the proper articulation of private law rules of adjudication to explain which government actions result simply in a "mere" loss of economic value and which government actions generate losses that require compensation. Epstein offers a two-step process for dealing with the private law issues: (1) developing principles of parity between private claimants, to the extent physically possible; and (2) picking the set of rules that maximizes the overall utility of all parties concerned, subject to the parity constraint. However, this system must yield to reasonableness considerations when the conditions of physical parity cannot be satisfied, as in all disputes between upper and lower owners of land, as well as upstream and downstream riparians. In such cases, the objective should be to create, when possible, rules that treat the last element of loss to one party as equal to the last element of gain of the next. Epstein argues that using these natural law baselines would produce, by and large, efficient results in private disputes, while their rejection in the takings context in both land and water cases would concede far too much power to state authorities in both land and water cases. He concludes that rationalizing both areas of law requires that the constitutional protection of private property start with the definitions of private property that have worked well in practice under the natural law traditions of private law. Epstein's chapter is discussed by Henry E. Smith.

Chapter 12, by William Blomquist, provides a positive political treatment of property rights. His approach supplements standard political-economic accounts of property rights that combine a simple story of property rights emerging from conditions of scarcity (rising demand relative to supply) with empirical assessments of why and how certain property rights regimes emerge at certain times and places, along with normative critiques of existing property structures based on public choice analysis. Blomquist endeavors to supplement political-economic explanations of property with a more realistic assessment of the role of politics in the evolution of private property. A political approach to property rights is concerned with, in an elaboration on Lasswell's (1958) famous phrase, who gets to decide (and according to what criteria) "who gets what, when, how." To resolve that issue, Blomquist focuses on how property rules are developed and changed over time in settings involving multiple actors, multiple resource use values, and multiple rule-making arenas. Empirical examples relating to water resources demonstrate how basic conceptions of specific property rights can be associated with various water resource

uses, including, for example, navigation, hydropower, recreation, waste disposal, and aesthetics. He then explains the ways in which resource use issues (or conflicts) are framed in political situations to influence inclusion or exclusion of certain participants and the choice of decision-making arenas. In every case, however, the outcomes are contingent and subject to being recontested, overruled, or contradicted on appeal. One important implication is that property rights are never settled for once and for all. In other words, they are never completely “well-defined,” which is a condition that much of the property rights literature presupposes as necessary to secure investment. Blomquist illustrates these points with a description of developments in Colorado water law, where traditional holders of water rights, including agriculture and municipal/industrial supply, have focused on protecting their interests in courts based on legal precedents, while proponents of legal recognition of recreational uses and instream flows have taken their case to other decision-making arenas, including the legislature, administrative agencies, and public referenda. Beyond the obvious point that water law is complex and dynamic, his analysis shows that (1) individuals compete not only for the same rights but for different rights in the same resource; (2) a multifunctional resource multiplies the types of use rights over which individuals compete; and (3) a multiorganizational policy arena not only multiplies the number of decision points but also affects the strategies of interested parties. He suggests that the quest for any kind of simple theory of property institutions is likely to be fruitless. After all, he asks, how often would we expect to find a resource that has only one dimension of value and only one use, entitlements to which are determined by a single decision-maker in a single forum for once and for all? A more realistic theory of property must account for the dynamic political nature of ongoing contests between competing users of multiple-use resources. Edella C. Schlager discusses this chapter.

In chapter 13, Gary D. Libecap explores water in the semiarid western United States—a region in which many of the intensifying demand and supply problems regarding fresh water are playing out—as a mixed private/public resource. The complex politics of water, as well as its physical characteristics, raise the resource and political costs of defining and enforcing property rights and complicate efforts to manage and allocate water in markets. Libecap finds major differences in water prices in 12 western U.S. states across agricultural, urban, and environmental uses. The persistence of those differences suggests that water markets have not developed enough to narrow the gaps. Considerable differences in the extent and nature of water trading across the western states indicate that water values and transaction costs of trading vary considerably across jurisdictions. Libecap then examines the resource and political costs of defining water rights and expanding the use of markets. In this discussion, efficiency and equity objectives often conflict. Public and private water uses are often substantially intertwined, generating public interest claims that, although legitimate, are susceptible to abuse by special interests to weaken private property rights and the efficiency-enhancing incentives those rights provide. Lee J. Alston discusses Libecap’s chapter.

Jouni Paavola, in chapter 14, investigates the potential of institutional diversity and polycentric governance to deal effectively with climate change. Starting with the recognition that top-down governance solutions are a “false panacea,” Paavola

observes that although climate change is, indeed, a global commons problem, that does not necessarily mean global governance is the most effective or efficient way of dealing with it. Indeed, the global regimes that have been created so far—the United Nations Framework Convention on Climate Change and the Kyoto Protocol—have made scant progress in reducing emissions of greenhouse gases (GHGs). Consequently, Paavola considers the extent to which regional, local, sectoral, and other partial or smaller-scale approaches to climate governance might speed progress on reducing anthropogenic GHG emissions. He considers whether the best approach is not to set collective goals at a high level of governance, but to establish mechanisms for achieving such goals at lower levels. On the basis of two streams of the broader governance literature—new institutional economics (growing out of Coase’s work [1937; 1960]) and polycentric governance (stemming from V. Ostrom, Tiebout, and Warren [1961])—Paavola suggests that smaller-scale efforts to reduce GHG emissions might prove more effective than global governance by minimizing the costs of achieving collective action, for example, by reducing incentives to free ride. He examines two small-scale, purely voluntary initiatives: Cities for Climate Protection and the Cement Sustainability Initiative. Although he finds such initiatives valuable, he admits that they are likely to realize only GHG emissions reductions that lead to (private) cost savings. Because GHG emissions need to be cut significantly by the middle of this century to stabilize the climate, he realistically notes that conventional state-based solutions retain a vital role. However, the contribution of voluntary, bottom-up, small-scale emissions-reduction programs should not be underestimated. Indeed, Paavola believes that such voluntary programs will proliferate as state-level climate regimes are implemented, suggesting a synergistic effect between levels of polycentric governance. Paavola’s chapter is discussed by V. Kerry Smith.

In the final chapter, chapter 15, Katrina Miriam Wyman addresses a novel property problem stemming from climate change: the submergence of low-lying lands because of sea-level rise and the resultant damage to property rights and state sovereignty. Low-lying Pacific island nations, such as the Maldives, are already in the process of being submerged. Wyman notes that President Mohamed Nasheed of the Maldives has created a sovereign wealth fund to purchase new territory on which to resettle all 300,000 Maldivians, but she raises a profound question of international law: what if, instead of buying new land, the citizens of the Maldives and other submerged states claimed a legal right to resettle elsewhere? She assesses historical precedents and jurisprudential and moral arguments (by the likes of Kant, Puffendorf, and Grotius) that support such a claim of right to property in another sovereign territory. She also examines how such a right might be operationalized. The main historical precedent Wyman discusses is the right to safe haven, which is rooted in the age of discovery. That precedent is further supported by moral arguments from utilitarianism or a “cosmopolitan variant of liberal egalitarianism.” An independent, nonmoral ground for the right may also stem from natural law arguments about collective ownership of the earth (Risse 2009). Even if such a right is supported and recognized, however, questions of implementation remain. To implement a right of relocation, Wyman first considers and rejects two simple principles for allocating duties to countries for resettling persons displaced by climate change:

(1) the proportion of their historical contribution to the existing stock of greenhouse gases in the atmosphere; and (2) availability of resources. Instead, Wyman proffers an allocation mechanism based on the average of three metrics: (1) population density (countries with lower population densities would have more responsibility to take climate refugees); (2) 2005 gross domestic product (GDP); and (3) 2005 GDP per capita, adjusted for purchasing power parity. Richard A. Barnes concludes the book with comments on this final chapter.

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