

Part 2

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APPLICATION OF ENVIRONMENTAL KNOWLEDGE

THE POLITICS OF CONSTRUCTING

SOCIETY/NATURE

All of the case studies in part 1 begin their explorations of environmental politics by focusing on the activities of scientific experts and their efforts to produce scientific knowledge about the environment. Each, however, demonstrates the inadequacy of focusing on scientific knowledge producers in isolation. The authors of part 1 were all compelled to examine, in varying degrees, how the knowledge produced by scientific experts is taken up and applied in situations apparently far removed from its production. This was not simply out of curiosity to see what eventually becomes of scientific knowledge once it is released into the world. Rather, all these authors show that scientific knowledge producers—as well as their knowledge-producing activities—are all intimately caught up in the politics surrounding the circulation and application of the knowledge they produce. Indeed, they demonstrate clearly that the production of environmental knowledge by scientific experts is merely one aspect of a much larger process. To examine the production of environmental knowledge without at the same time taking into account its application and circulation is to generate an impoverished view of knowledge production itself.

The chapters in this second part of the book approach the study of environmental knowledge and practice from a slightly different angle. All the authors of part 2 take as their starting point an examination of the politics at a particular site (or sites) where environmental managers are attempting to apply environmental knowledge. Just as the authors in part 1 realized they could not examine scientific knowledge producers in isolation, however, all the authors in this part quickly expand their analyses beyond a narrow focus on the politics of knowledge application in a particular place. They demonstrate clearly that one cannot hope to understand the politics of environmental knowledge application without taking into account how that knowledge is produced and the circumstances of its circulation. Indeed, all the chapters in this part help to disabuse us of the oft-held

notion (in resource management, if not critical academic, circles) that knowledge somehow exists in a pure state, fully formed, merely awaiting its application in particular places. The application of environmental knowledge, as a social—and deeply political—activity, simply cannot be distinguished from the social activity that constitutes its production and circulation. Nevertheless, a focus on the politics surrounding the application (or attempted application) of environmental knowledge at particular sites can provide an important window into the broader sociopolitical processes in which such efforts are embedded.

This part's focus on the politics surrounding specific attempts by scientific managers to apply environmental knowledge in particular situations is an especially powerful way of drawing attention to the existence of multiple, sometimes incommensurable, ways of knowing the environment. In so doing, the chapters all highlight problems associated with the notion of *expertise*. In my analysis of wildlife management in Canada's Yukon Territory, for example, I describe how wildlife managers' knowledge of animals and their ideas about how to manage them, structured as they are by metaphors of agricultural production, differ profoundly from those of aboriginal hunters. Mara Goldman, in her analysis of efforts to introduce wildlife corridors in East Africa, shows that a similar dynamic exists between Maasai pastoralists and conservation biologists, each of whom have very different understandings of wildlife and their relation to humans and livestock. In a similar manner, Karl Zimmerer shows how scientific models of water resources used to manage water in the Cochabamba region of Bolivia differed substantially from local farmers' understandings of water use in the same region. Because the environmental sciences are for the most part applied sciences, the knowledge they produce is necessarily knowledge for a particular use. This renders the distinction between the production and application of knowledge particularly problematic and highlights the political nature of knowledge production. As Peter Vandergeest and Nancy Peluso put it in their analysis of scientific forestry in postcolonial Southeast Asia, "forestry is concerned not just with scientific knowledge about these naturalized objects [forests], but also with transforming . . . ecologies through forest management . . . to achieve social, economic, or political ends." Thus, the knowledge-production process—especially (or at least most obviously) in the applied ecological sciences—is necessarily shaped by those social, economic, or political agendas; and ideas about proper resource use (or, indeed, about what constitutes a resource in the first place) are themselves the products of particular sociocultural histories. Zimmerer shows especially clearly how intended use structured the collection of information for scientific water-management models. It should not be surprising, then, if aboriginal hunters in the Yukon, Maasai pastoralists in Kenya, Runa farmers in Cochabamba,

and Orang Asli in newly designated Malaysian forest reserves produce very different kinds of knowledge about the nature of wildlife, water, and forests than do scientific resource managers employed by the state, who have very different ideas about how these resources should be used. Thus, each of the chapters in this part exposes quite clearly the flaw in quantitative understandings of expertise (i.e., that some people are experts because they know more than others) and makes the case, instead, for an approach to expertise that can accommodate multiple ways of knowing. Each chapter attends to the production of multiple forms of knowledge, the different weights assigned to each by various participants in the management processes under examination, and the political consequences of these epistemological encounters.

The point, however, is not simply that there exist multiple ways of knowing a single given environment. “The environment” itself cannot be known apart from our engagement with it. “Nature,” in this sense, is always socially constructed. Such constructions are always only partial and never politically neutral: one person’s soil erosion is another person’s soil fertility; one person’s home is, for another, a collection of commodities. Much work within political ecology has striven to uncover the multiple perceptions at play in defining nature and the various politics involved in creating, managing, and policing it. While less overtly focused on the politics of nature, work within STS has drawn attention to the nuanced and intricate ways in which nature and society are connected and interact, and how that leads to very specific (and political) outcomes. STS has also highlighted the various ways categories, names, and systems are created, maintained, and manipulated to produce “nature” and “society” as separate realms, and to “manage” nature effectively. The chapters in this part all draw from the insights of both political ecology and STS to explore the co-production of nature and society. The authors are particularly interested in how the application of scientific knowledge leads to the construction of certain kinds of natures (at the expense of others).

Goldman shows how wildlife corridors, theoretical constructs emerging from conservation biology, come to appear to their proponents as natural entities, components of ecosystems in urgent need of protection; and she notes that the naturalization of the corridor concept serves to limit debate and foreclose consideration of other possible conservation strategies. In their chapter, Vandergeest and Peluso show that in an important sense forests in Southeast Asia (as opposed to “jungles”) did not precede scientific forestry, but were constituted by it. Indeed, they argue that the production of forests and forestry have been part and parcel of postcolonial counterinsurgency and nation-building projects throughout the region. Zimmerer, too, describes the spatial naturalization of particular

watershed models, which ignored social complexity and heterogeneous land use to “create” areas of water abundance and scarcity. These new “natures” were then used to justify water projects, sometimes on a massive scale. For my part, I show how the agricultural metaphor creates a world in which wildlife is croplike, thus naturalizing assumptions about human ownership and control over animals and authorizing particular management interventions while precluding others.

In all four cases, the application of scientific knowledge entails the production and imposition of one nature/society and the erasure of others. Thus, environmental management must be viewed as an inherently political process. Contributors to this part are all interested in the power and politics of such processes. How are “natural” categories/zones created and what does it mean for the natural and political landscape in question? How are such categories contested, within science, with local people, in the lab and on the ground? These questions are all deeply political and engage simultaneously with a politics of knowledge (Whose knowledge counts when, where, and why?); a politics of nature (Which natures are to be protected, by whom, for whom, and in which ways?); and a politics of economy (Is nature a resource or commodity, in abundance or scarce, and for whom?).

In each of the case studies in this part, a critical mechanism for the imposition of one particular society/nature at the expense of others is the state’s assertion of and control over property rights. Goldman shows us that the establishment of wildlife corridors, however “natural” they may appear to their proponents, is wholly dependent upon the Kenyan state’s appropriation of Maasai land—a fact not at all lost on the Maasai who vigorously opposed their creation on precisely these grounds. I show that wildlife managers’ conception of animals and how to manage them are intimately bound up with the state’s assertion of property rights over wildlife. Similarly, Vandergeest and Peluso show that the assertion of state jurisdiction over forests (often accompanied by the forcible relocation of populations within them) was a prerequisite for the creation of state forests and the practice of scientific forestry in Southeast Asia. State jurisdiction over water is essential for the scientific management of that resource as well, as Zimmerer shows us, though sometimes there are limits to what the state can do. This became abundantly clear when the Bolivian state attempted to privatize water, setting off the Cochabamba Water War.

The application of scientific knowledge necessarily also implies its circulation. Although scientific knowledge, methods, and standardized models for management do circulate globally, it is difficult to generalize about how those knowledge artifacts will be received, understood, and acted upon in particular places. By analyzing specific efforts to apply scientific knowledge in particular situations,

contributors to this part provide an important perspective on how those knowledge artifacts are packaged and transported. They all show that a simple diffusion model of science is inadequate for understanding how scientific artifacts travel. In every case of attempted knowledge application, different people attach different meanings and understandings to the knowledge, methods, and models to be applied. The authors in this part all use analytical tools they draw from STS (e.g., boundary objects, standardized packages, metaphorical overlap) to make sense of the multiple meanings that get attached to seemingly agreed-upon but in fact essentially contested scientific terms and models, the illusion of agreement that can result from the use of these seemingly standardized terms and models, and the ways in which people negotiate among and struggle over these various meanings. Vandergeest and Peluso show that although the legal and institutional framework of scientific forest management was transferred to Southeast Asia from abroad (mostly during the colonial period), these were quickly transformed, given new meanings, and put to new uses in pursuit of regional and national agendas, agendas that transformed forests and the people living in them on a massive scale. Zimmerer describes the application of standard water-management models and how these were received and reacted to by local people, which in turn led to a revision of the management models and sometimes open rebellion. Goldman and I show that the terms “wildlife corridor” and “wildlife management,” respectively, can and do mean different things to different people. Use of such essentially contested terms can facilitate communication and serve to connect scientists, local people, activists, state and donor agencies, and policy makers, but it can also lead to misunderstandings and catalyze resistance to scientific management, as occurred in both the Kenyan and Yukon cases. Taken together, the cases in this part show that we must not view efforts to scientifically manage particular environments as a passive process of importing and applying knowledge artifacts that were produced elsewhere. Rather, scientific management always entails a negotiation and refashioning of meanings, a struggle not only over control of resources, but also over the very nature of those resources. In other words, it is always an effort construct a particular form of society/nature.