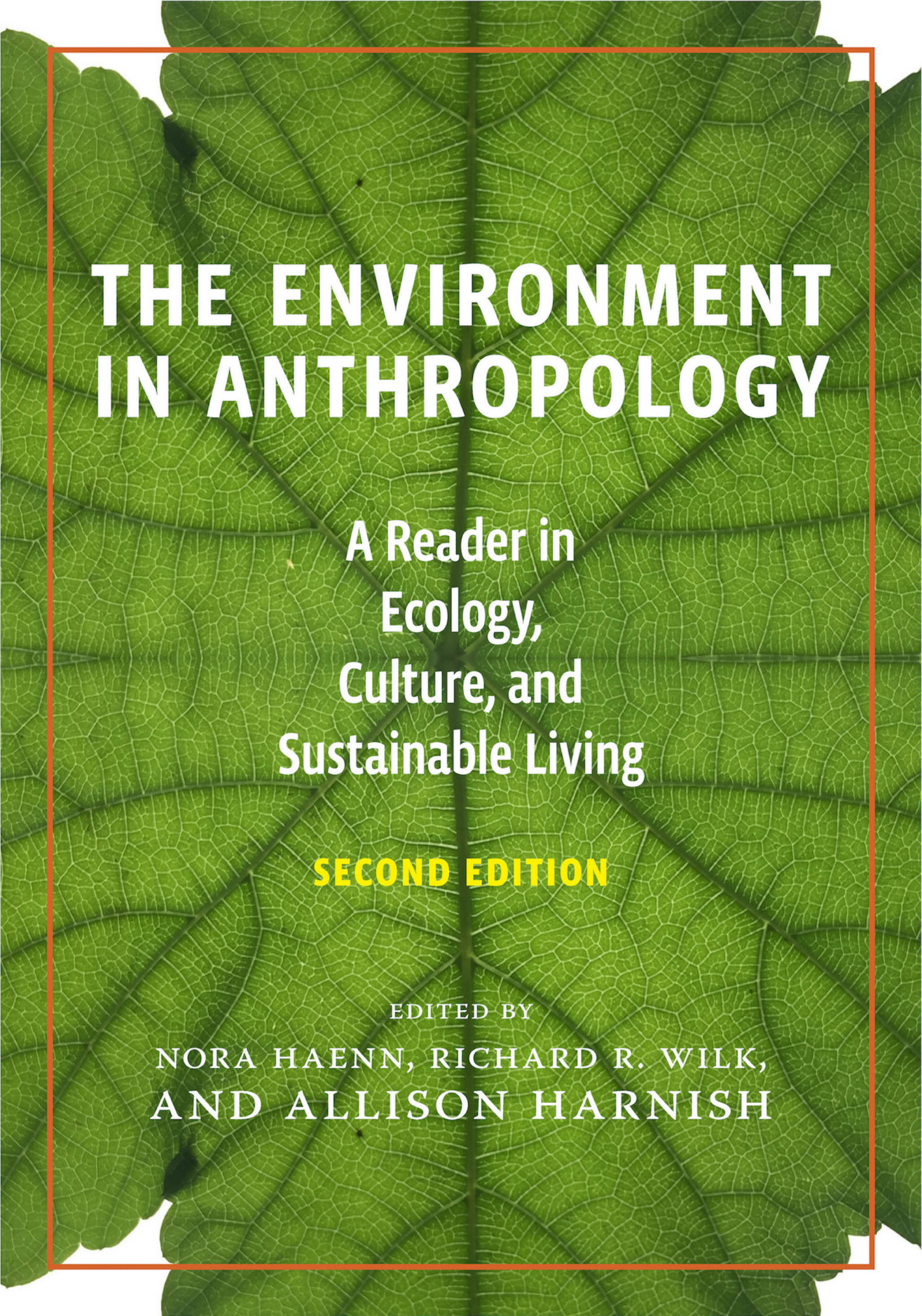


THE ENVIRONMENT IN ANTHROPOLOGY

A Reader in Ecology, Culture, and Sustainable Living

SECOND EDITION

EDITED BY
NORA HAENN, RICHARD R. WILK, AND ALLISON HARNISH

THE ENVIRONMENT IN ANTHROPOLOGY

This page intentionally left blank

The Environment in Anthropology

A Reader in Ecology, Culture, and Sustainable Living

SECOND EDITION

Edited by Nora Haenn, Richard R. Wilk, and Allison Harnish

NEW YORK UNIVERSITY PRESS
New York

NEW YORK UNIVERSITY PRESS
New York
www.nyupress.org

References to Internet websites (URLs) were accurate at the time of writing.
Neither the author nor New York University Press is responsible for URLs
that may have expired or changed since the manuscript was prepared.

ISBN: 978-1-4798-9782-7 (hardback)
ISBN: 978-1-4798-7676-1 (paperback)

For Library of Congress Cataloging-in-Publication data, please contact the Library of Congress.

New York University Press books are printed on acid-free paper,
and their binding materials are chosen for strength and durability.
We strive to use environmentally responsible suppliers and materials
to the greatest extent possible in publishing our books.

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

Also available as an ebook

CONTENTS

ACKNOWLEDGMENTS

Nora and Rick would like to thank Allison Harnish, who was the principal editor for this edition. Without Allison, the second edition was unlikely to come to fruition. Allison brought to the volume a fresh and compelling body of material. In addition, Allison honed new entries down to a manageable length, tracked down copyright permissions, edited for formatting, and served as a liaison with Fileve Palmer, who penned the volume's teacher's guide. Allison improved on the first edition significantly by authoring each section's introductory essay and adding a new section on anthropology's role in environmental advocacy. As a consequence, Nora and Rick extend our deepest gratitude to Allison.

Nora would like to thank Lisa Cliggett and Luis Melodelgado for cheering this project on at crucial moments. Nora also thanks Lana Chiad at North Carolina State University for helping secure permissions. Students in the spring 2013 course "Culture, Ecology, and Sustainable Living" at North Carolina State University provided valuable feedback on an earlier table of contents. Finally, Nora thanks everyone in the NCSU program in Genetic Engineering and Society, International Studies, as well as Birgit Schmook, Sophie Calmé, and Claudia Radel for conversations that continually challenge and refresh her appreciation for anthropology in interdisciplinary research.

Allison would like to thank Nora Haenn and Richard Wilk for inviting her to take part in this second edition of *The Environment in Anthropology*. She also extends gratitude to Lisa Cliggett for her excellent guidance and inspiration. Ian MacInnes and Aaron Shuman proofread early versions of this manuscript and offered vital encouragement. Three wonderful student research partners—Amanda Bedker, Sydney Roeder, and Emma Planet—served as copyeditors and assisted with the bibliography; Jillian Putnam helped secure permissions. Garrett Graddy-Lovelace and Julianne Hazlewood helped give shape to section 8, which is an exciting addition to this second edition. Cheers to Paul Durrenberger, Barbara Rose Johnston, Stefano Varese, Ben Orlove, and Tsechu Dolma for all their great work and for allowing us to share their stories. Lastly, Allison would like to thank the many members of the PESO and EANTH listservs who helped her to assemble the scholar-advocate bibliography and who remind her daily of why she decided to become an anthropologist.

Richard, in addition to thanking his coeditors, would like to acknowledge the influence of Bob Netting on the discipline of anthropology and on his contributions to it.

Most importantly, we would like to thank Jennifer Hammer and Constance Grady at NYU Press for making the second edition possible. Jennifer originally saw the value in a second edition and encouraged us to revisit the original publication. Constance kept things on track and showed good spirits as she finalized some key logistics. We are also indebted to Barbara Dilly and to an anonymous reviewer for their constructive comments on how to improve the second edition.

General Introduction

Today, environmental problems threaten not only natural ecological qualities but also humanity's very existence. This collection of readings demonstrates the importance of anthropological theory and practice for solving environmental problems. In making selections from a large body of excellent work, we searched for highly readable articles that touch on the breadth of environmental issues on which anthropologists work. Our search found that today's anthropology of the environment is changing rapidly. Anthropologists are deploying new research methods, new interdisciplinary collaborations, and new theories to make sense of environmental problems and people's responses to them. Given these innovations and the growing size of the literature, no reader can offer more than a sample. The readings we have chosen address some of the key environmental questions of the 21st century. These include the socio-ecological effects of population growth, economic development and underdevelopment, consumption, globalization, and biodiversity conservation as well as the role of identities in shaping human-environment interactions. In order to tackle these questions, this volume offers a mix of practical case studies, theoretical debate, and discussion of moral and ethical issues.

New to this second edition, we have added discussion questions to every section. These questions vary in their difficulty and are intended to help readers capture the key points from each chapter and to bring the work of the many authors included into conversation with one another. Additional discussion questions and activities are included in a separate "Instructor's Guide."

Section 1 presents an overview and background of today's anthropological approaches to the environment. Students will find that many of the ideas in this section reappear, sometimes in new guises, in later contributions. Discussions of theory continue in the following sections, each of which includes one chapter authored by a prominent theorist. The sections then include examples of academic and popular reporting of cases and issues, followed by a polemical piece offering a contrarian position and a chapter that gives an ethical reflection.

Investigative pieces offer broad descriptions of environmental problems, often using aggregate statistics. Case studies of current research and action focus attention on the specific ways people are working through, or failing to address, environmental problems. The polemical pieces present opposing information to challenge other contributions, to spark discussion, and to provide critical perspective. Finally, ethical discussions demonstrate that all environmental issues rest on larger questions of social justice, humanity's place in the world, and fundamental ideas about

what it means to be human. We hope readers will use the ethical arguments to reflect on the moral underpinnings of their own approach to environmental issues.

In order to fit so much material into an affordable reader, we have abridged the original publications. In making editorial choices, we sought to retain coherence in the authors' original argumentation and maintain a narrative flow. We encourage readers intrigued by a particular selection to return to the publication's original version to gain a fuller sense of the complete work.

This reader as a whole demonstrates three themes that link the topical sections. The first is the diversity of approaches to understanding environmental problems. People throughout the world face environmental crises. However, environmental issues are perceived differently by people of distinct genders, races, classes, and cultural orientations. People disagree about the content of problems and what they mean to the groups affected by them. These disagreements deeply affect the ways environmental problems are solved and by whom.

A second theme is the need for creative inquiry that finds possibilities within the limits of different knowledge structures. If no single approach is a cure-all for environmental problems, then we might question how far any theory or method can take us in understanding and resolving a situation. We may find that a theory that helps in explanation is less useful in the development of practical solutions. We may find a need for multiple explanatory theories. In any case, rather than view the diversity of environmental problems and proposed solutions as leading to a stalemate, students of anthropology will find themselves uniquely positioned to develop creative intellectual and practical responses to this diversity.

The third theme is the importance of personal action in the face of environmental problems. Students are often most familiar with environmental activism centered on recycling, litter removal, and rain forest protection. Some authors here point to the need for broader forms of activism, and they make clear suggestions for change. Other authors propose or imply the need for political solutions. Transparently or not, an author's ethical position always informs her or his writing. The readings on morality and ethics are meant to help students link moral positions to the solutions proposed by other authors.

Also new to this second edition is a section on applied work and scholar-advocacy. Formulating an effective personal response to environmental problems is difficult, especially as solutions are often depicted as an onerous number of small tasks ("100 Things You Can Do to Save the Environment"). The moral, ethical, political, and practical discussions presented in this section are intended to help students get beyond the dizzying number of environmental problems and solutions.

We believe that a combination of theory, empirical research, and ethical debate may offer the most powerful anthropological response to environmental problems. In this sense, we hope these readings serve as tools for those whose concern for ecological issues pushes them beyond cursory analyses to a more comprehensive approach.

SECTION 1

So, What Is Environmental Anthropology?

How do anthropologists go about studying humans' relationships with nature? How has this field of study changed over time? Questions regarding how people modify, symbolize, and adapt to their immediate surroundings have intrigued anthropologists since the discipline's earliest days. This section establishes some foundations for studying human-environment issues in anthropology and traces some of the recent trends within the growing field of ecological anthropology.

Ecological anthropology has been one of the most influential forms of anthropological inquiry since the 1960s (McGee and Warms 2012). Recognizing the importance of anthropological theory stemming from this era, we begin the volume with Julian Steward's work dating from the 1950s. Steward explained cultural diversity and culture change as resulting from individual cultures' unique adaptations to specific environmental circumstances. His views contrasted strongly with those of other theorists of the time, who believed that cultures followed a single universal trajectory of development. At the beginning of the 20th century, so-called unilineal evolutionists like Lewis Henry Morgan and Sir Edward Burnett Tylor believed that all cultures had passed (or would pass) through the same series of stages as they evolved from primitive to complex civilizations. For example, Tylor postulated that all religions "progressed" from animism to polytheism to enlightened monotheism, "what he viewed as the highest form of religious belief" (McGee and Warms 2012: 12). Steward proposed an alternative multilineal explanation for similarities and differences between societies, one that did not assume that all cultures passed through the same identical stages of development. The methodology for studying these multilineal trends in societal forms involved a field of study that Steward called *cultural ecology*. Cultural ecology "is the study of the processes by which a society adapts to its environment" (Steward 1968, cited in Moore 2012: 178). Under the framework of cultural ecology, parallel social patterns occurring in different cultures are viewed as adaptations to similar environments rather than fixed elements in a unilineal development (Moore 2012).

Steward's writing built on previous debates regarding environmental determinism and "possibilism." Respectively, determinism and possibilism examined whether environmental features determined or simply made possible cultural formations. By the 1950s, most anthropologists subscribed to this latter approach. Nonetheless, determinist ideas persist as researchers explore the extent to which ecologies are malleable and the extent to which people must

adapt to the demands of their immediate environment. Anthropologists thus often focus on the creativity involved in developing adaptive systems of exploitation. Prior to Steward's development of cultural ecology, anthropologists gave little consideration to the environment when endeavoring to explain cultural differences. The selection included here provides the outline of Steward's idea of a "culture core," those cultural features most closely associated with the utilization of a specific environment.

One of the most well-known monographs in cultural ecology was authored by this section's next contributor, Robert McC. Netting. Netting famously studied the agrarian practices of small-scale family farmers in the hills of Nigeria and the Alps of Switzerland. Here, we have included an excerpt from *Smallholders, Householders*—an ambitious, cross-cultural, comparative study of rural cultivators in Europe, Asia, Africa, and Latin America. In it, Netting argues that the household is the most effective management unit for intensive production and that smallholders can make a decent living off their land without experiencing the ecological damage, economic instabilities, resource exhaustion, and social inequalities inherent in large-scale industrial faming and export-oriented agribusiness. Netting introduces ideas of sustainability to the collection and expands notions of adaptation to include not only cultures' adaptation to a physical environment but also their adaptation to broader economic systems. Netting drew attention to the creativity of smallholders and had the foresight to contend that the smallholder system might offer a sustainable alternative to energy-intensive agriculture (Wilk and Stone 1998). Indeed, he made this assertion before *sustainability* became the buzzword that it is today. Moreover, Netting argued that the most productive farming economies occurred without government interference in production decisions. This version of cultural ecology differed from Steward's because Netting recognized the importance of colonial forces, local politics, indigenous ecological knowledge, and uneven development for smallholder production systems (Wilk 2006). The following passage from Richard R. Wilk and Priscilla Stone eloquently captures Netting's position: "In Nigeria, [Netting] was appalled at the ignorance and arrogance of colonial officials who meddled in the subsistence livelihoods of millions of people, without an inkling of the consequences. His work taught him that African cultivators were wise and wily, possessing immense ecological knowledge, and a wonderfully adaptable and tough social system. Any responsible development project, he thought, must start from this system and knowledge" (1998: 179).

The anthropologists James Fairhead and Melissa Leach, like Netting, take issue with the received wisdom that has been passed down through colonial memoirs, policy documents, and reports. Working in the West African prefecture of Kissidougou in southern Guinea, Fairhead and Leach employ a wealth of empirical evidence (including local oral accounts, interview data, participant

observation, village resource and vegetation surveys, and a time series of aerial photomosaics) in order to challenge the popular narrative that assumes first that deforestation is occurring in this region and second that it is caused by negligent land management on the part of local residents. In place of this "false forest history," Fairhead and Leach propose a counternarrative describing how residents of Kissidougou actually encouraged the formation of forest islands around their villages as a way to shelter tree crops, provide natural resources, conceal ritual activities, and offer general protection from the elements. Netting's and Fairhead and Leach's attention to environmental history, power inequality, and social constructions of nature corresponds with a larger transition in the field of ecological anthropology from the *cultural ecology* of Steward toward the *political ecology* of Eric Wolf and of Piers Blaikie and Harold Brookfield.

In the 1970s, Wolf—a student of Steward's—incorporated a greater focus on historical inequalities of power and wealth as they relate to humans' access and control over resources. Combining cultural ecology with the dependency theory of Andre Gunder Frank and the world system theory of Immanuel Wallerstein, Wolf coined the term *political ecology* to refer to this now-widespread interdisciplinary theoretical orientation (Biersack 2006). Having been further developed and honed by an array of scholars working mostly inside the discipline of geography (see for instance Blaikie and Brookfield 1987; Bryant and Bailey 1997; Bebbington and Batterbury 2001; Paulson et al. 2003; Walker 2005; Robbins 2012), political ecology remains the most widely used approach in ecological anthropology today (Townsend 2009).

From the earliest days of political ecology, researchers working in this area have been concerned with marginal social groups and issues of social justice (Paulson et al. 2005). The next selection, by Dianne Rocheleau, Barbara Thomas-Slayter, and Esther Wangari, exemplifies the ongoing efforts of researchers to refine the political ecology framework. In particular, since Rocheleau et al. observe that gender interacts with other axes of social difference (including class, caste, race, culture, and ethnicity), they propose bringing a feminist perspective to political ecology. They merge into the existing framework the themes of gendered knowledge, gendered environmental rights and responsibilities, and gendered environmental politics and grassroots activism. The resulting *feminist political ecology* explores how the conservation, commodification, enclosure, degradation, and dispossession of nature is experienced disproportionately on the basis of gender.

But cultural ecology, political ecology, and feminist political ecology are just some of the approaches to studying human-nature interactions that anthropologists have taken over the years. Other approaches include historical ecology, evolutionary ecology, and spiritual ecology, as well as ethnoecology, which is the focus of the next chapter, authored by Virginia D. Nazarea.

Ethnoecology is the cross-cultural study of how humans perceive and use the natural environment. Ethnoecologists integrate techniques from cultural ecology, biology, and linguistics to explore the role of cognition in framing humans' environmental behaviors (Brosius et al. 1986; Casagrande 2006; Nazarea 1999). They concentrate on terminology and classificatory systems for organizing knowledge about plants, animals, soils, habitats, and ecological processes. One of the primary claims of ethnoecologists has been that Western scientists tend to underestimate the extent of other people's environmental knowledge and arrogantly dismiss as inferior any non-Western ways of knowing. For example, Harold Conklin—a pioneer of ethnoecology—noted how the traditional agricultural practice of shifting cultivation (also known as milpa, swidden agriculture, field-forest rotation, and slash-and-burn agriculture) had been dismissed by colonial officers, development officials, and the scientific elite as primitive or wasteful, despite the fact that it was only minimally studied (Conklin 1954). After meticulously observing and participating in more than a full annual cycle of agricultural activities, Conklin discovered that the Hanunóo of the Philippines recognize and distinguish over 1,600 different plant types, over 430 of which are cultigens, and most of those are swidden grown (Conklin 1954; Brosius et al. 1986). Conklin drew attention not only to the diversity of swidden agricultural practices but also to the ecological benefits of certain swidden styles.

Generally speaking, "shifting cultivation may refer to any one of an undetermined number of agricultural systems" (Conklin 1957: 1). Typically, it involves the use of fire to clear fields for cultivation (the fire produces a layer of fertilizing ash). After a few years, when the fields become exhausted, new plots are cleared, and the old ones are left to fallow. As the fallowing fields (called swiddens) are reclaimed by native plants and trees, they may become a source of fruits, nuts, roots, fibers, and medicinal plants (Cornell 2011). While some (partial) forms of shifting cultivation—exercised under conditions of population growth and land pressure—can cause long-term environmental degradation (Conklin 1957; Fox et al. 2000), other (integral) systems of swidden farming are efficient, sustainable, and integrated into the existing natural ecosystem (Geertz 1963). Integral shifting cultivation restores nutrient levels in the soil and maintains greater biodiversity than does permanent agriculture, which typically involves either tree-dominated (e.g., rubber, palm oil, tea) or annual-dominated (e.g., maize, cassava) land cover (Chhabra et al. 2008). As Clifford Geertz writes, much of the depreciatory statements about swidden "are dubious and unqualified generalizations (and a few are simply incorrect)" (1963: 16). Conklin's groundbreaking work revealed the adaptive properties of swidden agriculture and exposed the sophistication of Hanunóo land-use practices.

Following the work of Conklin, ethnoecologists recognize and place a high value on the traditional environmental knowledge that indigenous and other

societies have cultivated over centuries or even millennia. Here, Virginia D. Nazarea suggests that ethnoecologists should shift their attention from theoretical interests in cognition and classification to applied work exploring the relationship between cognition and action. Pursued in this way, ethnoecology can provide important insights for the conservation of cultural and biological diversity and the study of environmental conflicts (Casagrande 2006; this volume, section 6).

This section's ethical discussion comes from Richard J. McNeil, who introduces readers to some basic concepts and principles in the field of environmental ethics. Ethical questions are fundamental for much of the work that we do as ecological anthropologists. Yet few of us are fluent in the language of ethics, and many feel uncomfortable incorporating ethics into public discussions of environmental policies and decision making. As McNeil explains, most of us "take and argue ethical positions without much prior reflection or understanding of the implications." Sometimes we make moral arguments without recognizing them as such; other times, we claim we are making a moral statement when in fact we are not. McNeil's "primer" helps readers to become more comfortable with the ethical dimensions of studying and responding to environmental issues. It offers a vocabulary that appears in later selections and with which students may begin to articulate their own ethical standpoints.

In the sixty years since the time of Julian Steward, ecological anthropology has grown from a conversation among researchers, professors, and students into a mature topical specialization and applied research field; its practitioners are as likely to hold university appointments as they are to work for government agencies, businesses, and nongovernmental organizations (NGOs). Several American universities feature graduate programs with concentrations in ecological anthropology. Inside the American Anthropological Association, there is a professional network of ecological anthropologists, with a listserv boasting over two thousand members. Still, there remains some disagreement regarding the field's terminology. Some use the term *environmental anthropology* as an umbrella for all the many anthropological approaches to environmental issues (including evolutionary ecology, historical ecology, cultural ecology, political ecology, ethnoecology, and spiritual ecology) and reserve the term *ecological anthropology* for research that seeks to describe a single ecosystem involving a human population (Townsend 2009). Others use the term *ecological anthropology* as the umbrella term and define *environmental anthropology* as the applied dimension of ecological anthropology (Sponsel 2007). Still others use the terms *environmental anthropology* and *ecological anthropology* interchangeably. Whatever one chooses to call it, the field of anthropology and the environment is alive and well and continuously responding to new information with new tools for exploring human-environment relationships.

In general, the transformations that have characterized ecological anthropology over the years mirror those that have occurred within the wider discipline of anthropology. Just as cultural anthropologists began to recognize the fluidity, contingency, and malleability of their topic of analysis, ecological anthropologists too recognized that "there are no isolated ecosystems and . . . all humans participate in a world system" (Kottak 1999: 25). Accordingly, anthropologists have broadened their focus to explore the ways in which regional, national, and international economic and political forces inform local processes of cultural and environmental change. And an increasing number of anthropologists characterize their work as applied, rather than purely theoretical.

The "new ecological anthropology" is "about finding practical solutions to environmental problems" and "building new methodological and theoretical approaches to study those phenomena" (Paulson et al. 2003: 212; Kottak 1999). Many contributors to this reader call for continued changes in the objects of anthropological research, as well as in the theories that frame human-environment inquiries. They want to focus attention on power structures, discourses, and identities in ecological settings. Yet these authors never set aside the original question of adaptation, a broader comparative and historical perspective, or a focus on situated knowledge.

REFERENCES

Bebbington, Anthony J., and Simon P. Batterbury. 2001. Transnational Livelihood and Landscape: Political Ecologies of Globalization. *Ecumene* 8 (4): 369–380.

Biersack, Aletta. 2006. Reimagining Political Ecology: Culture/Power/History/Nature. In *Reimagining Political Ecology*. Aletta Biersack and James B. Greenberg, eds. Pp. 3–40. Durham, NC: Duke University Press.

Blaikie, Piers, and Harold Brookfield. 1987. *Land Degradation and Society*. London: Methuen.

Brosius, J. Peter, George W. Lovelace, and Gerald G. Marten. 1986. Ethnoecology: An Approach to Understanding Traditional Agricultural Knowledge. In *Traditional Agriculture in Southeast Asia: A Human Ecology Perspective*. Gerald G. Marten, ed. Pp. 187–198. Boulder, CO: Westview.

Bryant, Raymond L., and Sinéad Bailey. 1997. *Third World Political Ecology*. New York: Routledge.

Casagrande, David G. 2006. Ethnoecology. In *The Encyclopedia of Earth*. Cutler J. Cleveland, ed. Washington, DC: National Council for Science and the Environment, Environmental Information Coalition. http://www.eoearth.org/view/article/152681/.

Chhabra, Abha, Helmut Geist, Richard A. Houghton, Helmut Haberl, Ademola K. Braimoh, Paul L. G. Vlek, Jonathan Patz, Jianchu Xu, Navin Ramankutty, Oliver Coomes, and Eric F. Lambin. 2008. Multiple Impacts of Land Use / Land Cover Change. In *Land Use and Land Cover Change: Local Processes and Global Impacts*. Eric F. Lambin and Helmut Geist, eds. Pp. 71–116. New York: Springer.

Conklin, Harold C. 1954. Section of Anthropology: An Ethnoecological Approach to Shifting Agriculture. *Transactions of the New York Academy of Sciences*, series 2, 17 (2): 133–142.

Conklin, Harold C. 1957. *Hanunóo Agriculture: A Report on an Integral System of Shifting Cultivation in the Philippines* (FAO Forestry Development Paper, 12). Rome: Food and Agriculture Organization of the United Nations.

Cornell, Joseph D. 2011. Slash and Burn. In *The Encyclopedia of Earth*. Michelle Miller, ed. Washington, DC: National Council for Science and the Environment, Environmental Information Coalition. http://www.eoearth.org/view/article/156045/.

Fox, Jefferson, Dao Minh Troung, A. Terry Rambo, Nghiem Phuong Tuyen, Le Trong Cuc, and Stephen Leisz. 2000. Shifting Cultivation: A New Old Paradigm for Managing Tropical Forests. *BioScience* 50 (6): 521–528.

Geertz, Clifford. 1963. *Agricultural Involution: The Process of Ecological Change in Indonesia*. Berkeley: University of California Press.

Kottak, Conrad P. 1999. The New Ecological Anthropology. *American Anthropologist* 101 (1): 23–35.

McGee, R. Jon, and Richard L. Warms. 2012. *Anthropological Theory: An Introductory Reader*. New York: McGraw-Hill.

Moore, Jerry D. 2012. *Visions of Culture: An Introduction to Anthropological Theories and Theorists*. Lanham, MD: AltaMira.

Nazarea, Virginia D. 1999. Preface. In *Ethnoecology: Situated Knowledge/Local Lives*. Virginia D. Nazarea, ed. Pp. 3–20. Tucson: University of Arizona Press.

Paulson, Susan, Lisa L. Gezon, and Michael Watts. 2003. Locating the Political in Political Ecology. *Human Organization* 62 (3): 205–218.

Paulson, Susan, Lisa L. Gezon, and Michael Watts. 2005. Politics, Ecologies, Genealogies. In *Political Ecology across Spaces, Scales, and Social Groups*. Susan Paulson and Lisa Gezon, eds. Pp. 17–37. New Brunswick, NJ: Rutgers University Press.

Robbins, Paul. 2012. *Political Ecology: A Critical Introduction* (2nd ed.). Malden, MA: Wiley.

Sponsel, Leslie. 2007. Ecological Anthropology. *Encyclopedia of Earth*. Cutler J. Cleveland, ed. Washington, DC: National Council for Science and the Environment, Environmental Information Coalition. http://www.eoearth.org/view/article/151926.

Steward, Julian. 1968. Cultural Ecology. In *International Encyclopedia of the Social Sciences (Volume 4)*. D. Sills, ed. Pp. 337–344. New York: Macmillan.

Townsend, Patricia. 2009. *Environmental Anthropology: From Pigs to Policies* (2nd ed.). Long Grove, IL: Waveland.

Walker, Peter A. 2005. Political Ecology: Where Is the Ecology? *Progress in Human Geography* 29 (1): 73–82.

Wilk, Richard R. 2006. "But Young Men Don't Want to Farm Any More": Political Ecology and Consumer Culture in Belize. In *Reimagining Political Ecology*. Aletta Biersack and James B. Greenberg, eds. Pp. 149–170. Durham, NC: Duke University Press.

Wilk, Richard R., and Priscilla Stone. 1998. Introduction to "A Very Human Ecology: Celebrating the Work of Robert McC. Netting." *Human Ecology* 26 (2): 175–188.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 1: "The Concept and Method of Cultural Ecology" by Julian Steward

1. What is cultural ecology? What are its three fundamental procedures?
2. How is the problem and method of cultural ecology different from other theoretical frameworks?
3. What does *holistic* mean? How does this definition inform the concept and method of cultural ecology?
4. What is the *culture core*?
5. Why does Steward suggest that the expression *culturally prescribed ways* should be used with caution? What does this expression have to do with human-environment interactions?

6. What relationships exist between humans' environments (e.g., deserts, rainforests) and their social patterns (e.g., kinship systems, political formations, economic cooperation)?

Questions to Accompany Chapter 2: "Smallholders, Householders" by Robert McC. Netting

1. What does Netting mean when he states that binary terms like "traditional and modern, preindustrial and industrial, Western and non-Western, or even extensive and intensive . . . [impose] an evolutionary straitjacket on our thinking"? How does this statement affect our anthropological thinking about human-environment relationships?
2. What does *sustainability* mean? Why is it that "traditional" cultivators are often assumed to employ more sustainable land-use tactics than "modern" commercial and industrial land users do?

Questions to Accompany Chapter 3: "False Forest History, Complicit Social Analysis: Rethinking Some West African Environmental Narratives" by James Fairhead and Melissa Leach

1. What is a *narrative*, as defined by Fairhead and Leach?
2. How do narratives inform our thinking about relationships between people and the environment? How have social scientists helped to produce and reproduce these kinds of narratives over time?
3. What false forest histories are contained in the narratives concerning Kissidougou?
4. What are the political effects of these narratives?
5. What counternarrative do Fairhead and Leach posit in place of the false forest history?
6. What methods do Fairhead and Leach employ in order to discredit the false forest history and substitute their own counternarrative?

Questions to Accompany Chapter 4: "Gender and Environment: A Feminist Political Ecology Perspective" by Dianne Rocheleau, Barbara Thomas-Slayter, and Esther Wangari

1. What is feminist political ecology? How is this different from political ecology and the other theoretical frameworks that came before it?
2. What three themes encompass Rocheleau et al.'s feminist political ecology framework?
3. What common threads connect feminist political ecology to other scholarship and movements focused on gender, science, and environment?
4. What do Rocheleau et al. mean when they state that "there are *real*, not imagined, gender differences in experiences of, responsibilities for, and interests in 'nature' and environments but that these differences are not rooted in biology per se"? Can you think of any instances in which your own perceptions of and interactions with nature were affected by gender, culture, class, race, or place?

Questions to Accompany Chapter 5: "A View from a Point: Ethnoecology as Situated Knowledge" by Virginia D. Nazarea

1. What two approaches to ethnoecology does Nazarea identify? How do these two approaches differ in regard to their implications for non-Western systems of classification?
2. What does Nazarea add to the anthropological conversation on ethnoecology? To where does she suggest ethnoecologists should turn their attention?
3. How do cognitive anthropology, in general, and the work of Harold Conklin, in particular, inform Nazarea's perspective?

Questions to Accompany Chapter 6: "Ethics Primer for University Students Intending to Become Natural Resources Managers and Administrators" by Richard J. McNeil

1. Which ethical theory or theories resonate most closely with your own social and environmental outlook?
2. Think of an example wherein you employed one ethical theory, then moderated your initial stance by incorporating a second ethical theory. McNeil offers the following example of such

a moderation: "I know that I am supposed not to lie, but the truth would hurt his feelings terribly." Have you ever performed such a moderation in regard to your behavior toward the environment?

3. What is the difference between a moral agent and a moral subject?
4. How far into the plant, animal, and other taxa do you extend ethical consideration? Do you include chimpanzees and dolphins in your moral community? What about fish and frogs? What about trees and rocks?
5. What is a moral dilemma? Can you recall an instance when you experienced one of the four types of moral dilemmas identified by Kidder? What moral dilemmas are present in this week's news?

1

The Concept and Method of Cultural Ecology*

JULIAN STEWARD

Cultural Ecology

Cultural ecology differs from human and social ecology in seeking to explain the origin of particular cultural features and patterns which characterize different areas rather than to derive general principles applicable to any cultural-environmental situation. It differs from the relativistic and neo-evolutionist conceptions of culture history in that it introduces the local environment as the extracultural factor in the fruitless assumption that culture comes from culture. Thus, cultural ecology presents both a problem and a method. The problem is to ascertain whether the adjustments of human societies to their environments require particular modes of behavior or whether they permit latitude for a certain range of possible behavior patterns. Phrased in this way, the problem also distinguishes cultural ecology from "environmental determinism" and its related theory "economic determinism," which are generally understood to contain their conclusions within the problem.

The problem of cultural ecology must be further qualified, however, through use of a supplementary conception of culture. According to the holistic view, all aspects of culture are functionally interdependent upon one another. The degree and kind of interdependency, however, are not the same with all features. Elsewhere, I have offered the concept of *cultural core*—the constellation of features which are most closely related to subsistence activities and economic arrangements. The core includes such social, political, and religious patterns as are empirically determined to be closely connected with these arrangements. Innumerable other features may have great potential variability because they are less strongly tied to the core. These latter, or secondary, features are determined to a greater extent by purely cultural-historical factors—by random innovations or by diffusion—and they give the appearance of outward distinctiveness to cultures with similar cores. Cultural ecology pays primary attention to those features which empirical analysis shows to be most closely involved in the utilization of environment in culturally prescribed ways.

* From Julian Steward, ed., *Theory of Culture Change: The Methodology of Multilinear Evolution*. © 1955 by the Board of Trustees of the University of Illinois. Renewed 1983 by Jane C. Steward. Used by permission of the University of Illinois Press.

The expression "culturally prescribed ways" must be taken with caution, for its anthropological usage is frequently "loaded." The normative concept, which views culture as a system of mutually reinforcing practices backed by a set of attitudes and values, seems to regard all human behavior as so completely determined by culture that environmental adaptations have no effect. It considers that the entire pattern of technology, land use, land tenure, and social features derive entirely from culture. Classical illustrations of the primacy of cultural attitudes over common sense are that the Chinese do not drink milk nor the Eskimo eat seals in summer.

Cultures do, of course, tend to perpetuate themselves, and change may be slow for such reasons as those cited. But over the millennia cultures in different environments have changed tremendously, and these changes are basically traceable to new adaptations required by changing technology and productive arrangements. Despite occasional cultural barriers, the useful arts have spread extremely widely, and the instances in which they have not been accepted because of preexisting cultural patterns are insignificant. In preagricultural times, which comprised perhaps 99 percent of cultural history, technical devices for hunting, gathering, and fishing seem to have diffused largely to the limits of their usefulness. Clubs, spears, traps, bows, fire, containers, nets, and many other cultural features spread across many areas, and some of them throughout the world. Later, domesticated plants and animals also spread very rapidly within their environmental limits, being stopped only by formidable ocean barriers.

Whether or not new technologies are valuable is, however, a function of the society's cultural level as well as of environmental potentials. All preagricultural societies found hunting and gathering techniques useful. Within the geographical limits of herding and farming, these techniques were adopted. More advanced techniques, such as metallurgy, were acceptable only if certain preconditions, such as stable population, leisure time, and internal specialization, were present. These conditions could develop only from the cultural ecological adaptations of an agricultural society.

The concept of cultural ecology, however, is less concerned with the origin and diffusion of technologies than with the fact that they may be used differently and entail different social arrangements in each environment. The environment is not only permissive or prohibitive with respect to these technologies, but special local features may require social adaptations which have far-reaching consequences. Thus, societies equipped with bows, spears, surrounds, chutes, brush-burning, deadfalls, pitfalls, and other hunting devices may differ among themselves because of the nature of the terrain and fauna. If the principal game exists in large herds, such as herds of bison or caribou, there is advantage in cooperative hunting, and considerable numbers of peoples may remain together throughout the year. If, however, the game is nonmigratory, occurring in small and scattered groups, it is better hunted by small groups of men who know their

territory well. In each case, the cultural repertory of hunting devices may be about the same, but in the first case the society will consist of multifamily or multilineage groups, as among the Athabaskans and Algonkians of Canada and probably the prehorse Plains bison hunters, and in the second case it will probably consist of localized patrilineal lineages or bands, as among the Bushmen, Congo Negritoes, Australians, Tasmanians, Fuegians, and others. These latter groups consisting of patrilineal bands are similar, as a matter of fact, not because their total environments are similar—the Bushmen, Australians, and southern Californians live in deserts, the Negritoes in rain forests, and the Fuegians in a cold, rainy area—but because the nature of the game and therefore of their subsistence problem is the same in each case.

Other societies having about the same technological equipment may exhibit other social patterns because the environments differ to the extent that the cultural adaptations must be different. For example, the Eskimo use bows, spears, traps, containers, and other widespread technological devices, but, owing to the limited occurrence of fish and sea mammals, their population is so sparse and cooperative hunting is so relatively unrewarding that they are usually dispersed in family groups. For a different but equally compelling reason, the Nevada Shoshoni were also fragmented into family groups. In the latter case, the scarcity of game and the predominance of seeds as the subsistence basis greatly restricted economic cooperation and required dispersal of the society into fairly independent family groups.

In the examples of the primitive hunting, gathering, and fishing societies, it is easy to show that if the local environment is to be exploited by means of the culturally derived techniques, there are limitations upon the size and social composition of the groups involved. When agricultural techniques are introduced, man is partially freed from the exigencies of hunting and gathering, and it becomes possible for considerable aggregates of people to live together. Larger aggregates, made possible by increased population and settled communities, provide a higher level of sociocultural integration, the nature of which is determined by the local type of sociocultural integration.

The adaptative processes we have described are properly designated ecological. But attention is directed not simply to the human community as part of the total web of life but to such cultural features as are affected by the adaptations. This in turn requires that primary attention be paid only to relevant environmental features rather than to the web of life for its own sake. Only those features to which the local culture ascribes importance need be considered.

The Method of Cultural Ecology

Although the concept of environmental adaptation underlies all cultural ecology, the procedures must take into account the complexity and level of the culture. It

makes a great deal of difference whether a community consists of hunters and gatherers who subsist independently by their own efforts or whether it is an outpost of a wealthy nation, which exploits local mineral wealth and is sustained by railroads, ships, or airplanes. In advanced societies, the nature of the culture core will be determined by a complex technology and by productive arrangements which themselves have a long cultural history.

Three fundamental procedures of cultural ecology are as follows:

First, the interrelationship of exploitative or productive technology and environment must be analyzed. This technology includes a considerable part of what is often called "material culture," but all features may not be of equal importance. In primitive societies, subsistence devices are basic: weapons and instruments for hunting and fishing; containers for gathering and storing food; transportational devices used on land and water; sources of water and fuel; and, in some environments, means of counteracting excessive cold (clothing and housing) or heat. In more developed societies, agriculture and herding techniques and manufacturing of crucial implements must be considered. In an industrial world, capital and credit arrangements, trade systems, and the like are crucial. Socially derived needs—special tastes in foods, more ample housing and clothing, and a great variety of appurtenances to living—become increasingly important in the productive arrangement as culture develops; and yet these originally were probably more often effects of basic adaptations than causes.

Relevant environmental features depend upon the culture. The simpler cultures are more directly conditioned by the environment than advanced ones. In general, climate, topography, soils, hydrography, vegetational cover, and fauna are crucial, but some features may be more important than others. The spacing of water holes in the desert may be vital to a nomadic seed-gathering people, the habits of game will affect the way hunting is done, and the kinds and seasons of fish runs will determine the habits of riverine and coastal tribes.

Second, the behavior patterns involved in the exploitation of a particular area by means of a particular technology must be analyzed. Some subsistence patterns impose very narrow limits on the general mode of life of the people, while others allow considerable latitude. The gathering of wild vegetable products is usually done by women who work alone or in small groups. Nothing is gained by cooperation, and in fact women come into competition with one another. Seed gatherers, therefore, tend to fragment into small groups unless their resources are very abundant. Hunting, on the other hand, may be either an individual or a collective project, and the nature of hunting societies is determined by culturally prescribed devices for collective hunting as well as by the species. When surrounds, grass-firing, corrals, chutes, and other cooperative methods are employed, the take per man may be much greater than what a lone hunter could bag. Similarly, if circumstances permit, fishing may be done by groups of men using dams, weirs, traps, and nets as well as by individuals.

The use of these more complex and frequently cooperative techniques, however, depends not only upon cultural history—i.e., invention and diffusion—which makes the methods available, but upon the environment and its flora and fauna. Deer cannot be hunted advantageously by surrounds, whereas antelope and bison may best be hunted in this way. Slash-and-burn farming in tropical rain forests requires comparatively little cooperation in that a few men clear the land, after which their wives plant and cultivate the crops. Dry farming may or may not be cooperative; and irrigation farming may run the gamut of enterprises of ever-increasing size based on collective construction of waterworks.

The exploitative patterns depend not only upon the habits concerned in the direct production of food and of goods but upon facilities for transporting the people to the source of supply or the goods to the people. Watercraft have been a major factor in permitting the growth of settlements beyond what would have been possible for a foot people. Among all nomads, the horse has had an almost revolutionary effect in promoting the growth of large bands.

The third procedure is to ascertain the extent to which the behavior patterns entailed in exploiting the environment affect other aspects of culture. Although technology and environment prescribe that certain things must be done in certain ways if they are to be done at all, the extent to which these activities are functionally tied to other aspects of culture is a purely empirical problem. In the irrigation areas of early civilizations, the sequence of sociopolitical forms or cultural cores seems to have been very similar despite variation in many outward details or secondary features of these cultures. If it can be established that the productive arrangements permit great latitude in the sociocultural type, then historical influences may explain the particular type found. The problem is the same in considering modern industrial civilizations. The question is whether industrialization allows such latitude that political democracy, communism, state socialism, and perhaps other forms are equally possible, so that strong historical influences, such as diffused ideology—e.g., propaganda—may supplant one type with another, or whether each type represents an adaptation which is specific to the area.

The third procedure requires a genuinely holistic approach, for if such factors as demography, settlement pattern, kinship structures, land tenure, land use, and other key cultural features are considered separately, their interrelationships to one another and to the environment cannot be grasped. Land use by means of a given technology permits a certain population density. The clustering of this population will depend partly upon where resources occur and upon transportation devices. The composition of these clusters will be a function of their size, of the nature of subsistence activities, and of cultural-historical factors. The ownership of land or resources will reflect subsistence activities on the one hand and the composition of the group on the other. Warfare may be related to the complex of factors just mentioned. In some cases, it may arise out of competition for

resources and have a national character. Even when fought for individual honors or religious purposes, it may serve to nucleate settlements in a way that must be related to subsistence activities.

The Methodological Place of Cultural Ecology

Cultural ecology has been described as a methodological tool for ascertaining how the adaptation of a culture to its environment may entail certain changes. In a larger sense, the problem is to determine whether similar adjustments occur in similar environments. Since in any given environment, culture may develop through a succession of very unlike periods, it is sometimes pointed out that environment, the constant, obviously has no relationship to cultural type. This difficulty disappears, however, if the level of sociocultural integration represented by each period is taken into account. Cultural types, therefore, must be conceived as constellations of core features which arise out of environmental adaptations and which represent similar levels of integration.

Cultural diffusion, of course, always operates, but in view of the seeming importance of ecological adaptations, its role in explaining culture has been greatly overestimated. The extent to which the large variety of world cultures can be systematized in categories of types and explained through cross-cultural regularities of developmental process is purely an empirical matter. Hunches arising out of comparative studies suggest that there are many regularities which can be formulated in terms of similar levels and similar adaptations.

2

Smallholders, Householders*

ROBERT MCC. NETTING

Energy and Evolution

The observation that there are two paths that lead to increased agricultural production appears to be obvious, even banal, but the labeling of these trajectories as traditional and modern, preindustrial and industrial, Western and non-Western, or even extensive and intensive obscures the significant differences and imposes an evolutionary straitjacket on our thinking. Technological and scientific "progress" is an unquestioned good in manufacturing and distributing commodities, so it *must* be the key to "getting agriculture moving," to relieving human want and removing drudgery. The "truths" of Western scientific and engineering knowledge are deemed universal, and only isolation, "peasant conservatism," illiteracy, and poverty impede their transmission and implementation. Each stage of technological advancement from Stone Age to Iron Age, from human muscle power to horsepower, from the steam engine of the Industrial Revolution to the electricity generated by atomic fission represents an increased capture of energy.

Cultural evolutionists from Lewis Henry Morgan, Sir Edward Tylor, Marx, and Engels to Leslie White (1943) never doubted that the discoveries and inventions that tapped larger sources of energy were the prime engines of change, providing not only more material goods but a higher standard of living, if only their fruits could be distributed equitably throughout society. The corollary view was that supplies of mechanical energy were practically limitless and that the efficiency of transforming one form of energy to another inevitably increased.[1] Some disillusionment with the side effects of power-hungry civilizations, the degraded soils, the polluted air and water, may now have set in, but the conviction that food production has a fundamental call on energy supplies, and that only a bit of technological rejiggering is needed to spread the Western pattern successfully to a waiting Third World of peasant farms, dies hard.[2]

All energy is not, however, created equal, or equally procreative. Of the fundamental physical sources of energy, sunlight, water, land, and labor are all

* From Robert McC. Netting, *Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture*.

renewable over time but finite in any given period. The technically useful energy of fossil fuels is both finite and nonrenewable. Food production, always a major user of land and solar power, is differentially dependent on human labor and on fuel energy in developing and industrialized countries (Leach 1976: 3). Which factors of production will be used most freely and which will be conserved depends on their relative costs and benefits. Where land is plentiful, readily appropriated, and cheap, and where population is sparse, as on a settlement frontier, or where aridity or mountainous terrain makes ordinary farming techniques marginally productive, the first choice is to economize on labor with extensive techniques like slash-and-burn cultivation or open-range herding. This is true regardless of whether we refer to the expansion of Neolithic farmers into Europe or the establishment of cattle ranches in Brazilian rain forests (National Research Council 1992: 67–75). If there are few people present and they have a variety of ways to make a living with relatively little effort, the cost of labor will be high. For intensification to take place under these circumstances, less expensive sources of energy will be sought, and there will be a heavy emphasis on increasing labor productivity, usually by mechanical means (ibid.: 15). With a market that prices the inputs of labor and fuel energy and the outputs of food, practical economic decisions can be clearly specified. The economically appropriate level of energy use is the point at which the marginal monetary value equals the cost of the increment of energy (Lockeretz 1984).

Sustainability: In the Eyes of Beholders and Smallholders

Sustainability is a term that has buzzed rapidly into the popular consciousness trailing clouds of positive affect, which are also evoked by *ecology*, *conservation*, and *environmental protection*. *Sustainability* is a prime candidate to be the watchword of the 1990s, and it is increasingly attached to the agroecology of the smallholder. I have especially emphasized the existence of favorable energy input/output balances on household-operated smallholdings and the dangers of environmental degradation, but the concept of sustainability in common usage covers a multitude of values and goals (Lockeretz 1990; Barbier 1987). Terry Gips (cited in Francis and Youngberg 1990: 4) maintains that "a sustainable agriculture is ecologically sound, economically viable, socially just, and humane." In an Agency for International Development concept paper, sustainability is "the ability of an agricultural system to meet evolving human needs without destroying and, if possible, by improving the natural resource base on which it depends" (cited in ibid.: 5). Sustainable production is an "average level of output over an indefinitely long period which can be sustained without depleting renewable resources on which it depends" (Douglass 1985: 10). These definitions combine environmental parameters with economic and social characteristics in the context of changing interactions.

Several dimensions of sustainability, the physical, chemical, biological, and socioeconomic, are identified in the literature (Schelhas 1991), with the degree of emphasis and analytic detail often depending on the scientific specialization of the investigator.[3] There is also a prevailing assumption that traditional cultivators, because of their low-energy technology, diversified production, small-scale operations, subsistence rather than market orientation, settlement stability, and lack of manufactured inputs, will occupy the sustainable end of the continuum, as opposed to commercial and industrial agriculture. In fact, the presence of these characteristics and their presumed interaction through time must be demonstrated, especially in the case of intensive cultivators, who modify the natural environment more profoundly and permanently than certain other types of land users. Unfortunately, measurements of the following relevant factors through time are seldom available in the case of either smallholder systems or large industrial farms:

1. Physical: soil degradation through erosion, weathering, compaction; diminished water supply, flooding, salinization; depletion of nonrenewable energy sources. Smallholders' techniques of terracing, contour mounding, drainage, irrigation, and diking may in fact be highly developed, and their use of fossil fuels minimal, but environmental deterioration owing to climatic perturbations or gradually increasing overuse may become apparent.
2. Chemical: decline in soil-nutrient status; decreasing responses to chemical applications, necessitating higher dosages; buildup of local or regional toxicity from the residues of fertilizers, pesticides, and herbicides. Rapid population increases among intensive farmers with no other economic options or the drive to raise production rapidly for the market may put pressure on resources so great that yields decline. There are unresolved questions as to whether the high-yielding seeds, chemical inputs, and mechanization of the Green Revolution as adopted by many smallholders will compromise their agricultural sustainability.
3. Biological: loss of biodiversity; declining ecosystem stability and resilience. Only groups of low-density foragers or shifting cultivators in large natural ecosystems may pose no threat to biological diversity (Schelhas 1991). Intensive cultivation can replace natural ecosystems, prevent their regeneration, and cause absolute declines in natural biodiversity. The substitution of an artificially diversified system of polycultures or interplanting, integrated crop/livestock regimes, and crop rotation can, however, increase total yields, while reducing yield variability, insect predation, and weed competition (Altieri 1987; Gliessman 1984). Such systems appear to be biologically more stable and more energy-efficient than the monocultures characteristic of largeholders.

4. Socioeconomic: providing sufficient sustained economic returns over the long run on existing cultivated lands so that people can achieve a continuing adequate livelihood (Schelhas 1991). Since the goals are social and economic, variable cross-culturally, and potentially changing through time, such sustainability is particularly difficult to measure objectively (Barbier 1987). Stable production may not be consonant with rising subsistence needs, greater market participation, lower agricultural prices, or higher input costs.

My emphasis on the process of intensification suggests that smallholders do indeed adapt to changing population and market forces and that households have a variety of off-farm production strategies. My work is, in fact, more directly concerned with the dynamics of smallholder social and economic systems as they encounter the challenge of long-term biological sustainability than it is with the physical stability of such ecosystems. The management choices that the smallholder makes in the light of intimate knowledge of the land are unlikely to involve short-range maximization of production. Farmers who survive must hedge against the uncontrollable fluctuations of the climate *and* the market. The very long time-horizon of the family's intergenerational security and its valuable, heritable property give the smallholder household a unique perspective on sustainability. There is room to question the doctrinaire position of many "deep ecologists" that sustainable production and economic growth are incompatible goals (Hildyard 1995) or that a market economy, population increase, and the new technologies of capitalism are inevitably at odds with sustainable systems (Weiskel 1989). But the suggestion that smallholder systems that can be shown to be sustainably productive, biologically regenerative, and energy-efficient tend also to be equity-enhancing, participative, and socially just (Barbier 1987: 104) is stimulating and provocative. Indigenous smallholder systems that show a favorable energy input/output balance, achieved by the application of labor and management rather than large amounts of unrenewable energy, exhibit a feasible solution to the problems of resource exhaustion, pollution, and environmental degradation that so often accompany large-scale, energy-intensive agriculture.

NOTES

1. Leslie White's "law of cultural evolution" ("culture develops when the amount of energy harnessed by man per capita per year is increased; or as the efficiency of the technological means of putting this energy to work is increased; or, as both factors are simultaneously increased"; White 1943: 338) explicitly focuses on variable nonhuman energy in tools and practices such as agriculture, while the human energy factor, along with particular skills, is treated as a constant. More "need-serving goods" come, not from more person-days of work with equal or even declining returns to labor, but only from the technological capture of energy that increases "the productivity of human labor" (ibid.: 346). "Efficiency" is ambiguously defined as "the efficiency with which human energy is expended mechanically, . . . the

efficiency of tools only" (ibid.: 337), but no attempt is made to measure human or other energy inputs quantitatively or to address the inverse relationship between increasing returns on human work and potentially declining returns on mechanical energy. (Analogies between low-cost electricity and the energy of a human slave [ibid.: 345] are merely anecdotal.) When evolution is modeled in this reductionist manner, technological change raising the amount of energy used per capita precedes and produces population growth, improves human well-being and comfort, grants "independence of nature," and raises output per unit of labor (ibid.: 342–43). To the degree that the smallholder adaptation is a low-energy alternative with less mechanical and more human energy expended, it would presumably be judged evolutionarily retrograde or reflecting a barrier to cultural development.

2. The evolutionary assumption that manual labor in agriculture is backward, extremely time-consuming, onerous, and coerced, and that replacement of such labor by technological energy is therefore the only route to abundance and freedom, is still very much with us. "An old saying has it, 'slavery will persist until the loom weaves itself.' All ancient civilizations, no matter how enlightened or creative, rested on slavery and on grinding human labor, because human and animal muscle power were the principal forms of energy available for mechanical work. The discovery of ways to use less expensive sources of energy than human muscles made it possible for men to be free. The men and women of rural India are tied to poverty and misery because they use too little energy and use it inefficiently, and nearly all they use is secured by their own physical efforts. A transformation of rural Indian society could be brought about by increasing the quantity and improving the technology of energy use" (Revelle 1976: 974).
3. Gordon Conway and Edward Barbier point to a source of confusion in the different definitions that various disciplinary groups attach to the term *sustainable agriculture* (1990: 9). Four interpretations are (1) agriculturalists: food sufficiency by any means; (2) environmentalists: responsible uses of the environment, stewardship of natural resources; (3) economists: efficiency, the use of scarce resources to benefit present and future populations; and (4) sociologists: production consonant with traditional cultures, values, and institutions. Clearly, the productivity, stability, and equitability that are the goals of sustainable development projects may be in conflict, and there are necessary trade-offs among them (ibid.: 39–43).

REFERENCES

Altieri, Miguel A. 1987. Agroecology: The Scientific Bases of Alternative Agriculture. Boulder, CO: Westview.

Barbier, Edward B. 1987. The Concept of Sustainable Economic Development. Environmental Conservation 14 (2): 101–10.

Conway, Gordon R., and Edward B. Barbier. 1990. After the Green Revolution: Sustainable Agriculture for Development. London: Earthscan.

Douglass, Gordon K. 1985. When Is Agriculture Sustainable? *In* Sustainable Agriculture and Integrated Farming Systems. Eden Thomas, Cynthia Fridgen, and Susan Battenfield, eds. Pp. 10–21. East Lansing: Michigan University Press.

Francis, Charles, and Garth Youngberg. 1990. Sustainable Agriculture: An Overview. *In* Sustainable Agriculture in Temperate Zones. Charles A. Francis, Cornelia Butler Flora, and Larry D. King, eds. Pp. 1–23. New York: Wiley.

Gliessman, Stephen R. 1984. Resource Management in Traditional Tropical Agroecosystems in Southeast Mexico. *In* Agricultural Sustainability in a Changing World Order. Gordon K. Douglass, ed. Pp. 191–201. Boulder, CO: Westview.

Hildyard, Nicholas. 1995. Adios Amazonia? A Report from the Altamira. Ecologist 1 (1): 2.

Leach, Gerald. 1976. Energy and Food Production. Guilford, CT: IPC Science and Technology Press.

Lockeretz, William. 1984. Energy and the Sustainability of the American Agricultural System. *In* Agricultural Sustainability in a Changing World Order. Gordon K. Douglass, ed. Pp. 77–88. Boulder, CO: Westview.

———. 1990. Major Issues Concerning Sustainable Agriculture. *In* Sustainable Agriculture in Temperate Zones. Charles A. Francis, Cornelia Butler Flora, and Larry D. King, eds. Pp. 423–38. New York: Wiley.

National Research Council. 1992. Global Environmental Change: Understanding the Human Dimensions. Washington, DC: National Academy Press, for the Committee on the Human Dimensions of Global Change.

Revelle, Roger. 1976. Energy Use in Rural India. Science 192:969–75.

Schelhas, John. 1991. Socio-economic and Biological Aspects of Land Use Adjacent to Braulio Carrillo National Park, Costa Rica. Ph.D. diss., School of Renewable Natural Resources, University of Arizona.

Weiskel, Timothy. 1989. The Ecological Lessons of the Past: An Anthropology of Environmental Decline. Ecologist 19 (3): 98–103.

White, Leslie A. 1943. Energy and the Evolution of Culture. American Anthropologist 45:335–54.

3

False Forest History, Complicit Social Analysis*

Rethinking Some West African Environmental Narratives

JAMES FAIRHEAD AND MELISSA LEACH

The Deforestation Narrative

Kissidougou looks degraded. The landscape is largely savanna, especially open in the dry season when fires burn off the grasses and defoliate the few savanna trees. Nonetheless, rising out of the savanna and surrounding and hiding each of the prefecture's villages are patches of immense semideciduous humid forest. Scientists and policy makers consider these forest "islands" and the strips of streamside gallery forest to be relics of an original, formerly much more extensive, dense humid forest cover. Inhabitants have, they suppose, progressively converted forest into "derived" savanna by their shifting cultivation and fire-setting practices, preserving only the belt of forest around their villages to protect their settlements from fire and wind, to give necessary shade to tree crops, to assist fortifications and hiding, and to provide seclusion for secret ritual activities. They argue that today's climate would support general forest cover and infer from the presence of "relic" forest islands that it once did:

> At origin, the forest between Kissidougou and Kankan was . . . a dense, humid, semi-deciduous forest. The trigger of degradation is . . . the farming system and the fragility of climate and soils in tropical regions. Some primary formations still exist, however, in the form of peri-village forest islands and gallery forests on the banks of water courses. These forest islands show the existence of a dense forest, which is today replaced in large part by degraded secondary forest. All the stages of degradation are represented: wooded savanna, bush savanna and grass savanna. (Programme d'Aménagement des Bassins Versants Haute Guinb, 1992, pp. 6–7)[1]

Deforestation is considered to provoke problems at several levels, rendering it an urgent policy concern. At the local level it leads to soil degradation and renders farming less productive and sustainable. At the regional level—the upper watershed of the Niger River—deforestation is thought to have caused irregularities in downstream river flow and in rainfall. In addition, it is contributing to global warming. Something must be done.

* From *World Development* 23, no. 6 (1995): 1023–1035. Used by permission of Elsevier.

Social analysis has always been instrumental in explaining this problem and its recent acceleration. In the early part of this century, the celebrated French colonial botanist Auguste Chevalier considered greater movement and trade during the postoccupation period to be responsible for an increase in fire-setting from a previous, less forest-harmful level (Chevalier, 1909). He considered that inhabitants conserved the forest islands for cultural reasons, presumably in a sea of otherwise degraded profanity (Chevalier, 1933). . . .

More recently, professional social scientists have focused on environmental issues in Kissidougou, usually in the pay of international or bilaterally funded environmental programs. One team, responsible for structuring the European Community–funded Niger River protection program, illustrate this focus thus:

> Our questions sought to explain the deterioration of the environment, viz: erosion and soil impoverishment, the drying up of water sources, the origin and nature of forest destruction, the origin of perverse use of bush fire. . . . Parallel to the physical causes of soil erosion, there are others of a social, political and religious nature. We can suppose a strong relationship between soil erosion, environmental degradation and the break-up and impoverishment of socio-economic structures and relations. Environmental management is strongly linked to the state of socio-cultural structures. . . . The more a community is in equilibrium at the level of social organisation, the healthier is the nature of its relations with the environment. There is a dialectical relationship between social, political and religious institutions and ecological equilibrium. . . . In these communities . . . the existence of the living is above all justified by a more or less good management of what the ancestors have left to them. This management is inscribed in the collection of laws, concrete and abstract, rational and irrational, which, once disturbed from the exterior, can be the cause of a deterioration which manifests itself as much at the level of social, religious, political and economic institutions, as at the level of the environment. (Programme d'Aménagement des Hautes Bassins du Fleuve Niger, n.d., pp. 4–7)

In a second study, devoted to local fire-setting, the author aimed to give an inventory of cultural traits which function around the practice of fire. "We have tried to retrace the transition from a traditional practice to 'modern' practice. Our hypothesis was that the 'fire social system' instituted itself as such, in destroying its host 'system,' the traditional one" (Zerouki, 1993, p. 1). In short, the author argues that "modernity" is responsible for disrupting the once successful integration of fire control within diffuse sets of intra- and intervillage social, cultural, and political relationships. He finds that "degradation seems to be recent" and that "it accelerates with the development of an urban network . . . and population growth." The study proposed "solutions to social dysfunctioning" (Zerouki, 1993). A coresearcher on this same study expands on the causes of such "dysfunctioning":

> According to inquiry on the one hand from elders . . . and on the other by IFAN in 1968, the whole region was covered with forest about 99 years ago, corresponding to the Samorian period. War chiefs used fire for better visibility and for encampments. The introduction of the locomotive during the colonial period had a serious impact on the vegetation. Since independence, there has been demystification of sacred forests and of islands considered once as cult places, the installation of wood mills, and brickmaking. Nomadic farming and herding, uncontrolled bush fire, forest fire, and runaway demography, aggravate the process of vegetation degradation already begun. (Fofana et al. 1993, p. 49)

Other recent expert views have drawn on conventional social analysis to assert once again that the Kuranko people (who speak a Mandinka dialect) are a savanna people and brought bush-fire practices with them when they pushed the Kissi further south. "As forest people, the Kissi are not as careless as savanna people with regard to fire" (Green, 1991, p. 20). In a typically racialist way, agency for degradation is diffused into the ambiguity between culture and origin.

A study of an area just over the eastern border of Kissidougou, while somewhat cynical of the crisis mold of environmental analysis, nevertheless claims that

> the degradation of forests—always qualified as "explosive"—has continued in an accelerating fashion. . . . Peasant exploitation is correctly identified as the principal factor of destruction, but in general, the measures taken [since colonial times] have only treated the symptoms. The social reasons for fire setting in hunting are . . . closely linked to growing tendencies of commercialization and monetarization in the rural milieu. This underlines the loss in importance of traditional organisations of hunters which, to date, are marked by an anticommercial character. (Stieglitz, 1990, pp. 54, 70, 77)

The author, who considers Islam to have disrupted this "pre-Islamic" tradition, incorporates more agro-demographic explanations into her explanatory mix:

> The period of cultivation being too prolonged or the fallow period too short, there is too great a loss in the nutritive materials leading finally to an irrevocable degradation of the soils. The fallow period is limited to 5–10 years. A tendency for land shortage can be seen. (Stieglitz, 1990, p. 71)

This is the position on demographic change held by most analysts. Ponsart-Dureau, for example, an agronomy student advising a nearby project, considers that

> around 1945, the forest, according to the elders, reached a limit 30 km north of Kissidougou town. Today, its northern limit is found at the level of Gueckedou-Macenta,

> thus having retreated about 100 km. . . . Demographic growth forces the villagers to exploit their land completely, and to practice deforestation which dis-equilibriates the natural milieu. (Ponsart-Dureau, 1986, pp. 9–10 and 60)

Thus, in different ways, each of these analyses contributes to a narrative now as prominent in Kissidougou's education and administrative circles as it is in social science analyses. Once Kissidougou had an extensive forest cover, maintained under low population densities and by a functional social order whose regulations controlled and limited people's inherently degrading land and vegetation use. The breakdown of such organized resource management under internal and external pressures, combined with population growth, has led to the deforestation apparently so evident in the landscape today. Observers invariably consider degradation as a recent, ongoing, and aggravating problem. The social and economic changes are, like "runaway demography," always seen to be accelerating out from a "zero point." . . . A host of indicators is drawn upon to support ideas concerning recent and ongoing degradation, such as rainfall decline since the mid-1950s, the drying-up of certain water sources, and more.

Policy implications have followed logically from the assumptions contained and stabilized within this narrative and have changed little since its first elaboration in the early colonial period. The first policy emphasis is on the reduction of upland farming—seen as inherently forest and soil degrading and becoming more so under greater individualization and population growth—in favor of swamp farming. What upland use must remain needs to be rationalized and intensified (e.g., through "model" agroforestry systems, reorganization of tenure and fallow systems). Second, policies have focused on bush-fire control through externally imposed prohibitions, regulations, and practices (e.g., early-burning). Third, policies have attempted to control deforestation both through prohibitions on the felling of a list of protected tree species (largely those forest species commercially valuable for timber and most representative of the "original" forest cover) and through the reservation of certain forest patches. Fourth, there are attempts at forest reconstitution through tree planting in village territories. Uniting these policies is their recourse to technology "packages." . . . Uniting them, too, is their attempt to establish or reestablish control and organization in resource management; although with changes in development philosophy, there have been changes in the levels deemed appropriate. Thus, in Guinea's colonial and first republic periods, the degradation narrative justified removing the villagers' (dysfunctional, incapable) "control" over resources in favor of the state. In bush fire, upland use, timber felling, and forest reservation policies, government administrations took over resource tenure and regulated local use through permits, fines, and at times military repression. More recently, emphasis has shifted somewhat toward patching up, reconstituting, or replacing broken community control over resources. . . .

The Counternarrative

Examining how vegetation has actually changed in Kissidougou is a necessary first step in evaluating these social science analyses. Fortunately, a number of historical data sources make this possible. . . . Aerial photographs exist for Kissidougou which clearly show the state of the vegetation in 1952–53. These provide incontrovertible evidence that during this recent, supposedly most degrading period, the vegetation pattern and area of forest and savanna have in fact remained relatively stable. Changes which have occurred do not involve forest loss; rather, there are large areas where forest cover has increased and where savannas have become more, not less, woody. Forest islands have formed and enlarged, and in many areas, savannas evident in the 1950s have ceded to secondary forest vegetation.

To examine vegetation change further back, we reviewed descriptions and maps of Kissidougou's landscape made during the early French military occupation (roughly the 1890s to 1910), as well as indicators of past vegetation that emerge from oral history and accounts of everyday life in the youth of today's elderly people. These sources make clear that what was true for 1952–94 is equally true for 1893–1952. Moreover, villagers suggest, quite contrary to policy interpretations, that they established forest islands around their settlements and that it is their work which encourages the formation of secondary forest thicket in savanna. In 27 of the 38 villages we investigated, elders recounted how their ancestors had founded settlements in savanna and gradually encouraged the growth of forest around them.

Earlier documentary sources from the 1780s–1860s do not suggest extensive forest cover; indeed they suggest the opposite. Both Harrison, traveling to Kissi areas (c. 1780; see Hair, 1962), and . . . Seymour (1859–60), in Toma country southeast of Kissi, describe short-grass savannas and an absolute scarcity of trees in places which now support extensive dense humid forest. Sims (1859–60), speaking of the area just to the southeast (between Beyla and Kerouane) writes that "there are no trees; the whole country is prairie; for firewood the people have to substitute cow dung, and a kind of moss which grows abundantly in that country." This picture of less, not more, forest cover in the 19th century is supported by several sets of early oral history data. All the above villages claiming foundation in savanna were established during or before the 19th century. Several village foundation stories in the south refer to conflicts triggered by the scarcity of construction wood, seemingly bizarre given the present forest and thicket vegetation. . . .

It appears, therefore, that social science analyses in Kissidougou have been providing explanations for forest loss which has not actually been taking place. In doing so, they have supported a vegetation-change narrative quite at odds with—even the reverse of—more demonstrable environmental "facts." This casts

into question the relationships between society, demography, and environment valorized in these analyses. As we suggest now, there are other ways of conceiving of these relationships—counternarratives, if you will—which better fit and explain vegetation history as demonstrated. . . .

The first reconception involves recognizing that local land use can be vegetation enriching as well as degrading. It can (and often does) serve to increase the proportion of useful vegetation forms and species in the landscape according to prevailing local values and productivity criteria. This has often meant increasing the prevalence of forest forms in a once more savanna landscape. Thus, for example, villagers have encouraged the formation of forest islands around their villages for protection, convenient shelter for tree crops and sources of gathering products, and the concealment of ritual activities. They have achieved this both through everyday use of village margin land (for instance, in the thatch and fence-grass collection and cattle tethering, which reduce flammable grasses, and in the household waste deposition, which fertilizes the forest successions beginning to develop), as well as through deliberately applied techniques (such as planting forest-initiating trees and cultivating the margins to create soil conditions suitable for tree establishment). In addition, on the slopes and plateaux between forest islands, local farming and fire use practices tend to maintain existing woody cover and to upgrade soils and vegetation from savanna to forest conditions. Much farming is concentrated on land that farmers have improved, whether by long-term alterations to edaphic quality through habitation, gardening, and gardening-like cultivation or by shorter-term fallow improvement through intensive cattle grazing, seed-source protection, the multiplication of savanna trees from suckers, or distributing forest-initiating creepers. These forms of knowledge and practice are found among all of Kissidougou's ethnolinguistic groups. There seems little basis for distinguishing between "forest" and "savanna" people.

A related reconception concerns the character of natural resource management "organization." Environmental management in this region seems to depend—and always depended—less on community-level authorities and sociocultural organizations (which might be "threatened" by social change) than on the sum of a much more diffuse set of relations, a constellation more than a structure. Indeed, the maintenance of long-term productivity is in many cases built into short-term production patterns; whether carried out for oneself, one's household, or one's compound, these improvements frequently interact with others—spatially or temporally—so that the combined effect on resource enrichment is greater than the sum of their parts. Thus, the fires set in the early and mid dry season by hunters to clear small hunting grounds, and by others to protect property and fallows, create barriers to more devastating later fires; and the small tree crop plantations which people make and protect behind their kitchen gardens add to the creation of the village forest island. For much

"resource management" there is no need for village or higher-level management structures to "regulate degrading pressures." Nevertheless, village authorities do intervene in certain vegetation-influencing activities—e.g., in managing early-burning around the village, in protecting palm trees, in imposing cattle-tethering dates, and in coordinating the fallow rotations of farmers' contiguous plots in some Kissi areas. Village and higher-level organizations also exert control over external factors which influence the agricultural environment. . . .

In this context, socioeconomic change has been articulated in shifts in landscape enrichment priorities and in the composition of a continued resource management constellation. Villagers have, for example, adapted forest island quality to suit changing socioeconomic conditions and commercial signals—managing them as fortresses during precolonial warfare, extending them for coffee planting when this became profitable, and abandoning coffee in favor of fruit tree and gathering—product enrichment as prices fell again. Urban employment opportunities, youth emigration, and more individual economic opportunities have contributed to changes in farming organization, but today's smaller farm-households use and improve fallows as large compound ones did earlier, and modern women's individualized, commercial food cropping is concentrated in the forms of upland gardening that upgrade soils and vegetation (Leach and Fairhead, 1995). Village-level authorities have played a continuing, though shifting, role within this historically flexible and diverse management constellation. There have been many social and economic changes, and there are many new social and economic problems. But these changes are rendered visible in the landscape largely through changing land-use and management priorities, not through organizational "breakdown" and vegetation degradation.

Explaining demonstrable vegetation change also suggests relationships between demographic and environmental change very different from the "rapid population growth–deforestation" relationship upheld by the policy narrative. Despite the problems of reconstructing precolonial populations, evidence certainly does not support the idea of dramatic population growth or even steady one-way increase. Comparing census data suggests that Kissidougou's rural population has increased by only 70% since 1917. Growth pockets have been concentrated around Kissidougou town and major road axes, and in many areas population has remained almost stagnant. Precolonial evidence suggests that certain areas had early 19th century rural populations significantly higher than today and suffered radical depopulation during late 19th century wars . . .

In this context, Kissidougou's forest increase trends might be supposed to relate to population stagnation or decline. This reversed argument, however, still depends on the assumption that local land use tends to convert forest and forest fallows to savanna, and thus that more people means more forest loss. A counter-narrative better fits evidence of local land-use practices and vegetation history:

from an earlier situation of greater savanna extent, there has been a broadly positive relationship between the peopling of this region and its forest cover. First, as settlements are associated with the formation of forest islands, more villages mean more forest islands. This relationship has been modified by changes in population distribution and settlement patterns, with greater multiplication of settlements and forest islands during the 19th century, when dispersed settlement was a survival strategy, than in the 20th, when much population growth has been accommodated through the expansion of existing settlements, and indeed some consolidation linked to depopulation. Still, new settlements and forest formation have more recently been associated with the movement of village sites. Second, greater population density assists the control of fire, both by providing the necessary labor and by creating the demand, filling the landscape with more places (upgraded fallows, plantations, settlement sites) which people need to protect. In certain cases, the density of such protected sites of denser vegetation easily enables the entire exclusion of fire from the territory. The districts where upland savannas have recently ceded to dense forest fallow vegetation correlate broadly with the areas where population has grown. By contrast, low population densities make fire prevention impossible and are a major factor in the persistence of running fire in the north and of the particular "living with fire" management strategies used there.

Viewing people-environment relations in terms of landscape enrichment-through-use by a diverse resource management constellation responding to changing incentives thus better explains (provides a counternarrative which better fits) demonstrable vegetation and population history. Policies conceived within the degradation narrative have sometimes undermined these relations, as well as created more general problems for villagers. In removing local control over resources, they have sometimes interfered with local management of them. In the north, for example, external fire control and prohibition prevented villagers from operating their sequenced management-through-use strategies, forcing clandestine coping strategies and rendering village and plantation protection more difficult. Removal of local resource tenure has reduced villagers' abilities to profit from past enrichment activities (e.g., in selling their forest island trees for timber) and their incentives for further landscape enrichment. The implementation of repressive environmental policies has in effect taxed rural populations for supposedly harmful activities which were, in fact, benign or beneficial. More recent approaches, which focus on decentralizing resource control by establishing village-level organization and management plans, actually risk undermining the existing flexible, diverse constellation of resource management relations. When initiated by state agencies with considerable foreign support and presence and predefined ideas about environmental dynamics, real decentralization can be undermined. . . .

Vegetation history and its counternarrative of landscape enrichment entail different policy implications, emphasizing support to proven local practices and determinants of change. There are clearly many techniques and land uses that serve to increase forest cover and that could provide an effective basis for external support. In working with the local ecology of fire, soils, vegetation successions, and animal dynamics, these "integrated vegetation management" practices are more locally appropriate, integrated with the social matrix, and thus more cost-effective in terms of labor than are the forestry "packages" generally proposed by outside agencies. Given that farming in the region is not inevitably degrading, environmental policy may look to support as well as to "rationalize and regulate" agriculture, specifically to support those upland farming practices which improve soils and fallow vegetation rather than concentrate technical effort exclusively on swamps. Fundamentally, rather than increase external intervention in the organization of resource management within villages, the more important priority is to create the enabling policy and socioeconomic conditions in which local resource management constellations can act effectively. This implies a shift on the part of environmental agencies away from direction (through repression or organizational restructuring as in assisted "community control") toward recognizing and supporting the diverse institutions which are actually engaged in resource management and toward a more responsive role in providing requested services at the village level.

NOTE

1. This, like all subsequent quotations, has been translated from the original French by the authors.

REFERENCES

Chevalier, A., "Les bois sacrés des noirs de l'Afrique tropicale comme sanctuaires de la nature," *Revue de la Société de Biogéographie* (1933), pp. 3742.

Chevalier, A., "Rapport sur les nouvelles recherches sur les plantes a caoutchouc de la Guinée Française," 1G276 (Dakar: Archives du Senegal, 1909).

Fofana, S., Y. Camara, M. Barry, and A. Sylla, "Étude relative au feu auprés des populations des bassins versants types du Haut Niger: Monographies des Bassins Kan I, Kan II, Kiss II," Report (Conakry, République de Guinée: Programme d' Aménagement des Bassins Versants Haut Niger, 1993).

Green, W., "Lutte contre les feux de brousse," Report (Conakry, République de Guinée: Projet DERIK, Dévéloppement Rural Intégré de Kissidougou, 1991).

Hair, P. E. H., "An account of the Liberian Hinterland c. 1780," *Sierra Leone Studies*, n.s., Vol. 16 (1962), pp. 218–226.

Leach, M., and J. Fairhead, "Ruined settlements and new gardens: Gender and soil-ripening among Kuranko farmers in the forest-savanna transition zone," *IDS Bulletin*, Vol. 26, No. 1 (1995), pp. 24–32.

Ponsart-Dureau, M.-C., "Le pays Kissi de Guinée forestière: contribution a la connaissance du milieu; problematique de dévéloppement," Mémoire (Montpellier: École Supérieure d'Agronomie Tropicale, 1986).

Programme d'Aménagement des Bassins Versants Haute Guinb (Projet Kan II), "Plan d'opération," Report (Conakry, République de Guinée: Programme d'Aménagement des Hauts Bassins du Fleuve Niger, 1992).

Programme d'Aménagement des Hauts Bassins du Fleuve Niger, "Étude sociologique," Report (Conakry, République de Guinée: Programme d'Aménagement des Hauts Bassins du Fleuve Niger, n.d.).

Seymour, G. L., "The journal of the journey of George L. Seymour to the interior of Liberia: 1858," *New York Colonization Journal*, Vol. 9, No. 12; Vol. 10, Nos. 6 and 8 (1859–1860).

Sims, J. L., "The journal of a journey in the interior of Liberia by James. L. Sims, of Monrovia: Scenes in the interior of Liberia: Being a tour through the countries of the Dey, Goulah, Pessah Barlain, Kpellay, Suloang, and the King Boatswain's tribes, in 1858," *New York Colonization Journal*, Vol. 9, No. 12; Vol. 10, Nos. 6 and 8 (1859–1860).

Stieglitz, F. V., "Exploitation forestière rurale et réhabilitation des forêts: Premiers résultats d'un projet de recherche interdisciplinaire en Haute-Guinée (Janv.–Mai 1990, République de Guinée)," mimeo (Berlin, 1990).

Zerouki, B., "Étude relative au feu auprés des populations des bassins versants types du Haut Niger," Report (Conakry, République de Guinée: Programme d'Aménagement des Bassins Versants Types du Haut Niger, 1993).

4

Gender and Environment*

A Feminist Political Ecology Perspective

DIANNE ROCHELEAU, BARBARA THOMAS-SLAYTER, AND ESTHER WANGARI

The convergence of interest in environment, gender, and development has emerged under conditions of rapid restructuring of economies, ecologies, cultures, and polities from global to local levels. Global economic, political, and environmental changes have affected both men and women as stakeholders and actors in resource use and allocation, environmental management, and the creation of environmental norms of health and well-being. Some scholars and activists see no gender differences in the ways human beings relate to the environment, except as they are affected by the constraints imposed by inequitable political and economic structures. Others see the gendered experience of environment as a major difference rooted in biology. We suggest that there are *real*, not imagined, gender differences in experiences of, responsibilities for, and interests in "nature" and environments but that these differences are not rooted in biology per se. Rather, they derive from the social interpretation of biology and social constructs of gender, which vary by culture, class, race, and place and are subject to individual and social change.

In this volume, we explore the significance of these differences and the ways in which various movements, scholars, and institutions have dealt with gendered perspectives on environmental problems, concerns, and solutions. The major schools of feminist scholarship and activism on the environment can be described as

1. ecofeminist;
2. feminist environmentalist;
3. socialist feminist;
4. feminist poststructuralist; and
5. environmentalist.

Ecofeminists posit a close connection between women and nature based on a shared history of oppression by patriarchal institutions and dominant Western

* From Dianne Rocheleau, Barbara Thomas-Slayter, and Esther Wangari, eds., *Feminist Political Ecology: Global Issues and Local Experiences*. © 1996 by Routledge. Used by permission of Taylor & Francis.

culture, as well as a positive identification by women with nature. Some ecofeminists attribute this connection to intrinsic biological attributes (an essentialist position), while others see the women/nature affinity as a social construct to be embraced and fostered (Plumwood 1993; Merchant 1981, 1989; King 1989; Shiva 1989; Mies and Shiva 1994; Rocheleau 1995). Feminist environmentalism as articulated by Bina Agarwal (1991) emphasizes gendered interests in particular resources and ecological processes on the basis of materially distinct daily work and responsibilities (Seager 1993; Hynes 1989). Socialist feminists have focused on the incorporation of gender into political economy, using concepts of production and reproduction to delineate men's and women's roles in economic systems. They identify both women and environment with reproductive roles in economies of uneven development (Deere and De Leon 1987; Sen and Grown 1987; Sen 1994) and take issue with ecofeminists over biologically based portrayals of women as nurturers (Jackson 1993a, 1993b). Feminist poststructuralists explain gendered experience of environment as a manifestation of situated knowledges that are shaped by many dimensions of identity and difference, including gender, race, class, ethnicity, and age, among others (Haraway 1991; Harding 1986; Mohanty 1991). This perspective is informed by feminist critiques of science (Haraway 1989; Harding 1991) as well as poststructural critiques of development (Escobar 1995; Sachs 1992) and embraces complexity to clarify the relation between gender, environment, and development. Finally, many environmentalists have begun to deal with gender within a liberal feminist perspective to treat women as both participants and partners in environmental protection and conservation programs (Bramble 1992; Bath 1995).

We draw on these views of gender and environment to elaborate a new conceptual framework, which we call feminist political ecology. It links some of the insights of feminist cultural ecology (Fortmann 1988; Hoskins 1988; Rocheleau 1988a, 1988b; Leach 1994; Croll and Parkin 1993) and political ecology (Schmink and Wood 1987, 1992; Thrupp 1989; Carney 1993; Peet and Watts 1993; Blaikie and Brookfield 1987; Schroeder 1993; Jarosz 1993; Pulido 1991; Bruce, Fortmann, and Nhira 1993) with those of feminist geography (Fitzsimmons 1986; Pratt and Hanson 1994; Hartmann 1994; Katz and Monk 1993a, 1993b; Momsen 1993a, 1993b; Townsend 1995) and feminist political economy (Stamp 1989; Agarwal 1995; Arizpe 1993; Arizpe, Stone, and Major 1993; Thomas-Slayter 1992; Joekes 1995; Jackson 1985, 1995; Mackenzie 1995). This approach begins with the concern of the political ecologists who emphasize decision-making processes and the social, political, and economic context that shapes environmental policies and practices. Political ecologists have focused largely on the uneven distribution of access to and control over resources on the basis of class and ethnicity (Peet and Watts 1993). Feminist political ecology treats gender as a critical variable in shaping resource access and control, interacting with class, caste, race, culture, and ethnicity to shape processes of ecological change, the struggle of men and

women to sustain ecologically viable livelihoods, and the prospects of any community for "sustainable development."

The analytical framework presented here brings a feminist perspective to political ecology. It seeks to understand and interpret local experience in the context of global processes of environmental and economic change. We begin by joining three critical themes. The first is *gendered knowledge* as it is reflected in an emerging "science of survival" that encompasses the creation, maintenance, and protection of healthy environments at home, at work, and in regional ecosystems. Second, we consider *gendered environmental rights and responsibilities*, including property, resources, space, and all the variations of legal and customary rights that are "gendered." Our third theme is *gendered environmental politics and grassroots activism*. The recent surge in women's involvement in collective struggles over natural resource and environmental issues is contributing to a redefinition of their identities, the meaning of gender, and the nature of environmental problems.

Several common threads have run throughout the scholarship and the movements that address the convergence of gender, science, and environment, but common concerns have often been obscured by the distinct discourses of resistance, critique, and alternative practice. We draw the following points into a common perspective, and the authors pursue each of them in the case studies, as appropriate:

1. Women's multiple roles as producers, reproducers, and "consumers" have required women to develop and maintain their integrative abilities to deal with complex systems of household, community, and landscape and have often brought them into conflict with specialized sciences that focus on only one of these domains. The conflict revolves around the separation of domains of knowledge, as well as the separation of knowing and doing and of "formal" and "informal" knowledge.
2. While women throughout the world under various political and economic systems are to some extent involved in commercial activities (Berry 1989; Jackson 1985), they are often responsible for providing or managing the fundamental necessities of daily life (food, water, fuel, clothing) and are most often those charged with health care, cleaning, and child care in the home, if not at the community level (Moser 1989). This responsibility puts women in a position to oppose threats to health, life, and vital subsistence resources, regardless of economic incentives, and to view environmental issues from the perspective of the home, as well as that of personal and family health. This does not preclude women from engaging in economic interests but suggests that they will almost always be influenced by responsibilities for home, health, and—in many cases—basic subsistence.

3. Both health and ecology are amenable to feminist and alternative approaches to practice since they do not necessarily require special instrumentation but rather focus on the "objects" and experience of everyday life, much of which is available through direct observation (Levins 1989). While some aspects of health and ecology have become highly technical, there is much new insight and information to contribute to these disciplines that is still available to observation without specialized instruments beyond the reach of ordinary folk. There is also scope for a feminist practice of ecology that uses specialized tools differently and for different ends.
4. While formal science relies heavily on fragmentation, replication, abstraction, and quantification (Levins 1989), many women have cited the importance of integration and a more holistic approach to environmental and health issues (Candib 1995). Feminist scholars have shown that some women researchers in professional sciences have used distinct approaches based on skills acquired in their socialization as women (Keller 1984; Hynes 1989, 1991, 1992). On a more personal and everyday level, some grassroots women's groups have explicitly stated that "our first environment is our bodies" (Gita Sen, personal communication), calling for a more integrative approach to health, environment, and family planning in development, welfare, and environmental programs.
5. Most feminist or women's environmental movements have incorporated some or all of the elements of the feminist critique of science as summarized by Sandra Harding (1987). The five classes of critique address
    1. inequity of participation and power in science-as-usual;
    2. abuse and misuse of science on and about women;
    3. assumptions of value-free objectivity and universality in science;
    4. use of culturally embedded, gendered metaphors in scientific explanation and interpretation; and
    5. development of alternative ways of knowing and ways of learning based on everyday life, women's experience, and explicit statement of values.

Feminist political ecology addresses the convergence of gender, science, and environment in academic and political discourse as well as in everyday life and in the social movements that have brought new focus to this issue.

These sciences occur in several forms, from local environmental knowledge (for example, which plants can cure us and how we can protect them), to recent innovations (new techniques to manage soil, water, and trees; new ways to diagnose exposure to toxic chemicals), to research on the unknown (what is making us sick; or how we can maintain our forest plants in a changing landscape). These various sciences are practiced by diverse groups from rural herbalists and forest farmers to suburban residents, professional nurses, environmental engineers, urban residents, and factory workers. While there are many other axes of

difference that may shape peoples' experience and understanding of "environment" and their sciences of ecology, feminist political ecology focuses on gender, while including discussions of interactions with class, race, age, ethnicity, and nationality.

REFERENCES

Agarwal, B. (1991). "Engendering the Environment Debate: Lessons from the Indian Subcontinent," CASID (Center for the Advanced Study of International Development) Distinguished Lecture Series, Discussion Paper 8, Michigan State University.

———. (1995). *A Field of One's Own: Gender and Property in South Asia*, Cambridge: Cambridge University Press.

Arizpe, L. (1993). *Cultura y Cambio Global: Percepciones Sociales sobre la Desforestación en la Selva Lacandona*, Mexico, D.F.: Centro Regional de Investigaciones Multidisciplinarias, Universidad Nacional Autonoma de Mexico.

Arizpe, L., Stone, M. P., and Major, D. (eds.). (1993). *Population and the Environment: Rethinking the Debate*, Boulder, CO: Westview.

Bath, Paquita. (1995). Plenary Address and Comments, "Gender, Communities and Natural Resource Management," Annual Conference of the Center for Latin American Studies, University of Florida, Gainesville, Florida, March 29–April 1.

Berry, S. (1989). "Access and Control and Use of Resources in African Agriculture," *Africa* 59, 1:41–55.

Blaikie, P., and Brookfield, H. (1987). *Land Degradation and Society*, London: Methuen.

Bramble, B. (1992). Statement presented to the Earth Summit Meeting, on behalf of the National Wildlife Federation, Rio de Janeiro.

Bruce, J., Fortmann, L., and Nhira, C. (1993). "Tenures in Transition, Tenures in Conflict: Examples from the Zimbabwe Social Forest," *Rural Sociology* 58, 4:626–42.

Candib, L. (1995). *Family Medicine: A Feminist Perspective*, New York: Harper and Row.

Carney, J. (1993). "Converting the Wetlands, Engendering the Environment: The Intersection of Gender with Agrarian Change in The Gambia," *Environmental Geography* 69, 4:329–48.

Croll, E., and Parkin, D. (eds.). (1993). *Bush Base, Forest Farm: Culture, Environment, and Development*. London: Routledge.

Deere, C., and De Leon, M. (eds.). (1987). *Rural Women and State Policy: Feminist Perspectives on Latin American Agricultural Development*, Boulder, CO: Westview.

Escobar, A. (1995). *Encountering Development: The Making of and Unmaking of the Third World*, Princeton, NJ: Princeton University Press.

Fitzsimmons, M. (1986). *A New Environmental Politics?* Los Angeles: Graduate School of Architecture and Urban Planning, University of California.

Fortmann, L. (1988). "Predicting Natural Resource Micro-protest," *Rural Sociology* 54:357–65.

Haraway, D. (1989). *Primate Visions: Gender, Race. and Nature in the World of Modern Science*, New York: Routledge.

———. (1991). *Simians, Cyborgs and Women: The Reinvention of Nature*, London: Free Association.

Harding, S. (1986). *The Science Question in Feminism*, Ithaca, NY: Cornell University Press.

———. (1987). *Feminism and Methodology: Social Science Issues*, Bloomington: Indiana University Press.

———. (1991). *Whose Science? Whose Knowledge? Thinking from Women's Lives*, Ithaca, NY: Cornell University Press.

Hartmann, B. (1994). *Reproductive Rights and Wrongs: The Global Politics of Population Control and Contraceptive Choice*, New York: Harper.

Hoskins, M. (1988). *Restoring the Balance*, Rome: Food and Agriculture Organization.
Hynes, P. (1989). *The Recurring Silent Spring*, Tarrytown, NY: Pergamon.
———. (1991). *Reconstructing Babylon: Essays on Women and Technology*, Bloomington: Indiana University Press.
———. (1992). "The Race to Save the Planet: Will Women Lose?," *Women's Studies International Forum* 14, 5:473–78.
Jackson, C. (1985). *Kano River Project*, West Hartford, CT: Kumarian.
———. (1993a). "Doing What Comes Naturally? Women and Environment in Development," *World Development* 21, 12:1947–63.
———. (1993b). "Environmentalisms and Gender Interests in the Third World," *Development and Change* 24:649–77.
———. (1995). "From Conjugal Contracts to Environmental Relations: Some Thoughts on Labour and Technology," *IDS Bulletin* 26, 1:33–39.
Jarosz, L. (1993). "Defining and Explaining Tropical Deforestation: Shifting Cultivation and Population Growth in Colonial Madagascar (1896–1940)," *Economic Geography* 69, 4:366–79.
Joekes, S. (1995). "Gender and Livelihoods in Northern Pakistan," *IDS Bulletin* 26, 1:66–74.
Katz, C., and Monk, J. (eds.). (1993a). *Full Circles: Geographies of Women over the Life Course*, London and New York: Routledge.
———. (1993b). "Making Connections: Space, Place and the Life Course," in C. Katz and J. Monk (eds.), *Full Circles: Geographies of Women over the Life Course*, London and New York: Routledge.
Keller, E. F. (1984). *Reflections on Gender and Science*. New Haven, CT: Yale University Press.
King, Y. (1989). "Ecofeminism," in J. Plant (ed.), *Healing the Wounds*, Philadelphia: New Society.
Leach, M. (1994). *Rainforest Relations: Gender and Resource Use among the Mende of Gola, Sierra Leone*, Washington, DC: Smithsonian Institution Press.
Levins, R. (1989). "Toward the Renewal of Science," paper presented at the Marxism Now / Re-thinking Marxism Conference, University of Massachusetts–Amherst, November.
Mackenzie, F. (1995). "'A Farm Is Like a Child Who Cannot Be Left Unguarded': Gender, Land and Labour in Central Province, Kenya," *IDS Bulletin* 26, 1:17–23.
Merchant, C. (1981). "Earthcare: Women and the Environmental Movement," *Environment* 23, 5:6–13, 38–40.
———. (1989). *Ecological Revolutions: Nature, Gender, and Science in New England*, Chapel Hill: University of North Carolina Press.
Mies, M., and Shiva, V. (1994). *Ecofeminism*, London: Zed Books.
Mohanty, C. (1991). "Under Western Eyes: Feminist Scholarship and Colonial Discourses," in C. Mohanty, A. Russo, and L. Torres (eds.), *Third World Women and the Politics of Feminism*, Bloomington: Indiana University Press.
Momsen, J. (1993a). "Gender and Environmental Perception in the Eastern Caribbean," in D. G. Lockhart, D. Drakakis-Smith, and J. Schembri (eds.), *The Development Process in Small Island States*, London and New York: Routledge.
———. (1993b). "Introduction," *Geoforum* 16, 2:289.
Moser, C. (1989). "Gender Planning in the Third World: Meeting Practical and Strategic Planning Needs," *World Development* 17, 11:1799–1825.
Peet, R., and Watts, M. (1993). "Introduction: Development Theory and Environment in an Age of Market Triumphalism," *Economic Geography* 69:227–53.
Plumwood, V. (1993). *Feminism and the Mastery of Nature*, London and New York: Routledge.
Pratt, G., and Hanson, S. (1994). "Geography and the Construction of Difference," *Gender, Place and Culture* 1, 1:5–29.

Pulido, L. (1991). "Latino Environmental Struggles in the Southwest," Ph.D. diss., Department of Urban and Regional Planning, University of California, Los Angeles.

Rocheleau, D. (1995). "Gender and Biodiversity: A Feminist Political Ecology Perspective," *IDS Bulletin* 26, 1:9–16.

———. (1988a). "Gender, Resource Management and the Rural Landscape: Implications for Agroforestry and Farming Systems Research," in S. Poats, M. Schmink, A. Spring, and G. Garing (eds.), *Gender Issues in Farming Systems Research and Extension*, Boulder, CO: Westview.

———. (1988b). "Women, Trees and Tenure: Implications for Agroforestry Research and Development," in J. B. Raintree (ed.), *Land, Trees, and Tenure: Proceedings of an International Workshop on Tenure Issues in Agroforestry, May 1985*, Nairobi: International Council for Research in Agroforestry; Madison, WI: Land Tenure Center.

Sachs, Wolfgang. (1992). *The Development Dictionary: A Guide to Knowledge as Power*, London: Zed Books.

Schmink, M., and Wood, C. (eds.). (1987). *Frontier Expansion in Amazonia*, Gainesville: University Press of Florida.

———. (1992). *Contested Frontiers in Amazonia*, New York: Columbia University Press.

Schroeder, R. (1993). "Shady Practice: Gender and the Political Ecology of Resource Stabilization in Gambian Garden/Orchards," *Economic Geography* 69, 4:349–65.

Seager, J. (1993). *Earth Follies: Feminism, Politics, and the Environment*, London: Earthscan.

Sen, G. (1994). "Women, Poverty and Population: Issues for the Concerned Environmentalist," in L. Arizpe, M. P. Stone, and D. C. Major (eds.), *Population and Environment: Rethinking the Debate*, Boulder, CO: Westview.

Sen, G., and Grown, C. (1987). *Development, Crises, and Alternative Visions*, New York: Monthly Review Press.

Shiva, V. (1989). *Staying Alive: Women, Ecology and Development*, London: Zed Books.

Stamp, P. (1989). *Technology, Gender and Power in Africa*, Ottawa: International Development Research Center.

Thomas-Slayter, B. (1992). "Politics, Class and Gender in African Resource Management: The Case of Rural Kenya," *Economic Development and Cultural Change* 40, 4:809–28.

Thrupp, L. A. (1989). "Legitimizing Local Knowledge: From Displacement to Empowerment for Third World People," *Agriculture and Human Values* 6, 3:13–24.

Townsend, J. (1995). *Women's Voices from the Rainforest*, London: Routledge.

5

A View from a Point*

Ethnoecology as Situated Knowledge

VIRGINIA D. NAZAREA

In 1954, Harold Conklin wrote his dissertation on "The Relation of the Hanunuo Culture to the Plant World." In the same year, he introduced what he called "the ethnoecological approach" in a seminal paper that was to dismantle the dominant view on shifting cultivation as a haphazard, destructive, and primitive way of making a living. What came after, from the midfifties to the midseventies, was a testimony to the power of the idea that Conklin had unleashed (for useful reviews, see Hunn 1989; Ford 1978; Fowler 1977; Toledo 1992). The prefix "ethno-" came to denote not merely a localized application of a branch of study (for example, ethnobotany as the botany of a local group from an outsider's—that is, an investigator's—perspective) but also, following the works of Conklin (1954, 1961), Goodenough (1957), Frake (1962), Sturtevant (1964), and many others, a serious attempt toward the understanding of local understanding (the so-called native point of view) about a realm of experience. An explosion of research papers, not to mention entire programs at prestigious universities, systematically documented and analyzed folk classification and paradigms pertaining to plants, animals, firewood, soils, water, illness, and the human body until only the most incorrigible could remain unimpressed by the logic, complexity, and sophistication of local knowledge.

Anthropologists and nonanthropologists alike could not stop marveling at why, to use Brent Berlin's phrase, "non-literates 'know so much' about nature" (1992:5). This sense of amazement and perplexity has been pursued, broadly speaking, in two different directions. One, as exemplified by Conklin's original conception of ethnoecology, is to demonstrate Western scientific ignorance about other peoples' ways of thinking and doing and to point out its arrogance in dismissing anything that is different as being inferior. The other, as exemplified by the methodical investigation of Tzeltal ethnobotany by Berlin, Breedlove, and Raven (1974) is to cross-refer native systems of classification to the Western scientific tradition—in this case, the Linnaean taxonomic system—and to

demonstrate how native systems virtually match scientific taxonomies rank by rank, category by category.

Both approaches led to a qualitative leap in the way local knowledge is regarded, causing a radical shift in mindset from viewing native systems of thought as naive and rudimentary, even savage, to a recognition that local cultures know their plant, animal, and physical resources intimately and are expert at juggling their options for meeting day-to-day requirements and making the most of ephemeral opportunities. Ethnoscience introduced a methodological rigor and theoretical depth that had been quite unknown in past cataloguing of the local uses of biological resources. There is a difference between the two approaches, however, if not by intent then at least by implication. I would argue that the first approach places value on local knowledge by reference to its internal coherence and its environmental and sociocultural adaptiveness. In contrast, the second approach strives to demonstrate the primacy of perceptual universals in determining patterns of classification. In so doing, it subjects local knowledge to a test of legitimacy by measuring it against Western systems of classification and downplaying its adaptability to varying environmental demands and cultural dimensions that have shaped, and continue to shape, its many formulations.

The distinction between these two trajectories is not petty, and the problem needs to be discussed because of contemporary concerns about the representation of local knowledge and related issues of authorship, access, and control. These issues inform, or should inform, national, regional, and international negotiations about biodiversity and the commons and about self-determination and intellectual property rights, as well as our understanding of humans-in-environment. Gone are the simpler days when anthropologists could refer to their fieldwork sites as "my village" and speak authoritatively about "my people" or use Western systems of thought as the yardstick for everything that is good and beautiful and true. As Gary Lease perceptively noted,

> In our post-modern, post-Marxist world, class struggles no longer have anything to do with "truth," with "right" and "wrong," but rather only with the most profound level of ideological battles. . . . Such contests never result in victory, in completion, in closure. We will not "get the story right," regardless of the tendency of some scientists to proclaim final triumph. . . . Our many representations of nature and human are, in other words, always and ultimately flawed. . . . This, in turn, underlines the role of *power* in the contestation over what gets to count in any ruling narrative, and who gets to tell it. (1995:5)

There is another, related level in which the debate has been pursued, this time more openly. This concerns the question about whether systems of classification are intellectually driven, a natural panhuman response to being confronted by the chaos (Lévi-Strauss 1966) or the chunks of biological diversity (Berlin,

Breedlove, and Raven 1974), or motivated primarily by the utilitarian concerns of human beings as biological entities themselves who need to eat, sleep, keep warm, seek shelter, defend their plots, heal, and reproduce (Hunn 1982). Berlin made his position clear:

> One is not able to look out on the landscape of organic beings and organize them into cultural categories that are, at base, inconsistent with biological reality. The world of nature cannot be viewed as a continuum from which pieces may be selected ad libitum and organized into arbitrary cultural categories. Rather, groups of plants and animals present themselves to the human observer as a series of discontinuities whose structure and content are seen by all human beings in essentially the same ways, perceptual givens that are largely immune from the variable cultural determinants found in other areas of human experience. (1992:8–9)

As a counterpoint, Hunn's observation about the striking difference between the minimal classificatory effort directed by the Tzeltal to adult butterflies that do not significantly affect their livelihood, and the considerable attention—resulting in more complicated classificatory schemes—they devote to caterpillars that do, indicates that in fact other areas of human experience impact classification in quite significant and interesting ways (Hunn 1982).

Distinct, but in close affinity to the second position, is the emphasis on cultural relations that shape classifications—an argument espoused, for example, by Ellen (1993)—that also questions the disembodied universalist, intellectualist stance. In explaining his position, Ellen wrote,

> My own intellectual socialization within the British tradition of social anthropology had brought with it an empirical and sociological bias which militated against an approach which seemed to me to reduce "mundane" classifications to narrow intellectual conundrums to be solved through the application of formal mathematical, logical, and linguistic procedures, or which relegated their analysis to comparative and evolutionary speculation about general mental principles of classification or cognition. . . . Without denying the importance of these matters, my main theoretical concern has been with classifications as situationally adapted and dynamic devices of practical importance to their users, reflecting an interaction—though in a by no means self-evident way—between culture, psychology, and discontinuities in the concrete world; a lexical and semantic field firmly embedded in a wider context of beliefs and social practices. (1993:3)

My purpose in organizing the conference entitled "Ethnoecology: Different Takes and Emergent Properties" was not to add yet another dissenting voice to this venerable debate. To my mind, the main protagonists in this debate are trying to answer different questions, and, although much has been accomplished

in extolling local knowledge and paying respect to its authors, an inordinate amount of energy has already been devoted to arguing for the best possible answer—to "get the story right" once and for all—to sets of questions that are fundamentally different to start with. Berlin has focused his efforts on elucidating universals based on his premise that ethnobiological classification is perceptually driven, while Hunn, Ellen, and others are more concerned with how culture shapes cognition and mediates behavior. There is no reason why human beings cannot operate at both levels sequentially or even simultaneously, as, I think, perhaps they do. In the meantime, we may be missing the opportunity to move on and pursue other interesting directions, to connect intellectually with exciting dialogues within and outside anthropology, and to address real-world concerns that are larger than our limited, albeit intense, paradigms.

I believe it is time to reorient the conversation to focus on an important dimension that has largely been missed, a problem with which ethnoecology has great potential for productive engagement, both at the theoretical and at the applied level. I refer to the connection between plant classification, for example, and conservation of plant genetic resources, or between cultural conceptions of landscape and management of the commons. In short, it is time to turn our attention to the interface between cognition and action—or decision-making frameworks and behavioral outcomes—and the lenses and latitudes that shape and structure these interconnections. We can only begin to tackle this problem, however, if we shift our attention from relations of similarity or paradigmatic alliances captured by our neat but static taxonomic trees to relations of contiguity embracing both syntagmatic and diachronic flow.

In an earlier conceptual paper, Hunn referred to this distinction as the Image vis-à-vis the Plan and noted that while "cognitive anthropologists have made substantial progress in the analysis of cultural Image, of Image domains such as color, kinship relations, folk biological taxonomies, and folk anatomy, . . . what is lacking is an effective integration of our models of Image and of Plan" (1989:147). Such integration would enable us to link categories to strategies and decipher the "action plans" and "activity signatures" (Randall and Hunn 1984) embedded in each category—a crucial step in understanding the role of local knowledge in human-environment interaction. We may also recall that while Conklin applied linguistic analysis to the service of describing spheres of local knowledge or semantic domains, he never lost sight of linkages between cognition, decision making, and action, or the embeddedness of ethnoecological systems in the environmental and cultural matrix. Discussing the importance of the "cultural axis," for instance, Conklin emphasized that

> along the cultural axis, three distinctions are noted: technological, social, and ethnoecological. Technological factors refer to the ways in which the environment is artificially modified, including the treatment of crops, soils, pests, etc.

> In systems of shifting cultivation, these relationships are of primary importance and often exhibit great complexity. . . . Social factors involve the sociopolitical organization of the farming population in terms of residential, kin, and economic groups. These factors are usually well within the domain of anthropological interest. Ethnoecological factors refer to the ways in which environmental components and their interrelations are categorized and interpreted locally. Failure to cope with this aspect of cultural ecology, to distinguish clearly between native environmental categories (and associated beliefs) and those used by the ethnologist, can lead to confusion, misinformation, and the repetition of useless cliches in discussing unfamiliar systems of land use. (1961:60)

Incorporating contiguity and process as critical components of an engaged ethnoecology also moves us closer to a dynamic rather than monolithic ethnoecology that will admit the importance of ideological negotiation and positioning. No longer encumbered by the need to essentialize our native collaborators, or freeze their taxonomies—or artifacts thereof—in time and space, we can better appreciate how understanding is shaped by standing, as is disposition by position, in an internally differentiated hierarchy of social, economic, and political relations. We can weave into our analysis the history of asymmetric relations with reference to class, gender, and ethnicity, a history that is all too easy to forget if we confine our analysis to perceptual givens, but a history that cannot be finessed because it continues to shape the present. Current thinking in psychology supports the position that even perception is "intelligent"—that it is based on a mental template that incorporates experience and socialization and makes the interpretation of what is perceived a nonmechanical, nonrandom process (Banks and Krajicek 1991). Since it is impossible to maintain that the formation of our mental templates occurs in a social vacuum, the "programming," in a qualified sense, of perception by constraints imposed by our social niche makes rods-and-cones determinism untenable. D. W. Meinig, a noted geographer, actually preceded the psychologists in articulating this insight:

> It will soon be apparent that even though we gather together and look in the same direction at the same instant, we will not—we cannot—see the same landscape. We may certainly agree that we will see many of the same elements—houses, roads, trees, hills—in such denominations as number, form, dimension, and color but such facts take on meaning only through association; they must be fitted together according to some coherent body of ideas. Thus we confront the central problem: any landscape is comprised not only of what lies before our eyes but what lies inside our heads. (1979:33)

Many individuals in ethnoecology and related disciplines address such questions as these: How are folk (and scientific) models shaped, and for what ends?

Who defines niches for different groups? Why do cognitive maps vary? By what processes and means is knowledge "naturalized"? In other words, following Meinig, how does "what lies inside our heads" structure how we see and act upon "what lies before our eyes"? Ethnoecology, as the investigation of systems of perception, cognition, and the use of the natural environment, can no longer ignore the historical and political underpinnings of the representational and directive aspects of culture, nor turn away from issues of distribution, access, and power that shape knowledge systems and the resulting practices. In searching for answers and directions, we are guided by Bourdieu's admonition that the social scientist cannot operate under the illusion that he or she can ever hope to produce "an account of accounts," since "in reality, agents are both classified and classifiers": "But they classify according to (or depending upon) their position within classifications. To sum up what I mean by this, I can comment briefly on the notion of point of view: the point of view is a perspective, a partial, subjective vision. . . . But it is at the same time a view, a perspective, taken from a point, from a determinate position in an objective social space" (1987:2).

REFERENCES

Banks, W. P., and D. Krajicek. 1991. "Perception." *Annual Review of Psychology* 42:305–31.

Berlin, B. 1992. *Ethnobiological Classification: Principles of Categorization of Plants and Animals in Traditional Societies*. Princeton, NJ: Princeton University Press.

Berlin, B., D. E. Breedlove, and P. H. Raven. 1974. *Principles of Tzeltal Plant Classification*. New York and London: Academic Press.

Bourdieu, P. 1987. "What Makes a Social Class? On the Theoretical and Practical Existence of Groups." *Berkeley Journal of Sociology: A Critical Review* 31:1–18.

Conklin, H. 1954. "The Relation of Hanunuo Culture to the Plant World." Ph.D. diss., Yale University.

———. 1961. "The Study of Shifting Cultivation." *Current Anthropology* 2:27–61.

Ellen, R. F. 1993. *The Cultural Relations of Classification: An Analysis of Nuaulu Animal Categories from Central Seram*. Cambridge: Cambridge University Press.

Ford, R. I. 1978. "Ethnobotany: Historical Diversity and Synthesis." In *The Nature and Status of Ethnobotany*. R. I. Ford, ed. Anthropological Papers, Museum of Anthropology, University of Michigan, no. 67, pp. 33–49. Ann Arbor: University of Michigan Press.

Fowler, C. 1977. "Ethnoecology." In *Ecological Anthropology*. D. Hardesty, ed. New York: Wiley.

Frake, C. O. 1962. "Cultural Ecology and Ethnography." *American Anthropologist* 64:53–59.

Goodenough, W. H. 1957. "Cultural Anthropology and Linguistics." In *Report of the Seventh Annual Table Meeting on Linguistics and Language Study*. P. L. Garvin, ed. Washington, DC: Georgetown University Monograph Series on Languages and Linguistics.

Hunn, E. 1982. "The Utilitarian in Folk Biological Classification." *American Anthropologist* 84:830–47.

———. 1989. "Ethnoecology: The Relevance of Cognitive Anthropology for Human Ecology." In *The Relevance of Culture*. N. Freilich, ed. New York: Bergin and Garvey.

Lease, G. 1995. "Nature under Fire." In *Reinventing Nature? Responses to Postmodern Reconstruction*. M. Soule and G. Lease, eds. Washington, DC: Island.

Lévi-Strauss, C. 1966. *The Savage Mind*. London: Weidenfeld and Nicolson.

Meinig, D. W. 1979. "The Beholding Eye: Ten Versions of the Same Scene." In *The Interpretation of Ordinary Landscape*. Oxford: Oxford University Press.

Randall, R. A., and E. Hunn. 1984. "Do Life Forms Evolve or Do Uses for Life? Some Doubts about Brown's Universals Hypotheses." *American Ethnologist* 4:1–26.

Sturtevant, W. C. 1964. "Studies in Ethnoscience Transcultural Studies. Cognition." *American Anthropologist* 66:99–113.

Toledo, V. 1992. "What Is Ethnoecology? Origins, Scope, and Implications of a Rising Discipline." *Etnoecológica* 1 (1): 5–21.

6

Ethics Primer for University Students Intending to Become Natural Resources Managers and Administrators*

RICHARD J. MCNEIL

What Is Ethics?

"Ethics is a branch of philosophy concerned with morals (the distinction between right and wrong) and values (the ultimate worth of actions or things). It considers the relationships, rules, principles, or codes that require or forbid certain conduct" (Cunningham and Saigo 1990). Natural resources ethics and environmental ethics are subsets of ethics.

Some Ethical Theories

Stewards of natural resources and of aspects of our natural environment are likely to find (1) that they draw their own ethical conclusions from more than one source or ethical theory and that (2) members of the public with whom they interact in their professional work will also have drawn upon several different ethical theories or sources. Generally, ethical theories provide frameworks which help us to reach ethical conclusions in some consistent, logical, and defensible way. Clearly, it is useful to understand the basis both of one's own and of others' ethical arguments. The following materials draw mainly from Shannon (1987) in general construction and some details.

Consequentialism

Consequentialism, and its most common subtype, utilitarianism, analyze possible actions by asking "which possible action will (or would be expected to) bring about the most good (or happiness, or pleasure, etc.) for the most people"? This is closely related to economists' ideas of utility and can be traced back to Jeremy Bentham (1748–1842), who was both an economist and a philosopher (Becker and Becker 1992). A consequentialist might ask whether certain proposed hunting or fishing regulations might produce the greatest overall good for all affected

* From *Natural Resources and Environmental Issues 7*, art. 23 (1998): 141–146. Available at http://digitalcommons.usu.edu/nrei/vol7/iss1/23.

people. Would the consequences of allowing larger Canada goose harvests by native peoples in Canada offset the possible reduced recreational opportunity in the United States?

Rule-Based Theories

Rule-based theories specify obligations or duties; that is, they stem from rules. The "ethical act is one in which I meet my obligations, my responsibilities, or fulfill my duties. . . . Obligations and rules are primary" (Shannon 1987). Rule-based ethics often go by the awkward name deontological ethics (*deon* is Greek for "duty"). The Ten Commandments are the best example.

Rule-based ethics tend to have a clear and certain starting point but an insensitivity to consequences. I must tell the truth, even though it badly hurts a friend's feelings. I must report the law violation by the deer poacher whose family is truly hungry.

Rights-Based Theories

This set of theories begins with statements about rights (moral, not legal, rights) being entitlements to certain "social goods" simply because one is a human being (or as we will expand this term later, a being of a certain kind). One need not earn rights; they simply exist because we exist. The claims of individuals are central to rights-based moral theories, and it is common to find conflicts between claims of different individuals to rights. Do you have a moral right to cross my private property to reach otherwise inaccessible public land? May I defend my lambs against the depredation of your (our) public eagles or wolves? Do I have a moral right to "more important" (e.g., subsistence farming) withdrawal uses of water than does the city of Richville, which has a prior legal claim and is now using that water for lawns, golf courses, and car washes?

Intuitionism

Some people (all of us?) argue that sometimes we cannot cite rules or argue logically, but we "just know that something is the right thing (or the wrong thing) to do." One of the greatest difficulties we can encounter in a public forum is that this source of ethical judgment is not logical or susceptible to rational argument or discussion.

Virtue Ethics

Virtue ethics is a moral theory which bases right behavior on virtues, that is, on dispositions such as "courage, temperateness, liberality, magnanimity and

justice" (Becker and Becker 1992). Long lists of virtuous behaviors can be created as guidelines for virtuous acts.

We are all likely to find, or to know already, that we use (and that we "believe in") one kind of ethical theory primarily. But as we observe our own thinking processes more closely, we may be surprised to see ourselves moderating our primary stance by the use of a secondary theory. (I know that I am supposed not to lie, but the truth would hurt his feelings terribly.) And, as we continue to observe others' choices of actions, we can begin to see in their discussions that they are using, individually as well as within a community, several ethical theories.

Some Sample Ethical Concepts

As beginning students in moral philosophy, the tools that we need at first are mainly a vocabulary and an extended understanding of the meanings of concepts as used by writers in discussing ethics. The following concepts are typical of those encountered most frequently in discussions of, for example, environmental ethics and should present a short-cut into much of the relevant literature. Much of the following, where there is no citation, is drawn from Becker and Becker's (1992) *Encyclopedia of Ethics*.

Moral Considerability

Moral considerability refers to the questions of what people and what things have rights or to what things we must give moral consideration. What things can be treated simply as property or as objects and what ones deserve to be thought of in terms of the rightness and wrongness of our treatment of them? May I treat my dog or my horse in any way that I wish, or must I consider their interests? May I conduct classroom experiments on live animals without considering their welfare? May I hunt or fish or trap or cut down a tree as I please (within the law) and without regard to the possible feelings of those organisms?

Some people argue that only human beings are morally considerable; they deserve moral consideration; the treatment of other living things is only a matter of our preference, not of right or wrong. Leopold (1949) uses the example of slaves hanged by Odysseus after the Trojan Wars. The slaves were regarded solely as objects, and their treatment "only a matter of expediency, not of right or wrong."

Moral Agent

A moral agent is one who has the capacity to make decisions regarding the rightness or wrongness of one's proposed actions and to act upon those decisions.

A newborn baby cannot make moral decisions and so is not a moral agent. An adult human being living in a coma similarly is not a moral agent. But note that we (who are moral agents) nevertheless have obligations to those people. If I cannot act upon a decision that I might mentally be able to form, then I may not be a moral agent with regard to that particular question.

Moral Subject

Today we almost universally believe that all human beings are moral subjects. That is, the way that we treat each other person is a matter of rightness or wrongness. All people have interests and rights, and they should be subjects of our moral concern.

It is not so easy for us to agree what other (if any) things are moral subjects and thus deserve moral consideration.

Moral Community

Moral agents and moral subjects are often considered to be members of a moral community. But how large is that moral community? Besides human beings, do other beings have rights? If so, which beings? (And what rights?) Among the most frequent and most violently argued questions which wildlife biologists, and to a lesser extent fisheries biologists and foresters, encounter these days are those over the presumed rights of other beings and our obligations to treat those other beings as deserving moral consideration. How we treat them then is a question of right and wrong based on their moral standing; they are moral subjects.

How do we decide what are proper subjects of moral concern? One common set of arguments stems from the respects in which other beings resemble human beings. Are they alive? (Do we need to treat rocks and waterfalls with moral concern?) Do they have "interests," e.g., to remain alive? Perhaps plants qualify. Can they feel pain? (Are they "sentient"?) Perhaps most vertebrate animals would qualify under that standard. Can they think? Do they have intellects (e.g., whales, porpoises, squid)?

Animal-welfare and animal-rights groups such as PETA (People for the Ethical Treatment of Animals) tend to concentrate their arguments on mammals and birds. But we have also heard the emotional discussions about classroom dissections of frogs and other organisms. I remember very distinctly the clear discomfort of a student when an instructor dumped a seine-haul of fish before a class on the shore and unconcernedly began to lecture while the fish flopped around on the sand. I have before me as I write a wallet-sized card with the photo of a round goby, an exotic species rapidly spreading in the Great Lakes region since 1990. This University of Minnesota Sea Grant card advises fishers to "always dump

your bait bucket on land, never into the water." Are living fish moral subjects; are they members of our moral community? This is, I think, typical of the difficult questions that students and professionals in natural resources majors will need to deal with much more frequently than we did in the recent past.

Many people seem to include all vertebrate animals in their moral community; legal rights are often similarly defined. For example, at Cornell University "all vertebrate animals used for teaching, demonstration, or research at Cornell (including cold and warm vertebrates) are subject to protection by both federal and state laws" (OSP 1997).

Moral Extensionism

What we think of as the moral community seems to be growing rapidly larger. Extending rights to animals is often called zoocentrism, and to all living thing things, biocentrism. Some go further and speak for ecocentrism, the idea that all of nature has rights or, alternatively, that we have obligations to all of nature.

This expansion of our moral community was proposed by Leopold (1949) in his discussion of a "land ethic." By "land" he meant not only the surface of the earth but all of the plants and animals, the ecosystems, the natural processes occurring there. Leopold suggested that stages in our ethical development included (1) the personal (I must not steal from you), (2) the relation between an individual and her community (I must pay just taxes; I must participate in civic activities) and (3) our relationship with the land. Rather than seeing land as only property and entailing no rights or obligations, we need to see it as a community of which we are a part and which requires moral consideration. Although Leopold did not speak much of an international community or of the long-term future, as an ecologist he surely would include them in his moral community. Astronomer Carl Sagan would extend the moral community still further: "The cognitive abilities of chimpanzees force us, I think, to raise searching questions about the boundaries of the community of beings to which special ethical considerations are due, and can, I hope, help to extend our ethical perspectives downward through the taxa on Earth and upwards to extraterrestrial organisms, if they exist" (Wilson 1997).

Many other concepts could be defined and discussed here, but that is the reader's job. Your primer will be different from mine, but no doubt we will both include ideas such as rights, obligations, autonomy, intrinsic value, reverence for life, and many others.

Moral Dilemmas

Moral dilemmas (if they occur at all; some say that there is no such thing) are situations in which there is a conflict between two right things to do, not between

a right and a wrong choice. And the need to choose one action over another results in a morally difficult situation.

Kidder (1995) argues that there are four common types of moral dilemmas:

1. Between truth and loyalty
2. Between the individual and the community
3. Between short-term and long-term interests
4. Between justice and mercy

Dilemmas between Truth and Loyalty

I probably have no moral dilemma when my brother asks me how I like his new necktie. I can gently break the news to him with a minimally stated truth. But a critically injured mother who asks about her baby's welfare, when the baby has just died in an accident, may present me with a dilemma.

I may have discovered the first cattle egret to be seen in Michigan (McNeil, Janson, and Martin 1963). When I went to a university museum and asked to see some study skins, the curator's first response was to ask me where I had seen the bird. Knowing that his intent was to collect the bird with a shotgun, I refused to tell him (until a few months later); I gave him only a general and perhaps misleading reply. This may have been a genuine dilemma: Did I have an obligation as a scientist to reveal the location of the bird? Did I have an obligation to protect the only known individual of its species ever to be found in the state from a would-be predator?

Dilemmas between the Individual and the Community

We all know of the classic cases where refugees are hiding from a despotic regime, and a mother smothers her coughing baby to avoid discovery of the group. If we have extended our moral community to include individuals and populations of wild organisms, related questions arise. Should we capture the last few members of an endangered species in hopes that captive breeding programs will generate a viable population? Should wild horses be killed if they become so numerous as to damage seriously the range where they are resident? Should fish-eating cormorants be slaughtered for the benefit of trout fishermen around Lake Ontario? Should individual oiled birds be rehabilitated at great expense when those resources used in different ways might have important positive effects on habitat for the same species?

Some of the most difficult discussions between animal-rights activists and wildlife managers occur because the former tend to look at the rights of the individual and have a limited regard for the more abstract ideas of population health and habitat conditions, while the biologists thinks mainly in terms of the larger

units and tend to be less careful about the way they choose to treat individual animals—the orphan deer, the trapped coyote, the caged experimental animal.

Dilemmas between Short-Term and Long-Term Interests

Deer hunters like to have lots of animals around. In some places, winter feeding programs to reduce starvation have resulted in long-term damage to habitat from overpopulations of deer brought about by those "artificial feeding" programs. Similarly, hatchery-raised trout and game-farm-raised pheasants may provide more animals for our short-term recreational interests but negative effects on the qualities of the wild stocks of animals. The masses of snow geese that the bird watcher loves to see in their wintering areas in the U.S. are now causing long-term damage to their nesting grounds in northern Canada.

Dilemmas between Justice and Mercy

These possible dilemmas seem mostly to deal with human beings. Examples in environment include, If we say that animals have rights, how should we deal with sick or injured and dying individual animals? Does the dying pheasant that I find at the edge of a marsh deserve to be left alone and to die "naturally" or to be killed quickly and thus to avoid extended pain? Or is this a matter of no moral question at all? . . . By our actions or our inactions we express our choices; if we have been dealing with a true dilemma, it is appropriate that we feel a little bit uncomfortable with our choice of action.

Some Summary Points

Regarding Ethics

1. There is no one uniform "god-given" system of ethics to which all knowledgeable philosophers subscribe and from which they derive their positions about right and wrong behaviors.
2. Many people take and argue ethical positions without much prior reflection or understanding of the implications of their positions. (And they may not know that they are making moral statements, or they think that they are when, in fact, they are not.)
3. It is possible to start from quite different presumed sources of ethics or to use quite different moral theories and to come out with logically defensible positions which are quite similar.
4. It is possible for two philosophers working from the same moral theory to come out with quite different positions about the rightness or wrongness of an act.

5. The world is complex; morally charged situations are complex. It is often a genuine advance to have simply identified and considered the moral aspects of a situation without unduly worrying about whether one's decision is the best possible in the sense of rightness or wrongness.
6. Genuine dilemmas arise and exist.
7. Some management problems and some policy problems do not have important ethical content.

Regarding How We Deal with Ethical Questions

1. We can all become deeper in our understanding and more skilled in our ways of dealing with ethical dimensions of our work.
2. Personal work plus occasional consultation with trained philosophers will help us to reach fairly quickly and easily a level of understanding which will make us capable of using ethical tools in our student, faculty, and professional career activities.
3. A little patience and considerable humility are in order when we discuss these deep and complex issues with trained philosophers (who, alas, are also deeply trained and experienced in, and perhaps genetically selected for, argumentation). Their work is important, and knowing how to ask for and use their help should be high on our list of how to deal with questions of ethics.

LITERATURE CITED

Becker, L.C., and C.B. Becker (ed. and assoc. ed.). 1992. Encyclopedia of ethics (2 vols.). Garland, New York.

Cunningham, W.P., and B.W. Saigo. 1990. Environmental science: A global concern. Wm. C. Brown, Dubuque, IA.

Kidder, R. 1995. How good people make tough choices. Fireside Books, Simon & Schuster, New York.

Leopold, A. 1949. A Sand County almanac. Oxford University Press, Oxford. Ballantine Books Ed. 1970.

McNeil, R.J., V. Janson, and F.R. Martin. 1963. Occurrence of the cattle egret in Michigan. Jack Pine Warbler 41 (2): 61.

OSP (Office of Sponsored Programs, Cornell University). 1997. Care and use of animals at Cornell University. Office of Sponsored Programs Newsletter (Cornell University) 16 (6): 1.

Shannon, T.A. 1987. An introduction to bioethics (2nd ed.). Paulist Press, New York.

Wilson, P. 1997. Carl Sagan speaks out on animal rights. AnimaLife 7 (2): 1, 19.

This page intentionally left blank

SECTION 2

What Does Population Have to Do with It?

What is the relationship between population growth and resource scarcity? How do human population dynamics influence environmental processes? And how do natural systems affect human demographic patterns, in turn? How does demography (the study of human populations, which tracks such characteristics as birthrates, death rates, marriages, and migration) inform environmental studies? How many people can the earth support? And, as the mathematical biologist Joel Cohen asks (2011), are increases in population, material consumption, and waste generation compatible with hopes for universal human health and dignity, environmental quality, and freedom from poverty? This section explores the links between demographic and environmental change, beginning with a review of a popular 18th-century theory on population and environment.

In the late 1700s, the English Reverend Thomas Malthus predicted a grim future in which human population growth would outstrip the environment's capacity to produce food. According to Malthus (1798), the resulting economic strains and environmental deterioration would necessitate a return to subsistence-level conditions, cause social disintegration, and ultimately lead to chaos; in a nutshell, Malthus predicted that population growth would inevitably bring about food shortage and an end to the civilized world as we know it. Cohen writes in *How Many People Can the Earth Support?* that "Malthus has been wrong for nearly two centuries" (1995: 429). This is, of course, because—writing as he did, prior to the invention of electricity, let alone the development of hormonal birth control, nitrogen fertilizers, pesticides, and mechanized agriculture—Malthus could not possibly foresee that government policies, economic development, and advances in education and technology would one day lead to a situation in which agricultural output actually outpaces human food needs. Truly, this is the present situation and, as the Nobel Prize–winning economist Amartya Sen has shown (1981), modern-day famines are due to political and economic inequalities that have very little to do with overall food supply. Indeed, the Bengal famine of 1943, which killed as many as three million people in British India, occurred during a year in which the per capita availability of rice and wheat was actually higher than in previous years on record. "Starvation," Sen explains, "is the characteristic of some people not *having* enough food to eat. It is not the characteristic of there not *being* enough food to eat. While the latter can be the cause of the former, it is but one of many causes" (1981: 1).

In the two hundred years since Malthus's thesis was published, researchers have continued to ponder the link between environmental resources and human population. Invoking the ghost of Malthus, the American biologist Paul Erlich published *The Population Bomb* in 1968. This best-selling book warned readers of impending mass human starvation and urged that immediate actions be taken to curb population growth. Though Erlich's work has been criticized as alarmist and though his predictions did not come to fruition, his writing helped reignite public interest in issues of population growth, food production, and the environment. For the first time in recent history, people began considering that the earth might have a finite carrying capacity. Following the release of the *Population Bomb*, the Club of Rome issued its World Model predicting an "overshoot" of global carrying capacity within one hundred years (Meadows et al. 1972). The Club of Rome's *Limits to Growth* study was the first effort by scientists to model the environmental effects of population growth using computer-based simulations. It combined different countries' population and resource data into a single global aggregate. In so doing, it glossed over the nuances of multinational capital, and in the tradition of Malthus, it made no room for technological advance (Taylor and Buttel, chapter 19 in this volume). In general, efforts to study the relationship between demographic patterns and environmental change tend to reduce environmental change (as well as economic growth) to a mere function of population growth (de Sherbinin et al. 2007).

Yet there is more to population than simply size and growth. Other population variables include age and sex composition, migration, and mortality and morbidity. Increasingly, population researchers are taking an interest in individual actors and considering how cultural variables—including consumption levels, local knowledge, technology, and structural relationships—are related to environmental change (de Sherbinin et al. 2007; Kertzer and Fricke 1997). The following quotation from a 2007 article by Alex de Sherbinin et al. eloquently captures this point: "Fortunately, a growing number of natural scientists are beginning to appreciate that humans interact with the environment in more ways than their raw numbers often imply. Populations are composed of people who collectively form societies, and people and societies cannot easily be reduced to food and material demands that result in some aggregate impact on the environment. . . . This makes human societies at once messy for modeling and fascinating to study" (2007: 363).

As Tom Fricke (1997) explains, and as the chapters in this section echo, anthropology's contribution to demographic studies is to show how culture and daily life experiences provide the context in which people make the decisions and choices that shape broader population and environmental changes. Speaking generally about "global carrying capacity" or "global environmental problems" ignores the great variability of human ecosystems as well as the fact that

both within and across populations, people contribute differently to environmental change.

The basis for a broader demographic approach in anthropology can be found in Ester Boserup's renowned theory of agricultural intensification, summarized by David Grigg. Boserup "shook up research practice" in the 1960s and '70s by posing a model of agricultural intensification and population growth that countered the neo-Malthusian and other prevailing ideas of the time (Turner and Fischer-Kowalski 2010: 21963). Her thesis, that increases in population density promote agricultural intensification, essentially reversed the causality in Malthus's hypothesis. According to Boserup, rising population and land pressure can inspire technologies and management strategies—adding labor and inputs and decreasing fallow periods, for example—that increase production without bringing additional land under cultivation. Boserup's work has influenced the research of agricultural ecological anthropologists such as Robert McC. Netting (chapter 2) and speaks to some of the questions of economic development that are raised in section 3.

Related to Malthus's thesis of population growth and environmental scarcity is Garret Hardin's "Tragedy of the Commons" (1968). Hardin was an American ecologist who viewed all humans as "rational maximizers." That is, Hardin imagined that people were always looking out for "number one" and making decisions at the expense of others in the group and at the expense of the environment. As Hardin saw it, the tendency for humans to self-maximize would undermine any common property system. Reviewing Hardin's thesis, Jim Igoe provides a useful example: "If herders hold an area of pasture in common, then everyone will keep the maximum number of cattle on the pasture, even if it means that [the pasture] is destroyed, and thus benefits no one" (2004: 55). Igoe goes on to explain that even though Hardin's *Tragedy* was published in the reputable *Science* magazine, "it contains not one shred of empirical data": "So numerous were empirical studies disproving the 'Tragedy of the Commons' that Hardin ultimately conceded that he wasn't talking about any particular real life situation, but a 'hypothetical commons,' which was 'unmanaged under conditions of scarcity' (Hardin 1993: 178–179). This is little better than saying that the 'Tragedy of the Commons' was something that he made up out of his own head" (56).

Still, Hardin's ideas—like the ideas of Malthus and the Club of Rome—continue to influence political thinking and to shape international development policies and conservation strategies in the present day. In the next chapter, Fikret Berkes, David Feeny, Bonnie J. McCay, and James M. Acheson visit a handful of cases in which communities dependent on common-property resources have defied Hardin's predictions by restricting access and establishing rules for sustainable use. In evaluating "the benefits of the commons," Berkes et al. identify

four shortcomings in Hardin's theory that account for the many exceptions they describe.

While we can continue to challenge neo-Malthusianism and question Hardin's thesis, one thing that is not up for debate are the raw numbers: global population is growing at an extraordinary rate. In the next chapter, David Bloom reminds readers that the past two hundred years have witnessed an unprecedented, exponential growth in human population. It took all of human history—from approximately two hundred thousand years ago until around 1800 CE for the world population to hit one billion. We passed the two billion mark around 1925. Less than one hundred years later, we have surpassed seven billion. Scientists predict that if population growth continues at this rate, we could surpass the ten billion mark as soon as 2050; by 2100, we could be as many as fifteen billion. Whether this rapid growth will detonate a population bomb, trigger a Malthusian collapse, or induce intensification and technological innovation remains to be seen, but we can make educated guesses informed by the growing body of population-environment literature.

In the chapter that follows, Alex de Sherbinin and coauthors review several decades' worth of scholarship exploring the relationships among rural household demographics, livelihood strategies, and environmental change. In describing several demographic variables that play into humans' livelihood strategies and dependence on natural resources, de Sherbinin et al. go beyond monocausal theorizing about the singular effect of population growth on environmental change. Population characteristics reviewed in this chapter include the basic demographic variables of fertility, migration, morbidity and mortality, and life cycle (or age and sex composition), as well as other contextual features including land-tenure security and the location of households relative to markets and services. In addition to these many household demographic variables, recent work on population and environment has also incorporated biophysical variables (such as forest cover, coastal mangroves, and soil quality), as well as information on natural resources (including firewood, timber, nontimber forest products, bushmeat, and water). The work summarized by de Sherbinin et al. speaks to the growing body of interdisciplinary scholarship on coupled human and natural systems (CHANS). CHANS research understands that human-environment relations are reciprocal, rather than unidirectional. Research on CHANS takes advantage of new data sources, including georeferenced biophysical and household survey data, and new analytical tools, including remote sensing, geographic information systems (GIS), and agent-based modeling (de Sherbinin et al. 2007). As the authors themselves state, "in studying the connections between humans and their environment, one is really studying *everything*" (de Sherbinin et al. 2008: 49).

The chapter that follows takes up the issue of carrying capacity. Its author, Lisa Cliggett, draws on ethnographic examples from a multigeneration study

in Zambia to show how humans creatively navigate what some observers might consider to be ecosystem limits. These findings suggest, as Cliggett says, that resource scarcity "does not limit Gwembe populations' ability to survive, . . . at least not yet." Even so, Cliggett approves of carrying capacity as a "folk model"—that is, a nonscientific explanation of phenomena. Though carrying capacity offers a flawed view of the interrelationships between humans and ecosystems, Cliggett contends that it succeeds in providing "a general framework for asking more important questions."

In this section's final chapter, Simon Dalby contends with an example of contemporary neo-Malthusian thinking: a 1994 cover story in the *Atlantic Monthly* called "The Coming Anarchy." Authored by Robert Kaplan, this article is evidence of the enduring appeal of Malthus's thesis, but with a modern twist: spurred on by increases in population, "environmental degradation may well lead to war" (Dalby 2002: 30). Accordingly, as Dalby explains, Kaplan's thesis is a highly visible example of a larger policy discourse on the topic of "environmental security." Since the article's publication, Kaplan has gone from a travel writer and war correspondent to a member of the Defense Policy Board (an advisory committee to the U.S. Department of Defense), a consultant to multiple branches of the U.S. armed forces, and a senior fellow at the Center for a New American Security. In evaluating Kaplan's most influential publication, Dalby identifies some of the assumptions behind "The Coming Anarchy"—namely, that Kaplan falsely depicts a "bifurcated world," that he ignores the persistent legacy of colonialism, that he overlooks the global causes of local social and environmental problems, and that he pays surprisingly little attention to food production or to the reasons for human migration. As Dalby considers the practical and moral implications of Kaplan's text, the chapter serves both as this section's ethical and its polemical reading.

REFERENCES

Cohen, Joel E. 1995. *How Many People Can the Earth Support?* New York: Norton.

Cohen, Joel E. 2011. Seven Billion. *New York Times* (October 23, 2011). http://www.nytimes.com/2011/10/24/opinion/seven-billion.html?pagewanted=all.

Dalby, Simon. 2002. *Environmental Security*. Minneapolis: University of Minnesota Press.

de Sherbinin, Alex, David Carr, Susan Cassels, and Leiwen Jiang. 2007. Population and Environment. *Annual Review of Environment and Resources* 32:345–373.

de Sherbinin, Alex, Leah K. VanWey, Kendra McSweeney, Rimjhim Aggarwal, Alisson Barbieri, Sabine Henry, Lori M. Hunter, Wayne Twine, and Robert Walker. 2008. Rural Household Demographics, Livelihoods, and the Environment. *Global Environmental Change* 18:38–53.

Ehrlich, Paul R. 1968. *The Population Bomb*. New York: Ballantine Books.

Fricke, Tom. 1997. Culture Theory and Demographic Process: Toward a Thicker Demography. In *Anthropological Demography: Toward a New Synthesis*. David I. Kertzer and Tom Fricke, eds. Pp. 250–280. Chicago: University of Chicago Press.

Hardin, Garrett. 1968. The Tragedy of the Commons. *Science* 162:1243–1248.

Hardin, Garrett. 1993. *Living within Limits: Ecology, Economics, and Population Taboos*. New York: Oxford University Press.

Igoe, Jim. 2004. *Conservation and Globalization: A Study of National Parks and Indigenous Communities from East Africa to South Dakota*. Belmont, CA: Thomson/Wadsworth.

Kertzer, David I., and Tom Fricke. 1997. Towards an Anthropological Demography. In *Anthropological Demography: Toward a New Synthesis*. David I. Kertzer and Tom Fricke, eds. Pp. 1–37. Chicago: University of Chicago Press.

Malthus, Thomas R. 1978. *An Essay on the Principle of Population as It Affects the Future Improvement of Society*. London: Johnson.

Meadows, Donella H., Dennis L. Meadows, Jørgen Randers, and William W. Behrens III. 1972. *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books.

Sen, Amartya. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford: Oxford University Press.

Turner, B. L., II, and Marina Fischer-Kowalski. 2010. Ester Boserup: An Interdisciplinary Visionary Relevant for Sustainability. *Proceedings of the National Academy of Sciences* 107 (51): 21963–21965.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 7: "Ester Boserup's Theory of Agrarian Change: A Critical Review" by David Grigg

1. According to Grigg, how does Esther Boserup define *intensification*?
2. How does intensive agriculture differ from extensive agriculture? How does this inform Boserup's thesis?
3. How do the implicit assumptions identified by Grigg support or hinder Boserup's argument?

Questions to Accompany Chapter 8: "The Benefits of the Commons" by Fikret Berkes, David Feeny, Bonnie J. McCay, and James M. Acheson

1. How do Berkes et al. define *common property* (or *common pool*) *resources*?
2. What types of property-rights regimes do they identify?
3. Considering the authors' definition of *common pool resources* and their taxonomy of property-rights regimes, why do Berkes et al. disagree with Hardin's assertion that "resource degradation is inevitable unless common property is converted into private property or government regulations are implemented"?
4. What specific evidence supports their challenge to Hardin's model?

Questions to Accompany Chapter 9: "7 Billion and Counting" by David Bloom

1. How has the pace of human population growth changed since 1800?
2. What are some of the different population projections for 2050 and 2100? What could possibly account for the variation in these projections?
3. What percentage of the projected population increase is predicted to occur in "less developed regions"? What could account for the variation in population growth between "more developed" and "less developed" regions?
4. What could account for the variation in growth rates within a single geographic region, such as Asia, Africa, or Latin America?
5. How might we bring the projections that Bloom mentions into conversation with the subsequent sections in this reader that are oriented around the topics of urbanization, economic growth, international development, globalization, identity, consumerism, and natural resources conservation?

Questions to Accompany Chapter 10: "Rural Household Demographics, Livelihoods, and the Environment" by Alex de Sherbinin, Leah VanWey, Kendra McSweeney, Rimjhim Aggarwal, Alisson Barbieri, Sabine Henry, Lori M. Hunter, Wayne Twine, and Robert Walker

1. What is a *household*?
2. What is the *livelihood approach*, and how are households incorporated into this organizing framework for studying human-environment relationships?
3. What categories of wealth, or forms of capital, do de Sherbinin et al. identify in their review of the population-environment research?
4. How do these various forms of capital play into the relationships between environmental change and (a) fertility, (b) morbidity and mortality, (c) migration, and (d) household life cycle?
5. Why, according to de Sherbinin et al., is it important to pay attention to *rural* smallholders when studying household population dynamics, livelihoods, and environmental change?

Questions to Accompany Chapter 11: "Carrying Capacity's New Guise: Folk Models for Public Debate and Longitudinal Study of Environmental Change" by Lisa Cliggett

1. What is *carrying capacity*?
2. What eight problems does Cliggett identify with the carrying capacity concept?
3. Why, in spite of these problems, does Cliggett still assert that carrying capacity is useful as a folk model?

Questions to Accompany Chapter 12: "The Environment as Geopolitical Threat: Rereading Robert Kaplan's 'Coming Anarchy'" by Simon Dalby

1. Under what conditions did the "conception of 'population' as an object to be controlled, manipulated, and managed by states" develop?
2. When Kaplan's article was published in 1994, what was "new" about it, relative to other theses on environmental security? Is this new component to the argument still relevant?
3. What were/are the political implications of Kaplan's argument?
4. How might we bring Dalby's critique of Kaplan's "The Coming Anarchy" into conversation with Netting's description of innovative, sustainable smallholders (chapter 2) and Johnson's aversion to binarism (chapter 29)?
5. What did Matthew Connelly and Paul Kennedy do in their article in *Atlantic Monthly* that Kaplan did not? How does this lead them to a more optimistic conclusion than Kaplan's?
6. What is *ethnocentrism*? How is Kaplan's argument ethnocentric, according to Dalby? How does the concept of ethnocentrism relate to the concept of American exceptionalism? And how do these two concepts affect our understanding of international development?

7

Ester Boserup's Theory of Agrarian Change*

A Critical Review

DAVID GRIGG

There is a long-established if minor tradition in economic writing which argues that not only does population growth cause economic improvement but that without such a spur human society would remain culturally and economically stagnant. . . . The theory of agricultural development put forward by Ester Boserup is far more subtle and complex than that of any of her predecessors, for she sees population pressure as a major cause of change in land use, agricultural technology, land tenure systems, and settlement form. Population growth, she argued, is independent of the food supply; indeed, rather than increase being a result of increased agricultural output, it is a cause of changes in agriculture. The principal means of increasing agricultural output is intensification. . . . Any given area will go through a series of stages of increasing land use intensity under the spur of population growth. . . . When population densities are low, little of the total area is cropped, and land which has been cropped for one or two years is left to revert to long periods of natural fallow. But as population density rises, so the period under crops increases and the length of the fallow has to be shortened. In the final stage not only is there no fallow, but more than one crop is sown on each unit of land in a year. But although *total* output increases as the frequency of cropping rises, output *per head* declines. Output per head is highest in the most extensive system of land use, lowest in the most intensive. It follows from this that cultivators will only give up an extensive system, in which they obtain an adequate output and maximize their leisure, when population growth requires a greater total output, which they obtain by intensifying land use. The transition from shifting cultivation, or forest fallow, to bush fallowing is prompted by falling crop yields; the reduction of the fallow also requires extra weeding and the collection of manure to maintain fertility. This increased effort is not compensated for by a proportional increase in output, so that output per man falls. A similar increase in labor inputs accompanies the transition from bush fallow to short fallow, from short fallow to annual cropping, and finally from annual to multicropping. Changes in the frequency of cropping also require

* From David Grigg, *Progress in Human Geography* 3, no. 1 (1979): 64–84. Used by permission of SAGE Publications.

changes in technology; the hoe replaces the digging stick, and later the plough ousts the hoe. Changes in land tenure and settlement patterns are also caused by population growth and the reduced length of the fallowing: from shifting to permanent settlements, and from communal tenure to individual ownership. However, although output per head normally declines as population densities increase, Mrs. [*sic*] Boserup believes that economic growth is possible within traditional agriculture. The progressively more intensive methods adopted require longer and more regular hours to be worked, and this, it is claimed, makes labor more efficient, whilst denser populations allow a region to benefit from the division of labor and the economies of scale.

These points are of course made in far more detail in Mrs. Boserup's book. Some require elaboration here. Further, some implicit assumptions made in the book need to be made explicit.

1. Population growth is taken as a given. Mrs. Boserup notes that the rapid population growth in the less developed countries since 1945 is due to the spread of improved medicine and not to increases in the food supply. It may be then, she suggests, that population growth in the past was independent of the food supply. Population growth in preindustrial societies has always been slow so "that it is often difficult or impossible to determine through historical research whether the demographic change was the cause or the effect of the changes in agricultural methods" (Boserup, 1965, 117). Mrs. Boserup argues, but does not explore in any detail, the possibility that population may decline and cause a change from intensive to extensive methods of land use. She also seems to allow that at some periods population growth will *not* be met by an adequate intensification, and soil erosion and overgrazing will result.
2. The theory appears to be confined to preindustrial societies and excludes farmers who (i) are profit maximizers, (ii) use industrial inputs such as artificial fertilizers or purchased cattle feeds, or (iii) use labor-saving machinery. . . .
3. Preindustrial farmers are interested first in obtaining an adequate output per head and second in maximizing their leisure. This has been described by one commentator as the principle of least effort (Spooner, 1972) and bears a close resemblance to the theory of peasant behavior outlined by A. V. Chayanov (1966). Farmers are assumed to be reluctant to forgo their leisure unless population growth necessitates an increase in total output.
4. Farmers at any given place and time are assumed to be aware of a wider range of techniques than those they practice; only population growth will lead them to adopt more intensive techniques. Mrs. Boserup does however allow that some societies may be unaware of more intensive techniques and thus be unable to intensify as population increases.

5. Spatial variations in land use intensity are assumed to reflect only variations in population pressure; variations in natural conditions are not thought to be significant (Boserup, 1965, 13, 18, 19). Indeed in a later work she has stated that existing agricultural systems are adaptations to historical differences in degree of population pressure (Boserup, 1975).
6. Mrs. Boserup criticizes the distinction made by the classical economists between the extensive margin and the intensive margin of cultivation and believes this distinction to be a function of the time when they wrote, when there was much uncultivated land in the Western Hemisphere. More important is the frequency with which existing land is cropped. She therefore appears to exclude the possibility of farmers under population pressure expanding into uncultivated areas, although she notes in a later work that "the first spontaneous reaction to tribal or peasant families to population growth within their community is to look for additional land to cultivate by the traditional methods. If no such land is available they have to use the land at their disposal more intensively" (Boserup, 1970, 101). Thus in the model, the supply of land which can be cultivated is fixed.
7. Intensification in Mrs. Boserup's theory is not the same as in classical economics, where intensity refers to labor and capital inputs per unit of cropland. She believes that the possibilities of increasing output per acre within preindustrial societies, by more thorough cultivation, by more frequent weeding, and by the application of greater amounts of manure, are very limited. Instead, she means by intensification the frequency with which a given area is cropped. As population densities increase, so the length of the fallow is reduced and the length of the period under crop is increased.
8. However, as the fallow is reduced due to population pressure, crop yields decline, and grasses replace secondary forest in the natural fallow. The farmer thus has to use the hoe and later the plough to prepare the land for sowing; weeding becomes increasingly necessary. Thus labor inputs are greater. The use of manure and weeding does little more than restore crop yields to what they were when the forest fallow was of adequate length. Thus whilst it is usual to regard the adoption of manuring or more careful preparation of the seed bed as a means of *increasing* yield per acre, Mrs. Boserup sees it as an attempt to *maintain* yields. It is for these two reasons—falling yields and rising labor inputs—that increasing intensification leads to diminishing output per head.
9. It should be noted that peasants may be reluctant to adopt a more intensive system not simply because annual labor inputs are higher but because the labor needed to create capital requirements is excessive; the switch from dry-land fragmentation to irrigation is the most notable instance of this.

REFERENCES

Boserup, E. 1965: *The conditions of agricultural growth: The economics of agrarian change under population pressure*, London: Allen and Unwin.

———. 1970: Present and potential food production in developing countries. In Zelinsky, W., Kosinski, L. A., Mansell Prothero, R., editors, *Geography and a crowding world*, London: Oxford University Press.

———. 1975: The impact of population growth on agricultural output. *Quarterly Journal of Agricultural Economics* 89, 257–70.

Chayanov, A. V. 1966: *The theory of the peasant economy*. Edited by Thorner, D., Kerblay, B. and Smith, R. E. F. for the American Economic Association. Homewood, IL: R. Irwin.

Spooner, B. 1972: Introduction. In Spooner, B., editor, *Population growth: Anthropological implications*, Cambridge, MA: MIT Press.

8

The Benefits of the Commons*

FIKRET BERKES, DAVID FEENY, BONNIE J. MCCAY,
AND JAMES M. ACHESON

It has become a truism that resources held in common are vulnerable to overexploitation. Twenty-one years ago, Hardin popularized this dilemma—calling it the "tragedy of the commons"—by the use of a metaphorical village common in which each herdsman "is locked into a system that compels him to increase his herd without limit."[1] Hardin argued that such problems have no technical solutions and emphasized the need for government controls to limit "freedom in the commons [which] brings ruin to all."[1] Hardin and others[2] have subsequently pointed to privatization of common resources as another solution consistent with the analysis of many resource economists.[3]

It is usual to assume that resource degradation is inevitable unless common property is converted into private property or government regulations are instituted. The prevalence of this view is reflected by an article in the *Economist* of 10 December 1988 about fisheries, typically viewed as a common-property resource: "it is possible to manage fisheries successfully," the author asserts, "provided three facts are kept in mind." Two of these are relevant here: "left to their own devices, fishermen will overexploit stocks" and "to avoid disaster, managers must have effective hegemony over them."

Nevertheless, research carried out in the 21 years since Hardin's article often leads to conclusions that challenge this conventional wisdom. Such results are of interest to resource managers, applied natural and social scientists, policy makers, and development planners. Many case studies, including our own, show that success can be achieved in ways other than privatization or government control.[4–7] Communities dependent on common-property resources have adopted various institutional arrangements to manage those resources, with varying degrees of success in achieving sustainable use. We use ecological sustainability[8] as a rough index of management success without necessarily implying resource use that is ecologically or economically optimal.

As a first step in the analysis, it is necessary to define the kind of resources under consideration. Common-property (or common-pool)[9] resources share two key characteristics. First, these are resources for which exclusion (or control

* Reprinted by permission from Macmillan Publishers Ltd.: *Nature* 340:91–93, copyright © 1989.

of access) of potential users is problematic. The physical nature of the resource is such that controlling the access of potential users is costly and, in some cases, virtually impossible. Migratory or fugitive resources such as fish and wildlife pose obvious difficulties. Similarly, ground water, range and forest lands, and global commons[8] such as the high seas, the atmosphere, and the geosynchronous orbit pose problems of exclusion.

The second key characteristic of common-property resources is subtractability; each user is capable of subtracting from the welfare of others. This characteristic creates a potential divergence between individual and collective economic rationality in joint use.[3] As one user continues to pump water from an aquifer, others experience increased pumping costs; as the number of fishing boats increases, the catch per unit of effort for each declines. On the basis of these two characteristics, we define common-property resources as a class of resources for which exclusion is difficult and joint use involves subtractability.

As a second step in the analysis, a taxonomy of property-rights regimes is needed.[9–11] Common-property resources are held in one of four basic property-rights regimes. (1) Open access is the absence of well-defined property rights. Access is free and open to all, as with ocean fisheries of the past century. This is the regime implied in Hardin's model. (2) Private property refers to the situation in which an individual or corporation has the right to exclude others from using the resource and to regulate its use. (3) Under communal property, the resource is held by an identifiable community of users who can exclude others and regulate use. Some shellfish beds, range lands, forests, irrigation, and ground water have been managed as communal property. (4) State property or state governance means that rights to the resource are vested exclusively in government, which controls access and level of exploitation. Examples include crown lands and resources such as fish and wildlife held in public trust. These four categories are ideal, analytical types. In practice, resources are often held in overlapping combinations of these four regimes, and there is variation within each.

We now briefly summarize selected case studies. These studies show the workings of communal-property systems not recognized in Hardin's model, as well as the limitations to the use of state governance in some situations.

Our first case concerns wildlife hunting territories in James Bay, Quebec, in northeastern Canada.[12] Hunters in this subarctic area have traditionally used resources communally, as do many Amerindian groups, and have a rich heritage of customary laws to regulate hunting. Beaver is an important species both for food and, since the start of the fur trade in James Bay in 1670, for commerce.

The beaver is vulnerable to depletion because colonies are easily spotted. A community-based hunting territory system, with senior hunters and their families acting as stewards of specific territories, at present ensures sustainable use. The beaver resource in James Bay, however, has not always been used sustainably. In the 1920s, a large influx of nonnative trappers followed the new railroad

into the area to take advantage of high fur prices. Amerindian communities lost control over their territories, and all trappers, including natives, contributed to a "tragedy of the commons." Conservation laws were eventually enacted after 1930, when beaver populations were at an all-time low, and outsiders were banned from trapping in James Bay. Amerindian community and family territories were legally recognized, and customary laws became enforceable, resulting in productive harvests after about 1950.[12] The experience of the 1920s and 1930s is not unique. Periods of cutthroat rivalry among fur companies had led to nonsustainable use of resources twice before: in the mid-1700s and in 1825–29. Gradually, however, local control was restored, and stocks recovered.[12]

Our second and third cases deal with lobster and fish management on the East Coast of the United States[13, 14] and show that communal territories exist even in societies that subscribe to the ideal of freedom in the commons. In the US tradition, marine resources belong to all citizens but are controlled by state governments as a public trust. Privatization of some marine resources such as shellfish beds is feasible but not always socially desirable or politically acceptable.[15] Government management is similarly difficult: limiting the number of licenses is considered an infringement of citizens' rights. Even so, some groups of users are able to restrict access and manage common-property resources.

The lobster resource is vulnerable to overharvesting, but lobster stocks in Maine have remained sustainable. Although some managers have for decades been predicting a resource collapse, the Maine lobster catch has been remarkably stable since 1947.[13] The state government establishes lobstering regulations but does not limit the number of licenses. In practice, however, there is exclusion through a system of traditional fishing rights; to go lobster fishing at all, one has to be accepted by the community. Once accepted, a lobsterman is only allowed to fish in the territory held by that community. Interlopers are usually discouraged by surreptitious violence.

One cannot say if the resource could have been used sustainably in the absence of such locally enforced exclusion and regulation. But we have compared the productivity of exclusively used territories with areas in which claims of adjacent communities overlap. We found that fishermen in the exclusive territories catch significantly more and larger lobsters with less overall effort.[13]

The third case, a trawl fishery in the New York Bight region, provides an alternative community-based solution to the commons dilemma.[14] The fishermen who belong to a cooperative specialize in the harvest of whiting. They have ready access to the best whiting grounds in the region and often dominate the regional whiting market in the winter months.

The cooperative maintains relatively high prices for members through supply management; it limits entry into the local fishery and establishes catch quotas among members. Limited entry is achieved through a closed membership policy and the control of docking space, effectively excluding nonmembers from

access to whiting grounds and markets. Quotas are based on the estimates of what the cooperative can sell to the regional market and are achieved in ways that reward individual initiative but also discourage "free-riding." By contrast with government-imposed regulations, which are considered by fishermen to be inflexible and which in any case are ineffective because they do not address the fundamental problem of access, self-regulation through the cooperative is considered to be both flexible and effective in maintaining sustainable use.[14]

Forests in Thailand comprise our fourth case.[16] Traditionally the exploitation of high-value timber was regulated by local governments; the use of low-value timber was essentially unregulated. The rapid commercial exploitation of teak in Thailand in the late nineteenth century led to the nationalization of all forests. State ownership fails to provide consistent enforcement, but it also serves to deny users the authority to manage local forests. Illegal logging, followed by further land clearing for cultivation, is widespread. Although much of this land is suitable for cultivation, there are few safeguards for conserving environmentally sensitive areas; this results in overall damage to land.

The lack of enforcement of state-forest property rights leading to accelerated degradation is not unique to Thailand. The nationalization of forests in Nepal (1957) and Niger (1935) produced a similar outcome.[17] In Nepal, the situation is being ameliorated by the re-creation of communal management at the local level.[18] Without effective control by government, nationalization has often converted traditional communal property into de jure state property but de facto open access.

Having reviewed a few cases, we return to the tragedy of the commons model to explore its problems in relation to the findings. Hardin asks the reader to assume a pasture "open to all." Each herdsman acts in an individually rational fashion by adding animals to the common pasture. For him, the private benefits of adding one more animal exceed the private cost. Because each herdsman does the same, the overall result is overgrazing and disastrous losses for all.

Hardin's model provides insight about the divergence between individual and collective rationality. But it fails to take into account the self-regulating capabilities of users. It assumes that the herdsmen are unable to limit access or institute rules to regulate use. Therefore, overexploitation is inevitable—unless privatization or government controls are imposed. These conclusions have been used as part of the justification for nationalization,[18] privatization of land resources,[19] and the widespread practice of top-down development planning that ignores local institutions.[4, 6] The social and ecological costs of these practices have often been tragic in their own right.

Recognition that users have the potential and, under some conditions, the motives and means to act collectively opens up other policy alternatives and provides questions about why some communal management systems fail and others succeed. The success or failure of common-property resource management has

to do with the exclusion and regulation of joint use. Forest destruction in Thailand, for example, occurs because villagers do not own the forest and cannot exclude others. Local people therefore have little incentive to conserve and every incentive to cut down trees before someone else does.[16]

By contrast, in other examples—hunters in James Bay, lobstermen in Maine, trawlermen in the New York Bight area, communal forest users in Nepal, and irrigation water users in South India[20]—groups are able to exclude other potential users and regulate their own joint use. They are therefore able to reap the benefits of their own restraint. Our examples are not isolated but are consistent with a large body of literature on grazing lands,[21] forests,[22] water,[23] and coastal marine resources,[24] covering a wide range of regions and cultures throughout the world.

What accounts for the many exceptions to the predictions of the conventional theory? How can Hardin's model be improved to obtain a more comprehensive theory of common-property resource management? First, the Hardin model confuses common-property resources with open access—the absence of property rights. By equating common-property resources with open access, and then assuming that open access leads to overexploitation, the model falls into the trap of equating the commons with overexploitation.

Second, the model assumes that the individual interest is unconstrained by existing institutional arrangements. In many communities, common-property resource users are compelled by social pressure to conform to carefully prescribed and enforced rules of conduct.

Third, the model assumes that resource users cannot cooperate toward their common interests. This is not necessarily so; under certain circumstances, voluntary collective action is feasible,[25] and sustainable outcomes are not unusual.[4–7, 20–24]

More fundamentally, the model overlooks the role of institutions that provide for exclusion and regulation of use. Cultural and historical factors underlying such institutional arrangements are a key to the success of communal management of coastal marine resources in Japan and several Pacific island nations,[24] in addition to the cases we describe above.

Finally, the set of solutions offered by the model is too limited. Privatization or the imposition of government control are not the only viable policy options. In fact, the conventional reliance on these approaches is overly sanguine. By definition, common-property resources are ones for which exclusion is difficult and so privatization is often not feasible. Although dividing a commons and assigning individual property rights can increase efficiency under some circumstances, it might not in others. Similarly, state control has worked in some cases, but the example of Thailand forests illustrates its potential for failure.

In general, we propose that successful approaches to the commons dilemma are found in complementary and compatible relationships between the resource,

the technology for its exploitation, the property-rights regime, and the larger set of institutional arrangements. We also propose that combinations of property-rights regimes may in many cases work better than any single regime. The success of local-level management, for example, often depends on its legitimization by central government; James Bay[12] and recent experience in Nepal[18] are examples. Such nested relationships are also found in fisheries in Japan and Oceania.[24] In some cases, cooperative management arrangements (comanagement) are needed, involving the sharing of power between governments and local communities.[26]

In sum, sustainable common-property resource management is not intrinsically associated with any particular property-rights regime. Successes and failures are found in private, state, and communal-property systems. Recent research highlights the potential viability and continued relevance of communal-property regimes, nested systems, and comanagement. Studies after that of Hardin have shown the dangers of trying to explain resource use in complex socio-ecological systems with simple deterministic models.

REFERENCES

1. Hardin, G. *Science* 162, 1243–1248 (1968).
2. Hardin, G., & Baden, J. (eds.). *Managing the Commons* (Freeman, San Francisco, 1977).
3. Gordon, J. S. *J. Polit. Econ.* 62, 124–142 (1954).
4. *Proc. NRC Conf. Common Property Resource Management* (National Academy, Washington, DC, 1986).
5. McCay, B. J., & Acheson, J. M. (eds.). *The Question of the Commons: The Culture and Ecology of Communal Resources* (University of Arizona Press, Tucson, 1987).
6. Ostrom, V., Feeny, D., & Picht, H. (eds.). *Rethinking Institutional Analysis and Development* (Institute for Contemporary Studies, San Francisco, 1988).
7. Berkes, F. (ed.). *Common Property Resources: Ecology and Community-Based Sustainable Development* (Belhaven, London, 1989).
8. World Commission on Environment and Development. *Our Common Future* (Oxford University Press, Oxford, 1987).
9. Ostrom, E. In *Proc. NRC Conf. Common Property Resource Management* 599–615 (National Academy, Washington, DC, 1986).
10. Bromley D. W. In *Proc. NRC Conf. Common Property Resource Management* 593–598 (National Academy, Washington, DC, 1986).
11. Bromley, D. W. *Economic Interests and Institutions* (Blackwell, Oxford, UK, 1989).
12. Berkes, F. In *Common Property Resources: Ecology and Community-Based Sustainable Development* 70–78 (Belhaven, London, 1989).
13. Acheson, J. M. *The Lobster Gangs of Maine* (University Press of New England, Lebanon, NH, 1988).
14. McCay, B. J. *Anthrop. Q.* 53, 29–38 (1980).
15. McCay, B. J. In *The Question of the Commons: The Culture and Ecology of Communal Resources* 195–216 (University of Arizona Press, Tucson, 1987).
16. Feeny, D. In *World Deforestation in the Twentieth Century* (Duke University Press, Durham, NC, 1988).
17. Thomson, J. T., Feeny, D. H., & Oakerson, R. J. In *Proc. NRC Conf. Common Property Resource Management* 391–424 (National Academy, Washington, DC, 1986).

18. Arnold, J. E. M., & Campbell, J. G. In *Proc. NRC Conf. Common Property Resource Management* 425–454 (National Academy, Washington DC, 1986).
19. Peters, P. In *The Question of the Commons: The Culture and Ecology of Communal Resources* 171–194 (University of Arizona Press, Tucson, 1987).
20. Wade, R. *Village Republics: Economic Conditions for Collective Action* (Cambridge University Press, Cambridge, 1987).
21. Netting, R. M. *Balancing on an Alp: Ecological Change and Continuity in a Swiss Mountain Community* (Cambridge University Press, Cambridge, 1981).
22. Fortmann, L., & Bruce, J. W. (eds.). *Whose Trees? Proprietary Dimensions of Forestry* (Westview, Boulder, CO, 1988).
23. Maass, A., & Anderson, R. L. . . . *And the Desert Shall Rejoice* (MIT Press, Cambridge, MA, 1978).
24. Ruddle, K., & Akimichi, T. (eds.). *Maritime Institutions in the Western Pacific* (National Museum of Ethnology, Osaka, Japan, 1984).
25. Ostrom, E. In *Rethinking Institutional Analysis and Development* 101–139 (Institute for Contemporary Studies, San Francisco, 1988).
26. Pinkerton, E. (ed.). *Co-operative Management of Local Fisheries* (University of British Columbia Press, Vancouver, 1989).

9

7 Billion and Counting*

DAVID BLOOM

Throughout most of human history, the pace of growth of world population has been extremely slow (1–3). World population did not reach 1 billion until around 1800, and it took another century and a quarter to reach 2 billion. But the world is currently in the midst of a period of substantially faster population growth, increasing from 3 to 7 billion within the space of the past half century (4, 5). In 2011, there will be ~135 million births and 57 million deaths, a net increase of 78 million people. According to the latest medium-fertility projections of the Population Division of the Department of Economic and Social Affairs of the United Nations (UN) (5), world population will continue to grow throughout this century, reaching 9.3 billion in 2050 and 10.1 billion in 2100 (6). There is, however, considerable uncertainty surrounding these projections, especially as one looks further into the future (7). For example, UN Population Division projections of world population in 2050 range from 8.1 billion to 10.6 billion under the low- and high-fertility projections, respectively; the corresponding range for 2100 is 6.2 billion to 15.8 billion (8, 9). In the low-fertility projection, world population will peak at roughly 8.1 billion around 2045. In the high-fertility projection, it will peak after 2100 at a figure higher than 15.8 billion. . . .

China, with 1.35 billion people, currently has the largest population in the world, followed by India, with 1.24 billion. Three developed countries (the United States, Russia, and Japan) are in the top 10. In 2050, India will be the most populous country, with a projected population of 1.69 billion, compared with China's 1.30 billion. At that time, the United States will be the only currently developed country among the world's 10 largest countries. Particularly notable will be Nigeria's rapid rise, from the seventh- to the fourth-largest population (and with a population nearly equal to that of the United States), and the disappearance of Russia and Japan from the top-10 list. . . .

As currently categorized by the UN Population Division, "less developed regions" have long been growing much faster than "more developed regions." The former, which accounted for 68% of world population in 1950, represent 82% in 2011 and are projected to constitute 86% by 2050. Nearly all (97%) of

* From *Science* 333 (2011): 562–569. Used by permission of The American Association for the Advancement of Science.

the 2.3 billion population increase projected to occur between now and 2050 will take place in the less developed regions, with 38% taking place in the "least developed countries" (10, 11). Those countries, which currently make up 12% of world population, tend to be the economically, socially, environmentally, and politically most fragile countries of the world.

The UN Population Division divides the world into six geographic regions: Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania. . . . There is considerable demographic heterogeneity across these regions, although the projected rate of growth between 2000 and 2050 is lower than the rate of growth between 1950 and 2000 in all of them. During 1950 to 2000, Africa had the highest regional rate of population growth (2.5% per year), followed by Latin America (2.3%) and Asia (1.9%). During this half century, the rates in Latin America and Asia are expected to fall to 0.7% and 0.6%, respectively, whereas Africa's rate will remain high (2.0%), corresponding to a population-doubling time of roughly 35 years. The population of Europe is projected to remain essentially flat.

Asia is and will continue to be home to a dominant share of the world's population (60% today and 55% in 2050). Africa, the second-most-populated region, also stands out in the UN Population Division figures. Africa's billion represents only 15% of world population today, but the UN Population Division projections indicate that Africa will account for 49% of global population growth over the next four decades, increasing its share of world population to 24%.

Even within geographic regions, there is much variation in the rate of population growth. In Asia, for example, population growth varies widely, from a current annual rate of 3.1% in Afghanistan and Iraq to 0.5% in China, –0.1% in Japan, and –0.6% in Georgia. The rate in Latin America and the Caribbean ranges from 2.5% in Guatemala to 0.9% in Brazil to –0.04% in Cuba. The rate in African countries ranges from 3.5% in Niger to 0.6% in Mauritius and South Africa. Among developed countries, rates include 1.4% in Australia, –0.04% in Japan, and –0.8% in Moldova.

The urban share of global population increased from 29% in 1950 to 51% in 2011 and is projected to reach 69% in 2050. . . . Asia and Africa are the least urbanized regions of the world (43% and 40%, respectively), and North America, at 82%, is the most urbanized. . . . (But many locations that are classified as nonurban according to a particular country's definition are effectively part of a nearby urban area and might be classified as urban by another country's definition or even by its own definition at some other point in time.) Urbanization may spur economic growth due to economies of scale, but it has also created problems (such as intense pressure on land, air, and water resources and life in squalid slum conditions, under which an estimated 1 billion people live) associated with sprawling megacities [urban areas with a population of 10 million or more, which, despite their prominence, account for less than 5% of world population

(12)]. Although the role of urbanization in fostering economic growth continues to be debated, there are many examples of cities that appear to demonstrate the importance of urbanization in creating strong economies (13, 14).

Population density varies considerably across regions, and it has increased greatly over time. Asia is by far the densest region, with 132 people per km^2—roughly four times the corresponding figures for Africa, Europe, and Latin America and the Caribbean. North America and especially Oceania are much less densely populated. The most densely populated countries are Monaco (nearly 24,000 people per km^2), Singapore (7,600), and Bahrain (1,900), whereas the least dense are Mongolia (1.8), Namibia (2.8), and Australia (2.9). Population density was, of course, much lower in 1950, when it ranged from 1.5 in Oceania to 44 in Asia.

REFERENCES AND NOTES

1. An excellent overview of the demographic history of the world and a discussion of its implications appears in ([2]). See also ([3]).
2. M. Livi Bacci, A Concise History of World Population (Blackwell, Cambridge, MA, ed. 4, 2006).
3. J.-P. Bocquet-Appel, Science 333, 560 (2011).
4. Unless otherwise indicated, demographic data are from ([5]).
5. United Nations Population Division, World Population Prospects: The 2010 Revision (United Nations, New York, 2011); http://esa.un.org/unpd/wpp/index.htm.
6. As used here, "fertility" refers to the TFR, which is defined as the average number of children a population of women would have over their childbearing years if they were subject to the age-specific childbearing rates prevailing in a particular time period. The replacement fertility rate—that is, the rate required to maintain a steady population size in the long run—is approximately 2.1 children per woman, although a country with a high mortality rate for infants and young people or a relatively high sex ratio at birth (i.e., boys to girls) would need to have a higher fertility rate to keep the population constant.
7. R. Lee, Science 333, 569 (2011).
8. Unless otherwise indicated, all population projections are the medium-fertility estimates of the UN Population Division. These projections depend critically on trajectories of future fertility, mortality, and migration. The fertility trajectories are based on a Bayesian projection model whose parameters are estimated separately by country using data on each country's own TFR history and also on the TFR histories of all countries [both extending back as far as 1950; see ([9])]. For the world as a whole, the medium-fertility trajectory declines smoothly from the current level of 2.5 to 2.2 in 2050. This change represents the net effect of TFR declines in 139 countries or economies and TFR increases in 58 (all of which are currently below replacement-level TFR). The low- and high-population projections are based on TFR trajectories that are 0.5 children below the medium and 0.5 children above the medium, respectively. Estimates of future life expectancy are based on historical country and sex-specific trends and a model that anticipates more rapid gains in countries with lower current life expectancy. Assumptions about migration are based on past estimates and the policies that countries have adopted. Projected levels of net migration incorporate a slow decline through 2100.
9. L. Alkema et al., Demography (2011); 10.1007/s13524-011-0040-5.

10. The UN Population Division includes 49 countries in the "least developed" category (a subset of countries in the less developed regions): 34 in Africa, 9 in Asia, 5 in Oceania, and 1 in Latin America and the Caribbean. The list of countries in this category, which was first defined by the UN General Assembly in 1971 and is reviewed every three years by the United Nations Economic and Social Council (ECOSOC), has changed considerably over time to reflect decolonization and development progress ([11]).
11. United Nations Conference on Trade and Development, The Least Developed Countries Report 2010: Towards a New International Development Architecture for LDCs (United Nations Conference on Trade and Development, New York, Geneva, 2010); www.unctad.org/en/docs/ldc2010_en.pdf.
12. United Nations Population Division, World Urbanization Prospects: The 2010 Revision (United Nations, New York, 2010); http://esa.un.org/wup2009/unup/.
13. E. Glaeser, Science 333, 592 (2011).
14. World Bank, World Development Report (World Bank, Washington, DC, 2009).

10

Rural Household Demographics, Livelihoods, and the Environment*

ALEX DE SHERBININ, LEAH VANWEY, KENDRA MCSWEENEY, RIMJHIM AGGARWAL, ALISSON BARBIERI, SABINE HENRY, LORI M. HUNTER, WAYNE TWINE, AND ROBERT WALKER

1. Introduction

One of the major areas of population-environment research in the past decade has focused on household-level population dynamics and their relationship . . . to environmental change, particularly in rural areas of the developing world. Studies have sought to go beyond the attribution of environmental degradation to high fertility and associated population increase. Instead, they have investigated the relationships among population variables (household size, age and sex composition, fertility, on-farm population density, migration, and mortality), biophysical variables (forest cover, coastal mangroves, and soil quality), and natural resources (firewood, timber, nontimber forest products, bushmeat, and water). . . .

A focus on household dynamics does not imply that smallholders are necessarily the primary nor the ultimate agents of natural resource degradation or rural landscape change. . . . Nevertheless, this focus on the microdemographic dynamics of rural smallholders is based on recognition that (a) they are important players in natural resource use and landscape change, particularly in rainforest frontiers in Central Africa and Amazonia; (b) rural dwellers account for 59% of the population of the developing world and play a vital role in provisioning cities and regional markets with foodstuffs and other resources (e.g., renewable fuels); and (c) policy interventions that target the health, livelihoods, or environments of rural people must be based on sound understandings of how these are linked. . . .

2. The Livelihood Approach as an Organizing Framework

. . . In most rural areas of the developing world, the household is the basic unit of production and reproduction, and the one at which most rural smallholders

* Reprinted from *Global Environmental Change* 18 (1), Alex de Sherbinin, Leah VanWey, Kendra McSweeney, Rimjhim Aggarwal, Alisson Barbieri, Sabine Henry, Lori M. Hunter, Wayne Twine, and Robert Walker, "Rural Household Demographics, Livelihoods and the Environment," pages 38–53, Copyright © 2008, with permission of Elsevier.

would say that critical decisions are made. Within the livelihood approach, a "household" has been described as "a site in which particularly intense social and economic interdependencies occur between a group of individuals" (Ellis, 2000, p. 18). To be sure, the idea of a unitary household decision-making unit can be problematic—there is striking empirical evidence, for example, that gender and age differences within the household lead to divergent preferences. . . . The studies reviewed below take the locally defined household as the unit of analysis. In order to survive and prosper in what can often be difficult circumstances, rural households pursue a "livelihood strategy" that may comprise a number of different activities such as farming, herding, fishing, off-farm employment, and the exploitation of natural resources through hunting and gathering. . . . A hallmark of the livelihood approach is its emphasis on the capabilities of the rural poor, based on the recognition that even the poorest families hold wealth in at least some of the following categories:

Natural capital: the natural resource stock, or local environmental endowment (including water, wind, soil, forest resources)

Social capital: social resources, such as interpersonal networks, membership in groups, relationships of trust, access to wider institutions of society

Human capital: including formal and informal education, local ecological knowledge, the ability to work, and good health

Physical capital: including productive assets held by the household (land, tools, oxen) as well as communal assets to which they have access (roads, communication infrastructure such as radio broadcasts)

Financial capital: typically, the most fungible of assets, including cash savings, supplies of credit, or regular remittances and pensions

Households' wealth is comprised of some combination of these assets. The type and amount of each that a household holds is a function of past investment and accumulation strategies, which in turn are shaped by social, cultural, political, and economic opportunities and constraints. . . .

The relationship that the household has with its environment, and by extension its impact on the environment, is mediated by its mobilization of these five forms of capital. The ability of the household to accumulate and utilize these forms of capital is further mediated by a number of factors. These include institutional factors (e.g., functioning markets and legal system, rights to organize, common property regimes, land tenure arrangements), cultural factors (status of women, culturally prescribed roles men and women can play, value of children, spiritual connections to the land), economic factors (national and global markets for locally produced goods), and global changes affecting the local environment (climate and oceanic pollution). Thus, a household, its assets, and even the local environment are all "embedded" in these contextual factors.

3. Household Population Dynamics, Environment, and Natural Resources

Household population dynamics encompass several key variables: nuptuality, fertility, morbidity, mortality, migration, as well as the "lifecycle" of a household, which is shaped by the former variables and affects a household's size and age and sex composition. . . .

This section is . . . organized into subsections addressing the relationships between forms of environmental change and fertility, morbidity and mortality, migration, and life cycles. For each, we review recent scholarly work . . . , as well as book chapters and monographs known to the coauthors, in which the researchers focus on households and give specific treatment to both demographic and environmental variables in their studies. . . . The multiplicity of independent and dependent variables would make a meta-analysis impractical, and a research synthesis allows us to bring together strands of research to advance theory in a more flexible and inclusive way. . . .

3.a. Fertility, Environment, and Natural Resources

One popular theory to explain the existence of sustained high fertility in the face of declining environmental resources is the vicious circle model (VCM). In this model it is hypothesized that several positive feedback loops contribute to a "downward spiral" of resource depletion, growing poverty, and high fertility. . . . In its simplest form the model describes the following causal connections: poverty leads to high fertility through mechanisms such as demand for farm labor, "insurance births" owing to high infant mortality, and the low status of women. High fertility then contributes to population growth, which further increases demands for food and resources from an essentially static resource base; the declining per capita resource base reinforces poverty through soil fertility loss, declining yields, and poor environmental sanitation. Finally, poverty, in turn, contributes to land degradation by increasing incentives for short-term exploitation (versus long-term stewardship) and because poor farmers lack access to costly fertilizers and appropriate technologies. Seen from the perspective of the livelihoods framework, the VCM would suggest that households without access to other forms of capital seek to build their human capital (and social capital through the marriage and migration of children) in order to better exploit natural capital.

Sutherland et al. (2004) provide a review of the theory and literature on the relationships between natural resources and household fertility. Of particular relevance here are the studies they review that examine the relationship between fertility and farm size, cattle, and access to natural resources. The VCM would predict that all of these relationships are negative, with poorer households having

higher fertility. We summarize here the key conclusions of the studies Sutherland et al. reviewed and then update them with some detail on more recently published work.

Farm size and farm tenure are key indicators of the physical capital of households. In contrast to the VCM, the relationship between this key productive asset and fertility (related to human capital) is expected to be positive under the land-labor-demand hypothesis advanced by Stokes and Schutjer (1984). They postulate that a larger farm size creates a demand for children as labor to keep land in production (and to retain use rights). This positive relationship has been observed in studies in Rwanda, Egypt, the Philippines, Iran, Peru, and Ecuador. Alternatively, it has also been proposed that the effects of land tenure can counteract the relationship between farm size and family size. Under this land-security hypothesis, land tenure security creates economic security that lowers the need to invest in large numbers of children. . . . Studies in the Philippines, Egypt, Ecuador, Iran, India, and Mexico provide evidence for the negative relationship between tenure security and fertility.

Easterlin (1976) proposed that in frontier settings it is not the size of farm that predicts family size but the perception of availability of land for one's children. In frontier areas, he argues, land is abundantly available, and therefore parents opt for higher fertility in expectation that land will be available for their children. As the frontier becomes settled, it is expected that fertility would decline in response to the perceived scarcity of land to settle. . . . Macro-level studies have supported this hypothesis in Thailand, the United States, and Brazil.

Cattle are second only to land as an important form of physical capital for rural families worldwide. But unlike land, cattle are portable assets that are easily transported and traded; further, they provide a stream of income from dairy products; and they represent a status symbol. Cattle grazing requires little labor, and they can be sustained on land that is too poor for crops. Thus, it could be expected that cattle, like land, might factor into fertility decision making. . . . However, Perz (2001) asserts (at least for the Brazilian Amazon) that cattle tend to be acquired later in life, after childbearing is completed, when households have acquired sufficient capital to invest in cattle. . . .

More recent work continues to debate the relationships between farm size, farm tenure, or cattle and fertility. In a study of Guatemala's Petén, an agricultural frontier, Sutherland et al. (2004) utilized a specially designed Demographic and Health Survey (DHS) that asked questions regarding land ownership, land use, fuelwood and water gathering, and attitudes towards conservation. Using number of living children as the dependent variable ("family size"), and controlling for maternal age, education, and living standards, they found that neither farm size nor tenure security had significant effects on family size. Those perceiving land to be available for their children had significantly fewer children than those who perceived land to be scarce, which appears to undermine Easterlin's

hypothesis but partially supports the notion that children may be seen as an economic safety net for those who perceive resources to be scarce. The authors posit, however, that this may actually reflect a reverse causality that those with smaller families are more likely to report that land is available for their children. Ownership of cattle was strongly and positively associated with family size. Here again, reverse causality is more likely, since larger families are presumably older and therefore more likely to have accumulated the resources necessary for cattle ownership.

Carr et al. (2006) take advantage of a subset of longitudinal data collected in 1990 and 1999 to explore land-fertility relationships in the Ecuadorian Amazon. By using longitudinal data they were able to follow families and plots over time and analytically describe the relationship between landholdings and fertility. The data support the land security hypothesis, with women in households with secure title having two-thirds fewer children then those without such titles. Consistent with the VCM hypothesis, women on the smallest farms in 1990 had more than double the number of children than did women on the largest farms. Large cattle and coffee holdings during the time period were associated with lower fertility. Generally their findings confirm hypothesized links between poverty and fertility: better-off households that are more centrally located, with good access to markets and services, choose to limit fertility more than poorer households. . . .

Two recent studies have focused on the importance of collecting open-access resources for fertility preferences and behaviors, showing the value of human capital (children) as a complement to natural capital (open-access water, fodder, and fuelwood). One is a longitudinal study from the Western Chitwan Valley of Nepal, where three measures of local resource depletion—the time to collect fodder, the increase in time required to collect fodder in the prior three years, and household's dependence on public lands for fodder—were found to be significantly and positively correlated with desired family size, even when controlling for household wealth and numerous other factors found to influence desired fertility. Furthermore, women in households where the time to collect firewood had increased by more than an hour in the three years prior to the initial survey were more likely to have had a pregnancy in the three years after that survey. Another study, in Pakistan, found a similarly positive effect of firewood scarcity on the probability of a birth in the past five years—a relationship that varies across regions of the country and may be partially explained by the evolution of property rights in different provinces.

Much of the research on fertility-livelihood-environment linkages is predicated on the notion that childbearing decisions are largely an economic calculus and that in rural, subsistence-based societies the returns to childbearing are higher than the net costs. For example, evidence from Zambia suggests that the age at which children change from net consumers to net producers is about age

12. In Pakistan female children are judged to be net contributors to household activities between the ages of 11 and 16, and by age 18 female children effectively "repay" the time mothers spend caring for children and in other household tasks. These studies suggest that . . . households do not begin to experience net benefits until they reach age 11, and in societies where girls marry early, the actual period of net contribution to a household's income is potentially very short. Yet there are obviously many other benefits to children beyond their immediate economic returns, including both the social/cultural benefits and longer-term benefits such as old-age security. . . .

FURTHER RESEARCH QUESTIONS

- At what scales of analysis do posited relationships between resource availability or scarcity and fertility hold true?
- Do households "externalize" the costs of high fertility, and if so, in what ways?

3.b. Morbidity and Mortality, Rural Livelihoods, and Environmental Resources

Environmental problems obviously have adverse effects on morbidity and mortality, through contamination or lack of drinking water or through decreases in crop yields and available food. The focus of this subsection is different, however. Here we explore the ways in which morbidity and mortality at the household level influence livelihood strategies and dependency on local environmental resources. Overall, the small but growing body of literature provides evidence for significant relationships between household morbidity and mortality patterns and the natural environment. . . . The primary conclusion of this emerging body of scholarship is that natural resources can have an important cushioning effect when households experience morbidity and mortality. . . .

Morbidity and mortality are likely to increase the stress on household finances, particularly among households already living on the "margins," pushing families deeper into destitution, often with concomitant increases in natural resource dependence (e.g., substitution of electricity or gas with local fuelwood). . . . In the event of illness or death, they lose scarce capital (physical, financial, human, or even social). In some cases, however, this immediate outcome can be avoided if the household is able to liquidate natural capital held communally—as, for example, when forest products are sold to meet health costs.

In general terms, mortality leads to increased household vulnerability particularly if the deceased was a productive adult household member. In a recent discussion of the impacts of HIV/AIDS on household livelihoods, Haddad and Gillespie (2001, p. 489) bluntly state that "HIV/AIDS strips individuals, households, networks, and communities of assets." AIDS-related adult mortality can yield degradation of nearly all forms of household capital. *Human capital* is lost

as a result of lowered productivity, the diversion of the labor of healthy individuals, and the potential loss of remittances from employed migrant family members. Intergenerational knowledge transfer also suffers. HIV/AIDS also has important impacts on *financial capital*, as households lose breadwinners and incur expenses, and potentially debt, related to drug, burial, and transport costs. *Social capital* may decline due to the weakening of institutions and the stigma associated with the illness. Research has also suggested that kin networks, a critical dimension of rural safety nets regarding food security, are undermined by AIDS, while *physical capital* may decline as a result of the sale of productive equipment or mortgaging of land.

Especially relevant to this overview, the sustainability of *natural capital* may also be undermined by the HIV/AIDS pandemic through its impacts on other forms of capital. Research suggests that such threats may take the form of lessened ability of communities and user groups to collectively manage common property resources such as rangelands. At a household level, coping strategies in response to the economic impacts of morbidity or mortality of household members may include the sale of natural products. . . . Also, agricultural productivity may be compromised as a result of the loss of prime-age labor. Less labor-intensive and less nutritious crops may be farmed, or land may lay fallow, thereby threatening tenure. . . .

FURTHER RESEARCH QUESTIONS

- To what extent do households substitute losses in human capital (due to illness or death) by drawing down local stocks of natural capital? . . .
- How has growing malaria prevalence in the Amazon and elsewhere affected household labor and natural resource dependency?
- To what degree, and under what circumstances, does AIDS-driven mortality result in a substitution of child labor for adult labor within the household . . . ?
- To what extent might investments in rural health care, microcredit lending, or insurance programs lessen the need to exploit forest products or overexploit agricultural lands during health crises?

3.c. Migration, the Environment, and Natural Resources

. . . Migration is widely considered to be one of the most important demographic factors affecting the environment. Yet, because the types of migration (including return, repeat, circular, permanent, and temporary) are as many and varied as the intervening variables (socioeconomic status, migrant selectivity) and environmental outcomes (deforestation, fisheries depletion, etc.), it is also one of the most difficult to adequately assess. The focus here will be on out-migration as a household strategy and its relationship with the environment and natural resources at places of origin rather than places of destination. . . .

We follow the approach currently in favor in demography of examining migration from rural households as an individual behavior that results from a household-level decision-making process. Households strategically deploy their human capital (both the number and education of members) across locations and economic sectors in order to increase income, access financial capital (in the absence of functioning credit markets in origin areas), and minimize risk. The environmental impact on the sending area depends heavily on who is sent, whether the siphoning of labor to other areas reduces pressures on land or other resources, and how remittances are allocated. The impact of resource scarcity or other environmental factors on a household's decision to send migrants is not well studied, except perhaps in the case of land resources. There is ample historical evidence to suggest that scarcity of land resources has led to waves of out-migration to new lands, as occurred in European history and is repeated from the cores to the peripheries of many developing countries. . . . Land scarcity is a key driver of migration in Uganda and Nepal; yet VanWey (2003, 2005) finds that both a lack of land *and* a large amount of land can motivate migration in Thailand and Mexico. . . .

Empirical research on the relationships between migration and environment shows mixed results. Using a multilevel longitudinal data set from Burkina Faso, Henry et al. (2004) show that the risk of out-migration is higher in villages with unfavorable agroclimatic conditions than in villages with favorable agroclimatic conditions and is lower in villages with increased water-conservation technologies. These effects are largely on short-term moves, which supports the theory that short-term migrations are part of a strategy to diversify income sources in a risky environment. In a longitudinal study of household migration strategies in the northern Ecuadorian Amazon, Barbieri and Carr (2005) find that on-farm natural resource constraints are significant drivers of migration, with higher population density and declines in areas under forests and crops associated with higher levels of male out-migration. Overall, though females were more likely than males to migrate to urban areas, both males and females had a higher probability of moving to rural frontier areas than to urban areas, leading the authors to suggest that a "vicious cycle" may be in place whereby households that settled in the first wave of frontier migration use up resources and then send younger members to settle more distant areas. . . .

However, too unfavorable environmental conditions can also hinder migration. Rainfall deficits and bad harvests tend to limit people's ability to invest in long-distance moves in Mali. Other studies in Burkina Faso suggest that if resource scarcity is severe enough in source areas, household poverty levels may actually preclude the possibility of a move to more favorable regions. Some additional studies find no effect of environmental factors on migration. Homewood (1997) studied land use, household viability, and migration among the Fulani

herders of the Sahel and showed that neither seasonal migration nor shifting livelihoods are necessarily or even primarily driven by either economic necessity or environmental deterioration. Actually, cultural constraints and social networks emerge as very important determinants of migration decisions at all levels. . . .

Any discussion of household migration-environment linkages without an assessment of the role of remittances would be incomplete, though the empirical research on remittances and the environment is sparse. Remittances may have beneficial impacts on the local environment by reducing resource dependency through the substitution of purchased goods (such as electricity or imported food) for locally produced goods. They may be invested in resource-conservation (e.g., fertilizers to improve soil fertility) or environmental activities. They may also allow households to manage the risk inherent in rural livelihoods. . . . On the other hand, remittances may have negative impacts on the environment by increasing investment in environmentally detrimental practices such as extensive pasturage or the transformation of agricultural lands into peri-urban real estate. . . .

FURTHER RESEARCH QUESTIONS

- How is migration differently affected by long-term resource scarcity and acute environmental crises?
- What are the effects of household out-migration on environmental quality and natural resource stocks in migrant-sending areas?
- How are gendered patterns of migration related to control over or ownership of natural resources?
- Do remittances increase household spending in environmentally beneficial or damaging ways?

3.d. Household Life Cycle and the Environment

Household life cycles are determined by changes in household-level demography due to fertility, mortality, and migration over time. The life cycle begins with household formation—typically when a new residence is established by a married couple. Children are then born and are reared to the point where they become economically contributing members of the household, eventually marrying and either leaving or staying within an extended family home. The original household life cycle "ends" when the founding couple are no longer those that make key livelihood decisions. Different points in the life cycle are characterized by different household age and sex compositions, dependency ratios, etc., and these life cycle dynamics can have important consequences for labor availability and household livelihoods and thus for land use strategies. . . . How and when

that labor is devoted to what activities, and with what environmental outcomes, is at the crux of research into the links between environment and household life cycle.

The theory upon which much research on household life cycles and the environment is built is Chayanov's household economy framework, which was the first attempt to conceptualize the relationship between a household's age (i.e., stage in household life cycle) and its landholdings. Chayanov, a Soviet economist, observed that peasant farming households possessed farms of different sizes and that well-endowed households with many family workers typically possessed larger holdings than those constrained by labor shortages; aging couples then bequeathed land to their children in a subsequent stage of asset disinvestment. . . .

By far the greatest work on the land use–household life cycle issue . . . has been conducted in the context of forest frontiers, particularly in the Amazon basin. Walker et al. (2002) review a large number of studies conducted in the Amazon for evidence of household size and life-cycle impacts on land use and deforestation, among other outcome variables. Out of 20 studies reviewed, they only identified a few that found statistically significant relationships between land use or environmental-dependent variables and life-cycle factors such as age of household head, duration of residence, family size, and number of children. For example, research has shown that duration of residence increases the cutting of old-growth forest and reduces the amount of forested land on colonist properties. . . . Family size is positively related to the amount of land cleared, as is number of adult males and females. These various findings are consistent with the Chayanovian framework. . . .

Recent work has built upon this framework but still finds mixed results regarding household life-cycle effects. The clearest pattern to emerge from much of the recent research in the Amazon is that there is a cycle of deforestation at the property level. In one study area (Altamira) in the Brazilian Amazon, McCracken et al. (1999) and Brondízio et al. (2002) use satellite data at the property level to show this cyclical pattern. In the first five years of settlement, colonists begin their occupation with a rapid spurt of deforestation necessary to establish rights to the land and to produce crops. After this the rate of deforestation declines as households seek to manage the areas already cleared and try to control the aggressive regrowth of native species. Research in Uruará (Pará, Brazil) has also documented, through panel analysis, a shift in farming systems, from mixed consortiums of annuals, perennials, and pasture to a dramatic emphasis on pasture, findings consistent with the Brazilian extensification model as formally stated by Walker (2003). Barbieri et al. (2005) find similar evidence for cycles of land use change in the northern Ecuadorian Amazon. The proportion of land in three classes—forest, pasture, and cropland—among later

settlers (despite overall smaller properties) is almost identical to the proportions for earlier settlers, reflecting similar strategies at similar life-cycle stages even if their landholdings are less than half as large.

In work focusing on the vicinity of Uruará (Pará, Brazil), researchers have investigated deforestation and secondary forest dynamics using remote sensing and panel data collected from field surveys. . . . The resulting analyses show that more household labor is associated with more deforestation, an effect that dominates any impacts associated with internal dependency due to young children and elderly individuals. More recent work in Altamira, Santarém, and Uruará (all in Pará, Brazil) questions the interpretations of past findings as household life-cycle effects. Once the time since acquiring the property is controlled, the household age has no significant effect on land use. In addition, the pace of conversion to profit-oriented systems, especially ranching, appears to occur very quickly, too "fast" for the impacts of dependency on household decision making to manifest, as anticipated by Chayanov. Household life cycles may not have the expected effects because of the availability of hired labor and the focus of households on profit above and beyond subsistence (both unaddressed by Chayanov's theoretical development). Instead, cycles of deforestation represent property life cycles unique to newly opened forested frontiers.

Compared with the tremendous research focus on frontiers, relatively less work has been done on the links between household life cycle and land/resource use in long-settled rural areas. What research has been done suggests an imperfect match between the findings of household life-cycle research at the frontier and similar research conducted among long-established indigenous and *ribereño* communities. That is, even though researchers have found that in these long-settled contexts, younger households tend to deforest more and to extract more forest products than do "older" households, they may not be motivated by the same factors as young colonist households. . . .

FURTHER RESEARCH QUESTIONS

- Much of the research on household life cycles and the environment has been in Latin America. Further investigations are warranted of how these dynamics differ in land-constrained Asia or in Africa. . . .
- How do intergenerational processes affect land use and land cover? How do we incorporate land inheritance, and the formation of new households through the marriage of children, into our models of first-generation life-cycle effects?
- How do life-cycle changes interact with institutional arrangements (e.g., availability of rural retirement or subsidies for children) to affect land use and natural resource extraction?
- How do processes of migration (and remittances) and off-farm employment change the theoretical model of the household life cycle?

WORKS CITED

Barbieri AF, Bilsborrow RE, Pan WK. Farm household lifecycles and land use in the Ecuadorian Amazon. Population and Environment 2005; 27 (1): 1–27.

Barbieri AF, Carr DL. Gender-specific out-migration, deforestation and urbanization in the Ecuadorian Amazon. Global and Planetary Change 2005; 47 (24): 99–110.

Brondízio ES, McCracken SD, Moran EF, Siqueira AD, Nelson DR, Rodriguez Pedraza C. The colonist footprint: Toward a conceptual framework of land use and deforestation trajectories among small farmers in the Amazonian frontier. In: Wood CH, Porro R, editors. Deforestation and Land Use in the Amazon. University Press of Florida; Gainesville: 2002. pp. 133–161.

Carr DL, Pan W, Bilsborrow RE. Declining fertility on the frontier: The Ecuadorian Amazon. Population and Environment 2006; 28 (1): 17–39.

Easterlin RA. Population change and farm settlement in the Northern United States. Journal of Economic History 1976; 36:45–75.

Ellis, F. Rural Livelihoods and Diversity in Developing Countries. Oxford University Press; Oxford: 2000.

Haddad L, Gillespie S. Effective food and nutrition policy responses to HIV/AIDS: What we know and what we need to know. Journal of International Development 2001; 13 (4): 487–511.

Henry S, Schoumaker B, et al. The impact of rainfall on the first out-migration: A multi-level event-history analysis in Burkina Faso. Population and Environment 2004; 25 (5): 423–460.

Homewood, K. Land use, household viability and migration in the Sahel. University College London, INERA (IRBET) / CNRST Burkina Faso, IDR/UPB Burkina Faso, Université National du Bénin, Universiteit van Amsterdam; 1997. 57 pages. Final report to INCO-DC.

McCracken SD, Brondizio ES, Nelson D, Moran EF, Siqueira AD, Rodriguez-Pedraza C. Remote sensing and GIS at farm property level: Demography and deforestation in the Brazilian Amazon. Photogrammetric Engineering & Remote Sensing 1999; 65:1311–1320.

Perz SG. Household demographic factors as life cycle determinants of land use in the Amazon. Population Research and Policy Review 2001; 20 (3): 159–186.

Stokes CS, Schutjer WA. Access to land and fertility in developing countries. Rural Development and Human Fertility. Macmillan; New York: 1984.

Sutherland EG, Carr DL, Curtis SL. Fertility and the environment in a natural resource dependent economy: Evidence from Petén, Guatemala. Población y Salud en Mesoamérica 2004; 2 (1): 1–14.

VanWey LK. Land ownership as a determinant of temporary migration in Nang Rong, Thailand. European Journal of Population 2003; 19:121–145.

VanWey LK. Land ownership as a determinant of international and internal migration in Mexico and internal migration in Thailand. International Migration Review 2005; 39 (1): 141–172.

Walker R. Mapping Process to Pattern in the Landscape Change of the Amazonian Frontier. Annals of the Association of American Geographers 2003; 93 (2): 376–398.

Walker R, Perz SG, Caldas M, Teixeira Silva LG. Land use and land cover change in forest frontiers: The role of household life cycles. International Regional Science Review 2002; 25 (2): 169–199.

11

Carrying Capacity's New Guise*

Folk Models for Public Debate and Longitudinal Study of Environmental Change

LISA CLIGGETT

Introduction

With increasing public concern about the environment, the human-environment link has moved from the realm of studies in the social and natural sciences to the center of public and political debate. . . . Amid this hubbub of environmental awareness lurks a term that emerged in scientific discussion of the human impact on ecosystems: carrying capacity. The carrying capacity concept seems to have left the domain of academic consideration and been assimilated by the public as the natural explanation for the balance between nature and human populations.

In this article, I want to explore the usefulness of the carrying capacity concept for anthropological discussions in particular but also for social science's contribution to environmental debates. By reframing the concept as a folk model, we can continue to use the phrase to highlight ecological relationships and advance arguments for environmental conservation but at the same time acknowledge the complexity of the human-environment links which formal applications of carrying capacity ignore. The longitudinal Gwembe Tonga Research Project (GTRP), in southern Zambia, offers one opportunity to look at how anthropologists have used a general notion of carrying capacity to understand social processes and the human-environment link over time.

The concept of carrying capacity relates the resources available in a given environment to the populations of particular animal species. Social scientists began using the term around the mid-1940s to assess human impacts on the environment, whether human populations in particular or human-influenced populations, such as herds of cattle, goats, or camels. Over the past three decades, many scholars have offered detailed critiques of carrying capacity—particularly its formal application—by pointing out that the term does not successfully capture the multilayered processes of the human-environment link and that it often has a blame-the-victim framework. These scholars most often cite the fluidity and nonequilibrium nature of this relationship and the role of external forces in influencing environmental change as key problems with the term.

* From *Africa Today* 48, no.1 (2001): 2–19. Used by permission of Indiana University Press.

Despite the critiques launched at the concept, I continue to ponder the question of whether or not "carrying capacity" can be at all useful in current social science and human ecology discussions. In particular, I wonder if it can provide a conceptual framework for describing some of the processes we see in Zambia's Gwembe Valley over the last fifty years and perhaps more generally in describing human-environment relations as the general public, politicians, and international agencies become increasingly concerned with environmental issues. Before discussing carrying capacity in greater detail, I will give some background to the GTRP and the nature of human-environment links that the project has considered in this region of southern Zambia.

GTRP History

The GTRP is one of the longest and most systematic long-term studies in Africa and is particularly remarkable in that it has followed a population as it has dispersed beyond the original study sites (Scudder and Colson 1978). Anthropologists Elizabeth Colson and Thayer Scudder initiated the Gwembe Study in 1956. . . . During the early 1990s, two new anthropologists (including this author) and one demographer joined the core team of the GTRP and increasingly oversee the project activities and agenda.

At the outset, Colson and Scudder designed their investigation as a before-and-after study of the effects of large-scale development on local populations. In this case, development meant the building of Kariba Dam on the Zambezi River and subsequent flooding of the river valley, causing the forced relocation of approximately 57,000 Gwembe Tonga people on both the Zambian and Zimbabwean (Northern and Southern Rhodesia during the period under discussion) sides of the river. Upon completion of the follow-up study of the relocation in 1962, Colson and Scudder decided to continue the study indefinitely as a means to understand community continuity and change. . . .

At the time of the creation of Lake Kariba, it was the largest artificial reservoir in the world, and the local population was the largest group ever to be forcefully resettled due to development activities. On the Zambian side of the lake, the majority of the resettled population moved up the escarpment from their old villages. However, due to last-minute changes in the engineering of the dam, some villages were forced to move approximately 100 miles downstream from their original homes and below the Kariba Dam wall. Six thousand people from these villages settled in an area known as Lusitu, among a different ethnic group with a population of approximately 1,000 people, as well as a new ecological setting. These circumstances unfortunately created conditions in which to consider the classic notions of carrying capacity and the effects of human population density on local environments. . . .

The Ecological Setting

. . . The increasingly frequent drought cycles of southern Africa make the already drought-prone region even more risky for subsistence farmers. However, the longitudinal framework of the GTRP, with its frequent field visits, gives us a much better sense of environmental fluctuations and change. Despite seemingly increasingly frequent droughts and their environmental costs, we have found that drought does not lead inevitably to permanent ecological decline. Even in the Lusitu region, one of the most ecologically disturbed areas of the Gwembe Valley (and Zambia as a whole), we have seen change from year to year. The drought between 1994 and 1995, which was called the worst drought in the past decade, resulted in no harvest for people living in the Lusitu area. The following year, people told us they had a "good harvest" (although still not enough to feed the local population for the whole year). Apparently this drought had acted as a kind of fallow for the fields, allowing the soil to rest for a season and then the following year produce better than in recent memory.

Of course, what local people might call a "good harvest" differs from what outsiders, including Zambians who live in areas with more consistent food production, might see as minimal survival. Indeed, the Gwembe Valley is notorious throughout Zambia as a drought-prone, impoverished, and backward region of scarcity. . . .

On top of these environmental conditions, the Zambian economy has experienced upheaval since the 1970s, when the copper industry collapsed. More recently, the structural adjustment program started after multiparty elections in 1991 has led to austere economic conditions for the Zambian nation and for the poor majority of the population in particular. Maintenance of national infrastructures, such as health clinics, schools, and roads, have received little or no attention over the past two decades. The infrastructure in rural areas, where clinics have no aspirin or chloroquin, let alone antibiotics, and teachers often refuse their posts because they are too remote, seems to have been forgotten by the majority of decision makers in the cities. Under these circumstances, in rural areas such as the Gwembe Valley, extended family networks and kinship play a large role in the way people cope with scarcity in their physical and economic environments.

Carrying Capacity Revisited

Having established the Gwembe Valley context, I can move on to reconsider the concept of carrying capacity. . . . In a general sense, carrying capacity as used in human ecology refers to the link between populations and the environment. One of the more cited definitions, particularly with reference to Africa, states that

carrying capacity is "the maximum number of people that a given land area will maintain in perpetuity under a given system of usage without land degradation setting in" (Allan 1949). . . .

Until the mid-1970s, many ecologists and social scientists tried to measure carrying capacity, transforming the concept into an analytical, methodological, and quantifiable tool (Birdsell 1953; Carneiro 1961; Rappaport 1967; Zubrow 1975). Even more recently, a few natural science scholars continue to apply the concept to current global concerns (Ehrlich and Ehrlich 1990; Mancl et al. 1999). These attempts at application have resulted in a growing outcry for a more flexible method to examine relationships between humans and their ecological settings and, ultimately, resource management. Since the late 1960s, the concept has received repeated critical attention, particularly from social scientists who have a variety of evidence suggesting that people, and their environments, adapt in oscillating periods of scarcity and sufficiency, if not always plenty (Boserup 1965; Street 1969; Netting 1981, 1993; Berry 1984; Dewar 1984; Agrawal 1995; Fairhead and Leach 1996). Critiques of the carrying capacity concept draw attention to a variety of problems in earlier attempts to measure a particular region's carrying capacity. A short list of some of the problems most often cited in the literature on carrying capacity include (1) an assumption of equilibrium, (2) difficulty in measuring food resources, (3) inability to account for human preference in taste and labor expenditure, (4) assumption of full use of food resources, (5) assumption of homogeneity across the landscape, (6) assumption of an isolated group/region, (7) an ahistorical view of a process that in fact fluctuates in short- and long-term time frames, and lastly, (8) the concept does not address the issue of standard of living.

An Assumption of Equilibrium

A variety of research during the 1990s focused on the open-ended nature of ecological systems (Berry 1993; Netting 1993; Moore and Vaughan 1994). Some of this literature even suggests that human populations can increase local biodiversity simply through their presence on the land, challenging the long-held assumptions that human habitation necessarily leads to deforestation and decreasing biodiversity (Fairhead and Leach 1996; Leach and Fairhead 2000; Leach and Mearns 1996). These findings can successfully end discussions that view ecosystems as static, balanced, and in check.

Difficulty in Measuring Food Resources

Measuring all potential food resources in a given environment poses a multitude of challenges for any investigator. How do we classify plants that could be eaten but usually are not eaten? How do we include plants that appear on the landscape

irregularly, over longer time periods than twelve-month cycles? Do we privilege caloric values over nutritional values (i.e., cassava versus beans)?

Inability to Account for Human Preference in Taste and Labor Expenditure

Humans have mysterious and deep relationships to what they eat; why one group of people will eat flying termites, while their neighbors in the same ecological niche refuse, can only be revealed, if at all, by sensitive exploration of worldviews, historical processes, and other cultural phenomena that gives food meaning. . . .

Sometimes food preferences have more simple, pragmatic explanations; in the Gwembe Valley, people prefer to grow and eat maize, millet, or sorghum (with a strong preference for maize whenever possible). However, at the end of drought, when harvests have failed, a visitor can see old women in areas where wild grasses grow, collecting—grain by tiny grain—the small seeds atop the thin waving stalks of grass. Even when hungry, younger Tonga avoid the arduous and tedious labor that produces such a small harvest. An afternoon of collecting seeds in this manner offers only one small, tasteless (according to my informants) meal, and brief respite from hunger pangs. However, the same young people will hike almost eight hours to better fishing grounds, and then eight hours back with only enough fish for one meal. People make choices about investment of labor, and in many cases they will think the return does not warrant the increased work. Yet, at given moments that are difficult to predict, the same people will invest increased labor in getting their food.

Assumes Full Use of Food Resources

This critique relates to the above point highlighting human preferences. In addition to conscious choices people make about what they will eat, and when, researchers and local populations may not recognize the same natural resources as potential food, leading again to a problem of measurement. Should all possible food resources be considered within a carrying capacity equation, or only foods local populations recognize? Whatever the answer to that question, the models will also need to account for seasonality of resources.

Assumption of Homogeneity across the Landscape

This point, like the issues mentioned above, focuses on the subtlety that any models must include in order to claim close representation to an ecological reality. In the Gwembe Valley, for instance, ecological resources vary significantly within a ten-minute walk. A small sandy hill can drop into a moist *dhambo* where people keep small gardens to supplement their lakeshore gardens. However, these *dhambo* appear with no regularity or certainty throughout one particular

village, let alone across the complete ecosystem from which people draw their food resources. A carrying capacity equation that seeks a clearly defined measurement could not successfully account for the significant, unpredictable variation found in any region large enough to support a local human population.

Assumption of an Isolated Group/Region

Defining a region for a carrying capacity measurement assumes that a human population relies only on the resources within their territory. The !Kung San of Botswana, often imagined to be the ideal example of a "natural population" living solely from their environment, have in fact been in contact and exchanging with neighbors and outsiders for centuries (Wilmsen 1989), suggesting once and for all that isolated populations exist only in the minds of romantic scholars searching for a pristine past.

An Ahistorical View of a Process That in Fact Fluctuates in Short- and Long-Term Time Frames

Also related to the point above, if we see ecosystems as nonstatic and changing, then we must look for change over time—both long term and short term. One easily identified problem with applications of carrying capacity is the assumption that a population has already reached its carrying capacity—in which people are already using all of the resources they can. This type of assumption occurs most frequently with short-term studies. Longitudinal research provides the antidote to any naïve conclusions drawn from *slice-of-life* and *moment-in-time* studies.

The Concept Does Not Address the Issue of Standard of Living

At an ethical and moral level, a quantifiable measurement of carrying capacity cannot account for the varying "standards of living" within which humans can survive. One way Gwembe people adjust to increasing food scarcity is through malnutrition (Gillett and Tobias, 2002). Humans can eat less and less, and less nutritionally valuable food, yet still continue to survive in a given environment. As social scientists concerned with the well-being of the people with whom we work, do we want to argue that a particular region's carrying capacity has not been exceeded yet, simply because people still get their food from the local environment and continue to survive there?

In terms of specific measurement, then, an investigator needs so much precision in data collection tools—to capture all the variation in time, space, ecological resources, and technology and all the social, cultural, and material components that go into how humans work with, and adapt to, their environment—that it renders the term quite limited. With an obligation to collect such a level of detail

in data, if in fact that detail can be measured, and if we decide that measuring such data does not compromise our ethical commitment to the local populations where we work, most researchers would (wisely) choose another research topic, particularly in this age of rapid-appraisal studies that seek answers quickly.

My Concern with Carrying Capacity

The well-founded critiques of formal application and measurement of carrying capacity strongly suggest that the concept, as a quantifiable phenomenon, proves more cumbersome than revealing. For the most part, the majority of social sciences, such as anthropology and geography, as well as many scholars in the natural sciences of biology and ecology, have dispensed with the concept because they see humans and culture as highly adaptable. These scientists argue that carrying capacity generalizes a complexity of interactions that should not be glossed over.

The optimists among social scientists, who follow arguments of Boserup (1965) and Netting (1993), have suggested that humans and cultures are almost infinitely adaptable, so that human groups can overcome limitations set by the environment through technological, institutional, and social change. Using this framework of adaptation, through human energy and investment, the ability of a given environment to support growing human populations, that is, the carrying capacity, can actually increase through social and technological change.

The pessimists among social scientists, who find inspiration in the neo-Malthusian models proposed by Paul Ehrlich (Ehrlich et al. 1989; Ehrlich and Ehrlich 1990) and Garret Hardin (Hardin 1959; Hardin and Baden 1977), tend to see human populations growing beyond an environment's ability to provide resources and ultimately decreasing the carrying capacity of a region, and the planet as a whole, through overuse of limited resources.

Although my training in anthropology emphasized the optimist's appreciation for the amazing creativity in humans' adaptability, particularly in regard to their ecosystem relationship and coping strategies, at a more abstract level, I believe our planet holds limited resources that risk destruction and extinction if we do not take steps to curb their overconsumption. In this way, then, I find myself considering a very general concept of carrying capacity.

My reconsideration of the topic arose in part because of courses I teach in ecological anthropology. When we address carrying capacity in readings and lectures, undergraduate students demonstrate an intuitive understanding of the concept. And in my last two undergraduate courses, I conducted a brief survey on the first day of class to get a sense of my students' baseline knowledge. Carrying capacity was one of the few terms they knew prior to taking the course. Dewar (1984) also recognized the commonsense facet of carrying capacity as he offered his critique of the concept and attributed its appeal to its simplicity. For

scientific purposes, we know that carrying capacity poses irreconcilable problems and misleads us into believing in the simplicity of the relationship between humans and the environment. However, that simplicity helps the idea persist for a broader public. . . .

The generalized knowledge that the public shares of this concept suggests that perhaps the term has moved beyond an issue of measurement and quantification. As my students . . . offer their understanding of carrying capacity, I hear them expressing something more akin to a "folk model" of how humans and their ecosystems interact, rather than a research method to produce empirical data on calories in the environment. This folk model provides an explanation for a complex relationship whose many facets remain beyond popular knowledge. Carrying capacity has become the story we tell ourselves about what our environment can offer to us and how we must behave toward our environment. The term, though originating from the natural and social sciences, has moved beyond our academic boundaries into the public domain. . . .

Some Examples of Coping with Scarcity

Since the inception of the GTRP, it has paid close attention to Gwembe people's adaptation to their ecosystem, which includes a wide array of coping strategies when environmental conditions become less hospitable. As I mentioned above, malnutrition represents one adaptation to the region's food scarcity (Gillett and Tobias 2002; Gillett 1995). Colson (1979) has identified at least three more flexible strategies that people employ during periods of scarcity, both in the Gwembe and in other agrarian-based societies.

First, when preferred food resources disappear, Gwembe people shift to alternative food sources, things they call "famine foods," such as tamarind seeds mixed with ash. . . . Second, people also decrease their domestic-group size so that they are more mobile and have fewer mouths to feed. This mobility also allows finding food sources, both in the environment and through pleading with kin, in distant areas not plagued with the same problems. And finally, Gwembe people also limit sharing with outsiders during periods of scarcity. During bad droughts, families do not repair or rebuild homestead granaries. Instead they let them continue to disintegrate, despite still holding grain. In this way, families can appear to have no food stores, so that passersby will not come pleading for grain. Families also begin to eat indoors, as opposed to in public view near the cooking hearths; again, this prevents neighbors from seeing how much food a family has to eat.

These examples of adaptation demonstrate that Gwembe people know how to, and do, cope with the conditions of scarcity they face, both seasonally and cyclically. These ethnographic findings suggest that resource availability in

the environment does not limit Gwembe populations' ability to survive, or at least not yet; that is, perhaps the carrying capacity model does not apply in a formal sense.

At the same time, our study has . . . seen changes in the environment. In general, the changes tend toward decreasing resources: little to no wild game in regions of human population, decreasing forest areas, increasing agricultural areas, smaller harvests tied to long-term field use and erosion, among other indicators. . . .

Conclusion: Carrying Capacity's New Guise

. . . Although I strongly support the critiques launched at attempts to formally measure any region's carrying capacity, my general sense of the limits of the land in this region tells me that population and natural resources in an ecosystem *are* linked. And using popular language, the concept of carrying capacity generally expresses this relationship. Of course, using the term glosses over profoundly important processes such as the World Bank's structural adjustment program, which has resulted in worker layoffs, soaring food prices (which decreases quality of life for the majority of Zambia's population), shifting agricultural activities focused on export crops, and the impact of chronic disease on household labor.

However, using carrying capacity in a general sense highlights the environment as a topic that needs attention. As academics, we . . . spend great energy taking apart terms, ideas, and concepts in order to clarify our meanings, reveal social constructions, and ultimately promote better understanding of our social world. . . . By critically examining such terms, we free ourselves to use them, as long as we reflect on the complexity the terms represent.

Carrying capacity may well have become another one of these terms, recreated through scholarly critique and launched into the public domain through increasing environmental consciousness. . . . Carrying capacity offers a general, and yes, flawed, view of the interrelationship between humans and their ecosystems. But it also provides a general framework for asking more important questions. Why do some areas and some groups of people seem to draw on their natural resource reserves more than other areas and people? How do local populations in small-scale farming economies respond to national and international forces that encourage particular, and often destructive, forms of resource use? Under what conditions will farmers resist overextraction of resources? Our jobs as social scientists should not be simply to question whether or not the environment has limits, and whether or not humans have exceeded those limits, but to look more closely, and with a more subtle lens, at populations and regions most vulnerable to the impacts of this relationship.

REFERENCES

Agrawal, Arun. 1995. Population Pressure = Forest Degradation: An Oversimplistic Equation? *Unasylva* 181 (46): 50–58.

Allan, William. 1949. *Studies in African Land Usage in Northern Rhodesia*. Rhodes-Livingstone Papers 15. Manchester: Manchester University Press.

Berry, Sara S. 1984. The Food Crisis and Agrarian Change in Africa. *African Studies Review* 27 (2): 59–112.

———. 1993. *No Condition Is Permanent: The Social Dynamics of Agrarian Change in Sub-Saharan Africa*. Madison: University of Wisconsin Press.

Birdsell, J. B. 1953. Some Environmental and Cultural Factors Influencing the Structuring of Australian Aboriginal Population. *American Naturalist* 86:171–207.

Boserup, Ester. 1965. *The Conditions of Agricultural Growth*. Chicago: Aldine.

Carneiro, Robert L. 1961. Slash and Burn Cultivation among the Kuikuru and Its Implications for Cultural Development in the Amazon Basin. In *The Evolution of Horticultural Systems*, edited by J. Wilbert. Caracas, Venezuela: Sociedad de Ciencias Naturales La Salle.

Colson, Elizabeth. 1979. In Good Years and Bad: Food Strategies in Self-Reliant Societies. *Journal of Anthropological Research* 35 (1): 18–29.

Dewar, Robert. 1984. Environmental Productivity, Population Regulation, and Carrying Capacity. *American Anthropologist* 86 (3): 601–14.

Ehrlich, Paul R., Gretchen C. Daily, Anne H. Ehrlich, Pamela Matson, and Peter Vitousek. 1989. Global Change and Carrying Capacity: Implications for Life on Earth. In *Global Change and Our Common Future*, edited by Ruth S. DeFries and Thomas F. Malone. Washington, DC: National Academy Press.

Ehrlich, Paul R., and Anne H. Ehrlich. 1990. *The Population Explosion*. New York: Simon and Schuster.

Fairhead, James, and Melissa Leach. 1996. *Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic*. Cambridge: Cambridge University Press.

Gillett, Rhonda. 1995. Growth and Physical Status: Biocultural Measures of Long-Term Underdevelopment among the Gwembe Tonga of Zambia. Ph.D. diss., Indiana University.

Gillett, Rhonda, and P. V. Tobias. 2002. Human Growth and Development in Southern Zambia: A First Study of Tonga Children Predating the Kariba Dam, as a Baseline for Comparison with Contemporary Zambians. *American Journal of Human Biology* 14 (1): 50–60.

Hardin, Garrett. 1959. *Nature and Man's Fate*. New York: Rinehart.

Hardin, Garrett, and John Baden, eds. 1977. *Managing the Commons*. San Francisco: W. H. Freeman.

Leach, Melissa, and James Fairhead. 2000. Challenging Neo-Malthusian Deforestation Analyses in West Africa's Dynamic Forest Landscapes. *Population and Development Review* 26 (1): 17–44.

Leach, Melissa, and Robin Mearns, eds. 1996. *The Lie of the Land: Challenging Received Wisdom on the African Environment*. London: James Curry.

Mancl, Karen, Kathleen Carr, and Michele Morrone. 1999. Environmental Literacy of Ohio Adults. *Ohio Journal of Science* 99 (3): 57–61.

Moore, Henrietta, and Megan Vaughan. 1994. *Cutting Down Trees: Gender, Nutrition, and Agricultural Change in the Northern Province of Zambia, 1890–1990*. Portsmouth, NH: Heinemann.

Netting, Robert McC. 1981. *Balancing on an Alp: Ecological Change and Continuity in a Swiss Mountain Community*. Cambridge: Cambridge University Press.

———. 1993. *Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture*. Stanford, CA: Stanford University Press.

Rappaport, Roy A. 1967. Ritual Regulation of Environmental Relations among a New Guinea People. *Ethnology* 6 (1): 17–30.

Scudder, Thayer, and Elizabeth Colson. 1978. Long-Term Field Research in Gwembe Valley, Zambia. In *Long-Term Field Research in Social Anthropology*, edited by George M. Foster, Thayer Scudder, Elizabeth Colson, and Robert V. Kemper. New York: Academic Press.

Street, John M. 1969. An Evaluation of the Concept of Carrying Capacity. *Professional Geographer* 21 (2): 104–7.

Wilmsen, Edwin N. 1989. *Land Filled with Flies: A Political Economy of the Kalahari*. Chicago: University of Chicago Press.

Zubrow, Ezra. 1975. *Prehistoric Carrying Capacity: A Model*. New York: Academic Press.

12

The Environment as Geopolitical Threat*

Reading Robert Kaplan's "Coming Anarchy"

SIMON DALBY

Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison of the second.

By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal.

This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall somewhere and must necessarily be severely felt by a large portion of mankind. (Thomas Malthus)[1]

Every explosion of social forces, instead of being dissipated in a surrounding circuit of unknown space and barbaric chaos, will be sharply re-echoed from the far side of the globe, and weak elements in the political and economic organism of the world will be shattered in consequence. (Halford J. Mackinder)[2]

It is time to understand "the environment" for what it is: *the* national-security issue of the early twenty-first century. The political and strategic impact of surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, and possibly, rising sea levels in critical overcrowded regions like the Nile Delta and Bangladesh—developments that will prompt mass migrations and, in turn, incite group conflicts—will be the core foreign-policy challenge from which most others will ultimately emanate, arousing the public and uniting assorted interests left over from the Cold War. (Robert D. Kaplan)[3]

Once Again, the Malthusian Specter

Robert Kaplan's cover story in February 1994's *Atlantic Monthly* magazine painted a particularly depressing picture of the future. In "The Coming Anarchy" he argues that much of the world is on a path to violence-ridden "anarchy," where states collapse and private armies and organized crime establish themselves as effective local administrations. . . . The natural environment is the key

* Simon Dalby, *Ecumene* 3, no. 4, pp. 472–496, copyright © 1996 by Arnold. Reprinted by permission of SAGE.

villain in the piece. Its degradation has, he argues forcefully, set off a downward spiral of crime and social disintegration in many places. . . .

While Kaplan's article generated an angry response from readers who contested his specific accounts of various countries in the letters pages of subsequent issues of the magazine, the themes he wrote about clearly resonated with contemporary American angst about crime, environmental deterioration, and . . . foreign-policy planning. His very rhetorically powerful analysis is a high-profile public articulation of contemporary neo-Malthusian themes in post–Cold War geopolitical discourse.[4] It parallels much of the rest of the US media coverage of Africa, and Rwanda in particular, in its representations of Africa as a place of "tribal," "hostile," "violent" Others.[5] It is notable for its pessimism, forceful prose, and the absence of any suggested substantive political remedies for the imminent dystopia.

But Kaplan is not alone. Readers of contemporary international-relations literature, foreign-policy journals, and magazines of popular political discussion, in particular in the United States, have noted that there has been a revival of interest in the themes that concerned Britain's first professional academic economist.[6] Thomas Malthus, the country parson who is widely memorialized for his pessimism about humanity's lot, a fate due largely to our supposed predilection for breeding faster than we can improve our capabilities to feed ourselves, is again in vogue. . . . But his theories are often now linked to themes of environmental degradation and to some of the traditional themes of geopolitics in popular policy and political discussion.

Against the backdrop of the major United Nations conferences on environment and development, . . . when this theme is linked, as it explicitly is by Kaplan, to the more general concerns about environment as a "security" threat, these arguments become important in the political processes of foreign and security policy formulation in states in the "North." Foreign and security policy prescriptions depend in part on how the questions of appropriate policies are practically understood within the larger geopolitical discourses and their interpretations of contemporary geopolitical order.[7] The same is true of environmental themes in international political discussions and policy formulation.[8] The recent academic discussions of the links between environment and security have been suggesting that these matters are complex and unclear and that simple assumptions about the interconnections between environmental factors, population, and conflict need careful evaluation that is sensitive to specific geographical contexts. . . .

Malthus and Mackinder

In many ways none of this is very new. In England, in the years following Malthus's initial publication during the transformations of the Industrial Revolution,

and in the aftermath of the American and French Revolutions, there were widespread concerns among the political elites and in the emergent middle classes about political order, linked to the fear of the mob as a destabilizing social factor. . . .

Fear of "over"-population and social hardship has been a recurring political theme through the Cold War, albeit one that was less prominent than concerns with superpower rivalry. Harrison Brown's *The Challenge of Man's Future*, published in the early 1950s, was a discussion of then contemporary Malthusian themes.[9] A generation later Paul Ehrlich published *The Population Bomb*, which generated considerable controversy with its dire predictions of future catastrophe.[10] Following the much-publicized African famines of the 1980s, Paul Ehrlich returned to his earlier themes of population growth in a new book called *The Population Explosion*, where he argued that the "bomb" he warned of earlier had now exploded, with huge numbers of people dying each year from hunger and hunger-related diseases.[11]

Beyond the Limits was published as a sequel to the *Limits to Growth* in 1992, suggesting policy options to be taken to prevent "overshoot" and collapse by working toward a sustainable society.[12] While estimates of how many people the planet can feed vary widely depending on assumptions about technology, diet, distribution of wealth, water resources, and calculations of the availability of arable land, the logic of this type of thinking suggests that disaster will occur as "natural" limits are reached.[13] . . .

Given these themes, Kaplan is in some ways a continuation of long-established lines of argument. But he is new in that his powerful articulation of environment as the cause of threats to national security has updated Malthusian themes and brought the "environmental security" policy discussions forcefully to the attention of a wider public. In doing so Kaplan revisits many of the geopolitical assumptions in security thinking, and does so in specifying the environment as a threat. This use of specific geopolitical assumptions to frame the demographic and related environmental dimensions in post–Cold War security thinking is a focus in what follows. In the case of neo-Malthusianism and the more general policy discourse of "environmental security," the "threat" is often at least partly from somehow external "natural" or "environmental" phenomena. More specifically, Kaplan's essay can be read as an analysis of, in Ó Tuathail and Luke's terms, the "wild" zones of the new geopolitical (dis)order where the potential for disruptive incursions into the "tame" zones of postmodern prosperity requires their containment, if necessary by military force.[14] . . .

In an ironic reprise of earlier American cultural themes of a hostile nature that needed to be "tamed," "domesticated," and rendered benign by colonization of the "frontier," "the environment" has been specified as that which is foreign and threatening.[15] As writers have made clear, metaphors of wars with nature are not new; but this paper argues that the explicit linkage of military metaphors of

nature as a hostile force with geopolitical threats to national security gives these themes a new and potentially ominous twist.[16]

Robert Kaplan's "Coming Anarchy"

Kaplan's article pulls no punches in its pessimistic vision of environmentally induced social collapse, spreading disease and crime. With armed gangs of "technicals," inspired by "juju spirits," in West Africa and the widespread collapse of social order in Asia and Yugoslavia, the nation-state is, he argues, quickly becoming a political formation of the past, and sovereignty is now a dated fiction derived from the cartographic practices of another era.

The magazine's designers powerfully reinforce the message. The front-cover illustration shows a crumpled map of the world starting to burn on a wood floor, the flames rising into words superimposed on the wall behind. In bold capitals they ominously announce, "The coming anarchy: Nations break up under the tidal flow of refugees from environmental and social disaster. As borders crumble, another type of boundary is erected—a wall of disease. Wars are fought over scarce resources, especially water, and war itself becomes continuous with crime, as armed bands of stateless marauders clash with the private security forces of the elites. . . ."

The article is accompanied by stark photographs. The opening pages depict armed soldiers walking past human skeletal remains in Liberia. Photographs of roadside warnings of "killing zones" in Sierra Leone, of mass graves in Bosnia, and of Kurdish guerrillas in Turkey are followed by pictures of human corpses, the consequences of violent retribution in Liberia and Vukovar. Pictures of "the press of population," showing buses amid crowds in Lagos and people doing their washing in an Abidjan lagoon as well as other photographs of southern cities, suggest overcrowding. The final photograph is of looters in the riots following the trial of police officers in the Rodney King case in Los Angeles, suggesting that the scenes in the earlier depictions were intimations of things to come in the United States. The theme of "ethnic" conflict is prominent.

Kaplan starts with West Africa, where he argues that crime is the order of the day or, more specifically, the order of the night, when what tentative authority governments have dissipates as youthful criminals take to the streets. We are told that organized crime is related to the collapse of the nation-state and the rise of demographic and environmental stresses. Drug cartels and private security forces take over where social stress has led to the collapse of more conventional political order. To Kaplan this is clearly the future of global politics, a specter that confronts "our" civilization and one that conjures up "Thomas Malthus, the philosopher of demographic doomsday, who is now the prophet of West Africa's future. And West Africa's future, eventually, will also be that of most of the rest of the world."[17] . . .

This introduces the environmental theme framed in terms of extensive shanty towns on the urbanizing coast of West Africa. "In twenty-eight years Guinea's population will double if growth goes on at current rates. Hardwood logging continues at madcap speed, and people flee the Guinean countryside for Conakry. It seemed to me there that here, as elsewhere in Africa and the Third World, man is challenging nature far beyond its limits, and nature is now beginning to take its revenge."[18] But quite what the mechanism is that drives the migration is not explained; the text merely suggests that it is related to deforestation. Africa may, he suggests, be like the Balkans 100 years ago, a harbinger of an old (imperial) order collapsing and giving way to nations based on tribe. But a century later the analogy contains a fundamental difference: "Now the threat is more elemental: *nature unchecked*."[19]

Environmental scarcity is the first of the concepts that one must look at to understand Kaplan's new world. It is linked to cultural and racial clashes, geographical "destiny," and the transformation of warfare. Looking in turn at these themes allows Kaplan to sketch out the map of the new political situation. Of prime importance to all these matters is the environment. In the pivotal passage in his article, reproduced above at the beginning of this paper, he draws on the themes from the more pessimistic "environmental security" literature, to argue that the environment is the national-security issue of the near future.[20] This is no small claim. It suggests that the fate of modern states is now tied directly to the fate of environments around the world. Ecological disruptions are now to be feared—the environment understood as "a hostile power." . . .

The clashes between groups that are likely to result from identity conflicts induced by environmental degradation are, Kaplan argues, probably going to occur along lines of tribal and cultural fracture. In making this case he uses Samuel Huntingdon's much-cited . . . "The Clash of Civilizations," which suggested that long-term cultural divisions were likely to determine the pattern of post–Cold War geopolitics. Kaplan argues that because Huntingdon's argument is painted with such a broad brush, some of the details are inaccurate.[21] The clashes in the Caucasus are a matter of cultural identity and Turkish versus Iranian civilizations, rather than a clear battle between the forces of Christianity and Islam, as Huntingdon's thesis suggests. Kaplan points to the continued struggles between the Turkish state and the Kurdish population in eastern Turkey as a contest of great importance for the future of the Middle East, not least because of the presence in this region of major Turkish hydroelectric projects that control crucial water flows into Syria and Iraq.

These specifications of identity in terms of cultures link the text to another theme of classical geopolitics, the focus on "organic communities" as the preferred political communities. As Ó Tuathail notes, Mackinder's political thinking, often remembered in the terms of the quotation introducing this paper as relating to matters of "geopolitics" (a term Mackinder didn't like), is perhaps

better understood in terms of conservative nostalgias for stable cultural identities which support political stability.[22]

The organic assumption of stable cultural identities plays into support for clan, tribe, and nation and becomes particularly powerful when coupled to claims to territory and sovereignty. As in Huntingdon's analysis, "eternal" social essences and identities are invoked in the face of dramatic social and political change. For Kaplan only Huntingdon's *scale* is wrong: politics is about geopolitical identities that suggest permanent fissures between potentially warring parties.

Kaplan ends his article by arguing that coherent national states are a fading political phenomenon that conventional political cartographies no longer accurately represent and by speculating on the future of India and Pakistan as their burgeoning populations, with long histories of collective violence, face the future on a dwindling resource base. Add to this speculations about global climate change and the future of political order in states like Egypt, and the potential for drastic political upheaval seems huge. Even the United States may not survive, given its ethnic tensions and individualist culture. These tensions might well be aggravated by African disasters, as Afro-Americans demand American actions to provide help to stricken populations. . . .

Robert Kaplan's Geopolitical Imagination

However, the world is not quite so conveniently simple as Kaplan's popularization of environmental degradation as the key national security issue for the future suggests. His article, for all its dramatic prose and empirical observation, is vulnerable to numerous critiques. If one reads it as a cultural production of considerable political importance, it is fairly easy to see how the logic of the analysis, premised on "eyewitness" empirical observation and drawing on an eclectic mixture of intellectual sources, leaves so much of significance unsaid. But the impression, as has traditionally been the case in geopolitical writing, generated from the juxtaposition of expert sources and empirical observation is that this is an "objective," detached geopolitical treatise. Detailed critique of the epistemologies of both traditional and contemporary geopolitics has been developed elsewhere.[23] The focus in what follows is on the political implications of the widely shared geopolitical assumptions that structure this text and ultimately render the environment as a threat.

The most important geopolitical premise in the argument posits a "bifurcated world," one in which the rich in the prosperous "post-historical" cities and suburbs have mastered nature through the use of technology, while the rest of the population is stuck in poverty and ethnic strife in the shanty towns of the underdeveloped world.[24] The presentation of the article in the magazine supports this basic formulation of the world into the rich, who read magazines like *Atlantic*, and the rest, who don't.

Insofar as politics is defined in terms of the articulation of discourses of danger, Kaplan's analysis can be read in terms of a persistent textual dualism between postmodern consumer aspirations and fear of "reprimitivized" violence and environmental degradation.[25] The presentation of a bifurcated world is powerfully reinforced by the dramatic contrasts between the advertisements and the images and content of the text. All the advertisements suggest the symbols of consumer affluence: three are for automobiles, one for gin, two for stereophonic audio equipment, one for a book club. . . . Nothing unusual here. But on closer inspection these advertisements speak volumes about the geopolitics of the contemporary world. Where the article uses the metaphor of stretched limousines for the affluent, driving over potholed streets in New York, the automobile advertisements show the luxury interior of one vehicle, another parked beside a traditional brick house in a state of apparently rural bucolic bliss. . . .

But the juxtaposition of the two worlds of aspiration and fear can be taken further. Where the article talks of non-Western cultures in conflict, and of slums that are described as so appalling that not even Charles Dickens would give them credence, the Book of the Month Club advertisement is for a twenty-one-volume collection of Dickens's works. The advertisement for a Bose radio is focused on a Stradivarius violin. The advertisement for a Sony CD player shows a grand piano and a Sony scholarship-winning Juilliard School pupil, cultural artifacts far removed from juju spirits, animism, or even Islam. The appreciative student pianist endorsing Sony contrasts dramatically with the mention in the text of the article of Solomon Anthony Joseph Musa, a coup leader in Sierra Leone who, it is claimed, "shot the people who had paid for his schooling, 'in order to erase the humiliation and mitigate the power his middle class sponsors held over him.'"[26] . . .

Perhaps most geopolitically revealing, however, is the advertisement for "Bombay Sapphire Distilled London Dry Gin." The juxtaposition of Bombay and London, along with the image of Queen Victoria on the label on the bottle, suggests the legacy of colonialism and the commercial advantages gained by European powers in earlier geopolitical arrangements. In all of Kaplan's article such matters of international trade are barely mentioned. The wall of disease may bar many foreigners from all except some coastal trading posts of Africa in the future, but the significance of what is being traded and with what implications for the local environment is not investigated. "Hot cash," presumably laundered drug money from African states, apparently does flow to Europe, we are told, but this has significance only because of the criminal dimension of the activity, not as part of a larger pattern of political economy. . . . Logging continues apace, but it is apparently driven only by some indigenous local desire to strip the environment of trees, not by any exogenous cause. A focus on the larger political economy driving forest destruction would lead the analysis in a very different direction, but it is a direction that is not taken by

the focus on West Africa as a quasi-autonomous geopolitical entity driven by internal developments.

The political violence and environmental degradation are not related to larger economic processes anywhere in this text. These sections of Kaplan's text show a very limited geopolitical imagination, one that focuses solely on local phenomena in a determinist fashion that ignores the larger transboundary flows and the related social and economic causes of resource depletion. Kaplan ignores the legacy of the international food economy, which has long played a large role in shaping the agricultural infrastructures, and the nutritional levels, of many populations of different parts of the world in specific ways.[27] He also ignores the impact of the economic crisis of the 1980s and the often deleterious impact of the debt crisis and structural adjustment policies. He completely misses their important impact on social patterns and on rural women, who suffered many of the worst effects.[28]

Ironically, while Kaplan emphasizes the inadequacies of maps for understanding ethnic and cultural clashes, he never investigates their similar inadequacies for understanding economic interconnections as an important part of either the international relations or the foreign policies of these states.[29] This crucial omission allows for the attribution of the "failure" of societies to purely internal factors. Once again, the local environment can be constructed as the cause of disaster without any reference to the historical patterns of development that may be partly responsible for the social processes of degradation.[30]

Given the focus of most Malthusians on the shortage of "subsistence" and resources in general, there is remarkably little investigation of how the burgeoning populations of various parts of the world are actually provided for, in terms either of food production or of other daily necessities. . . . Precisely where the crucial connections between environmental change, migration, and conflict should be investigated the analysis turns away to look at ethnic rivalries and the collapse of social order. The connections are asserted, not demonstrated, and insofar as this is done, the opportunity for detailed analysis is missed and the powerful rhetoric of the argument retraces familiar political territory instead of looking in detail at the environment as a factor in social change. In this failure to document the crucial causal connections in his case, Kaplan ironically follows Malthus, who relied on his unproven key assumption that subsistence increases only at an arithmetical rate in contrast to geometric population growth.

Political angst about the collapse of order is substituted for an investigation of the specific reasons for rapid urbanization, a process that is by default rendered as a "natural" product of demographic pressures. This unstated "naturalization" then operates to support the Malthusian fear of poverty-stricken mobs—or, in Kaplan's terms, young homeless and rootless men forming criminal gangs—as a threat to political order. Economics becomes nature; nature in the form of political chaos becomes a threat: the provision of security from such threats

thus becomes a policy priority. In this way "nature unchecked" can thus be read directly as a security threat to the political order of postmodernity.

Kaplan explicitly links the Malthusian theme in his discussion of Africa to matters of national security, where a clear "external" threatening dimension of crime and terrorism is linked to the policy practices of security and strategic thinking. The logic of a simple Malthusian formulation is complicated by the geographical assumptions built into Kaplan's argument, while he has simultaneously avoided any explicit attempt to deal with the political economy of rural subsistence or contemporary population growth. Thus, in his formulation, the debate is shifted from matters of humanitarian concern, starvation, famine relief, and aid projects and refocused as matters of military threat and concern for political order within northern states.

What ultimately seems to matter in this new designation is whether political disorder and crime will spill over into the affluent North. The affluent world of the *Atlantic* advertisements with their high-technology consumer items is implicitly threatened by the spreading of "anarchy." The article implies that it has done so already insofar as American inner cities are plagued with violent crime. The reformulation once again posits a specific geopolitical framework for security thinking. Kaplan himself suggests that by his own logic the US may become more fragmented and Canada may dissolve following the secession of Quebec, shorn of its northern resource hinterland. . . . What cannot be found in this article is any suggestion that the affluence of those in the limousine might in some way be part of the same political economy that produces the conditions of those outside.

Although Kaplan is particularly short on policy prescription in his *Atlantic* article, some of the implications of his reworked Malthusianism do have clear policy implications. Instead of repression and the use of political methods to maintain inequalities in the face of demands for reform, Kaplan's implicit geopolitics suggest abandoning Africa to its fate. If more northern states withdraw diplomatic and aid connections and, as he notes, stop direct flights to airports such as Lagos, the potential to isolate this troubled region may be considerable. Once again, security is understood in the geopolitical sense of containment and exclusion.

In a subsequent article in the *Washington Post*, Kaplan explicitly argues against US military interventions in Africa. . . . The pessimism of the *Atlantic* article is muted here by a contradictory suggestion that all available foreign-policy money for Africa be devoted to population control, resource management, and women's literacy. These programs will, Kaplan hopes, in the very long term resolve some of the worst problems, allowing development to occur and "democracy" eventually to emerge. The ethnocentrism of the suggestion that Africa's problems are soluble in terms of modernization is coupled with the implication that

West Africa is of no great importance to the larger global scheme of power and economy, and therefore can be ignored, at least as long as the cultural affinities between Africans and African Americans do not cause political spillovers into the United States. Precisely this marginalization is of concern to many African leaders and academics. But in stark contrast to Kaplan, many Africans emphasize the need to stop the export of wealth from the continent and the need to draw on indigenous traditions to rebuild shattered societies and economies.[31]

There is an ironic twist in Kaplan's geopolitical specifications of "wild zones." He argues that they are threats to political stability and, in the case of Africa, probably worth cutting loose from conventional political involvement. In the subsequent *Washington Post* article he argues against military interventions in Africa on the basis of their uselessness in the political situation of gangs, crime, and the absence of centralized political authority. His suggestions imply that interventions are only considered in terms of political attempts to resolve conflicts and provide humanitarian aid. In this assumption Kaplan is at odds with Cold War geopolitical thinking. While ignoring the political economy of underdevelopment as a factor in the African situation, he also ignores the traditional justifications for US political and military involvement in Africa and much of the Third World. . . . These focused on questions of ensuring Western access to strategic minerals in the continent. . . . But Kaplan ignores both these economic interconnections and their strategic implications, preferring an oversimplified geopolitical specification of Malthusian-induced social collapse as the sole focus of concern.

But the specification of danger as an external "natural" phenomenon works in an analogous way to the traditional political use of neo-Malthusian logic. Once again threats are outside human regulation, inevitable, and natural in some senses—if not anarchic in the neorealist sense of state system structure, then natural in a more fundamental sense of "nature unchecked." By the specific spatial assumptions built into his reasoning, Kaplan accomplishes geopolitically what Malthusian thinking did earlier in economic terms. Coupled with prevalent American political concerns with security as "internal" vulnerability to violent crime and "external" fears of various foreign military, terrorist, economic, racial, and immigration "threats," Kaplan rearticulates his modified Malthusianism in the powerful discursive currency of geopolitics. . . .

Kaplan notes that the disintegration of order is not a matter of a "primitive" situation but, following van Creveld, a matter of "reprimitivized" circumstances in which high-technology tools are used for gang and "tribal" rivalries. But the economic connections that allow such "tools" to become available are not mentioned. Thus reprimitivization is specified as the indirect result of environmental degradation, a process that is asserted frequently but not argued, demonstrated, or investigated in any detail. . . .

The Rest against the West

One important theme in contemporary discussions of northern "security" is mentioned only in passing in Kaplan's analysis. This is the theme of massive long-distance migration and the likely social consequences.[32] In contrast, Matthew Connelly and Paul Kennedy's later article in the *Atlantic Monthly* looked specifically at migrations of impoverished humanity. . . .[33] The environmental theme is of less salience in their article, which focuses more explicitly on strictly demographic matters. In the context of current fears about illegal migration in both Europe and the United States, they look to Malthusian speculations about global demography and return to Kishore Mahbubani's phrase to raise the question of whether "demographic politics" has to be played out in a geopolitical conflict between "the rest" and "the West."[34] In particular, they focus on "the key global political problem . . . : unbalanced wealth and resources, unbalanced demographic trends, and the relationship between the two."[35] In contrast to Kaplan, who is concerned with the spillover from the wild zones to the tame ones but who never looks seriously at international migration as a mechanism for this "danger," Connelly and Kennedy examine this geopolitical factor directly.

Where Kaplan relies on his "eyewitness" journalistic accounts to set up his larger discussion, Connelly and Kennedy start with Jean Raspail's controversial early-1970s French novel *The Camp of the Saints*, focusing on its dramatic story of impoverished Indians hijacking ships and setting forth across the oceans for France. Again, the designers of the *Atlantic Monthly* use a dramatic cover illustration, framed again in spatial terms of the tension between fear and aspiration, to emphasize the theme of the article. It shows a pale-skinned suburban householder equipped with a spatula and wearing an apron emblazoned with the motif "home sweet home." Accompanied by his dog, he is standing on a patio beside a barbecue which is cooking wieners. The suburban ideal is marred only by the many dark-skinned faces, some clad in various "ethnic" headgear, who are looking over the white picket fence surrounding his yard. The text superimposed on the fence summarizes the theme of the article: "Whether it's racist fantasy or realistic concern, it's a question that won't go away: As population and misery increase, will the wretched of the earth overwhelm the Western paradise?" The article argues that Raspail is in many places guilty of a variety of racist sentiments but that the themes in this disturbing novel are germane to current discussions of foreign policy and the focus in the US on immigration. In particular, the relative decline of the European races in terms of total numbers of population suggests the inevitable triumph of the former colonized peoples who will in the next few decades, as European populations atrophy, reverse the geopolitical patterns of North and South.

While the neo-Malthusian framework is in the presentation of the argument in terms of massive dislocations and migrations from the poor to the rich world,

this article's conclusions are notably different from Kaplan's geopolitical pessimism. It notes the arguments by the technological optimists, in response to Kaplan's despair, that global economic indicators show widespread signs of optimism but suggests that this optimism is not in any practical way linked to the fate of the poorest billions of the world's population.[36] Connelly and Kennedy also point out that, while production has been globalized, the mobility of labor has not. Geographical restrictions on the mobility of workers are in dramatic contrast to the ability of transnational corporations to switch production and investments around the globe.[37] Even if the "techno-liberal" optimists are correct and growth does occur, it seems likely that, given population growth, the absolute, if not relative, numbers of very poor will increase.

Drawing on the elaborated speculations in Kennedy's earlier book *Preparing for the Twenty-First Century*, the article offers much greater recognition of the interconnectedness of global problems and proffers suggestions for policy initiatives that tackle poverty and related economic and environmental issues.[38] The scenario of desperate, impoverished people attempting to move to the affluent world and the unpleasant policy implications of trying to resist such migrations by force are merely hinted at. But unlike Kaplan, with his unexamined assumptions of environmental degradation, the geopolitical version of the Malthusian scenario is not judged to be inevitable. Instead, they argue the case for a new North-South political deal in which global cooperation is seen as necessary by political leaders. They admit that transcending partisan and national perceptions of political possibilities and difficulties may not be easy but argue that it is clearly necessary to deal with "global" problems.

Beyond Malthus and Mackinder?

. . . If the more alarmist versions of some of Kaplan's arguments gain credence in Washington, or if the formulation of politics in terms of the rest and the West becomes prominent, then the dangers of a new Cold War against the poor are considerable. The discussions of illegal immigration in the US, . . . and suggestions that the solution is increased border guards, denial of services to immigrants incapable of proving legal residence, and deportations, suggest that the geopolitical imagination of spatial exclusion is dominating the policy discourse once again. In particular this may be because of the propensity among American politicians to formulate American identity in antithesis to external perceived dangers. Through the history of the last two centuries this has been a powerful theme in the formulation of American foreign policy, which has drawn on the related discourses of American exceptionalism.[39]

This geopolitical imagination has been frequently coupled with assertions of cultural superiority and ideological rectitude in the form of various articulations of moral certainty. The dangers of ethnocentrism, when coupled with

geopolitical reasoning, are greatest precisely where they assert strategic certainty in ways that prevent analysis of the complex social, political, and economic interactions that might lead to assessments that in at least some ways "the problem is us."[40]

All this suggests the need for continued challenges to the use of traditional geopolitical reasoning in the formulation of foreign policy and in the study of the discourses of contemporary international politics. Geographical complexity and in particular detailed local environmental investigations and transboundary economic interconnections may not provide grisly images and spectacular headlines; but it seems a reasonable bet that such geographs offer better possibilities for the demilitarization of international politics, the amelioration of environmental problems, and the resolution of at least some of the difficulties induced by economic change and migration.

NOTES

1. T. Malthus, *An essay on the principle of population* (Harmondsworth, UK, Penguin, 1970: original ed. 1798), p. 71.
2. H. J. Mackinder, "The geographical pivot of history," *Geographical Journal* 23 (4) (1904), repr. in R. Kasperson and J. Minghi, eds., *The structure of political geography* (Chicago, Aldine, 1969), p. 161.
3. R. D. Kaplan, "The coming anarchy," *Atlantic Monthly* 273 (2) (1994), p. 58.
4. It has apparently received a wide readership. The article was reproduced in the *San Francisco Chronicle* on Sunday, 13 Mar. 1994, and has been commented on by media columnists including Anthony Lewis in the *New York Times* ("A bleak vision," 7 Mar. 1994, p. A17). It has been cited, in a diverse range of languages, in articles concerned in one way or another with visions of the future, in academic and policy journals ranging from sociological theory in the Czech *Sociologicky Casopis* to design philosophy in *Ergonomics*.
5. G. Meyers, T. Klak, and T. Koehl, "The inscription of difference: News coverage of the conflicts in Rwanda and Bosnia," *Political Geography* 15 (1) (1996), pp. 21–46.
6. I. Bellany, "Malthus and the modern world," *Review of International Studies* 20 (4) (1994), pp. 411–22.
7. On the importance of geopolitical discourse and its assumptions in foreign-policy formulation at the largest scales, see J. Agnew and S. Corbridge, *Mastering space: Hegemony, territory and international political economy* (London, Routledge, 1995).
8. S. Dalby, "The threat from the south," in D. Deudney and R. Matthews, eds., *Contested grounds: Security and conflict in the new environmental politics* (Albany, State University of New York Press, 1996); Vandana Shiva, "Conflicts of global ecology: Environmental activism in a period of global reach," *Alternatives* 19 (2) (1994), pp. 195–207.
9. H. Brown, *The challenge of man's future* (New York, Viking, 1954). There is an interesting precursor to Kaplan's use of Fukuyama in the bibliographical essay at the end of Brown's book. He also cites a title with the term "post-historic" in it: R. Seidenberg, *Post-historic man* (Durham, University of North Carolina Press, 1950).
10. P. R. Ehrlich, *The population bomb* (New York, Ballantine, 1968).
11. P. R. Ehrlich and A. H. Ehrlich, *The population explosion* (New York, Simon & Schuster, 1990).
12. D. H. Meadows, D. L. Meadows, and J. Randers, *Beyond the limits* (London, Earthscan, 1992).

13. V. Smil, "How many people can the earth feed?," *Population and Development Review* 20 (2), (1994), pp. 255–92.
14. G. Ó Tuathail and T. W. Luke, "Present at the (dis)integration: Deterritorialization and reterritorialization in the new wor(l)d order," *Annals of the Association of American Geographers* 84 (3) (1994), pp. 381–98. They note that "wild" and "tame" zones can be read from Samuel Huntingdon's widely cited "The clash of civilizations," *Foreign Affairs* 72 (3) (1993), pp. 22–49, and are a particularly salient theme in M. Singer and A. Wildavsky, *The real world order: Zones of peace, zones of turmoil* (Chatham, NJ, Chatham House, 1993).
15. There is a vast literature, not only in the pages of this journal, on the themes of the domination of nature and its philosophical roots; see, e.g., William Leiss, *The domination of nature* (Boston, Beacon, 1974); and Carolyn Merchant, *The death of nature: Women, ecology, and the scientific revolution* (San Francisco, Harper & Row, 1980); as well as such themes as pastoral ideals in American thought in books like Leo Marx, *The machine in the garden* (New York, Oxford University Press, 1964). This article, however, traces the logic of Kaplan's writing in terms of the appropriation of the environment as a security threat in post–Cold War political thinking. Undoubtedly Kaplan's analysis in part finds its resonance with its audience because of the cultural ambiguities in the multiple constructions of "nature" and "wilderness," but such a reading is not the focus of this analysis.
16. E.g., John McCannon, "To storm the Arctic: Soviet polar exploration and public visions of nature in the USSR, 1932–1939," *Ecumene* 2 (1) (1995), pp. 15–31.
17. Kaplan, "The coming anarchy," p. 48.
18. Ibid., p. 54.
19. Ibid.
20. See, in general, N. Myers, *Ultimate security: The environmental basis of political stability* (New York, Norton, 1993); D. Pirages, "Demographic change and ecological security," in M. T. Klare and D. C. Thomas, eds., *World security: Challenges for a new century* (New York, St. Martin's, 1994), pp. 314–31.
21. Huntingdon, "The clash of civilizations."
22. G. Ó Tuathail, "Putting Mackinder in his place: Material transformations and myth," *Political Geography* 11 (1) (1992), pp. 100–118.
23. S. Dalby, "Critical geopolitics: Difference, discourse and dissent," *Environment and Planning D: Society and Space* 9 (3) (1991), pp. 261–83; G. Ó Tuathail, *Critical geopolitics* (Minneapolis, University of Minnesota Press, 1996).
24. Kaplan, "The coming anarchy," p. 59. Kaplan cites Francis Fukuyama in relation to the designation "post-historical."
25. On "discourses of danger," see M. Dillon, "The alliance of security and subjectivity," *Current Research in Peace and Violence* 13 (3) (1991), pp. 101–24; and D. Campbell and M. Dillon, eds., *The political subject of violence* (Manchester, Manchester University Press, 1993).
26. Kaplan, "The coming anarchy," p. 45. Thanks to Deepika Grover for pointing this out.
27. J. Warnock, *The politics of hunger: The global food system* (London, Methuen, 1987).
28. F. Mackenzie, "Exploring the connections: Structural adjustment, gender and the environment," *Geoforum* 24 (1) (1993), pp. 71–87.
29. On the complicated interconnections of these themes in West Africa, see T. Shaw and J. E. Okolo, eds., *The political economy of foreign policy in ECOWAS* (New York, St. Martin's, 1994).
30. This "amnesia" is a recurring feature in many development discourses; see D. Slater, "The geopolitical imagination and the enframing of development theory," *Transactions of the Institute of British Geographers*, n.s., 18 (1993), pp. 419–37; and J. Crush, ed., *Power of development* (London, Routledge, 1995).

31. See, e.g., A. Adadeji, ed., *Africa within the world: Beyond dispossession and dependence* (London, Zed, 1993); D. R. F. Taylor and F. Mackenzie, eds., *Development from within: Survival in rural Africa* (London, Routledge, 1992); and, more generally, S. Amin, *Maldevelopment: Anatomy of a global failure* (London, Zed, 1990).
32. See O. Waever, B. Buzan, M. Kelstrup, and P. Lemaitre, *Identity migration and the new security agenda in Europe* (London, Pinter, 1993).
33. M. Connelly and P. Kennedy, "Must it be the West against the rest?," *Atlantic Monthly* 274 (6) (1994), pp. 61–83.
34. K. Mahbubani, "The West and the rest," *National Interest* (1992), pp. 3–13.
35. Connelly and Kennedy, "Must it be," p. 62.
36. On "optimistic" rejoinders to the Kaplan thesis, see A. E. Server, "The end of the world is nigh—or is it?," *Fortune*, 2 May 1994, pp. 123–24; M. Gee, "Surprise! The world gets better!," *World Press Review* 14 (7) (1994), pp. 18–20.
37. See R. Barnet and J. Cavanagh, *Global dreams: Imperial corporations and the new world order* (New York, Simon & Schuster, 1994).
38. P. Kennedy, *Preparing for the twenty-first century* (New York, HarperCollins, 1993).
39. D. Campbell, *Writing security: American foreign policy and the politics of identity* (Minneapolis, University of Minnesota Press, 1992).
40. T. Hentsch, *Imagining the Middle East*, trans. F. A. Reed (Montreal, Black Rose, 1992).

SECTION 3

What Are Urban, Rural, and Suburban Environments?

This section offers historical and contemporary examples of urbanization, industrialism, economic growth, and international development. Collectively, the contributors to this section ask, what is the goal of development? How do the problems of economic growth overlap with those of environmental destruction? Does development inevitably destroy nature? What is the difference between urbanization and industrialization? What does geography (e.g., urban, rural, and suburban space) have to do with patterns of industrialism, economic growth, and development? Who benefits from the extraction of fossil fuels, the application of pesticides, and the disasters that accompany these industries? What kinds of bureaucratic management do large-scale settlements require, and how capable are these of coping with environmental problems?

In addition, this section raises the issue of consumerism (addressed in section 7) by questioning the consequences of certain kinds of economic behaviors. It also shows readers the intertwined character of urban and rural landscapes while alerting them to practices associated with energy production and with the manufacture of everyday commodities. For example, two of the chapters in this section deal explicitly with agrochemicals.

In December 2014, men and women from Bhopal, India, mourned the thirty-year anniversary of the world's worst industrial disaster, which involved a pesticide plant. In the late evening–early morning of December 2–3, 1984, a factory owned by Union Carbide Company (now the Dow Chemical Company) began leaking twenty-seven tons of methyl isocynate (MIC) gas. Within hours, thousands of local residents were dead. For decades following the disaster, the incidence of cancer among persons living in the vicinity of the factory increased dramatically in comparison to rates among those living outside the gas-affected area. Today, hundreds of thousands of Bhopal residents suffer chronic health problems stemming from contaminated water and soil; children in Bhopal are born with epilepsy and other neurological disorders, while their parents continue to protest unsatisfactory compensation and rehabilitation for victims (Kumar 2014). Meanwhile in North America, both the amount of lawn coverage and the quantity of pesticides and fertilizers applied to private lawns have grown steadily. As Paul Robbins writes, "inputs into the lawn—in time, labor, money, and chemicals—have never been higher than they are today, and the rate of increase in the last decade is startling" (2007, xiii).

While some of the foundations of ecological anthropology were laid out in section 1, and anthropological contributions to the study of population were illustrated in section 2, section 3 reminds readers that ecologies cannot be neatly separated from economies, politics, or other social and biocultural elements—including public health. Thus, ecological anthropology often dovetails with other fields of inquiry, including critical medical anthropology and the study of social movements and environmental justice. Acting as a bridge between section 2 and the subsequent sections in this book, section 3 invites readers to contemplate other variables, besides population growth, that might account for the accelerated rates of pollution, species extinctions, and changes in climate. Taken together, some researchers argue these environmental changes have created an anthropocene epoch, an era in the world's history in which human activities profoundly shape ecological processes. These chapters also invite readers to weigh the social consequences of economic growth. With authors representing multiple academic fields—including geography, economics, sociology, environmental studies, archaeology, and cultural anthropology—the chapters in this section feature diverse research methods, from surveys to interviews to computer modeling, and underscore the interdisciplinary nature of environmental research.

The first chapter in this section reminds readers of the important role archaeology has to play in understanding the long-term impacts of human activities on the environment as well as the effects of environmental changes on human civilizations. While it is beyond the scope of this reader to focus extensively on the archaeology of environmental change (see instead Redman 1999; Fagan 2009; Fisher et al. 2009), such research is valuable because it can identify the land-use changes that accompanied the emergence and decline of the world's greatest civilizations. For instance, thanks to archaeologists—key among them is V. Gordon Childe (1950)—we know that the Neolithic revolution (characterized by the domestication of wild plants and animals) actually *preceded* the first cities.[1] More recently, archaeologists have uncovered ancient land-management systems that could help us create a sustainable future (Costanza et al. 2007; Straughan [1991] 2012).

Following approaches in historical ecology (see chapter 41 for an overview of historical ecology), this section's first author, Charles Redman, surveys the archaeological record for ecological changes wrought by the growth of ancient cities in Mesopotamia, Mesoamerica, and the American Southwest. This chapter extends the previous section's discussion on population by citing archaeological evidence that humans have been able to curb population growth in both ancient and modern times through social and other means.

Redman's chapter is followed by a discussion from economist Theodore Panayotou of several hypotheses concerning the relationship between economic growth and environmental degradation. At the center of the article is a review of a particular economic model (the environmental Kuznets curve, or EKC),

which posits an inverted-U-shaped relationship between environmental degradation and per capita income. Proponents of the EKC posit that degradation first increases and then decreases as a country's economic development proceeds and its citizens presumably enjoy a higher per capita income, which allows them to afford greener technologies and a cleaner environment. Panayotou discusses the many problems with this theory. This article is important for any conversation about urbanism, industrialism, and economic growth because it reminds us that the way we imagine the relationship between economic development and environmental quality has critical implications for regulatory policies.

Sometimes, regulations are not sufficient to protect public health and environmental quality. As S. Ravi Rajan tells us in the next chapter, the MIC unit was added to the Bhopal factory in violation of the 1975 Bhopal Development Plan, which stipulated that hazardous industries should be positioned a safe distance away from heavily populated areas. This chapter chronicles the events leading up to the 1984 Bhopal disaster and describes how the company, the state, and activists failed in their recovery efforts and exacerbated vulnerability for survivors. Lamenting how the enduring tragedy of Bhopal has been virtually erased from public notice, Rajan refers to the incident as a "private nonissue."

Despite mounting concern about their negative effects (Carson [1962] 2002; Robbins 2007), agrochemicals have been central in the farming of cheap and abundant food that supports the world's growing cities. Yet individual homeowner applications of fertilizer in the United States can be as high as three to four times the rates used on nutrient-demanding commercial crops. Indeed, the chemically manicured lawn has become an ubiquitous, even defining, feature of the suburban landscape. The geographers Paul Robbins and Julie Sharp begin the next chapter by reviewing the history of the North American lawn and chronicling the efforts of some suburban municipalities to ban the use of pesticides on lawns. They then review some of the political economic variables that drive the high-input aesthetic and normalize homeowners' use of lawn chemicals. Questioning whether it is demand or supply that drives the prevalent and growing application of insecticides, herbicides, and fertilizers in North America, the authors argue that the lawn in its current popular form—that is, "monocultural, evenly shaded, emerald, crew-cut" (Robbins 2007: 83)—arises from a desire by agrochemical companies to expand their market reach.

Just as the manicured lawn is laced with "hidden impacts and invisible costs" (Robbins 2007: 4), so too are the structures of our urban landscapes and the everyday, sometimes lifesaving, consumer goods stockpiled therein. Steel production and cement manufacturing are some of the largest users of coal, a well-known fossil fuel and greenhouse gas emitter. Coal and coal by-products are used in soaps, aspirins, solvents, dyes, plastics, and fibers such as nylon and rayon. Coal is also a key ingredient in the production of filters that are used in water and air purifiers and in kidney dialysis machines; it is found in the carbon

fibers used in sporting goods—like canoes, hockey sticks, and bicycle parts—and in automotive and aerospace engineering; coal is an ingredient in the creation of silicones and silanes, which are used in lubricants, cosmetics, shampoos, and even toothpaste (World Coal Association 2015). Of course, the most significant use of coal is in electricity. Approximately 40 percent of electrical production in the United States comes from coal (U.S. Energy Information Administration 2014), and much of that electricity is consumed in cities whose residents never see the effects of their usage.

In another North American case study, Robert Todd Perdue and Gregory Pavela investigate the relationship between poverty and coal mining in West Virginia. These sociologists employ the tools of demography, the statistical study of human populations. Their analysis includes data from the Bureau of Labor Statistics, the U.S. Census Small Area Income and Poverty Estimates (SAIPE), the Bureau of Economic Analysis, and the West Virginia Office of Miner's Health Safety. Perdue and Pavela's calculations complement Panayotou's writing about the income-environment relationship; whereas Panayotou considers the effect of per capita income on environmental quality, this chapter explores the human capital implications of coal-mined environments. After finding that nonmining counties enjoy lower poverty and unemployment rates than mining counties do, the authors recommend "leaving remaining coal stores in the ground."

Much of the economic activity described in this section ultimately aims to increase the production and sale of consumer goods. Many people have responded to the environmental changes wrought by consumer-oriented industrialism by promoting sustainable economic development. Yet the idea of "development" is not without its critics. In this section's final chapter, the anthropologist James Ferguson and coauthor Larry Lohmann note how government "development" projects can cause social as well as environmental problems. They describe two failed development projects in Lesotho and review their "side effects"—the things these aid programs *did* accomplish even though they failed to alleviate poverty. In attending to local-level diversity and emphasizing the nuances of economic and social power, the authors make a strong case for incorporating anthropology in the formulation and evaluation of "development" assistance. The concern articulated by Ferguson and Lohmann for the differences between policy ideas and practices appears elsewhere in this volume (in sections 4, 5, 6, and 7), in chapters addressing sustainable development.

NOTE

1. The adoption of an agricultural lifestyle occurred independently in seven or eight parts of the world—including China and the Indus Valley in Asia, Egypt and Mesopotamia in North Africa and the Middle East, and Mesoamerica and the Andes in the New World. In all sites known to archaeologists, the adoption of an agricultural lifestyle occurred first, and only after several millennia did some of the Neolithic societies transform into states and cities (Smith 2009).

REFERENCES

Carson, Rachel. (1962) 2002. *Silent Spring*. Boston: Houghton Mifflin.

Childe, V. Gordon. 1950. The Urban Revolution. *Town Planning Review* 21 (1): 3–17.

Costanza, Robert, Lisa Graumlich, Will Steffen, Carole Crumley, John Dearing, Kathy Hibbard, Rik Leemans, Charles Redman, and David Schimel. 2007. Sustainability or Collapse: What Can We Learn from Integrating the History of Humans and the Rest of Nature? *Ambio* 36 (7): 522–527.

Fagan, Brian. 2009. *The Great Warming: Climate Change and the Rise and Fall of Civilizations*. New York: Bloomsbury.

Fisher, Christopher, J. Brett Hill, and Gary M. Feinman, eds. 2009. *The Archaeology of Environmental Change: Socionatural Legacies of Degradation and Resilience*. Tucson: University of Arizona Press.

Kumar, Raksha. 2014. Bhopal: Tragedy Lives On: 30 Years Later, Survivors of Lethal Gas Leak Still Fight for Justice. Al Jazeera America. December 2, 2014. http://projects.aljazeera.com/2014/bhopal-anniversary/.

Redman, Charles. 1999. *Human Impact on Ancient Environments*. Tucson: University of Arizona Press.

Robbins, Paul. 2007. *Lawn People: How Grasses, Weeds, and Chemicals Make Us Who We Are*. Philadelphia: Temple University Press.

Smith, Michael E. 2009. Centenary Paper: V. Gordon Childe and the Urban Revolution: A Historical Perspective on a Revolution in Urban Studies. *Town Planning Review* 80 (1): 3–29.

Straughan, Baird. (1991) 2012. The Secrets of Ancient Tiwanaku Are Benefiting Today's Bolivia. In *Applying Anthropology: An Introductory Reader*. Aaron Podolefsky, Peter J. Brown, and Scott M. Lacy, eds. Pp. 106–111. New York: McGraw-Hill.

U.S. Energy Information Administration. 2014. Frequently Asked Questions: What Is U.S. Electricity Generation by Energy Source? http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3.

World Coal Association. 2015. Uses of Coal. http://www.worldcoal.org/coal/uses-of-coal/.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 13: "The Growth of World Urbanism" by Charles Redman

1. What different land-use strategies did the preindustrial Mesopotamian, Mesoamerican, and Hohokam societies employ? How did these strategies affect their environments and their civilizations, in turn?
2. In what ways were the land-management strategies and hierarchical social systems of these agrarian societies adaptive and/or maladaptive?
3. What techniques do archaeologists use to study the impacts of past cultures on the environment?
4. What does Redman say about the role of population growth in shaping human impacts on the environment? How does this relate to what some of the other authors (see section 2) argue about population?

Questions to Accompany Chapter 14: "Economic Growth and the Environment" by Theodore Panayotou

1. What are some different theories about the relationship between economic growth and environmental degradation?
2. What questions should we ask when considering empirical models of environment and growth?
3. How might we bring Cliggett's critique of the concept of carrying capacity (chapter 11) into conversation with the empirical models described by Panayotou?

Questions to Accompany Chapter 15: "Bhopal: Vulnerability, Routinization, and the Chronic Disaster" by S. Ravi Rajan

1. What events led up to the catastrophic gas leak at the Union Carbide facility in Bhopal on December 4, 1984? What factors caused the initial leak to transform from an acute calamity into a chronic disaster?
2. In what ways did Union Carbide and its managers and shareholders benefit from the disaster, according to Rajan? Who else benefited from the "ecology of opportunity" that followed the disaster?
3. What "tactics of erasure" did Union Carbide employ in order to deflect responsibility for the leak?
4. In what ways is anthropology particularly well suited to study trends in, and the social and environmental effects of, urbanization, economic development, and industrialism?

Questions to Accompany Chapter 16: "The Lawn-Chemical Economy and Its Discontents" by Paul Robbins and Julie Sharp

1. What pressures have agrochemical manufacturers faced over the past few decades, and what has been their response?
2. What, according to Robbins and Sharp, has historically driven the increase in lawn-chemical application, supply or demand?
3. What steps are individuals, organizations, and states taking to challenge the high-input lawn?
4. At various points in the article, Robbins and Sharp strategically deploy words like "self-evident," "uncontroversial," and "ordinary" when describing the American lawn. Why, according to them, is it so important for us to study the history and ecology of such a "relatively noncontroversial landscape" as yards?
5. How does Robbins and Sharp's use of the term "uncontroversial" to describe the cosmetic application of pesticides in the Global North relate to Rajan's use of the term "nonissue" to refer to the tragedy that has befallen a community in the Global South where pesticides are manufactured?

Questions to Accompany Chapter 17: "Addictive Economies and Coal Dependency: Methods of Extraction and Socioeconomic Outcomes in West Virginia, 1997–2009" by Robert Todd Perdue and Gregory Pavela

1. The title "Addictive Economies" refers to a comparison made by the environmental sociologist William Freudenburg between the "the short-term logic" of drug addicts seeking their next "fix" and the decision-making processes of policy makers when it comes to resource extraction. Do you find this metaphor useful? Why or why not?
2. What is the "resource curse"? How does Purdue and Pavela's study either support or refute the resource curse literature?
3. Why, according to Purdue and Pavela, are there higher rates of poverty in coal-mining counties?
4. What is the "cost/price squeeze"? How does this affect poverty and per capita income in coal-mining areas?
5. What other variables are lessening the viability of the West Virginia coal industry?
6. What trends do Perdue and Pavela predict with respect to the future of underground and aboveground mining in Appalachia?

Questions to Accompany Chapter 18: "The Anti-Politics Machine: 'Development' and Bureaucratic Power in Lesotho" by James Ferguson with Larry Lohmann

1. Why, according to Ferguson and Lohmann, did the Thaba-Tseka Development Project and the livestock development program in Lesotho fail?
2. What do Ferguson and Lohmann mean when they refer to development as an "anti-politics machine"?
3. What is the problem, according to Ferguson and Lohmann, with the question "What should *we* do?" What is their suggested alternative to this question?

13

The Growth of World Urbanism*

CHARLES REDMAN

One of the dominant trends in world history during the past 5,000 years has been the emergence, spread, and continued growth of aggregations of people to the point that in modern times, each decade sees a larger majority of people living in cities worldwide. With an increasing reliance on an expanding food base provided by agrarian innovations and improvements in the transport of foodstuffs, it became possible for larger and larger numbers of people to exist and to live in nucleated locations. . . .

The emergence of urban society introduced a whole new set of human-environmental interactions. One set of impacts derives from the fact that there were just more people in the world, requiring greater food production. A second impact is the increased need for building materials—wood, stone, and fired bricks—to construct these cities. A third impact is the territory itself that is given over to settlement, creating urban ecosystems. A fourth impact is really a series of newly established interactions caused by the nature of urban society with its industry, trade, and hierarchical administration. . . .

Mesopotamia

It was a study conducted in the Near East that first demonstrated the value of archaeology in understanding human impacts on the environment and possible methods to ameliorate these problems. In 1958 Thorkild Jacobsen and Robert McC. Adams published an article in *Science* that spoke directly to the problems caused by salinization of farmlands in lower Mesopotamia 4,000 years ago and what modern inhabitants of that region might learn from the past (Jacobsen and Adams 1958). Over the years since 1958, sporadic papers have continued to appear on this subject (Gibson 1974; Gelburd 1985; Dickson 1987; Redman 1992), and salinization is often expressed in textbooks (Redman 1978; Nissen 1988) as a major problem leading to the reduced political importance of southern Mesopotamia, even though there remains considerable debate (Powell 1985) over the cultural context that led to this environmental "catastrophe." . . .

Four thousand years ago, the Ur III Dynasty was situated in the southern half of Mesopotamia and consisted of numerous cities, each inhabited by several tens of thousands of people and supported by an associated hinterland of farms and villages. This was one of the great early societies of Mesopotamia with well-developed writing, a system of laws, extensive trade networks, and ambitious builders, and it was a period of strong centralized political control (Edzard 1967; Nissen 1988). The economic system relied heavily on irrigation agriculture with vast field systems along the Euphrates River and canals leading from it. Winter-cultivated cereals were the main crops, although there were many secondary crops. Herding was also important, with contemporary records indicating as many as two million sheep were being kept.

The aspect of Ur III society emphasized here is the rapid rise in the centralized control of the political hierarchy and paradoxically how that contributed to an era of declining agricultural productivity and environmental damage. Centralized control of the once independent city-states was a logical objective of the growing power of the Ur III rulers. Centralization gave them greater access to labor pools, military conscripts, trade goods, and agricultural produce. More telling from our perspective, centralized control increased the potential for the production of food and other goods. Some of this increased productivity was achieved through increased specialization of production, but the majority resulted from centralized management of the construction and maintenance of water works and the allocation of water in the growing irrigation network that fed the Mesopotamian fields. Moreover, it was a logical decision for Ur III rulers to extend the land served by irrigation and to increase the capacity of the existing canal system so more water could be brought to the fields. This would allow more water to be used, particularly in flood years. Another decision that would have seemed logical under pressure to produce more would be to shorten the period of time fields were left fallow. But the same decisions that brought short-term increases in production, as evidenced in the high population density and great construction projects of the Ur III period, rapidly undermined the agrarian base and led to a long period of diminished productivity. The major villain was salinization of the soils. Although there is general agreement that salinization was, as Hans Nissen says, "one of the greatest countrywide catastrophes," there remains considerable debate over the causes.

Written records of temple storehouses of the period allow scholars to reconstruct with some certainty the relative productivity of fields and the crops being planted. A long-term decrease in productivity occurred between 2400 and 1700 B.C. At the outset of this period, wheat was an important crop, accounting for at least one-sixth of the cereals produced. But as salinization increased, people slowly shifted to the more salt-tolerant barley, so that by the end of the Ur III Dynasty in 2000 B.C., wheat made up only one-fiftieth and by 1700 B.C., it appears that wheat was totally abandoned in the region (Jacobsen 1982). The

end of this decline in wheat production coincides with a long period during which centralized political control had broken down. Many cities were abandoned or reduced to villages, and the emphasis in agriculture shifted. Whereas during the height of Ur III control-maximizing surplus production for central rulers dominated, during the subsequent political breakdown, the object became satisfying the needs of local populations in a more self-sufficient localized production mode.

The evidence from the uplands surrounding Mesopotamia that is only beginning to be collected by a couple of projects has provided a consistent set of results. Naomi Miller has examined macrobotanical remains from two widely separated sites in upland Iran and Turkey (1992). She found that over time during the second and third millennia fuel wood was brought into the settlements from farther and farther away. There was also a shift to a greater reliance on dung over wood as a source of fuel. Both patterns indicate that forests were being clear-cut in the vicinity of the settlements. . . .

Another study, this time of pollen taken from a core from the bottom of a lake in south central Anatolia, reveals a more broadly regional pattern of vegetative change over the past 10,000 years. During the last Ice Age, the region was a glacial, steppe environment with few trees and mainly grasses (characterized as *cheno-artemisia*). During the early Holocene (ca. 9000 B.P.), when the first farming villages would have been established, the region hosted a mixed forest of oak, pine, and juniper. By the mid-Holocene (ca. 3000 B.P.) the oak in the forests was drastically reduced; pine, whose pollen can travel great distances, continued; and cereal grasses increased. Recent pollen evidence is dominated by pine pollen that is traveling from mountainous refuge areas and a modest occurrence of cereals, reflecting the reduction in agriculture in the region.

The traditional lore today in the Near East to explain deforestation and localized failures of farming blames it on the Ottoman rule of the region during the last few centuries. It is said that the denuded lands are largely the result of overgrazing of goats during the period of Ottoman rule and that in ancient times these were the lands of "milk and honey." This assertion is probably true to some extent in that the Ottoman political system discouraged local infrastructure development and encouraged small-scale social groups that would rely on herded animals. However, this interpretation is an oversimplification that takes our attention away from the needs of the domestic hearth and industrial kiln from as far back as the earliest civilizations 5,000 years ago. . . .

Mexico and Central America

Mexico and Central America were home to a wide variety of impressive prehistoric societies. The Maya to the south and a variety of Central Mexican societies to the north each built strong agrarian systems that supported very high

populations and elaborate urban centers (Coe 1964). The main New World crop in North, Central, and South America was corn. First domesticated about 5000 B.C., or somewhat earlier, corn started out as a very small cob, not economically viable as the dominant food source. This differs from Old World species like wheat that were nearly as productive in the wild as under early cultivation. Early forms of corn were pioneering weeds basically used by Central Americans as a backup or famine food. However, over a long period of low-level use, the nature of corn changed, with larger cobs and kernels being selected for by the early users. It took three or four millennia of slowly increasing the size of the cob, the number of kernel rows, and the size of individual kernels before corn as a crop became so productive that people could depend on it as their primary food. With this change, somewhere around 2000 to 1000 B.C., it became practical to invest the labor to clear fields and to establish year-round villages that could rely on corn harvests and stored corn for their primary subsistence. During this same period other crops were also experimented with and ultimately domesticated by New World groups. Gourds, squash, and beans are among the most important, but altogether more than 40 species of economic plants were domesticated in the New World.

Once well developed, corn and other New World domesticates offered people an abundant source of food, leading to increasing population and social advance. The Maya of Central America were among the most innovative people of the Americas, having many accomplishments in the arts, science, and human organization. Well before the beginning of the Christian era, the Maya and their associates had built enormous ceremonial and administrative centers throughout their lands and developed into a tightly controlled society that thoroughly settled the landscape between centers with scattered farming households and hamlets. The geography of the Mayan homelands did not lend itself to centralized irrigation works but rather was most suitable for extensive fields of slash-and-burn (milpa) agriculture. This ensured that the agrarian population would have to remain scattered to be close to their fields and that a maximum amount of land would have to be under tillage to support the growing population. In fact, as many as 8 to 10 million people lived in the Mayan domains 1,000 years ago, a figure not surpassed until the recent decades of this century.

The Mayan homelands of the Yucatán, Belize, Guatemala, and parts of Honduras were well watered and primarily lowlands. The upland zone, focused in Guatemala, had relatively well-drained soils that were favorable to maize agriculture, especially in the valley bottoms. The Mayan lowlands were characterized by less well-drained soils in an environment of flatlands with scattered lakes. Classic Mayan civilization, best known for its ceremonial centers with earth-filled pyramids topped with carefully ornamented temples, was well established by A.D. 300. The construction and decoration with stucco relief of pyramids and temples absorbed tremendous amounts of Mayan labor and resources. These centers

were the focus of religious activities, trade relations, and whatever political integration existed at the time. The Maya were remarkable astronomers and regulated religious events with a sacred calendar that was calibrated by an extremely accurate secular calendar. Public ceremonies utilizing the temples, pyramids, and ritual ball courts demonstrated the power of the elite, as did the rising tide of militarism. Despite their many talents, the zenith of Mayan ceremonial centers and the organized society they represented was not especially long lived. By A.D. 900 to 1000 there is widespread archaeological evidence for the abandonment of most of the major centers and an overall drop in the population of the region. Clearly there is a breakdown in the political and social organization that had led the Maya to such impressive accomplishments. Various theories have been put forward as to the cause of this "collapse." Primary among them is that degradation of the environment through excessive agricultural practices played a major role (see Culbert 1973). . . .

The Petén region of lowland Guatemala was the subject of a pioneering study of prehistoric human-environmental relations by the Central Petén Historical Ecology Project (CPHEP; see Rice 1996). This project was designed primarily to learn about the genesis and change of the tropical forest, rather than focusing on the prehistory of the Maya. However, the Maya were clearly one of the central agents of environmental transformations, being a "strain" on the natural ecosystem. One of the goals of this study was to delineate changes in the forest ecosystem that could be attributed to climate change versus those resulting from human impact. May to October is the rainy season in the Petén, with 70 to 90 inches per year. A high canopy of mahogany, breadnut, and sapodilla trees dominates the landscape with a middle canopy of avocado and other small trees and shrubs. In temperate regions, . . . forest soils contain most nutrients that sustain plant growth. When a temperate forest is cut down, it is the soil that stores the nutrients until they are utilized by subsequent growth.

In contrast, it is the vegetative cover rather than the soil that holds most of the nutrients in tropical forests, such as those of the Petén (Rice and Rice 1984: 8). More than 75% of the nutrients in a tropical forest ecosystem are in the living vegetation and the dead organic matter on the ground, which is rapidly recycled into new growth rather than enriching the soil. Because of this a tropical forest can regenerate almost all of its biomass within a 10-year period, versus up to 100 years in most temperate settings. If the trees and vegetation that are cut are also burned, this recycling is even faster. Hence, a slash-and-burn strategy can transfer the abundant nutrients in the tropical cover to newly planted crops and yield impressive returns. At the same time, slash-and-burn exposes the soil to potential erosion and therefore is best conducted in selected topographic settings and under close management.

We know from historic periods that this region can efficiently support a swidden or milpa agricultural system, where trees are cut from a plot of land before

the dry season and burned at the end of the dry season. Then it is used for two years of crops and left fallow for three to six years. This type of rotation has been known in recent times to comfortably support a density of about 25 people per square kilometer. However, archaeological evidence from this region suggests that at certain times and in some locations, the population density attained 250 people per square kilometer (Rice 1996: 196). Obviously, Mayan farming strategies were well developed and closely attuned to the potentials of the environment. Houses were dispersed across the countryside to allow farmers easy access to the maximum amount of arable land. Instead of transforming the entire landscape to increase production, the Maya grew a diversity of crops on the same field and may have focused on the naturally low-lying areas, or *bajos*, with their relatively fertile soils for labor investments such as raised fields. The efficient production and centralization of farm products allowed the growth of enormous ceremonial centers such as Tikal, which thrived from 100 B.C. to A.D. 900. However, even Tikal entered a period of decline in A.D. 800, with the last dated monument being constructed in A.D. 909. The general belief is that the land had been filled up for some period, and with declining fertility, the dense population could not be supported and fell into rapid decline, requiring emigration. Archaeologists estimate that within a few centuries, population had fallen by 80% and most of the formerly majestic ceremonial centers had been abandoned.

As part of the Central Petén Historical Ecology Project, Don and Prudence Rice and Bill Deevey studied several lake basins from a number of perspectives: archaeological settlement patterns, pollen record, erosion of sediment, and chemical loss of soils (Rice and Rice 1984). Their unit of study was the lake and its drainage basin. One can relatively easily define the surface boundaries of each lake basin and then monitor the movement (flux) of nutrients and sediments between the terrestrial and aquatic portions of the system (see Binford and Leyden 1987). Their model views an ecosystem as sustaining itself on the flow of chemical elements drawn by vegetation from rocks, soil, and air, carried either in dissolved or suspended form in water into the lake. The presence of humans increased this flow. Thus a lake basin can be thought of as a *trap* in a closed system, revealing activities that influence the terrestrial components of the catchment basin.

By examining sediment cores taken from lake bottoms, these authors found that the deposition of phosphorous and silica were both amplified over normal levels during the period of Mayan occupation, indicating a significant disturbance of the surrounding landscape. Phosphorus is rare in the lowlands and is crucial for agrarian success; hence tracing its movement through the environment is a meaningful measure of impact on chemical nutrients. Erosion leads to a permanent loss of phosphorus from the soil, since it is generated very slowly from underlying bedrock. Because of this, in modern times phosphorus is one of the major elements added to soil in the form of chemical fertilizer. It is believed

that activities such as burning vegetative cover and constructing stone buildings released large amounts of phosphorus into the soil (Rice and Rice 1984: 21). Phosphorus deposited in lake bottoms reflects the active transport through erosion of the chemicals from surrounding topsoil, where it exists both because of natural generation from bedrock as well as from human waste, food products, mortuary, and disintegration of stone building materials. The researchers found that the phosphorus deposition in the lakes increased roughly in a linear relationship with the archaeological evidence of population increase, reflecting probably both more phosphorus in the soil and more erosion of this soil into the lake bed. This loss of a key element, and other components of the topsoil as well, led to a slow but progressive undermining of the productivity of the lands around the lakes, particularly the uplands that would be most vulnerable to slope wash.

Silica, being a relatively large-grained component of soils, is a reasonable indicator of the rate of transport of soil in a lake basin (Binford and Leyden 1987). It might reflect a variety of landscape-altering activities that would make the soil more susceptible to erosion, such as deforestation, cultivation, and settlement construction. The researchers found that in Lake Sacnab and especially in Lake Yaxha, silica deposition increased several fold during the height of Mayan occupation (Rice, Rice, and Deevey 1985). Despite this evidence of soil erosion and the implied reduced productivity of local lands, the Maya lived here and elsewhere for a long period of time. Clearly the Maya understood the tropical forest ecosystem well enough to maximize the exploitation of the region and to conserve available resources so as to thrive for centuries in most locations. Researchers have suggested that the Maya tried not to completely clear the land and to plant it with diverse crops to maintain fertility and minimize exposure to erosion. They also invested heavily in water control to minimize the destabilizing aspects of water flow while maximizing the flow to fields to increase crop yield per hectare (Rice and Rice 1984: 27). And finally they organized themselves to move food around the region, buffering localized risks and allowing for concentrations of population.

The picture that comes together from studies of the Petén and the adjacent Mayan area of the Mexican Yucatán reveals an anthropogenic ecosystem through much of the Holocene. The high forest that prevailed in much of that region was largely removed by the farming and settlement-building activities of the Mayas as early as 3,000 to 4,000 years ago (Islebe et al. 1996). This resulted in a shift toward more open vegetation during much of the Mayan occupation, with the maximum deforestation between 1,000 and 2,000 years ago. The basic drain on the land of dense population, intensive agricultural manipulation, and construction of massive settlements increased to the point where the system was no longer sustainable. Declining productivity must have had a multiplier effect, leading to food shortfalls, reduced labor investment, and political instability. By the end

of the tenth century A.D., most of the large settlements of the Mayan uplands and southern lowlands had been abandoned or at least seriously depopulated. The deterioration seems to coincide with a relatively dry period that would have also put pressure on productivity, making it difficult to determine whether the primary influence was climatic or human (Hodell, Curtis, and Brenner 1995). Without denying this uncertainty, I believe this "collapse" was primarily due to the extended period of intense human exploitation, albeit aided by microclimate variability. . . .

Hohokam of Southern Arizona

The Hohokam represent one of the great cultural traditions of the American Southwest. Archaeologists have characterized them by the red paint on buff-colored pottery, the fact that they built platform mounds and ball courts, and their highly efficient irrigation agriculture (Gumerman 1991; Crown and Judge 1991). Their settlements are found along the lowland river valleys in the desert region of central and southern Arizona. Their occupations of parts of this region are very long lived, beginning before the Christian era and lasting until almost A.D. 1400. Some of their settlements were occupied for only a few generations, but in selected locations, such as the basin occupied by the modern city of Phoenix, Hohokam communities were present for a millennium. These were very successful farmers who built impressive irrigation systems; their homeland received only six or eight inches of rain per year, far less than corn requires. The Hohokam supplemented their irrigation crops by gathering plants and hunting game. They also developed a regional trading network that brought them products from the uplands to the north and east. Although the population density of the Phoenix basin ebbed and flowed, the persistence of the Hohokam in that location is truly impressive, and to the Hohokam themselves, their existence must have appeared sustainable forever.

The centerpiece of the Hohokam's success was their irrigation system, which was built around the two rivers—the Salt and the Gila—that traversed the broad Phoenix lowland basin. These rivers ran year-round, but their volume varied enormously in response to runoff from rainfall and snowmelt in their catchments during the spring. When these rivers were in flood, they carried substantial quantities of suspended sediment from the uplands. When the fields were purposely watered or accidentally flooded, they received a load of nutrients and new silt that served to regenerate the soil's fertility. This was extremely important in the Southwest, where soil development was slow and remained shallow. The Hohokam took advantage of this resource by building hundreds of miles of canals, some as long as 30 km, to bring water and sediments to increasingly distant fields. Hohokam settlement focused in the wide valley bottoms of the Salt, the Gila, and their tributaries. However, they also utilized the sloping

uplands, the bases of alluvial fans, and the arroyo bottoms, where storm runoff could be channeled and would bring major organic and sediment additions to the desert soils.

Other aspects of the Hohokam's food-producing strategy were designed for enhancing productivity and maintaining sustainability. Use of surface water was essential for Hohokam survival, and sources of this water in the desert Southwest were extremely localized. Moreover, locations suitable for water diversion or canal headings in association with downstream flatlands for farming were even more restricted. This made it very disadvantageous for a settlement to move frequently. In addition, the major labor invested in constructing canals and runoff-gathering features, and the fact that population was increasing and filling up alternative locations, made it very important for Hohokam settlers to conserve the long-term productive potential of their immediate surroundings. The fact that intensive agriculture results in reduced mobility options for human groups is key to understanding the human-environmental interactions of the Hohokam and many other groups around the world.

The removal of ground-cover plant material was mediated by the fact that the Hohokam were "direct gatherers"; that is, they consumed what they gathered rather than depending on domestic animals that consumed the plant material. This meant that a wide range of plants not eaten by humans that might be consumed by domesticates would be spared. It also meant that when humans did consume wild plant material, they often focused on the seeds or fruits, leaving the plant intact. This, combined with the fact that the Hohokam homeland had a relatively warm climate (minimizing the need for fuel to heat their homes), meant that the vegetative ground cover was favored. Potential sources of fuel, such as mesquite trees, were also spared because they produced seedpods that were important sources of food. Wood for fuel and for construction would have had to come from elsewhere. Also, transplanted desert species supplemented the corn, beans, and squash that spread from Mexico. Local varieties of beans were grown, agave was harvested for food and fiber, and other crops like cotton and little barley also contributed. Animals hunted were usually small and found in the vicinity of settlements, such as rabbits. Trapping them may have been a regular part of the daily farming regime. Large artiodactyls, like antelope and deer, were hunted when available, but over time it appears that long-distance hunting parties were needed to bring back these animals, implying that they were no longer available locally. Also over time, the shift in type of rabbits eaten (from cottontail to jackrabbit) reflects increasingly open habitats. Both of these processes show that despite the conservation efforts of the Hohokam, their presence in high numbers took its toll on the natural vegetation.

Archaeological evidence reveals that there was a dramatic increase in riparian species consumed during the Classic period (ca. A.D. 1250–1400), a time by which the other terrestrial fauna would be depressed in the vicinity of

settlements. Although the overall climate and environment of central Arizona has not changed significantly since Hohokam times, the riverine ecosystem along the Salt and Gila Rivers has changed dramatically as a result of human-induced alterations, primarily during the past century. In prehistoric times the rivers would have had some water year-round, and they would have flowed actively for substantial periods of time. There would have been lakes and swamps along the river courses, and the riparian areas would probably have been lush and large. Nevertheless, the use of muskrat, beaver, birds, and fish implies a food crisis for the Hohokam. Fish ranked second behind rabbits as a source of animal protein for the Classic period Hohokam (James 1994). In measuring the size of the fish taken during Classic Hohokam times, Steven James found that they were smaller than the modern examples, suggesting to him that already these fish were under pressure and the larger ones had been fished out, leaving only relatively small fish to be caught. James's overall point is that long-term, dense occupation of the Salt-Gila River Valleys by the Hohokam led to the impoverishment of large game in the region, forcing them to use less desirable small game as a source of protein. It even led to the degradation in the river fish available. But this was probably not enough to lead to the abandonment of the region by A.D. 1400.

The Hohokam developed important social institutions to help overcome the difficulties in their environment. As the number of Hohokam settlements grew in an area, they developed coherent groupings we call the Hohokam "community." In the denser situations, this resulted in large central sites with public architecture, such as a ball court and/or platform mound that would be the focus of ceremonial and civic activities. Small settlements, and even distant, part-time hamlets, were involved in the success of these "communities" by being located nearer the agricultural fields and wild-food collecting stations. Community organization provided the framework for allocating water from canals and mobilizing labor for construction and maintenance of the canal system.

In sum, the Hohokam developed a distinctively enduring settlement system that outlasted most of their southwestern and North American neighbors. Renewal of fields through waterborne additives permitted a seemingly sustainable agriculture. The yield of domestic crops was supplemented by tended and weedy indigenous species. Because settlements were localized along watercourses, the large surrounding expanses were left uninhabited, allowing for the continued growth of wild vegetation for fuel, craft materials, and edible wild resources. Added to these procurement strategies was an overarching social organization that acted to spread agricultural risks over a sufficient number of environmental zones and allowed for temporary shortfalls that would be buffered through social connections. An example of this relationship is the fact that agricultural fields in the uplands would benefit from a year of heavy rainfall that might cause destructive floods in the lowland fields. This is clearly a lesson in human organization that adjusted to the requirements of its environment to

survive for what, to its inhabitants, must have seemed like an eternity. Nevertheless, Hohokam society came to an end in the fourteenth century, and it is informative to examine the possible causes.

To suggest a possible set of reasons for the demise of Hohokam society, it is useful to look more closely at the relation of environmental factors, irrigation strategies, and social responses. A study of tree ring variability taken from the upper drainage of the Salt and Gila Rivers provides new insight into this complex set of relationships (Nials, Gregory, and Graybill 1989). The basic assumption of tree ring studies is that trees will grow more (i.e., thicker rings) in wet years and less in dry years. In the lower valleys where the Hohokam irrigation system was centered, this should correlate directly with stream runoff and consequent levels of flooding. Although there may be intervening variables, this assumption seems reasonable, and moreover, it provides archaeologists with a useable surrogate measure of annual environmental cycles, at a level of accuracy we seldom attain for the past.

In the Salt-Gila River Valley, settlement grew as people were able to develop irrigation systems using the river floodwaters to advantage. The rivers themselves probably braided as well as ran in a deep channel. Settlement appears to have been along the channels and the main feeder canals. These feeders and the ultimate distributor canals were located some distance downstream from the initial intakes, making each major canal that took water directly from the river the feeder to an entire system of canals that often stretched for many miles downhill. Communities were located along these feeder canals, and it is hypothesized that because they all depended on maintaining the same source of water, they also were held together as a social or political unit (Abbott 1994).

According to the tree ring records, there were some big variations in flood levels before A.D. 800, but after that date for over two centuries (until ca. A.D. 1075), there were relatively consistent water levels. This condition favored the construction of an expanded irrigation system in the lower valley. This climate predictability would have encouraged a period of great growth in population and organization. Archaeological evidence confirms this hypothesis, documenting not only a filling in of the Phoenix basin and other lower river valleys but also the appearance of settlements well up the tributary rivers that displayed Hohokam characteristics. Archaeologists consider these as potential colonies where materials and goods were exchanged with the central valley settlements.

During the next century and a half (ca. A.D. 1075–1250), tree ring evidence indicates that the variability of floods increased with dramatically higher or lower water levels occurring each 20 years or less. Although this situation is less favorable for growth than the preceding centuries, it is within limits that the Hohokam were able to handle without major disruption to their society. Although droughts must have been hard on these people, if they were spaced years apart and reasonable quantities of corn were stored, they could be weathered without enduring

trouble. Floods might have had a more serious impact on the system, because they would likely inundate whatever crops were in the fields and destroy irrigation facilities that would take substantial labor to replace. Regional trading partners were probably sufficient to get the Hohokam through drought years, and the destructive flood years must have been far enough apart for irrigation works to be reconstructed without discouraging the inhabitants.

In the century following A.D. 1250, the climatic situation appears to have become even more erratic, with floods or droughts coming at least once every 10 years. This put tremendous pressure on the survival of the entire system. Crop production in the valleys was seriously diminished, and labor required to maintain the irrigation works dramatically increased. The reduced surpluses of the valley people led to the dissolution of the regional system, which put increased pressure on the valley residents in bad years. To make up for these shortfalls, it is likely that the valley farmers overplanted in their good fields, extended planting to marginal fields, and cut back on fallow periods. All of these strategies would lead to decreases in soil fertility and subsequent productivity. It might also have led to salinization of the formerly most productive soils in the lower valleys. To increase the fields watered during favorable water years, the canal intakes may have been built larger, but during serious floods this would only increase the destructive force of the flood and require even greater labor to replace. At this same time, there was most likely a transformation of the sociopolitical system that emphasized more centralized control, possibly as a response to the increasing environmental threat to the agricultural system (Abbott 1994). . . .

The human presence and agricultural activities of the Hohokam on and around the floodplain also contributed to basic environmental problems. Stream channel entrenchment seems to have occurred more frequently and more severely during late prehistoric times than one would expect from climatic factors alone (Waters 1991: 155–156). By clearing vegetation from the floodplain and surrounding slopes (*bajadas*), the Hohokam would have inadvertently increased the volume and velocity of surface runoff. Compacted foot trails, short ditches, and even the canals themselves would have concentrated the runoff and further increased its velocity. Taken together, this would seriously enhance the likelihood of serious soil erosion from the slopes surrounding the valley and siltation of the canals on the valley floor.

The longer the Hohokam existed in the same location, the more pressure they put on floodplain dynamics and on the fertility of the soil, but they maintained it through various conservation methods and by supplementing local food with goods brought in by exchange systems. However, when the climate entered a long period of greater variability, including disastrous flooding, it put an additional pressure on the Hohokam system that could not be easily sustained. Their response was to invest more labor in extracting the maximum from the land,

but that made the system even more vulnerable to climatic extremes. The production shortfalls also diminished their ability to maintain their regional trading partners and threatened their local organizational control as well. Energy and resources devoted to ceremonial activities and other cooperative ventures helped hold the system together for generations, but at a cost. To provide for these activities, the agricultural extraction was continually maximized, which cost enormous labor investments and weakened the underlying resilience of the system. When an infrequent but extreme climatic situation arose, the system now could not recover from it, as it probably would have recovered if it had happened a century or more earlier. Nials, Gregory, and Graybill (1989) believe such an event, or series of events, occurred around A.D. 1350. Two years in succession witnessed the highest flood level they had recorded and were followed immediately by one of the driest years on record. The system, already weakened by a century of disruptions, obviously did not overcome this one-two punch. Archaeological evidence shows very sparse settlement in the valley after that date and the disappearance of many of the traits we have identified as Hohokam from the record.

Human-Land Relationships in Early Civilizations

The main point of the Mesopotamian and Hohokam examples, and I believe of the Mesoamerican examples as well, is that at least in these preindustrial societies, short-term political stability and economic maximization were only achieved by weakening the capacity of the productive system to react to internal and external challenges and, hence, undermined its long-term survival. Cooperative activities in many contexts may help survival of small-scale systems, but as those cooperative ventures become larger and more formalized, their adaptive potential does not always operate. The archaeologists responsible for the Mesoamerican case studies have not yet suggested the social context of the environmental problems they observed, but I would not be surprised if they paralleled the Mesopotamian and Hohokam situations. State ideologies asserted at that time, as do many today, that everyone's interests were served when the interests of the central rulers were served. Yet many people may not share the rulers' objectives, and all elements of the population may not benefit equally from a particular productive strategy. The issue, therefore, is the effective locus of decision making within the society, how these decision makers gain their information, and how they perceive their needs.

As successful agrarian societies began to develop managerial and hierarchical social systems, they set in motion forces that reshaped the agricultural decision-making process, which in turn guided human impacts on the environment. There were benefits to these changes, but in many cases they appear to have threatened the long-term stability of human-land relationships. Anthropologist

Roy Rappaport considers this type of inefficiency in the flow of information a "maladaptation" that exists in many complex societies and often undermines their continued survival (1978). Gifts to religious orders, taxes for political leaders, or even unequal exchange values in a market are all ways a surplus can be culled from the producers for the benefit of the elite. For these types of asymmetrical flows of goods to exist in a society, there must also be a strong ideology that convinces the producers that it is in their benefit, or at least necessary, to provide these goods to the elite. The promulgation of these ideologies helps to hold together complex societies.

A useful framework for the discussion of the Ur III Dynasty and the other case studies in this chapter is to think of long stretches of history as a series of cycles of growth, stability, and decline. The idea of regions and their dominant societies oscillating in a cyclical pattern is not new, having been proposed by the fourteenth-century geographer Ibn Khaldun (1967). This pattern can be measured in terms of any number of key variables, such as population, energy consumption, other technological indicators, centralization of political power, changes in social organization, or agricultural productivity of the landscape. It is likely that many of these factors are interrelated through feedback mechanisms that act to limit excessive growth in order to regenerate overdepleted situations—hence the appearance of cyclical behavior.

It is generally agreed that population level is a key variable in understanding the seriousness of human impacts. This is true for any animal species: if the population grows too large, the readily available resources in their environment are no longer able to support it. What alters this relationship for human groups is that through agricultural technology we have been able to enhance the natural productivity of an environment, and through trade or warfare we have been able to move resources from areas of availability to areas of high demand. The actual population numbers in any particular community or for an entire society reflect a variety of biological and social factors that govern fertility, mortality, and migration. The archaeological and ethnographic records clearly demonstrate that although human populations are biologically capable of growing quite quickly, they equally are able to limit that growth through social and other mechanisms (Cowgill 1975). This produces a situation in which population growth is seen not as an unremitting pressure but rather as a flexible variable responding to many factors by increasing, remaining stable, or even declining.

WORKS CITED

Abbott, David R. 1994. "Hohokam Social Structure and Irrigation Management: The Ceramic Evidence from the Central Phoenix Basin." Ph.D. dissertation, Department of Anthropology, Arizona State University, Tempe.

Binford, Michael W., and Barbara Leyden. 1987. Ecosystems, Paleoecology and Human Disturbance in Subtropical and Tropical America. *Quaternary Science Reviews* 6:115–128.

Coe, Michael D. 1964. The Chinampas of Mexico. *Scientific American* 211 (1): 90–98.

Cowgill, George L. 1975. On Causes and Consequences of Ancient and Modern Population Changes. *American Anthropologist* 77 (3): 505–573.

Crown, Patricia L., and James Judge (eds.). 1991. *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*. School of American Research Press, Santa Fe, NM.

Culbert, T. Patrick (ed.). 1973. *The Classic Maya Collapse*. University of New Mexico Press, Albuquerque.

Dickson, Bruce D. 1987. Circumscription by Anthropogenic Environmental Destruction: An Expansion of Carneiro's (1970) *Theory of the Origin of the State*. *American Antiquity* 52 (4): 709–716.

Edzard, Dietz O. 1967. The Third Dynasty of Ur: Its Empire and Its Successor States. In *The Near East: The Early Civilizations*, edited by Jean Bottéro, Elena Cassin, and Jean Vercoutter, 133–176. Delacorte, New York.

Gelburd, Diane E. 1985. Managing Salinity: Lessons from the Past. *Journal of Soil and Water Conservation* 40 (4): 329–331.

Gibson, McGuire. 1974. Violation of Fallow and Engineered Disaster in Mesopotamian Civilization. In *Irrigation's Impact on Society: Anthropological Papers of the University of Arizona, No. 25*, edited by Theodore E. Downing and McGuire Gibson, 7–19. University of Arizona Press, Tucson.

Gumerman, George J. (ed.). 1991. *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*. Amerind Foundation Publication, Dragoon. University of New Mexico Press, Albuquerque.

Hodell, David A., Jason H. Curtis, and Mark Brenner. 1995. Possible Role of Climate in the Collapse of Classic Maya Civilization. *Nature* 375 (6530): 391–394.

Islebe, Gerald A., Henry Hooghiemstra, Mark Brenner, Jason H. Curtis, and David A. Hodell. 1996. A Holocene Vegetation History from Lowland Guatemala. *Holocene* 6 (3): 265–271.

Jacobsen, Thorkild. 1982. Salinity and Irrigation Agriculture in Antiquity; Diyala Basin Archaeological Projects: Report on Essential Results, 1957–58. *Biblioteca Mesopotámica* 14. Undena, Malibu, CA.

Jacobsen, Thorkild, and Robert McC. Adams. 1958. Salt and Silt in Ancient Mesopotamian Agriculture. *Science* 128 (3334): 1251–1258.

James, Steven R. 1994. Hunting, Fishing, and Resource Depletion: Prehistoric Cultural Impacts on Animals in the Southwest. Paper presented at the 1994 Southwest Symposium, January 7–8, Arizona State University, Tempe.

Khaldun, Ibn. 1967. *The Muqaddimah*. Translated by F. Rosenthal. Princeton University Press, Princeton, NJ.

Miller, Naomi F. 1992. Clearing Land for Farmland and Fuel: Archaeobotanical Studies of the Ancient Near East. In *Economy and Settlement in the Near East: Analyses of Ancient Sites and Materials*, edited by Naomi F. Miller, 71–78. MASCA, University Museum of Archaeology and Anthropology, University of Pennsylvania, Philadelphia.

Nials, Fred L., David A. Gregory, and Donald A. Graybill. 1989. Salt River Stream Flow and Hohokam Irrigation Systems. In *The 1982–1984 Excavations at Las Colinas: Environment and Subsistence*, by Donald A. Graybill, David A. Gregory, Fred L. Nials, Suzanne K. Fish, Robert E. Gasser, Charles H. Miksicek, and Christine R. Szuter, 59–76. Archaeological Series No. 162 (5). Arizona State Museum, Tucson.

Nissen, Hans J. 1988. *The Early History of the Near East, 9000–2000 B.C.* Translated by E. Lutzeier. University of Chicago Press, Chicago.

Powell, Marvin A. 1985. Salt, Seed, and Yields in Sumerian Agriculture: A Critique of the Theory of Progressive Salinization. *Zeitschrift für Assyriologie und Vorderasiatische Archäologie* 75 (1): 7–38.

Rappaport, Roy R. 1978. Maladaptations in Social Systems. In *The Evolution of Social Systems*, edited by J. Friedman and M. J. Rowlands, 49–87. University of Pittsburgh Press, Pittsburgh.

Redman, Charles L. 1978. *The Rise of Civilization: From Early Farmers to Urban Society in the Ancient Near East*. W. H. Freeman, San Francisco.

———. 1992. The Impact of Food Production: Short-Term Strategies and Long-Term Consequences. In *Human Impact on the Environment: Ancient Roots, Current Challenges*, edited by J. E. Jacobsen and J. Firor, 35–49. Westview, Boulder, CO.

Rice, Don S. 1996. Paleolimnological Analysis in the Central Petén, Guatemala. In *The Managed Mosaic: Ancient Maya Agricultural and Resource Use*, edited by Scott L. Fedick, 193–206. University of Utah Press, Salt Lake City.

Rice, Don S, and Prudence M. Rice. 1984. Lessons from the Maya. *Latin American Research Review* 19 (3): 7–34.

Rice, Don S., Prudence M. Rice, and Edward S. Deevey, Jr. 1985. Paradise Lost: Classic Maya Impact on a Lacustrine Environment. In *Prehistoric Lowland Maya Environment and Subsistence Economy*, edited by Mary Pohl, 91–105. Papers of the Peabody Museum 77. Peabody Museum of Archaeology and Ethnology, Cambridge, MA.

Waters, Michael R. 1991. The Geoarchaeology of Gullies and Arroyos in Southern Arizona. *Journal of Field Archaeology* 18 (2): 141–159.

14

Economic Growth and the Environment*

THEODORE PANAYOTOU

Introduction

Will the world be able to sustain economic growth indefinitely without running into resource constraints or despoiling the environment beyond repair? What is the relationship between a steady increase in incomes and environmental quality? Are there trade-offs between the goals of achieving high and sustainable rates of economic growth and attaining high standards of environmental quality? For some social and physical scientists such as Georgescu-Roegen[1] and Meadows et al.,[2] growing economic activity (production and consumption) requires larger inputs of energy and material and generates larger quantities of waste by-products. Increased extraction of natural resources, accumulation of waste, and concentration of pollutants will therefore overwhelm the carrying capacity of the biosphere and result in the degradation of environmental quality and a decline in human welfare, despite rising incomes.[3] Furthermore, it is argued that degradation of the resource base will eventually put economic activity itself at risk. To save the environment and even economic activity from itself, economic growth must cease and the world must make a transition to a steady-state economy.

At the other extreme are those who argue that the fastest road to environmental improvement is along the path of economic growth: with higher incomes comes increased demand for goods and services that are less material intensive, as well as demand for improved environmental quality that leads to the adoption of environmental protection measures. . . .

Yet others[4] have hypothesized that the relationship between economic growth and environmental quality, whether positive or negative, is not fixed along a country's development path; indeed, it may change sign from positive to negative as a country reaches a level of income at which people demand and afford more efficient infrastructure and a cleaner environment. The implied inverted-U relationship between environmental degradation and economic growth came to be known as the "environmental Kuznets curve," by analogy with the income inequality relationship postulated by Kuznets.[5] . . .

The issue of whether environmental degradation (i) increases monotonically, (ii) decreases monotonically, or (iii) first increases and then declines along a

* From *Economic Survey of Europe*, no. 2 (2003): 45–72. Used by permission of United Nations Publications.

country's development path has critical implications for policy. A monotonic increase of environmental degradation with economic growth calls for strict environmental regulations and even limits on economic growth to ensure a sustainable scale of economic activity within the ecological life-support system.[6] A monotonic decrease of environmental degradation along a country's development path suggests that policies that accelerate economic growth lead also to rapid environmental improvements and that no explicit environmental policies are needed; indeed, they may be counterproductive if they slow down economic growth and thereby delay environmental improvement.

Finally, if the environmental Kuznets curve hypothesis is supported by evidence, development policies have the potential of being environmentally benign over the long run (at high incomes), but they are also capable of significant environmental damage in the short-to-medium run (at low-to-medium-level incomes). In this case, several issues arise: (i) At what level of per capita income is the turning point? (ii) How much damage would have taken place, and how can it be avoided? (iii) Would any ecological thresholds be violated and irreversible damage take place before environmental degradation turns down, and how can they be avoided? (iv) Is environmental improvement at higher income levels automatic, or does it require conscious institutional and policy reforms? And (v) how can we accelerate the development process so that developing and transition economies can attain the same improved economic and environmental conditions enjoyed by developed market economies? . . .

The Basic Environmental Kuznets Curve

The 1990s saw the advent of the environmental Kuznets curve (EKC) hypothesis and an explosion of studies that tested it for a variety of pollutants. In this section, I review the basic EKC studies that focus on the income-environment relationship; in subsequent sections, I review studies that focus on mediating or conditioning variables. . . . The first set of empirical studies appeared independently in three working papers: by Grossman and Krueger[7] in an NBER working paper as part of a study of the likely environmental impacts of NAFTA; by Shafik and Bandyopadhyay[8] for the World Bank's 1992 *World Development Report*; and by Panayotou[9] in a working paper as part of a study for the International Labour Office. It is reassuring that these early studies found turning points for several pollutants (SO2, NOX, and SPM) in a similar income range of $3,000–$5,000 per capita. Grossman and Krueger[10] estimated EKCs for SO2, dark matter (smoke), and suspended particles using the Global Environmental Monitoring System (GEMS) data for 52 cities in 32 countries during the period 1977–1988; per capita GDP data were in purchasing power parity (PPP) terms. For SO2 and dark matter, they found turning points at $4,000–$5,000 per capita; suspended particles continually declined even at low-income levels. However, at

income levels over $10,000–$15,000 all three pollutants began to increase again, a finding which may be an artifact of the cubic equation used in the estimation and the limited number of observations at high-income levels.

Shafik and Bandyopadhyay[11] estimated EKCs for 10 different indicators of environmental degradation, including lack of clean water and sanitation, deforestation, municipal waste, and sulfur oxides and carbon emissions. Their sample includes observations for up to 149 countries during 1960–1990, and their functional specification includes log linear, log quadratic, and logarithmic cubic polynomial forms. They found that the lack of clean water and sanitation declined uniformly with increasing incomes and over time; water pollution, municipal waste, and carbon emissions increase; and deforestation is independent of income levels. In contrast, air pollutants conform to the EKC hypothesis with turning points at income levels between $300 and $4,000. Panayotou, using cross-section data and a translog specification, found similar results for these pollutants, with turning points at income levels ranging from $3,000 to $5,000.[12] (The lower figures are due to the use of official exchange rates rather than PPP rates.)

Panayotou also found that deforestation also conforms to the EKC hypothesis, with a turning point around $800 per capita; controlling for income, deforestation is significantly greater in tropical and in densely populated countries. Cropper and Griffiths,[13] on the other hand, using panel data for 64 countries over a 30-year period, obtained a turning point for deforestation in Africa and Latin America between $4,700 and $5,400 (in PPP terms). These turning points are a multiple of those found in the Panayotou and Shafik and Bandyopadhyay studies, a possible consequence of Cropper and Griffith's use of panel data. A study by Antle and Heidebrink,[14] which used cross-section data, found turning points of $1,200 (1985 prices) for national parks and $2,000 for afforestation. On the other hand, Bhattarai and Hammig,[15] who used panel data on deforestation for 21 countries in Latin America, found an EKC with a turning point of $6,800. Furthermore, earlier studies have controlled for macroeconomic factors, such as the level of indebtedness and for the quality of institutions, which were found to have the expected signs, negative and positive, respectively.[16]

Returning to urban environmental quality, the mid-1990s saw a large number of studies focusing on airborne pollutants. Selden and Song[17] estimated EKCs for SO2, NOX, SPM, and CO using longitudinal data on emissions in mostly developed countries. They found turning points of $8,700 for SO2, $11,200 for NOX, $10,300 for SPM, and $5,600 for CO. These are much higher levels than those found by Grossman and Krueger, a difference that the authors explain in terms of the reduction of emissions lagging behind the reduction in ambient concentrations. However, this reasoning does not explain the large difference between their results and those of Panayotou, who also uses emissions data; the use of longitudinal versus cross-section data may help explain part of the difference.

Cole, Rayner, and Bates[18] estimated income-environment relationships for many environmental indicators, including total energy use, transport emissions of SO_2, SPM, and NO_2, nitrates in water, traffic volumes, chlorofluorocarbons (CFC) emissions, and methane. They found inverted-U-shaped curves only for local air pollutants and CFCs and concluded that "meaningful EKCs exist only for local air pollutants, while indicators with a more global, more indirect, environmental impact either increase with income or else have high turning points with large standard errors." This conclusion would lead one to expect that CO_2, the global pollutant par excellence, would increase monotonically with income, at least within any observable income range, since the impacts of global warming are (totally) externalized to other countries and future generations. Indeed, earlier studies[19] obtained such a result. Holtz-Eakin and Selden[20] estimated EKCs for CO_2 using panel data and found that CO_2 emissions per capita do not begin to decline until income per capita reaches $35,000, a result that confirms earlier findings by Shafik.[21]

However, more recent studies, using better data and more sophisticated estimation techniques, have obtained turning points for CO_2 emissions that, while higher than those of local pollutants, are still within the range of observable income levels. Schmalensee, Stoker, and Judson[22] . . . obtained an inverted-U-shaped relationship between CO_2 emissions and income per capita in 1985 PPP dollars. They found negative CO_2 emission elasticities with respect to income per capita at the lowest and highest income . . . and a turning point in the range of $10,000 to $17,000 per capita. Galeotti and Lanza[23] . . . found turning points between $15,000 and $22,000 depending on the specification and sample.

Another recent study, by Sachs, Panayotou, and Peterson,[24] using . . . panel data for 150 countries during 1960–1992, found results similar to those of Schmalensee et al. . . . Finding an inverted-U-shaped relationship for an invisible pollutant with much delayed effects and ample scope for free-riding behavior is a bit puzzling but fully explainable by the structural changes that accompany economic growth: from agriculture to industry to services, three sectors with different carbon emission intensities.

Decomposition of the Income-Environment Relationship

The income-environment relationship, as specified and tested in much of the literature, is a reduced form function that aims to capture the "net effect" of income on the environment. Income is used as an omnibus variable representing a variety of underlying influences, whose separate effects are obscured. For this reason, some authors have termed the reduced form specification as a "black box" that hides more than it reveals; "without explicit consideration of the underlying determinants of environmental quality, the scope of policy intervention is unduly circumscribed."[25] In order to understand why the observed

relationship exists, and how it might be influenced, more analytical and structural models of the income-environment relationship are needed. As a first step, it must be recognized that the observed environmental quality is the outcome of the interplay of emissions and abatement within a specific location, and an attempt has to be made to identify the different effects of economic development on environmental quality transmitted through the income variables.

Panayotou[26] and Islam, Vincent, and Panayotou[27] identify three distinct structural forces that affect the environment: (i) the scale of economic activity; (ii) the composition or structure of economic activity; and (iii) the effect of income on the demand and supply of pollution abatement efforts. . . .

International Trade

An alternative explanation for the downward-sloping segment of the inverted-U-shaped relationship between certain pollutants and income per capita may be found in the hypothesized propensity of countries as they get richer to spin off pollution-intensive products to lower-income countries with lower environmental standards, either through trade or direct investment in these countries. If this is true, the past is not a good predictor of the future: developing countries, as Grossman and Krueger[28] noted, "will not always be able to find still poorer countries to serve as havens for the production of pollution-intensive goods." There is little evidence, however, that either the patterns of trade or the location of investment are significantly influenced by different environmental standards among countries.[29] This is not to say that environmental dumping does not take place but that it has not been significant enough to explain the observed reductions of pollution in developed countries. . . .

International trade obscures the link between income and environment in a given country by delinking consumption from production within the country. This has led some authors to take a consumption, rather than a production, approach to the income-environment relationship; income changes are seen to drive environmental degradation. Ekins[30] argues that when consumption patterns do not change to match shifts in the pattern of production, environmental effects are displaced from one country to another, an opportunity that may not be available to today's least developed countries.

Ekins[31] tested the EKC hypothesis using a consumption-based aggregate indicator of environmental impacts developed by the OECD to include local and global pollutants, access to water and sanitation, imports of tropical timber, energy intensity, private road transport, water abstraction, nitrate fertilizer application, and threatened species, among others. He found no support for the EKC hypothesis, which is not surprising since the aggregation of so many dissimilar indicators may have eliminated any systematic covariation with income.

Clearly, more work needs to be done to fully understand the role of international trade in mediating the relationship between environment and economic growth. On the one hand, there appears to be little evidence in support of the pollution haven hypothesis; instead, there is increasing evidence that open economies tend to be cleaner than closed economies. On the other hand, a growing body of the ecological economics literature provides evidence that, while the production patterns of developed countries may have grown cleaner over time, their consumption patterns continue to be as environmentally burdensome as ever. To resolve these issues, we need more analytical and disaggregated structural models than the standard reduced-form specifications.

Thresholds, Irreversibility, and the Quest for Sustainability

The finding of an environmental Kuznets curve or inverted-U-shaped relationship between income per capita and environmental degradation for a subset of pollutants seems to suggest that countries can outgrow their environmental problems by simply emphasizing economic growth without the need for special attention to the environment itself. While the environment is certain to get worse before it gets better, it seems that channeling a country's limited resources to achieve rapid economic growth and move quickly through and out of the environmentally unfavorable stage of development makes good environmental sense, as well as good economic sense.

However, the EKC, despite its theoretic microfoundations, is ultimately an empirical relationship, which has been found to exist for some pollutants but not for others. There is nothing inevitable or optimal about the shape and height of the curve. First, the downturn of EKC with higher incomes may be delayed or advanced, weakened or strengthened by policy intervention. It is not the higher income per se which brings about the environmental improvement but the supply response and policy responsiveness to the growing demand for environmental quality, through the enactment of environmental legislation and development of new institutions to protect the environment.

Second, since it may take decades for a low-income country to cross from the upward- to the downward-sloping part of the curve, the accumulated damage in the meantime may far exceed the present value of higher future growth and a cleaner environment, especially given the higher discount rates of capital constraint on low-income countries. Therefore, active environmental policy to mitigate emissions and resource depletion in the earlier stages of development may be justified on purely economic grounds. In the same vein, current prevention may be more cost effective than a future cure, even in present value terms; for example, safe disposal of hazardous waste as it is generated may be far less costly than future cleanups of scattered hazardous-waste sites.

Third, the height of the EKC reflects the environmental price of economic growth: the steeper its upward section, the more environmental damage the country suffers for each increment in its income per capita. While this depends in part on income level (stage of development), the efficiency of markets and policies largely determines the height of the EKC curve. Where markets are riddled with failures (externalities, ill-defined property rights, etc.) or distorted by subsidies of environmentally destructive inputs, outputs, and processes, the environmental price of economic growth is likely to be significantly higher than otherwise. Economic inefficiency and unnecessary environmental degradation are two consequences of market and policy failures that are embodied to different degrees in empirically estimated EKCs. Perhaps more importantly, the higher the EKC, the more likely it is that critical ecological thresholds will be crossed and irreversible changes take place.[32] For example, tropical deforestation, the loss of biological diversity, extinction of species, and destruction of fragile ecosystems and unique natural sites are either physically irreversible or prohibitively costly to reverse. Similarly, the economic and social consequences of damage to mental development and learning capacity from high lead levels in the blood of school-age children (due to lead emissions) are not easy to reverse, and they are certainly not reversed by switching to unleaded gasoline at later stages of development.

NOTES

1. N. Georgescu-Roegen, *The Entropy Law and the Economic Process* (Cambridge, MA, Harvard University Press, 1971).
2. D. H. Meadows, D. L. Meadows, J. Randers and W. Behrens, *The Limits to Growth* (London, Earth Island, 1972).
3. H. Daly, *Steady-State Economics* (San Francisco, Freeman, 1977; 2nd ed., Washington, DC, Island, 1991).
4. N. Shafik and S. Bandyopadhyay, *Economic Growth and Environmental Quality: Time-Series and Cross-Country Evidence*, World Bank Policy Research Working Paper 904 (Washington, DC, June 1992); T. Panayotou, *Empirical Tests and Policy Analysis of Environmental Degradation at Different Stages of Economic Development*, ILO Technology and Employment Programme Working Paper WP238 (Geneva, 1993); G. Grossman and A. Krueger, "Environmental impacts of a North American free trade agreement," *The U.S.-Mexico Free Trade Agreement* (Cambridge, MA, MIT Press, 1993); T. Selden and D. Song, "Environmental quality and development: Is there a Kuznets curve for air pollution emissions?," *Journal of Environmental Economics and Management*, Vol. 27, Issue 2, September 1994, pp. 147–162.
5. S. Kuznets, *Economic Growth and Structural Change* (New York, Norton, 1965); and *Modern Economic Growth* (New Haven, CT, Yale University Press, 1966).
6. K. Arrow, B. Bolin, R. Costanza, P. Dasgupta, C. Folke, C. Holling, B. Jansson, S. Levin, K. Mäler, C. Perings, and D. Pimental, "Economic growth, carrying capacity and the environment," *Science*, Vol. 268, 1995, pp. 520–521.
7. G. Grossman and A. Krueger, *Environmental Impacts of a North American Free Trade Agreement*, NBER Working Paper No. 3914 (Cambridge, MA, November 1991).

8. N. Shafik and S. Bandyopadhyay, op. cit.
9. T. Panayotou, op. cit.
10. G. Grossman and A. Krueger, "Environmental impacts . . .", op. cit.; and "Economic growth and the environment," *Quarterly Journal of Economics*, Vol. 110, Issue 2, May 1995, pp. 353–377.
11. N. Shafik and S. Bandyopadhyay, op. cit.
12. T. Panayotou, op. cit.; "Environmental degradation at different stages of economic development," in I. Ahmed and K. Doeleman (eds.), *Beyond Rio (The Environmental Crisis and Sustainable Livelihoods in the Third World)* (Basingstoke, UK, Macmillan, 1995).
13. M. Cropper and C. Griffiths, "The interaction of population growth and environmental quality," *American Economic Review*, Vol. 84, 1994, pp. 250–254.
14. J. Antle and G. Heidebrink, "Environment and Development: Theory and International Evidence," *Economic Development and Cultural Change*, Vol. 43, Issue 3, April 1995, pp. 603–625.
15. M. Bhattarai and M. Hammig, "An empirical investigation of the environmental Kuznets curve for deforestation in Latin America," paper presented at the SAEA meeting (Lexington, KY, January 2000).
16. Ibid.
17. T. Selden and D. Song, op. cit.
18. M. Cole, A. Rayner, and J. Bates, "The environmental Kuznets curve: An empirical analysis," *Environment and Development Economics*, Vol. 2, Issue 4, 1997, pp. 401–416.
19. N. Shafik and S. Bandyopadhyay, op. cit.
20. D. Holtz-Eakin and T. Selden, "Stoking the fires? CO2 emissions and economic growth," *Journal of Public Economics*, Vol. 57, Issue 1, May 1995, pp. 85–101.
21. N. Shafik, "Economic development and the environmental quality: An econometric analysis," *Oxford Economic Papers*, Vol. 46, 1994, pp. 757–773.
22. R. Schmalensee, T. Stoker, and R. Judson, "World carbon dioxide emissions: 1950–2050," *Review of Economics and Statistics*, Vol. 80, Issue 1, February 1998, pp. 15–27.
23. M. Galeotti and A. Lanze, "Richer and cleaner? A study on carbon dioxide emissions in developing countries," proceedings from the 22nd IAEE Annual International Conference (Rome, 9–12 June 1999).
24. J. Sachs, T. Panayotou, and A. Peterson, *Developing Countries and the Control of Climate Change: A Theoretical Perspective and Policy Implications*, CAER II Discussion Paper No. 44 (Cambridge, MA, November 1999).
25. T. Panayotou, "Demystifying the environmental Kuznets curve: Turning a black box into a policy tool," *Environment and Development Economics*, Vol. 2, Issue 4, November 1997, p. 469.
26. Ibid., pp. 465–484.
27. N. Islam, J. Vincent, and T. Panayotou, *Unveiling the Income-Environment Relationship: An Exploration into the Determinants of Environmental Quality*, Harvard Institute for International Development, Development Discussion Paper No. 701 (Cambridge, MA, May 1999).
28. G. Grossman and A. Krueger, "Economic growth and the environment," *Quarterly Journal of Economics*, Vol. 110, No. 2, 1995, pp. 353–377.
29. J. Tobey, "The effects of domestic environmental policies on world trade: An empirical test," *Kyklos*, Vol. 43, 1990, pp. 191–209; G. Grossman and A. Krueger, "Environmental impacts . . .", op. cit.; A. Jaffe, S. Peterson, P. Portney, and R. Stavins, "Environmental regulation and the competitiveness of U.S. manufacturing: What does the evidence tell us?," *Journal of Economic Literature*, Vol. 33, No. 1, March 1995, pp. 132–163; T. Panayotou and J. Vincent,

"Consumption and sustainable development," *Science*, Vol. 276, 1997, pp. 53–55 (also published in Harvard Institute for International Development, Development Discussion Paper No. 567, Cambridge, MA, January 1997).
30. P. Ekins, "The Kuznets curve for the environment and economic growth: Examining the evidence," *Environment and Planning*, Vol. 29, No. 5, 1997, pp. 805–830.
31. Ibid.
32. T. Panayotou, *Empirical Tests and Policy Analysis . . .* , op. cit.

15

Bhopal*

Vulnerability, Routinization, and the Chronic Disaster

S. RAVI RAJAN

On the night of December 2–3, 1984, a gas leak from a factory owned by the Union Carbide Company killed thousands of people in Bhopal, India.[1] For those who survived, the disaster . . . metamorphosed from a sudden calamity to a chronic cancer. . . . This unrelenting social suffering has, however, largely receded from public attention.[2] Barring the ritualistic reports datelined Bhopal in the first week of December every year, the potent malignancy of the chronic disaster is ignored by almost everyone but the survivors. The remembered Bhopal disaster is the gas leak from a pesticide factory run by a multinational company, not the day-to-day misery of half a million survivors. A state of affairs that should seem distastefully pathological, therefore, somehow appears normal, routine, and for the most part invisible.

This paper seeks to understand the processes that have normalized the pathological and erased the enduring disaster from public notice. It explores why Bhopal has gone from being the potent political issue that it was on December 3, 1984, to a private nonissue today, the exact opposite trajectory that many other disasters have traversed (Reich 1991). It also attempts to understand the factors that have produced and exacerbated vulnerability. It asks, in particular, why the relief and rehabilitation efforts in Bhopal failed so colossally despite the presence of trained scientific and medical personnel, a bureaucracy that in recent years has responded adequately to natural disasters, and a seemingly potent and active civil society.

The paper begins by considering the safety record of the multinational company Union Carbide Company, its role in the creation of the accident, and the strategic politics that defined its responses at different stages. It then goes on to examine the state administration's economic and medical relief and rehabilitation efforts in the aftermath of the calamity. Finally, it explores the nature of the various civil society initiatives. . . .

* From Anthony Oliver Smith and Susannah Hoffman, eds., *The Angry Earth: Disaster in Anthropological Perspective*, pp. 257–277,

The Company

The Union Carbide Company was founded in 1898. The company entered India at the turn of the century and by 1983 had fourteen plants in the country, manufacturing an assortment of products including dry cell batteries, chemicals, and pesticides. . . . The company's Indian operations were conducted by its subsidiary Union Carbide India Limited (UCIL). The parent U.S. company held 50.9 percent of UCIL's stock and exercised managerial control through its eastern division, headquartered in Hong Kong (Dembo et al. 1990: 12–21).[3]

Union Carbide established its Bhopal plant in 1969 to formulate a range of pesticides and herbicides derived from carbaryl, a base chemical. The process of manufacturing this compound involves setting up a chain reaction between methyl isocyanate (MIC) and alpha napthol. Union Carbide initially imported these ingredients (Morehouse and Subramanian 1986: 3). In 1979, however, the company built an MIC unit within the existing Bhopal facility, which was located next to a densely populated neighborhood and a heavily used railway station. In doing so, it violated the 1975 Bhopal Development Plan, which had stipulated that hazardous industries such as the MIC plant be located in the northeast end of the city, away from and downwind of the heavily congested areas. According to M. N. Buch, one of the authors of the development plan, UCIL's initial application for a municipal permit for the MIC plant was rejected. The company, however, managed to procure approval from central government authorities. . . . (CSE 1985: 216).

During the planning process, at least two basic issues came to the fore. One concerned the size of the proposed factory. Many in the UCIL preferred a relatively small plant adequate for the company's needs at that time, rather than something as big as the Union Carbide MIC plan in Institute, West Virginia. . . . A second issue concerned the method of ingredient storage to be adopted. Again, many in the UCIL argued for a design that demanded only nominal storage of MIC determined by downstream process requirements on grounds that such a facility was inherently safe. . . . The design engineers of Union Carbide in the United States, however, insisted on large-scale storage, a less expensive process but one that was substantially more prone to risk (Dembo et al. 1990: 87). . . .

Having decided to build such a plant, the company neglected to put in place many of the safety features that were present at a similar facility in West Virginia. . . . This was compounded by a management culture that did not pay much attention to safety, a point that was underlined by three Carbide experts who undertook an internal investigation in May 1982. . . . Largely in response to an unsafe work environment, between half to two-thirds of the engineers who had been hired when the plant was commissioned had resigned by December 1984 (CSE 1985: 207–208, 215–216).

As a result of the reduction in operator strength, the company was forced to use underqualified and underpaid workers to operate highly complicated and risk-ridden technological systems (CSE 1985: 216; Chouhan et al. 1994: 23–38, 55–60). While hiring these workers . . . , Union Carbide obligated itself formally to providing them specified amounts of advanced training. In practice, however, the company reneged on this. Several workers, realizing the hazards involved in running complex plants, therefore protested, insisting that the company meet its contractual obligations to provide adequate training (Chouhan et al. 1994: 30–35). At the same time, there was also a litany of accidents, some involving fatalities (Dembo et al. 1990: 86–101; Chouhan et al. 1994: 23–24). During this period, the local press carried several articles predicting an impending disaster (CSE 1985: 216). There were also a string of worker protests demanding better and safer working conditions. The company's response to the protests, however, was to use strong-arm tactics to dispel what it saw as routine labor struggle (Chouhan et al. 1994: 31–38).

Why were better safety systems not put in place by the company? A comprehensive answer to this question demands an ethnography of Union Carbide's corporate culture. . . . The company's safety record . . . is public knowledge and provides some important insights. The Union Carbide Company has a long record of environmental negligence in every part of the world throughout its corporate history. Among its worst excesses are some of the most infamous environmental crimes of the twentieth century. . . .

There is a wider context to the company's negligence. There was, in almost every case of negligence, a direct correlation between economic class and vulnerability to the risks created by the company's safety procedures (Dembo et al. 1990: 12–81). Furthermore, that vulnerability was reflected in a lack of political power among affected communities to address the dangers through institutionalized formats. In Bhopal, this phenomenon was reflected in the fact that Union Carbide workers did not have the wherewithal to mobilize adequate political support to ensure better and safer working conditions in the plant (Chouhan et al. 1994: 31–38). Moreover, the company had acquired a great deal of political power locally by employing or providing illegal favors to the relatives of a number of powerful politicians and bureaucrats (CSE 1985: 216). . . .

In the absence of strong and widespread public pressure to act in the interest of the gas victims, the Union Carbide Company had a number of options on how to react to the gas disaster. It could have responded to the great human suffering with an attempt to contribute in some meaningful way to the rehabilitation effort. The company, however, decided that its principal responsibility was to its shareholders and that the disaster it needed to react to was not that of the survivors but the threat of financial decline (Kurzman 1987: 193–223). It is in part this decision of Union Carbide that led to the transformation of Bhopal from an acute calamity to a chronic disaster. . . .

In the Bhopal case, the market of pain was formally entered into once the various parties decided to negotiate within the legal system. This process commenced when U.S. personal injury lawyers attempted to obtain the rights of representation from individual Bhopal victims (CSE 1985: 216–218). Subsequently the Indian government filed a lawsuit, following the passage of the parentis-patria act that gave it the sole right to represent the gas victims. . . . The company began to act as a rational agent, focusing on regaining viability on Wall Street. It therefore put in place a systematic response strategy toward this end, enacting a series of stock purchases, bond retirements, and personnel and salary adjustments. . . . The company, furthermore, emerged with a new leadership, not only young and energetic but psychologically distanced from the accident and its implications (Lepkowski 1994: 29–30) . . .

The restructuring of Union Carbide, however, had a clear impact on the gas victims. By all external criteria, UCC and its managers benefited from the Bhopal incident, as did UCIL. They had justification to close a burdensome plant, make aggressive moves to restructure both companies, and enhance management benefits. The irony was that a disaster such as Bhopal left its victims devastated but corporate shareholders better off (Lepkowski 1994: 29–30).

The company's legal strategy was designed to complement its economic recovery plans. The framework of the approach was clear by the time Union Carbide officers met their shareholders in the spring of 1985. The company would reject any responsibility for the accident, implicitly attributing any technical and managerial problems at the Bhopal plan to its Indian affiliate. It would maneuver to have the trial shifted to India from the United States and, when that happened, aim for an early and inexpensive settlement. . . .

Thus began a process of systematic erasure and denial, following a pattern Union Carbide had set in responding to other accidents in the United States and elsewhere. . . . As a second aspect of its campaign of erasure, Union Carbide began to put the accident "in perspective" and blame the victim. As the Union Carbide works manager told the media barely fifteen days after the accident, "MIC is only an irritant, it is not fatal. . . . We don't know of any fatalities either in our plant or in other Carbide plants due to MIC" (CSE 1985: 206). The company subsequently claimed that the large mortality was due to a combination of undernourishment and a lack of education among the people affected. It also claimed that the persistent morbidity had to do with baseline diseases such as tuberculosis in the gas-affected areas and that the victims afflicted their plight on themselves by maintaining poor standards of public hygiene. . . . Moreover, it sponsored research and data gathering on the toxicological impact of the gas on the physiology of the Bhopal survivors, to counter the data of state hospitals and other NGO clinics. . . .

Union Carbide's third tactic of erasure was to divide public opinion by effective image management. It hired public relations companies, including

Burson-Marsteller (B-M), the largest independent public relations company in the world and one with an impeccable track record for handling companies involved with disasters over the last forty years (Greenpeace 1992). . . .

Union Carbide's postdisaster strategy paid off in February 1989. Against the spirit of an earlier attempt to settle the Bhopal case out of court, and without any consultation with victims or their representatives, the government of India offered a settlement package to Union Carbide. The terms totally favored the latter. In the aftermath of the accident, victims' organizations in Bhopal registered an injury claim of US$10 billion, based on standards in the United States. The Indian government meanwhile claimed $3.3. billion. Union Carbide's initial offer was $300–$350 million, and the final settlement was $470 million. The ultimate cost to Union Carbide came to a mere forty-three cents a share. In its annual report following the settlement, Union Carbide boasted, "The year 1988 was the best in the seventy-one year history of Union Carbide, with a record $4.88 earnings per share which included the year-end charge of 43 cents a share related to the resolution of the Bhopal litigation" (Union Carbide, 1988). The parent company then proceeded to sell its entire 50.9 percent shares in UCIL to the Calcutta-based McLeod Russell India Ltd., clearing the way for it to exit India without any further involvement with Bhopal (Chouhan et al. 1994: 174). . . .

Yet the story of Union Carbide in Bhopal is not just a case of a multinational company gone wild. As argued earlier, there appears to be a deep structural logic to each of its actions, and this logic is embedded in a very specific culture that defines the social role of a corporation. A very good example of what this culture entails is in a paper by Harold Burson, chairman of Burson-Marsteller, in which he argues that "being the professional corporate conscience is not part of the job description of other executives. It is part of the job description of the chief public relations officer" (Burson n.d.). Burson goes on to add that "a corporation cannot compensate for its inadequacies with good deeds. Its first responsibility is to manage its own affairs profitably," and that "we should no more expect a corporation to adopt a leadership role in changing the direction of society than we should expect an automobile to fly. The corporation was simply not designed for that role" (Burson n.d.). . . .

Union Carbide thus acted according to established cultural practice of absolving itself by participating in the market of suffering. The fact that it could do so, that such a culture is in place to begin with, has to do with issues beyond just the company. It has to do with, among other things, the wider politics of corporate power in contemporary society, the weakness of citizens groups and governments, the global green-washing industry, and the politics of forgetting that the market of suffering engenders.

The Rehabilitation Bureaucracy

While corporate politics and the wider social structures in which they are embedded were important determinants in the production of vulnerability in Bhopal, they do not in themselves explain the chronic disaster. To understand why more than half a million people continue to suffer without any sign of hope, one must also systematically examine the governmental relief and rehabilitation effort in the aftermath. . . .

One of the first issues such an examination reveals is the lack of capacity within the government to deal with a disaster such as Bhopal. To begin with, no obvious contingency planning existed to cope with an event such as a gas leak. There was no systematic governmental operation to evacuate people (CSE 1985: 209). On the contrary, it took no less than forty hours for the government to arrange the first coordination meeting of secretaries and heads of departments. . . . The government also failed to ensure basic public health. Among other things, carcasses of dead animals were not disposed of effectively for up to three weeks after the gas leak, bringing a well-founded fear of a mass epidemic (CSE 1985: 218).

The governmental lack of capacity is, however, perhaps best illustrated by its inability to innovate while designing relief and rehabilitation programs. In the immediate aftermath, the government announced ex gratia payments to the victims' families to help get them through the immediate crisis. It also arranged for the distribution of clothes, food, blankets, and other material goods. Such measures typify the established response to natural disasters in India. A few months after the accident, though, it became clear that standard government disaster-management efforts were not going to suffice in Bhopal. . . . Unlike floods or cyclones, which, although they are catastrophic events, are, however, amenable to stabilization and the restoration of normality . . . , the Bhopal survivors were permanently injured physically. This meant a crisis for the city's medical infrastructure, which was simply not designed for such large-scale morbidity. . . .

The bureaucracy responded about eleven months after the disaster with a long-term strategy. . . . There were three broad aspects to the plan. Firstly, the government would attempt to attract firms to the Bhopal area and thereby create more jobs for the gas affected. Secondly, it would set up production centers with the view of employing the victims in industries like garment making. . . . Thirdly, it would attempt to adapt for Bhopal a version of a stock governmental poverty-alleviation scheme, the Special Training and Employment Program for the Urban Poor (STEP-UP). . . . The STEP-UP program envisaged small loans for individuals to help them start businesses in either the retail or service sectors. . . .

These programs were, however, launched without any realistic appraisal of what it took to attract capital, absorb labor in the production process, or market products. As a result, the economic program unraveled slowly but surely. . . . The

STEP-UP program, too, failed for a set of related reasons. To put it simply, the local economy was not geared for this new spate of economic activity. . . . In a context where there was little or no buying power because livelihoods had been debilitated by the disaster, and with little other industrial or economic activity in the city and its immediate hinterland, the small retail units and other businesses began to collapse and close down one after the other.

There were other reasons for the failure of the STEP-UP program. Foremost among these were the divisions between the rehabilitation bureaucracy and the gas victims engendered by economic and social class differences between these two communities. One illustration of the consequence of these divisions is the behavior of many bank officers. Already biased against poor people, they began to perceive the gas victims and the sheer volume of loan applications they had to process as needless and rewardless work inflicted upon them by the whims of bureaucrats and politicians. Among other things, bad-debt recovery would mean a slow track for their own career trajectories. . . .

Another reason for the failure of the STEP-UP program was corruption. An informal market sprung up around the entire relief apparatus, which extracted large chunks of what little the gas victims received. A complex governmental form combined with an illiterate gas victim, for example, created space for an unofficial scribe who charged fifty rupees as service charges to fill out an application (Rajan 1988: 17–18). A frustrated protest followed by an arrest could mean several hundred rupees to local policemen. Multiple stages in the loan application process, with the accompanying hassle of document procurement, form filling, and lost time, could be reduced to a relatively bearable process by a cash payment at existing market rates. At another level, infrastructure projects aimed at public health or slum improvement offered a vast opportunity for a wide range of agents to make money. The rehabilitation bureaucracy around the disaster actually proved to be one of the greatest sites of institutional innovation, as middlemen systematically identified and occupied a variety of service niches. Indeed, the disaster created an ecology of opportunity for lower-middle-class entrepreneurs unaffected by the gas leak, petty bureaucrats, politicians, and, in some cases, even unscrupulous NGOs. The problem, however, was that these economies were built largely at the expense of victims. . . .

The Activists

. . . The Bhopal gas disaster spawned a wide diversity of activist initiatives (Rajan 1988: 24–36). The most visible of the activist initiatives during the first two years after the gas leak was that of the Zahreeli Gas Khand Sangharsh Morcha (Poisonous Gas-Event Struggle Front). The Morcha saw itself primarily as a political movement. Judged by the backgrounds of its members, the Morcha was extremely heterogeneous. The rank and file included many motivated gas

victims, as well as dedicated volunteers from smaller towns in Madhya Pradesh state. It also included middle-class activists from cities such as Delhi, Bombay, and Calcutta, mainly student environmentalists, feminists, and public health activists.

Despite its diversity, the Morcha cohered around a common approach born out of a revolutionary, as opposed to a reformist, mode of politics. Underlying this perspective was a basic understanding. Disasters like Bhopal, tragic as they are, had revolutionary potential. They could help shatter the faith the masses had in the institutions of the state. Hence, an organization with truly revolutionary consciousness had to use the disaster to expose the Indian state and particularly its class composition, interests, and priorities and its collusion with multinational capitalist interests. In doing so, it could build among the common people a class consciousness that would in time create the objective conditions for a revolution.

With this approach, the Morcha devised a four-pronged strategy. It would mobilize the gas victims over issues that exposed the failure of the government to provide for them. It would create alternative data to counter what it saw as governmental and company attempts at erasure. It would present "people's plans" as alternatives to the governmental programs where appropriate. Finally, it would establish a network of organizations to debate and act on the "larger issues" raised by Bhopal (Rajan 1988: 27).

For more than a year and a half, the Morcha succeeded in at least three of these four aims. It mobilized the gas-affected people; used such events to "educate" the people about their class identity; kept Bhopal in the news and exposed efforts at erasure by both the company and the government; and conducted socioeconomic surveys of sections of the affected population. . . .

The Morcha, however, floundered in certain crucial areas. Perhaps the most important of these was its failure systematically to address the issue of rehabilitation and the wider problem of growing social and economic vulnerability. In focusing on demonstrating governmental erasure, it blinded itself to the fact that the state government did in fact have a rehabilitation program, however badly designed. Given that denial was its starting point, constructive engagement and viable alternatives were never really part of its agenda.

Perhaps the most important reason for the Morcha's failure to tackle the issue of vulnerability, however, was the extremely doctrinal and inflexible ideology that framed its activism. Missing was a sense of pragmatism, a willingness to explore the gray areas between revolution and reform. Underlying such an attitude was an inability to see social suffering as a political category unto itself, as opposed to a mere manifestation of wider structural issues, such as the class composition of the state or the rapaciousness of multinational companies. There was arguably scope for a more constructive engagement with the state, an engagement that could have been part of a pragmatic strategy that did not necessarily mean reneging on its wider understanding. For all the corruption and

apathy at the lower levels of the governmental bureaucracy, many in the state administration were genuinely concerned about the failure of their programs.

Moreover, with its connections to the Indian and, in some cases, foreign intelligentsia, the Morcha had the opportunity to commission research that could have helped provide alternatives to the governmental program, creatively politicize the question of vulnerability, and thereby help it remain a potent public issue. Had the Morcha seen vulnerability as an intrinsic political problem, it might have felt compelled to act in this manner, and this in turn might have changed the landscape of the chronic disaster. A political strategy based on pressing for the implementation of such alternatives might have given the Morcha itself a new lease on life and the basis for further mobilization. As it turned out, the Morcha declined in influence and was for all practical purposes extinct within two years of its formation.

With the Morcha's decline, another grassroots movement began to emerge, one that has endured to this day. It was different from the Morcha in that it was comprised entirely of gas-affected people. Equally important, 85 percent of its members were women. It was therefore called the Bhopal Gas Peedith Mahila Udyog Sanghatan (the Bhopal Gas-Affected Women's Trade Union—BGPMUS). The BGPMUS grew out of the shop floor and the house floor, where women manufactured commodities for sale for businesses set up under STEP-UP and other schemes, not all of which were related to the official rehabilitation program.

Much of the BGPMUS's activities have concentrated on material tangibles directly targeted at mitigating the members' collective vulnerability. For example, when the state government closed down a sewing center, one of its rehabilitation projects, the BGPMUS agitated until the government reconsidered and reopened the facility in June 1987, thereby providing twenty-three hundred jobs. Again, in the aftermath of the out-of-court settlement in 1989, more than five thousand women took the train to protest outside the Supreme Court in Delhi. This agitation eventually led to the filing of a review petition by the BGPMUS, with handwritten testimonies from thousands of gas-affected women (Basu 1994a, 1994b). The BGPMUS has engaged in many similar activities over the past decade. . . .

In the decade and a half after Bhopal, however, the political landscape has changed drastically. The power of corporations is rising at the expense of citizens, as the environmental and social causes in the various trade agreements and proposals, such as the Multilateral Agreement on Investment, testify (Barlow and Clarke 1998; Grossman and Adams 1993; Valliantos and Durbin 1998). At the same time, the capacity of nation-states to deal with disasters such as Bhopal is decreasing. Besides, social movements, while being successful on specific issues and places, largely lack an alternative global vision. In this environment, anthropology has new challenges and opportunities. Understanding corporate cultures, for example, needs a major ethnographic effort. Again, anthropologists

are well positioned to help create capacity in governments and bureaucracies, especially by building into these institutions an ethnographic imagination that will eventually help make them more sensitive and accountable. To what extent the discipline is able to embrace these challenges might well decide the fate of the Bhopals to come.

NOTES

1. The exact number of deaths remains a disputed figure, though most sources point to a total in excess of two thousand.
2. The term "social suffering" is used here in the sense it has been used in Kleinman et al. 1997.
3. Unless otherwise specified, "Union Carbide," "Union Carbide Company," and "Carbide" in this paper refer to both the U.S. parent company and the Indian subsidiary.

BIBLIOGRAPHY

Barlow, M., and T. Clarke. 1998. *MAI: The Multilateral Agreement on Investment and the Threat to American Freedom*. Foreword by L. Wallach and R. Nader. New York: Stoddart.

Basu, A. 1994a. "Bhopal Revisited: The View from Below." *Bulletin of Concerned Asian Scholars* 26:3–13

———. 1994b. "Interview with Jabbar Khan." *Bulletin of Concerned Asian Scholars* 26:14–16.

Burson, H. n.d. "The Role of the Public Relations Professional." http://www.burson-marsteller.com/files/per/PER-RO7a.html.

Chouhan, T., et al. 1994. *Bhopal: The Inside Story, Carbide Workers Speak Out on the World's Worst Industrial Disaster*. New York: Apex.

CSE. 1985. "The State of India's Environment 1984–85: The Second Citizen's Report." New Delhi: Centre for Science and Environment.

Dembo, D., W. Morehouse, and L. Wykle. 1990. *Abuse of Power, Social Performance of Multinational Corporations: The Case of Union Carbide*. New York: New Horizons.

Greenpeace. 1992. *The Greenpeace Book of Greenwash*. http://www.greenpeace.org.

Grossman, R., and F. Adams. 1993. *Taking Care of Business: Citizenship and the Charter of Incorporation*. Cambridge, MA: Chapter Inc.

Kleinman, A., V. Das, and M. Lock, eds. 1997. *Social Suffering*. Berkeley: University of California Press.

Kurzman. D. 1987. *A Killing Wind: Inside Union Carbide and the Bhopal Catastrophe*. New York: McGraw-Hill.

Lepkowski, W. 1994. "The Restructuring of Union Carbide." In S. Jasanoff (ed.), *Learning from Disaster: Risk Management after Bhopal* (pp. 22–43). Philadelphia: University of Pennsylvania Press.

Morehouse, W., and M. Subramanian. 1986. *The Bhopal Tragedy: What Really Happened and What It Means for American Workers and Communities at Risk*. New York: Council on International and Public Affairs.

Rajan, S. R. 1988. "Rehabilitation and Volunteerism in Bhopal." *Lokayan Bulletin* 6 (1–2): 3–32.

Reich, M. 1991. *Toxic Politics: Responding to Chemical Disasters*. Ithaca, NY: Cornell University Press.

Union Carbide. 1988. *Union Carbide Annual Report*. Danbury, CT: Union Carbide.

Valliantos, M., and A. Durban. 1998. *License to Loot: The MAI and How to Stop It*. Washington, DC: Friends of the Earth.

16

The Lawn-Chemical Economy and Its Discontents*

PAUL ROBBINS AND JULIE SHARP

In 1991, the Montreal suburb of Hudson became the first of many Canadian municipalities to entirely outlaw the use of cosmetic pesticides on lawns. Since that time, dozens of other towns have enacted similar bans, including some of the country's largest cities. A decade later, the Canadian supreme court upheld the Hudson restriction, giving local authorities across Canada the right to follow suit (*Lawn & Landscape Magazine* 2001).

This legal decision did not go unopposed by any means, however. Landscape contractors Spraytech and Chemlawn (now named Greenspace Services in Canada) actually brought the case to the supreme court, insisting that the ban was discriminatory against the lawn-care industry and that it should not be generalized to other provinces, as it is an entirely local matter. Organized under action groups with euphemistic names such as the Ontario Environmental Coalition, landscape- and chemical-company trade groups formed coalitions attempting to stall efforts to enact similar laws elsewhere (Carmichael 2002).

This high-profile conflict raises a rather obvious question. If the public is struggling in some places to ban chemical applications that the industry is fighting to maintain, is it *demand* or *supply* that drives the prevalent and growing application of lawn chemicals—insecticides, herbicides, and fertilizers—throughout the United States and Canada? Is the tidy monocultural lawn a product of idiosyncratic regional culture—or of the pressing exigencies of global chemical capitalism? How do landscapes such as the lawn undermine the very dualisms of demand and supply, culture and economy, regional and global? . . .

The Vastness of the Chemical-Lawn Monoculture

The North American lawn monoculture is rooted in English garden and manorhouse landscape fads of the 18th century, themselves a product of Italian landscape painting. In these landscape designs, grassy pastoral spaces, interlaced with hedges, dominated estate horizons until their replacement by a wilder romantic aesthetic (see Stoppard 1993 for a compelling account).

* From *Antipode* 35, no. 5 (2003): 955–979.

Wealthy landholders introduced not only these lawn landscapes from Europe but also many of its constituent species. . . . The dominant turfgrass species in the North American lawn . . . are nonnative. This fact underlines two critical features of the landscape. First, despite the lawn's profoundly North American cultural significance, it is by no means an indigenous ecosystem, and as a result, the requirements for its propagation are high. Though these species are robust, the climatic demands of many regions . . . make tremendous demands on homeowners seeking to nourish exotic monoculture. Second, this landscape, no matter how extensive and normal in contemporary cities, is a *relatively recent invention*. The key species of the monocultural lawn have, in many cases, come to North America in the last century. While some species arrived incidentally with early settlers, as in the case of Kentucky bluegrass, others were intentionally introduced only in recent years specifically for turf production, as in the case of Kikuyu grass.

The high-input chemical management system is even more recent. As late as the 1930s, lawn-maintenance texts insisted that toleration of weeds was reasonable, that hand pulling and the keeping of chickens were the most practical solution for weeds and grubs, and that use of chemicals might detract from many of the lawn's functions, including the source of edible greens (Barron 1923; Dickinson 1931). It was only in the post–World War II era that the quantity of lawn coverage and the intensity of its management began to accelerate (Jenkins 1994). . . .

As early as 1962, Rachel Carson noted that

> suburbanites—advised by nurserymen who in turn have been advised by the chemical manufacturers—continue to apply truly astonishing amounts of crabgrass killers to their lawns each year. Marketed under trade names, which give no hint to their nature, many of these preparations contain such poisons as mercury, arsenic, and chlordane. Application at recommended rates leaves tremendous amounts of these chemicals on the lawn. (Carson 1962: 80)

The inputs into lawn management have only expanded in the intervening years. In an analysis of national water quality, the United States Geological Survey (USGS) (1999) reveals that 99% of urban stream samples contain one or more pesticides and that insecticides were detected more often and at higher concentrations in urban watersheds than in nonurban systems. Though these chemicals are coming from a range of urban sources, lawn care is an important contributor. . . .

Experimental research in the field of analytic chemistry . . . increasingly reveals that lawn chemicals

1. are commonly tracked into homes, where they represent ongoing exposure risks (Nishioka, Burkholder, Brinkman, and Hines 1999);

2. are far more persistent than previously thought in indoor environments (Nishioka et al. 1996);
3. accumulate in house dust and on surfaces and carpets, where small children are placed at disproportionate risk (Lewis et al. 1991; Lewis, Fortmann, and Camann 1994; Nishioka, Burkholder, Brinkman, and Lewis 1999);
4. lead to persistent contamination through deposition on clothing (Leonas and Yu 1992); and
5. may be far more dangerous to children in chronic exposure (especially the neurotoxins, such as chlorpyrifos) than has been generally accepted to date (Zartarian et al. 2000).

. . . Beyond direct chemical deposition, with its serious implications for ambient insect, fish, and bird populations . . . , lawn management has been associated with the degradation of air quality through the use of two-stroke engines with higher emissions per unit fuel than diesel farm equipment (Christensen, Westerholm, and Almen 2001; Priest, Williams, and Bridgman 2000; Sawyer et al. 2000). The fragmentation of the landscape in lawnscapes also adversely effects reproduction, survivorship, and dispersal of bird species. Restoration ecologists increasingly recommend a decrease in lawn coverage in commercial and residential development (Marzluff and Ewing 2001).

In sum, the lawn represents a vast landscape across North America, demanding and receiving increasing quantities of inputs per unit land. We wish to suggest here, however, that the expansion of the lawn and the increasing intensity of its ecology occurs at appreciable expense and represents the end of an extensive commodity chain, with political-economic pressures for its development exerted at multiple scales. Pressures for the development of the lawn monoculture are most evident at the local scale, where the economy of urban development assures a steady supply of spaces for management and an enforced demand for normative lawn aesthetics.

Community Political Economy of Green Grass

In many ways, the production of the lawn is a performance of normative class identity, which prevails even where it contradicts the ecological ethos of well-educated North Americans.

. . . Open-ended interviews with lawn-chemical users consistently revealed a conscious knowledge of their possibly harmful externalizing implications. Respondents commonly reported, moreover, that they felt obligated to maintain their lawns for the sake of neighborhood cohesion, and lawn-chemical users were more likely to know their neighbors by name. Moreover, lawn-chemical users typically associated moral character and social reliability with the condition of the lawn, suggesting that the lawn represents a *public* statement about

proper *private* behavior in a neighborhood context (Robbins, Polderman, and Birkenholtz 2001). The performance of class values in urban middle-class neighborhoods is clearly as important as instrumental property values for explaining local pressures for high-input lawn ecologies.

The state is also implicated in lawn propagation at the local scale, through the enactment and enforcement of "weed laws." While such laws exist at the state and federal level and are designed with the stated objective of protecting local ecologies from harmful plants, especially invasives (Rappaport 1992), municipal restrictions are specifically aimed at maintaining lawn appearance for development value, with some references to public health. Minimally, most urban municipalities have formal rules restricting tall lawn growth or other "degradation" of front yards, including "six-inch" and "eight-inch" rules restricting nonmanicured growth in municipalities (Rappaport 1993). While these laws are not reported as the most important motivation for high-input lawn care, they are commonly explained as a barrier to lawn alternatives by people opposed to chemical inputs. Coupled with . . . normative class aesthetic performance, these statutes help to form the local political economy of green-lawn production.

But local enforcement is by no means the only force at work directing high-input ecologies, and the lawn is not a strictly "demand-driven" phenomenon. Indeed, where local restrictions on chemical use are created and enforced—as in Canadian municipalities—it is the chemical industry that responds in protest, rather than lawn-chemical users (Carmichael 2002). This is because localized demand is the obvious end of a much larger dynamic in which formulator and chemical producer firms have turned to the municipal market in an effort to sustain otherwise collapsing profit margins. This political economy of supply, though more deeply obscured, is the engine for local chemical use. . . .

Agrochemistry and the Search for Markets

. . . Pesticide and fertilizer manufacturing is largely an outgrowth of military technology developed during World War II. The insecticidal properties of the pesticide DDT were discovered in 1939 and used by the US military to fight typhus and malaria on the front. Other chemicals were developed in the search for chemical warfare agents (Whitten 1966). In 1944, scientists working in Britain and the United States independently discovered the herbicidal properties of 2,4-D and MCPA, the first organic weed killers (Aldus 1976; Anderson, Kanaroglou, and Miller 1996). These discoveries showed that pesticide production could be cost-effective, and pesticide and fertilizer production increased dramatically after the war.

Postwar conditions made pesticides very profitable. Agricultural land prices were rising, farming was profitable, farm labor was scarce, and growing middle-class affluence meant people were willing to pay more for food with no signs of

pest damage or disease. In addition, the baby boom in North America and western Europe encouraged increases in food production (Stephens 1982). Farmers in North America and Europe, encouraged by the invention of cheap and reliable tractor-drawn spray equipment, quickly adopted inexpensive, easy-to-use farm chemicals (Green, Hartley, and West 1987). The new petroleum industry was also creating a variety of organic chemical by-products, and petrochemical companies entered pesticide manufacture as a way to market their by-products. Use of farm chemicals also increased through active promotion by academic researchers and extension agents (Young, Westfall, and Colliver 1985), resulting in the steady growth of pesticide and fertilizer production through 1975 (Green, Hartley, and West 1987).

Following the energy crisis of the 1970s, the US farm crisis of the mid-1980s, and the concurrent economic recession, however, a contraction of farm chemical markets began. After 1985, there were fewer acres in crops, and economically strapped farmers became more discerning customers of farm chemicals. By the 1980s, pesticides had already been developed and marketed for all major pests and crops in North America and Europe. By 1985, over 90% of all US cropland was already treated with pesticides (US Department of Commerce 1985). Demand for farm chemicals began to drop as the market became saturated (British Medical Association 1992). . . .

In addition to a contracting market, pesticide manufacturers currently face several challenges specific to pesticides. The costs of raw materials, solvents, and other chemicals needed for the reactions and purification processes have climbed in recent years. This pattern reflects the general rise in costs of materials associated with chemical manufacturing as a whole (British Medical Association 1992).

Perhaps the largest cost associated with pesticide production is the cost of research and development, which has risen dramatically over the last few decades. . . . Meeting regulatory conditions for new pesticide approval became more difficult in 1996 with the passage of the Food Quality Protection Act (FQPA) (US EPA 2003 . . .). . . .

Under the FQPA, any current pesticide can lose its EPA registration. For example, in 2000 the EPA banned the production of chlorpyrifos, a common pesticide for farm and household use—a decision raising an outcry from the chemical and agricultural industries but applauded by environmental groups (Hess 2000). Since the passage of the FQPA in 1996, the potential profit of any new pesticide is tempered by the possibility that it could be outlawed at any time by the FQPA, despite an investment of ten years and up to $50 million in research and development.

The development of resistance to pesticides by insects and weeds poses a further ecological barrier for the industry. Industry analysts estimate that pests usually develop effective resistance to any new pesticide in less than ten years (Engel, Harnish, and Staetz 1990). This means that new compounds must constantly be

researched and sent through the EPA registration process to replace those active ingredients that become useless, in addition to those that lose their patents or are banned by the FQPA.

The rising costs of research and restrictions of patent law have fueled the intense concentration of the pesticide-manufacturing industry. In the mid-1980s, the patents on several major herbicides expired, driving a series of mergers and acquisitions by chemical companies (British Medical Association 1992). Pesticide makers must be quite large to afford the costs of research and development and quite diversified to absorb a decade of negative cash flow during the years of regulatory testing (US Department of Commerce 1985). As a result, pesticide manufacturing is now dominated by a few large chemical companies with familiar names such as DowElanco, du Pont, and Ciba-Geigy.

In sum, the agrochemical industry of the early 21st century must deal with a saturated agricultural market, rising costs of materials, the expense and lengthy time requirements of research and development, extensive and retroactive regulatory requirements, patent expiration, the growing problem of pest resistance, and the intense competition of a highly concentrated industry. Profits from agricultural pesticides have been low for years as a result of these pressures, and agrochemical manufacturers are increasingly turning away from conventional agriculture and seeking new markets (Zimdahl 1999).

. . . So far, attempts to sell pesticides to the developing world have been largely unprofitable, despite hopes that population growth (which increases the demand for food) and rapid urbanization (which decreases the availability of farm labor and so creates chemical demand) will rise (US Department of Commerce 1985). . . .

What *has* proven successful is the cultivation of the North American yard as a site for pesticide and fertilizer use. Agrochemical companies are increasingly finding that yard-chemical formulators are their most reliable customers. Formulator companies have increasingly developed agreements with chemical manufacturers to secure exclusive access to pesticide and fertilizer active ingredients (US Securities and Exchange Commission 2001). Contracting margins in the agrochemical industry mean that chemical manufacturers will continue to seek out relationships like these, which, in turn, strengthen the ability of formulators to develop new marketing plans and increase the ranks of chemical-using lawn managers. Changes in the broader economy of agricultural chemical manufacturing have paved the way for increases in the sales of lawn chemicals.

As a result, raw, *nonagricultural* pesticides represent a worldwide market currently worth $7 billion that is growing at 4% per annum—a rapid increase relative to contraction in the agricultural sector. Forty percent of these sales represent US household consumption. . . . According to the Human Health Technical Work Group (HHTWG) of the New Jersey Comparative Risk Project, over 500,000 pounds of lawn-care chemicals are applied annually in New Jersey, as

compared to 63,000 pounds for mosquito control and 200,000 pounds for golf courses (New Jersey Department of Environmental Protection 2002).

In sum, an increasingly constricted industry is the central engine for the expansion of chemical commodity markets and the invention of new arenas for the consumption of toxins. It is ultimately the *supply* of pesticides, herbicides, and fertilizers that directs the imperatives for chemical demand. . . .

Resistance and Counterinstitutionalization of the Lawn

But as the toxic tail continues to wag the turfgrass dog, there are signs of resistance from individuals and communities at local, regional, and national levels. Movements by individuals, organizations, and states have begun to collectively challenge the high-input lawn, and efforts at counterinstitutionalization are gaining momentum.

At the local level, this resistance is most commonly realized as a direct and conscious violation of "weed laws," those municipal restrictions setting maximum lawn height and on the proliferation of nongrass species. On many occasions, individual homeowners will plant tallgrass perennials or xerophytic species or simply allow secondary succession to establish diverse local herbaceous, shrub, and tree species on the lawn (Crumbley and Albrecht 2000). This form of localized resistance has generally met with legal success. Municipalities commonly drop such cases (Long 1996). This is especially true where weed statutes are based in public-health policies and no credible risk can be demonstrated (Crumbley 2000a). So too, these US efforts commonly address and defend such counterinstitutionalization by stressing private property rights.

Successful criminal cases, however, do not necessarily pave the way for conflict-free institution of nonlawn environments. The predominant source of pressure is commonly not the municipality but rather the neighborhood. In many cases, it is a neighboring household that alerts enforcement authorities to the violation of weed laws. Moreover, even where the city may rule in favor of a nonmonocultural lawn, neighbors may seek civil proceedings and suits to force mowing and weeding. In the most dramatic cases, irate neighbors have themselves entered the property of lawn "dissidents" and mowed the grass and pulled up saplings and shrubs (Crumbley 2000b). Failure to adhere to local yard norms, therefore, often represents an explicit struggle for homeowners with alternative aesthetics.

Neither is all of this local resistance ad hoc. Formal organizations such as the Wild Ones and the National Wildlife Federation Backyard Wildlife Habitat Program have become increasingly prominent in Canada and the US, acting to reform municipal weed laws, encourage biodiverse home spaces, and provide and distribute information about low-input alternatives. In addition, these organizations are active in drafting model municipal ordinances and amending

ordinances that encourage native plant communities in public (nonlawn) landscape design. This has further extended alternative designs in xeriscaping, where low-water-input plants and rock gardens come to displace turfgrass entirely, an increasingly popular option in the West.

At the municipal scale, more proactive efforts are apparent, especially in Canada, where more than 50 municipalities have banned pesticides. Most such bans begin with public lands, including schools and other public buildings, later expanding to include private lawns. Manufacturer responses to these bans are only beginning to be mobilized, but chemical-industry representatives have increasingly been in attendance at municipal/city council meetings, vocally contesting chemical bans where they are debated, organizing a "grassroots" industrial response to public action (Carmichael 2002).

Some evidence of municipal-level action has also begun to appear in the United States. In a prominent example, the lawn-dominated suburbs of Long Island in Suffolk County, New York, are beginning to shift towards experimental alternatives. . . . The Suffolk County Water Authority has joined forces with the Long Island Organic Horticultural Association, the Long Island Neighborhood Network, and the Long Island Groundwater Research Institute at the State University at Stony Brook. Together they have instituted a half-million-dollar, three-year program to compare chemical lawn care with organic alternatives. Unlike the route of municipal legislation favored in Canada, these US community efforts operate on a more volunteer basis, though in coordination with state agents (Paquette 2003).

At the federal/national scale, lawn-chemical controls have been slower to emerge. In the United States, the EPA has testified on numerous occasions concerning the underregulation of household and lawn pesticides and herbicides, especially relative to controls enforced in the agricultural sector (Guerrero 1990). In the last few years, however, the EPA has been more active, issuing cancellation orders for a range of pesticide registrations, most recently including those products with the active ingredient chlorpyrifos (*Pesticide & Toxic Chemical News* 2000). . . . This recent effort has been resisted most visibly by pesticide manufacturers (Hess 2000). . . .

Alternatives to Capital in Your Own Back Yard

In sum, the propagation of the high-input lawnscape is structurally enforced by economic forces at many scales, with a synergy of production logics that facilitate the expansion of an expensive, high-maintenance, ecologically unstable environment. . . . As such, the lawn is a political ecology not unlike that of other industrial agrarian systems, both in the challenges it faces and in the opportunities it exploits. This suggests the general applicability of political-ecological approaches for explaining landscapes outside the traditional rural development context: in

the global North, in consumer environments, and in cities and suburbs (McCarthy 2002; Robbins 2002).

An equally fundamental lesson of the lawn is the degree to which such self-evident and relatively noncontroversial landscapes are the ones *most* configured by socioeconomic force relations, their very uncontroversial nature belying the convergence of the power-laden elements that naturalize the ecologies of daily life. The happy optimism of individualist green volunteerism, therefore, where "50 simple things" can save the planet (Lamb 1991), seems a somewhat inadequate solution in the face of pressures that direct the status quo. Where individuals remove themselves from the chemical treadmill, for example, they commonly fall afoul of not only social scrutiny and carefully enforced aesthetic norms but also legal and neighborhood restrictions and property configurations enforced by state authority.

Technological solutions appear equally compromised. Consider the possibilities, for example, of genetically engineered turfgrasses, which require reduced human labor (less mowing) and longer seasons, growing over difficult, dry, or cold periods. Envisioned under the same crushing imperatives of production, however, these lawns must either be bred to demand increasing chemical inputs, like their high-yielding counterparts in modern green-revolutionary agriculture, or else be designed to require periodic reproduction, activation, or propagation, like the "terminator" variety of new crop seeds. While prominent lawn-care companies vociferously suggest a role for genetically modified lawns in the future (Barboza 2000), . . . to date none of them has suggested lawns that reproduce in perpetuity or that demand fewer purchased chemical inputs. Any truly sustainable alternative is, put simply, bad for business.

Even so, community and grassroots action has begun to challenge the hegemony of the lawn in its current form, setting the stage for alternative urban landscapes in the future. Struggles with capitalism do indeed seem to begin in the back yard. . . .

In the institutionalization of alternatives, therefore, using legal, normative, and aesthetic revisions of current practice, future urban landscapes can be imagined that are truly green and sustainable. Struggle over the lawn, *in its very ordinariness*, underlines the deeply structured reality of daily life but also, therefore, the most promising areas of resistance—collective action, systems thinking, and progressive law, which harness the reasonable desire for livable and green places.

REFERENCES

Aldus L (ed.) (1976) *Herbicides: Physiology, Biochemistry, Ecology*. Vol. 1. 2nd ed. London: Academic Press.

Anderson W P, Kanaroglou P S, and Miller E J (1996) Urban form, energy, and the environment: A review of issues, evidence, and policy. *Urban Studies* 33 (1): 7–35.

Barboza D (2000) Suburban genetics: Scientists searching for a perfect lawn. *New York Times* 9 July: sec. 1, p. 1.

Barron L (1923) *Lawn Making: Together with the Proper Keeping of Putting Greens*. New York: Doubleday, Page.

British Medical Association (1992) *The British Medical Association Guide to Pesticides, Chemicals, and Health*. London: Edward Arnold, Hodder and Stoughton.

Carmichael A (2002) Lawn-care businesses fight bans against herbicides. *Edmonton Journal* 27 May: C11.

Carson R (1962) *Silent Spring*. New York: Houghton Mifflin.

Christensen A, Westerholm R, and Almen J (2001) Measurement of regulated and unregulated exhaust emissions from a lawn mower with and without an oxidizing catalyst: A comparison of two fuels. *Environmental Science and Technology* 35 (11): 2166–2170.

Crumbley R (2000a) Neighbors sue over high grass. *Columbus Dispatch* 19 October: 4C.

Crumbley R (2000b) Reynoldsburg says resident can let back yard grow wild. *Columbus Dispatch* 15 September: B4.

Crumbley R, and Albrecht R (2000) It's mowing versus growing in area's turf war grass-height laws. *Columbus Dispatch* 14 August: 1B.

Dickinson L S (1931) *The Lawn: The Culture of Turf in Park, Golfing, and Home Areas*. New York: Orange Judd.

Engel J F, Harnish W N, and Staetz C A (1990) Challenges: The industrial viewpoint. In E Hodgson and R J Kuhr (eds.), *Safer Insecticides: Development and Use* (pp. 441–574). New York: Marcel Dekker.

Green M B, Hartley G S, and West T F (1987) *Chemicals for Crop Improvement and Pest Management*. 3rd ed. Oxford, UK: Pergamon.

Guerrero P F (1990) Lawn care pesticides remain uncertain while prohibited safety claims continue. *Statement of Peter F. Guerrero before the Subcommittee on Toxic Substances, Environmental Oversight, Research and Development of the Senate Committee on Environment and Public Works*. Washington, DC: US General Accounting Office.

Hess G (2000) Pesticide manufacturers are unhappy with EPA's crackdown on chlorpyrifos. *Chemical Market Reporter* 257 (19 June): 1, 13.

Jenkins V S (1994) *The Lawn: A History of an American Obsession*. Washington, DC: Smithsonian Institute Press.

Lamb M (1991) *Two Minutes a Day for a Greener Planet: Quick and Simple Things You Can Do to Save Our Earth*. New York: HarperCollins.

Lawn & Landscape Magazine (2001) Canadian municipalities allowed to restrict use of pesticides. http://www.lawnandlandscape.com/ (accessed 8 July 2003).

Leonas K K, and Yu X K (1992) Deposition patterns on garments during application of lawn and garden chemicals: A comparison of six equipment types. *Archives of Environmental Contamination and Toxicology* 23 (2): 230–234.

Lewis R G, Bond A E, Fortman R C, and Camann D E (1991) Preliminary results of the EPA House Dust Infant Pesticides Exposure Study (HIPES). 201st National Meeting of the American Chemical Society, Atlanta, Georgia, April 14–19. Paper No. AGRO-89.

Lewis R G, Fortmann R C, and Camann D E (1994) Evaluation of methods for monitoring the potential exposure of small children to pesticides in the residential environment. *Archives of Environmental Contamination and Toxicology* 26 (1): 37–46.

Long C (1996) Joe Friday, lawn cop! *Organic Gardening* 43 (1): 15.

Marzluff J M, and Ewing K (2001) Restoration of fragmented landscapes for the conservation of birds: A general framework and specific recommendations for urbanizing landscapes. *Restoration Ecology* 9 (3): 280–292.

McCarthy J (2002) First World political ecology: Lessons from the Wise Use movement. *Environment and Planning A* 34 (7): 1281–1302.

New Jersey Department of Environmental Protection (2002) *New Jersey Comparative Risk Project, Draft Report*. Trenton: New Jersey Department of Environmental Protection.

Nishioka M G, Burkholder H M, Brinkman M C, Gordon S M, and Lewis R G (1996) Measuring transport of lawn-applied herbicide acids from turf to home: Correlation of dislodgeable 2,4-D tuff residues with carpet dust and carpet surface residues. *Environmental Science and Technology* 30 (11): 3313–3320.

Nishioka M G, Burkholder H M, Brinkman M C, and Hines C (1999) *Transport of Lawn-Applied 2,4-D from Turf to Home: Assessing the Relative Importance of Transport Mechanisms and Exposure Pathways*. Research Triangle Park, NC: National Exposure Research Laboratory.

Nishioka M G, Burkholder H M, Brinkman M C, and Lewis R G (1999) Distribution of 2,4-dichlorophenoxyacetic acid in floor dust throughout homes following homeowner and commercial applications: Quantitative effects on children, pets, and shoes. *Environmental Science and Technology* 33 (9): 1359–1365.

Paquette C (2003) Organic methods are urged for farms and lawns. *New York Times* 16 February.

Pesticide & Toxic Chemical News (2000) EPA announces cancellation of end-use pesticide products containing chlorpyrifos. 29 (5). http://www.ptcnonline.com/home.asp (accessed 8 July 2003).

Priest M W, Williams D J, and Bridgman H A (2000) Emissions from in-use lawnmowers in Australia. *Atmospheric Environment* 34 (4): 657–664.

Rappaport B (1992) Weed laws—A historical review and recommendations. *Natural Areas Journal* 12 (4): 216–217.

Rappaport B (1993) As natural landscaping takes root we must weed out the bad laws: How natural landscaping and Leopold's land ethic collide with unenlightened weed laws and what must be done about it. *John Marshall Law Review* 26 (4). http://www.epa.gov/glnpo/greenacres/weedlaws/ (accessed 29 June 2003).

Robbins P (2002) Obstacles to a First World political ecology? Looking near without looking up. *Environment and Planning A* 34 (8): 1509–1513.

Robbins P, Polderman A-M, and Birkenholtz T (2001) Lawns and toxins: An ecology of the city. *Cities: The International Journal of Urban Policy and Planning* 18 (6): 369–380.

Sawyer R F, Harley R A, Cadle S H, Norbeck J M, Slott R, and Bravo H A (2000) Mobile sources critical review: 1998 NARSTO assessment. *Atmospheric Environment* 34 (12–14): 2161–2181.

Stephens R J (1982) *Theory and Practice of Weed Control*. London: Macmillan.

Stoppard T (1993) *Arcadia*. London: Faber and Faber.

US Department of Commerce (1985) *A Competitive Assessment of the US Herbicide Industry*. Washington, DC: International Trade Administration, US Department of Commerce.

US Environmental Protection Agency (EPA) (2003) Food Quality Protection Act (FQPA) of 1996. http://www.epa.gov/opppsps1/fqpa/ (accessed 20 October 2003).

US Geological Survey (USGS) (1999) *The Quality of Our Nation's Waters: Nutrients and Pesticides*. Washington, DC: United States Geological Survey.

US Securities and Exchange Commission (2001) *The Scotts Company Annual Report (SEC form 10-K)*. http://biz.yahoo.com/e/011214/smg10-k.html (accessed 12 July 2003).

Whitten J L (1966) *That We May Live*. Princeton, NJ: Van Nostrand.

Young R D, Westfall D G, and Colliver G W (1985) Production, marketing, and use of phosphorous fertilizers. In O P Englestad (ed.), *Fertilizer Technology and Use* (pp. 323–376). 3rd ed. Madison, WI: Soil Science Society of America.

Zartarian V G, Ozkaynak H, Burke J M, Zufall M J, Rigas M L, and Furtaw E J, Jr. (2000) A modeling framework for estimating children's residential exposure and dose to chlorpyrifos via dermal residue contact and nondietary ingestion. *Environmental Health Perspectives* 108 (6): 505–514.

Zimdahl R L (1999) *Fundamentals of Weed Science*. 2nd ed. San Diego: Academic Press.

17

Addictive Economies and Coal Dependency*

Methods of Extraction and Socioeconomic Outcomes in West Virginia, 1997–2009

ROBERT TODD PERDUE AND GREGORY PAVELA

Does resource extraction benefit local communities? Twenty years ago, William Freudenburg (1992) addressed this misleadingly simple question and concluded it depended largely on the time frame employed. In the short term, communities are likely to benefit from increased employment and capital investment, the so-called "shot in the arm," but in the long run such communities tended to fare worse than those independent from resource extraction. This led Freudenburg to compare the short-term logic of policy makers with that of drug addicts and to label these Faustian arrangements "addictive economies." Freudenberg called for longitudinal research that could shed light on the human-capital implications of these economies and determine how and why outcomes varied across regions and industries. A decade later, Freudenburg and Wilson (2002) noted an increase in such studies but concluded that "while the overall body of literature addressing the economic well-being of mining-dependent areas is vast, the number of studies explicitly offering systematic, quantitative data on the impacts of mining in the rural United States is actually much smaller" (p. 554).

Yet another decade has passed, and these socioeconomic relationships are still murky. Clarification is important because the empirically questionable belief that resource extraction will be a boon for local economies and citizens is typically accepted without question in policy circles (Wilkinson, 1998). These decisions often result in degraded landscapes and communities, as the environmental justice literature illustrates (Gedicks, 2001). Empirical research assessing the impacts of coal extraction is more critical than ever in Appalachia, as the ecological impacts of the mountaintop removal (MTR) mining method are clear (Environmental Protection Agency [EPA], 2010). The MTR method of extraction uses explosives to remove up to 1,000 feet of mountaintop, which is then pushed into neighboring valleys to reveal coal seams. The result is similar to a landscape of plateaus, as more than 2,000 square miles of woodland have been deforested and more than 2,000 miles of Appalachian headwater streams buried in the past three decades (EPA, 2010).

* From *Organization and Environment* 25, no. 4 (2012): 368–384. Used by permission of SAGE.

Despite these significant ecological costs, little empirical evidence suggests that coal extraction tangibly benefits the people of the region, notwithstanding the claims of proindustry supporters that coal is the lifeblood of Central Appalachia (Bell & York, 2010). In this article, we examine the impacts of coal extraction over a 13-year time period in West Virginia, the second-leading producer of coal in the United States and its number-one producer of underground coal. As such, West Virginia is a useful case for evaluating the relationship between extraction and socioeconomic outcomes on the short and longer timescales. West Virginia also permits examination of a key aspect of resource extraction that has received little empirical attention: the potential differential effects of methods of extraction on socioeconomic outcomes. Using a fixed effects model, we analyze the association between poverty, per capita income, and unemployment rates with coal production and method of coal extraction, either surface or underground, in West Virginia counties from 1997 to 2009. Our findings call into question the widely touted claim that coal adds to community well-being in the state of West Virginia, for coal may very well "keep the lights on," but our findings suggest that ending dependence on coal regardless of extraction modality would likely prove more beneficial to the state's economy and people.

Resource Dependence and Socioeconomic Well-Being

The political economy of Andre Gunder Frank (1967) grounds many debates of the costs and benefits of resource extraction, both internationally and domestically. Frank pointed out that peripheral nations economically enmeshed with core nations did not develop in the ways modernization scholars predicted but rather were "underdeveloped." . . . The paradoxical presence of extensive poverty in the presence of great resource wealth became crystallized as the "resource curse" and stimulated numerous other studies attempting to unpack these complex dynamics on the international level (Bebbington, Hinojosa, Bebbington, Burneo, & Warnaars, 2008; Rajan, 2011; Ross, 2003; Sachs & Warner, 1995; Stedman, Parkins, & Beckley, 2004; Tonts, Plummer, & Lawrie, 2012). . . .

The Gallup-Healthways Well-Being Index ranked West Virginia 50th (last) out of 50 states in "Physical Health," "Emotional Health," "Life Evaluation," and "Overall Well-Being" for the years 2009 and 2010. In addition, Freudenburg's drug metaphor seems most apt given that the coalfields are currently awash in prescription drug abuse (Kobak, 2012).

Only recently have researchers attempted to differentiate social outcomes by mining type, however, notably by differentiating MTR areas from underground mining operations. Such research has documented negative health outcomes in MTR areas, including the study by Ahern et al. (2011) which found higher rates of birth defects and premature death from respiratory, heart, and kidney diseases near MTR sites. Hendryx and Zullig (2009) found higher rates of cardiovascular

disease, angina, and heart attacks for both men and women living near MTR sites. Hendryx (2011) documented higher mortality rates but, importantly, also included socioeconomic variables, finding higher total poverty and child poverty rates in MTR areas. Although these studies are exceedingly valuable, more longitudinal work is needed to validate the above-mentioned findings. To this end, we seek answers to two main questions: (a) Do communities with coal extraction have better socioeconomic outcomes than other communities? (b) Among coal-extraction communities, do those relying on underground mining methods have better outcomes than those where surface mining dominates? We use the case of West Virginia to answer these questions.

The Case: West Virginia and Coal

Like all coal-dependent states in the Appalachian region, West Virginia rode the "resource roller coaster" during the 20th century (Wilson, 2004). As demand for Appalachian coal dwindled in the interwar years, the formerly thriving coal industry went bust, and the Great Depression was especially painful in the region. With World War II and the war effort, however, the region was catapulted into a boom time. Recognizing the key role played by coal, the U.S. government took control of coal operations during World War II to ensure an uninterrupted flow of the fuel (Couto, 1993), and miners suddenly became coveted. . . .

The federal government made labor-friendly deals with John L. Lewis and the United Mine Workers, resulting in a strong union, generous wages, and high times in the mountains (McGinley, 2004).

But as quickly as the boom had begun, it deflated as the war effort ended. The coal operators resumed control of the nationalized mines and accelerated production, resulting in a glutted market (McGinley, 2004). At the same time, domestic coal demand decreased as homeowners across the nation switched from coal to cleaner-burning oil for their heat, while the railroads shifted to diesel power. As Thomas notes, "the disruption or disappearance of traditional coal markets led to falling coal production, narrower profit margins, and discharge notices for growing numbers of miners as coal operators mechanized to reduce labor costs" (2010, p. 12). Indeed, mechanization processes only accelerated following the war, as McGinley points out: "In 1948, 117,104 miners were at work in West Virginia. In 1957, only 58,732 miners had jobs, and by 1961 employment of miners had shrunk to only 42,557 in West Virginia" (2004, p. 34).

Mechanization altered both surface and underground mining operations. On the surface, the economies of scales created by massive power shovels, bulldozers, dump trucks, and train cars greatly increased efficiency and reduced the need for human labor, while simultaneously increasing coal-extraction rates. Nevertheless, underground mining still accounted for 75% of all mining in 1950

(Bonskowski, Watson, & Freme, 2006), and the subterranean technological developments were every bit as dramatic as those on the surface, forever altering the work and health of deep miners. The continuous mining machine introduced by the Joy Manufacturing Company in 1948 automated the mines and virtually eliminated the need for hand loaders, dramatically reducing extraction costs (Thomas, 2010, p. 13). In terms of health outcomes, the number of mining fatalities decreased during the increasingly mechanized postwar period, but injury rates increased due to the accelerated work pace and the increased noise of the job site (Thomas, 2010). But the most insidious danger of mechanization was created by the continual sawing and release of fine coal dust, and pneumoconiosis, black lung disease, soon emerged as an eminent health threat to miners.

Nevertheless, those with jobs were grateful for them, as newly out-of-work miners and their families had tough decisions to make. Thousands reluctantly left the mountains in search of work in Detroit, Akron, Cincinnati, Cleveland, and other industrial hubs in what became known as the Great Migration (Berry, 2000). As Rice and Brown note, "Between 1950 and 1960 the population of West Virginia declined from 2,005,552 to 1,860,421, a loss in excess of seven percent at a time when nearly every other state gained population. More than seventy percent of the loss occurred in the ten leading mining counties" (1993, p. 280). At the same time, the landscape underwent dramatic changes as denuded mining sites replaced many family farms. In addition to the loss of jobs and environmental degradation, broad-form mining deeds challenged that seminal hallmark of American capitalism, private property. Such deeds granted mining companies the mineral rights beneath the surface, allowing these companies to surface mine land under color of law.

The 1970s saw a continuation of the boom/bust cycle of the coal industry. The pain inflicted by skyrocketing oil prices reinvigorated interest in coal as a fuel source, and a short-lived boom ensued. Many of the shuttered company towns of Appalachia again sprang to life. . . .

But this time . . . the boom in the coalfields lasted but a few years. The 1980s saw the region entering into yet another bust phase as a consequence of the recession of the early Reagan years and the economic restructuring away from manufacturing toward service and information sectors. More than 1,600 West Virginian mines closed at this time, while the number of miners declined by half from 1980 to 1990 (Latimer & Mencken, 2003, p. 81), and by 1984 West Virginia led the nation in unemployment (Rice & Brown, 1993). . . .

Amendments to the Clean Air Act in 1990, specifically limits on sulfur dioxide emissions from burning coal, resulted in yet more upheaval in the coal industry. Utility companies, major emitters of sulfur dioxide, were left with two options: they could install expensive retrofits to their plants to reduce these emissions, or they could burn coal with less sulfur (Faber, 1998).

These legislative acts made the high-sulfur mines of the Midwest much less desirable, evidenced by the shuttering of more than 1,000 high-sulfur mines (Faber, 1998, p. 45). In this context, the low-sulfur coal deposits in Appalachia became more attractive to utilities, and 1997 (the first year of this study) witnessed the greatest total production recorded in West Virginia history, with about 180 million tons of coal extracted, roughly a third coming from surface operations (WVOMHST, n.d.-a). The use of MTR methods accelerated greatly at this time, expanding from about 77,000 acres in 1985 to 272,000 acres under MTR in 2005 (Skytruth, 2009). Indeed, MTR has come to be the dominant type of surface mining, as 43 million of the 56 million tons of West Virginia coal extracted from the surface in 2009 came from MTR mines (WVOMHST, n.d.-b). While underground mining still dominates in West Virginia, production rates have declined steadily since the production high point of 1997. Conversely, surface-mined coal has increased at roughly the same rate that underground mining has declined since this time.

These data show a clear shift in the way that coal is pulled from the ground in West Virginia. It is still unclear, however, if these methods of extraction matter for socioeconomic outcomes or if coal extraction in general is associated with better socioeconomic outcomes for West Virginians. To shed more light on how coal dependency affects the people of West Virginia, we correlate available coal data broken down by county and extraction type from 1997 through 2009 with numerous socioeconomic indicators.

Data

Our analysis includes data from all of West Virginia's 55 counties over a 13-year observation period from 1997 to 2009. Unemployment data come from the Bureau of Labor Statistics, poverty data come from the U.S. Census Small Area Income and Poverty Estimates (SAIPE data set), and per capita income data come from the Bureau of Economic Analysis. Coal-mining data come from the West Virginia Office of Miners' Health Safety and Training, which includes underground and surface totals of short tons of coal produced and employment in the sector at the county level.

Method

For each outcome of interest (poverty, per capita income, unemployment), we estimated a fixed effects regression using the mean deviation algorithm procedure. In our analysis, the mean deviation method computes means over time for each county and each time-varying variable. County-specific means are then subtracted from the observed values of each variable, and the differences for the dependent variable are regressed on the differences of the independent variables

(Allison, 2009). The model was estimated using the "xtscc" procedure in STATA 12 as follows:

$$Y_{it} = \beta X_{it} + \alpha_i + u_{it},$$

where subscript *i* indicates entity and subscript *t* indicates time, α is the unknown intercept, Y_{it} is the dependent measure for county *i* at time *t*, β is the coefficient for the vector of the set of time-varying variables included in the model, and u_{it} is the error term for observation *i* at time *t*.

Dependent Variables

We estimate three models, one for each outcome of interest: county-level unemployment percentage, county poverty percentage, and county-level per capita income in constant 2009 dollars deflated using the consumer price index. County-level unemployment is defined as the percentage of individuals who do not have a job, made at least one attempt to find a job in the past month, and were available for work (U.S. Department of Labor, Bureau of Labor Statistics, 2012). County poverty estimates come from the SAIPE program. The SAIPE program uses administrative records, intercensal population estimates, and the decennial census with direct estimates from the American Community Survey "to provide consistent and reliable single-year estimates of poverty" (U.S. Census Bureau, n.d.). County-level per capita income estimates come from the Regional Income Division of the Bureau of Economic Analysis (U.S. Department of Commerce, 2011). Per capita personal income is calculated as the personal income of the residents of a given area divided by the total resident population of that area using the Census Bureau's annual midyear population estimates as the area population estimate (U.S. Census Bureau, n.d.).

Independent Variables

Independent variables included in the analyses are total coal tonnage produced within a county, tonnage of coal produced from underground mines as a percentage of total West Virginia underground production, tonnage of coal produced from surface mines as a percentage of total West Virginia surface production, a dichotomous indicator of either none or any mining activity (surface or underground) in a county, percentage of employment within a county in the mining sector, and an indicator for a linear effect of time. All these data are derived from WVOMHST. In addition, we included the price of underground West Virginia coal relative to the national average price of underground coal and the cost of West Virginia surface coal relative to the national average price of surface coal in constant 2009 dollars. These data come from the Annual Coal Report released by

the Energy Information Administration (EIA, 2011). Finally, we include annual population estimates from the U.S. Census Bureau as a covariate.

Results

Average poverty across all observed counties and time periods is 17.87%. Mean per capita income was $26,249 and average unemployment was 6.43%. Approximately half of the counties had mining activity, with an average 2.975 million tons of coal produced per county over the 13-year observation period. Each mining county accounted for an average of 1.8% of all underground coal produced in West Virginia and 1.8% of all surface coal produced in West Virginia. Within each county, an average of 2.9% of all workers found employment in the mining sector. West Virginia underground coal was, on average, $7.65 more expensive than the average national price of underground coal, while surface coal was, on average, $32 more expensive than the average national price of surface coal.

Table 17.2 reports the results from the analysis estimating county-level poverty. Significant predictors of poverty include the presence of any mining activity in a county, the percentage of West Virginia underground coal produced within a county, and the relative market cost of West Virginia surface coal. Counties with no mining activity are expected to have lower poverty rates than counties with mining activity ($b = -0.64$, $p < .01$). Counties that produce a higher percentage of West Virginia's underground coal are expected to have slightly higher rates of poverty ($b = 0.11$, $p < .05$), and poverty is also expected to increase as the market cost of West Virginia surface coal increases ($b = 0.08$, $p < .10$).

Table 17.3 presents the results from the analysis estimating county-level per capita income. The relative market price of West Virginia surface coal is

TABLE 17.1. Descriptive Statistics of Variables, 1997–2009

Variable	Mean	*SD*	Minimum	Maximum
Per capita income (2010 dollars)	26,249.07	4,557.61	102	4,130
Percentage poverty	17.87	4.778	8.3	40.8
Percentage unemployment	6.43	2.31	2	17
Mining activity	0.506	0.500	0	1
Total county coal tonnage	2,975,003	0	34,197,230	
Percentage WV underground coal	1.84	3.63	0	25.4
Percentage WV surface coal	1.81	4.55	0	30.1
Percentage employed mining	2.90	6.60	0	83.5
ΔWV underground price, national price ($)	7.65	6.74	2	15
ΔWV surface price, national price ($)	32.01	6.89	22	41

Note: $N = 715$ observations; WV = West Virginia

TABLE 17.2. Results from a Fixed Effects Model Predicting Poverty in West Virginia (WV) Counties, 1997–2009

Variable	Coefficient (*SE*)
Mining activity	
No mining	−0.64 (0.31)*
Total tonnage (per million tons)	−0.09 (0.06)
Percentage WV underground coal	0.11 (.05)**
Percentage WV surface coal	0.06 (0.04)
Percentage employed mining	−0.08 (0.21)
Resource pricing	
Relative cost WV underground coal	0.094 (0.05)
Relative cost of WV surface coal	0.082 (0.04)*
Population (per thousand)	−0.07 (0.02)
Linear time trend	−0.186 (0.16)
Constant	17.48 (0.98)***
*R*2 (within county)	.16

* $p < .10$; ** $p < .05$; *** $p < .01$

TABLE 17.3. Results from a Fixed Effects Model Predicting Per Capita Income (2009 Dollars) in West Virginia (WV) Counties, 1997–2009

Variable	Coefficient (*SE*)
Mining activity	
No mining	92.83 (140.00)
Total tonnage (per million)	−71.06 (39.86)
Percentage WV underground coal	56.90 (40.20)
Percentage WV surface coal	12.27 (17.92)
Percentage employed mining	4.85 (6.69)
Resource pricing	
Relative cost WV underground coal	−26.60 (22.69)
Relative cost of WV surface coal	−64.32 (16.69)***
Population (per thousand)	−56.77 (21.60)**
Linear time trend	567.35 (32.01)***
Constant	26,997.73 (848.35)***
*R*2 (within county)	.84

* $p < .10$; ** $p < .05$; *** $p < .01$

significantly associated with per capita income. As the market price of surface coal increases, county per capita income is expected to decrease ($b = -64.32$, $p < .01$). The indicator of a linear time effect was also significant—across all time points, per capita income increased by an average of $567.35 ($p < .01$). Table 17.4 reports the results from the analysis estimating county-level unemployment.

TABLE 17.4. Results from a Fixed Effects Model Predicting Unemployment in West Virginia (WV) Counties, 1997–2009

Variable	Coefficient (*SE*)
Mining activity	
No mining	−0.55 (0.24)**
Total tonnage (per million tons)	−0.10 (0.09)
Percentage WV underground coal	0.16 (0.08)*
Percentage WV surface coal	−0.03 (0.05)
Percentage employed mining	−0.01 (0.01)
Resource pricing	
Relative cost WV underground coal	−0.12 (0.31)
Relative cost of WV surface coal	−0.17 (0.09)**
Population (per thousand)	0.11 (0.01)***
Linear time trend	0.24 (0.42)
Constant	8.0 (2.2)***
*R*2 (within county)	.25

* $p < .10$; ** $p < .05$; *** $p < .01$

The presence of mining activity, the percentage of West Virginia underground coal produced within a county, and the relative market cost of surface coal are significantly associated with unemployment. Counties with no mining activity are expected to have lower unemployment levels ($b = -0.55$, $p < .05$). Unemployment is also expected to decrease as the relative market cost of surface coal increases ($b = -0.17$, $p < .05$). However, the percentage of West Virginia underground coal produced within a county is associated with higher unemployment—for each percentage increase in a county's contribution to West Virginia's total underground coal production, we expect a 0.16% increase in unemployment levels ($p < .10$).

Discussion

. . . We found that West Virginia counties with no coal mining have lower levels of poverty than mining counties. Moreover, counties that mine a higher percentage of underground coal relative to other counties have higher levels of poverty. These findings support much of the "resource curse" literature, which contends that dependency on natural resources results in stifled development and negative socioeconomic outcomes. This is due in large part to the fact that coal extraction is a primary industry; coal is pulled from the ground, cleaned, and shipped away. Therefore, little opportunity exists for these operations to be economically "linked" to secondary industries which process and transform raw materials into value-added finished products, such as refineries for oil (Freudenburg

& Gramling, 1998) or paper plants and sawmills for forest products (Overdevest & Green, 1995). The very nature of the resource and the "fixity of extraction" require coal to be transported large distances to utilities and factories, reinforcing its peripheral nature (Bunker, 1985). Moreover, access to local markets ended after most Appalachian homeowners switched to oil and the railroads shifted to diesel-powered engines. These circumstances prevent coalfield communities and businesses from exploiting the processing and services which provide high-wage specialized jobs and additional tax revenue. As such, it is not surprising that coal-dependent counties have higher rates of poverty than nonmining counties, as little potential for capitalization of the resource exists.

The jobs found in the coal industry, however, are typically thought of as "good jobs" with relatively high pay, especially considering the low cost of living in the coal-bearing regions of the state. It is not, then, low wages paid to miners that contribute to the higher rates of poverty in coal-mining counties but rather the sheer lack of opportunity. Mechanization of both underground and surface mines has dramatically reduced the number of jobs available to coalfield communities, for as Williams (2002, pp. 345–346) points out, more West Virginians work at Wal-Mart than in the mines. . . . Indeed, the increased capitalization and modest demand for labor in coal operations calls into question the assertion made by the coal industry and its supporters that coal is the lifeblood of the region. As Bell and York (2010, p. 121) point out, although West Virginia is the leading producer of coal in the region, coal contributed only 7% to the gross state product in 2004. This highlights the minor economic benefits of the industry, while others suggest that if the hidden costs of coal were internalized, coal would actually be a net loss for coal-state economies (McIlmoil, Hansen, Boettner, & Miller, 2010).

We argue that our second main finding, that as the relative market price of West Virginia surface coal increases, poverty increases while per capita income decreases, is due to several factors which make up what Freudenburg (1992) called the "cost/price squeeze." In essence, higher coal prices do not necessarily imply higher profits but instead signify a less attractive option for coal purchasers. In West Virginia, the main factors creating this cost/price squeeze are (a) depletion of productive and easily accessible reserves, (b) competition from cheaper western coal, (c) increased competition from other energy sources, especially natural gas, and (d) tightening environmental regulations. These factors have increased the costs of coal production while reducing the price West Virginia coal can fetch, resulting in shrinking margins.

The most obvious of these factors is the exhaustion of productive and easily accessible reserves. Coal has been mined in West Virginia for hundreds of years, and operators began mining in the most rewarding locations. Unlike the much newer mining operations in the Powder River Basin of Wyoming and Montana, where coal is close to the surface and seams can reach 100 feet deep, Appalachian

coal operators are forced to spend greater sums to reach and extract relatively thin seams of coal. Indeed, more coal is extracted from Wyoming mines than from all of Appalachia combined (EIA, 2011).

Another crucial factor lessening the viability of West Virginian coal, both surface and underground, is the explosion of natural gas drilling and use. New methods of extraction, such as hydraulic fracturing, have opened new vistas to the natural gas industry. Coupled with extensive reserves in many regions of the country (including Appalachia), the price of natural gas has dropped precipitously in the past few years, pushing coal out of many markets as its cost drops close to that of coal. . . .

When increased regulation and pollution-control costs are factored into the equation, coal is even less attractive for utilities. Despite a recent ruling by U.S. District Judge Amy Berman Jackson which restricted the authority of the EPA to withdraw Clean Water Act permits, allowing the largest ever MTR mining operation to go forward, the EPA has placed other significant obstacles in the path of the coal industry. Recently, the EPA proposed the first Clean Air Act standard for carbon emissions for future power plants, imposing much stricter allowances of CO_2 emissions and forcing new coal-burning plants to capture a large portion of their pollution (EPA, 2012). Meeting these standards will be much easier for power plants using cleaner-burning natural gas, and coal's primacy as America's electricity provider is now in doubt. As the president of Duke Energy (one of the largest consumers of coal in the United States), Jim Roger, concludes, "As we look out over the next two decades, we do not plan to build another coal plant" (National Public Radio, 2012). In addition to these new standards, utilities are facing tighter restrictions on the disposal of coal ash at their facilities following the catastrophic damage of the failure of the TVA Kingston Fossil Plant's slurry lagoon in December 2008. Finally, as the reality of climate change is less easy to deny, regulations regarding the release of greenhouse gases will likely tighten further, a reality that utilities are undoubtedly factoring into their business models.

The above-mentioned factors have resulted in higher prices for West Virginia coal, which have in turn made it less competitive compared with coal mined from other regions and states. . . . Although the coal mined in West Virginia is of higher quality than that found almost anywhere else in the nation, its premium price coupled with the increasingly competitive nature of natural gas is making it a less attractive option for energy providers. Indeed, those conglomerates heavily invested in the region are experiencing difficulties, evidenced by the bankruptcy filing of Patriot Coal, the third-largest producer of MTR coal, in July 2012.

Finally, our model predicting unemployment suggests that differing extraction methods exert slightly different impacts in this realm. Indeed, the relationship between underground coal mining and unemployment is somewhat counterintuitive: Counties that produce a higher percentage of underground

coal are expected to have higher levels of unemployment. As underground mines require more human labor than those on the surface, it would seem that employment should increase as more coal is produced. However, in many ways, underground mining has become as mechanized as that on the surface, and increased production does not necessarily mean more human laborers are required. In addition, counties with high levels of underground mining typically have longer legacies of mining, which, as these findings suggest, creates dependency and stifles the development of other opportunities for employment.

The high costs of developing, maintaining, and expanding underground operations will likely push coal operators to extract more coal from the surface. This will continue a trend, evidenced by the steady decrease in underground production since 1997 and the halving of underground employment in the past three decades; in 1983, more than 26,000 miners were employed in the underground mining sector, while barely 13,000 found work in 2010 (Mine Safety and Health Administration, n.d.). Underground mines are the first to cut back on production and employment and to be shuttered by coal operators during bust cycles. For instance, in February 2012, Alpha Natural Resources announced plans to make cuts due to decreased demand. The company reduced worker hours at several surface mines, but two underground mines were completely shut down, resulting in the layoff of 320 workers (Ward, 2012). Such outcomes are likely to continue given the bleak future of the Appalachian coal industry, for as McIlmoil et al. (2010, p. 9) project, coal production in Central Appalachia faces a decline from 234 million tons in 2008 to 99 million tons by 2035. . . . This represents a decline of 58% over the next 25 years, with the greatest share of the decline occurring in the next decade. As such, a replication of this study in another decade may yield very different results. For now, our findings make clear that transitioning away from coal dependence, regardless of extraction method, will benefit both the land and the people of West Virginia.

Conclusion

As Freudenburg (1992) pointed out, the temporal scale employed is critically important in natural resource decision making. Our analysis contributes to these understandings by analyzing the relationship between coal extraction and community well-being in West Virginia during a period when rates of surface mining increased and underground mining decreased. We find little difference in socioeconomic outcomes between surface and underground mining but, rather, find that it is the presence or absence of mining that matters most. These findings call into question the argument that coal extraction is beneficial for citizens of the Mountain State, as counties that do not extract coal have lower rates of poverty than extracting counties, while poverty increases in mining counties as relative extraction rates increase. Moreover, coal-mining counties do not have

higher per capita income or employment than nonmining counties. In addition, we find that as the relative market price of West Virginia surface coal increases, so too does poverty, a phenomenon explained by the "cost/price squeeze." Given the negative socioeconomic ramifications of coal mining and the price squeeze on Appalachian coal, it seems that a radical restructuring of the West Virginian economy is in order *before* resource exhaustion. Indeed, it seems that the state would be better off capitalizing on other natural resources, namely its scenic beauty and economically viable wind power, while conserving its ancient ecosystems. Leaving remaining coal in the ground will likely prove the best alternative in the *long run* for West Virginians, as the opportunities to capitalize on renewable and, therefore, perpetual economic development are great.

That said, it is still uncertain how generalizable these findings are to other regions and resources. Future research examining if and how extraction method matters in diverse contexts is needed, especially on the international scale. Our findings suggest that the method of extraction is less important than the capital intensity of production, supporting the main thesis of dependency theorists, as well as that of the treadmill of production school (see Schnaiberg, 1980). The rapid acceleration of mechanization in both underground and surface mines following World War II, the concomitant production increases, and the demise of organized labor heightened the region's dependency on coal. This dependency has resulted in dire socioeconomic outcomes in West Virginia that are similar to those found in other peripheries. Opportunities exist, however, for alternative economic pathways to be constructed as coal's viability diminishes, but increased scrutiny of the relationships between local elites and outside capital is also necessary. Finally, communities contemplating or currently taking part in the natural gas boom should consider the outcomes found in the coalfields of West Virginia, for as Pellow notes, "the domination over people is reinforced and made possible by the domination of ecosystems" (2011, p. 247). In this light, the relationship between resource addiction and the pain of withdrawal becomes all too clear.

REFERENCES

Ahern, M. M., Hendryx, M., Conley, J., Fedorko, E., Ducatman, A., & Zullig, K. J. (2011). The association between mountaintop mining and birth defects among live births in Central Appalachia, 1996–2003. *Environmental Research*, *111*, 838–846.

Allison, P. D. (2009). *Fixed effects regression models*. Thousand Oaks, CA: Sage.

Bebbington, A., Hinojosa, L., Bebbington, D. H., Burneo, M. L., & Warnaars, X. (2008). Contention and ambiguity: Mining and the possibilities of development. *Development and Change*, *39*, 887–914.

Bell, S. E., & York, R. (2010). Community economic identity: The coal industry and ideology construction in West Virginia. *Rural Sociology*, *75*, 113–143.

Berry, C. (2000). *Southern migrants, northern exiles*. Urbana: University of Illinois Press.

Bonskowski, R., Watson, W., & Freme, F. (2006, October). *Coal production in the United States: An historical overview* (Energy Information Administration). Retrieved from ftp://ftp.eia.doe.gov/coal/coal_production_review.pdf.

Bunker, S. G. (1985). *Underdeveloping the Amazon: Extraction, unequal exchange, and the failure of the modern state*. Urbana: University of Illinois Press.

Couto, R. A. (1993). The memory of miners and the conscience of capital: Coal miners' strikes as free spaces. In S. L. Fisher (Ed.), *Fighting back in Appalachia: Traditions of resistance and change* (pp. 165–194). Philadelphia: Temple University Press.

Energy Information Administration (EIA). (2011, November 30). *Annual coal report*. Retrieved from http://www.eia.gov/coal/annual/.

Environmental Protection Agency (EPA). (2010, April 1). *EPA issues comprehensive guidance to protect Appalachian communities from harmful environmental impacts of mountaintop mining*. Retrieved from http://yosemite.epa.gov/opa/admpress.nsf/e77fdd4f5afd88a3852576b3005a604f/4145c96189a17239852576f8005867bd!OpenDocument.

Environmental Protection Agency (EPA). (2012, March 27). *EPA proposes first carbon pollution standard for future power plants/Achievable standard is in line with investments already being made and will inform the building of new plants moving forward*. Retrieved from http://yosemite.epa.gov/opa/admpress.nsf/6427a6b7538955c585257359003f0230/9b4e8033d7e641d9852579ce005ae957!OpenDocument.

Faber, D. (1998). The political ecology of American capitalism: New challenges for the environmental justice movement. In D. Faber (Ed.), *The struggle for ecological democracy: Environmental justice movements in the United States* (pp. 27–59). New York: Guilford.

Frank, A. G. (1967). *Capitalism and underdevelopment in Latin America*. New York: Monthly Review Press.

Freudenburg, W. R. (1992). Addictive economies: Extractive industries and vulnerable localities in a changing world economy. *Rural Sociology*, *57*, 305–332.

Freudenburg, W. R., & Gramling, R. (1998). Linked to what? Economic linkages in an extractive economy. *Society & Natural Resources*, *11*, 569–586.

Freudenburg, W. R., & Wilson, L. (2002). Mining the data: Analyzing the economic implications of mining for nonmetropolitan regions. *Sociological Inquiry*, *72*, 549–575.

Gedicks, A. (2001). *Resource rebels: Native challenges to mining and oil companies*. Cambridge, MA: South End.

Hendryx, M. (2011). Poverty and mortality disparities in Central Appalachia: Mountaintop mining and environmental justice. *Community Health*, *4* (3), 44–53.

Hendryx, M., & Zullig, K. J. (2009). Higher coronary heart disease and heart attack morbidity in Appalachian coal mining regions. *Preventive Medicine*, *49*, 355–359.

Kobak, S. E. (2012). OxyContin flood in the coalfields: "Searching for higher ground." In S. L. Fisher & B. E. Smith (Eds.), *Transforming places: Lessons from Appalachia* (pp. 198–209). Urbana: University of Illinois Press.

Latimer, M., & Mencken, F. C. (2003). Socioeconomic trends in mining-dependent counties in Appalachia. In W. W. Falk, M. D. Schulman, & A. R. Tickamyer (Eds.), *Communities of work: Rural restructuring in local and global contexts* (pp. 79–103). Athens: Ohio University Press.

McGinley, P. C. (2004). From pick and shovel to mountaintop removal: Environmental injustice in the Appalachian coalfields. *Environmental Law*, *34*, 21–106.

McIlmoil, R., Hansen, E., Boettner, T., & Miller, P. (2010, June 22). *The impact of coal on the West Virginia state budget*. Morgantown: Downstream Strategies and West Virginia Center on Budget & Policy.

Mine Safety and Health Administration. (n.d.). *Mining industry accident, injuries, employment, and production statistics and reports*. Retrieved from http://www.msha.gov/ACCINJ/accinj.htm.

National Public Radio. (2012, March 27). *EPA plan targets new coal-fired plants*. Retrieved from http://www.npr.org/2012/03/27/149480756/new-epa-plan-targets-new coal-fired-plants.

Overdevest, C., & Green, G. P. (1995). Forest dependence and community well-being: A segmented market approach. *Society & Natural Resources*, *8*, 111–131.

Pellow, D. (2011). Politics by other greens: The importance of transnational environmental justice movement networks. In J. Carmin & J. Ageyman (Eds.), *Environmental inequalities beyond borders: Local perspectives on global injustices* (pp. 247–265). Cambridge, MA: MIT Press.

Rajan, S. C. (2011). Poor little rich countries: Another look at the "resource curse." *Environmental Politics*, *20*, 617–632.

Rice, O. K., & Brown, S. W. (1993). *West Virginia: A history* (2nd ed.). Lexington: University Press of Kentucky.

Ross, M. (2003). The natural resource curse: How wealth can make you poor. In I. Bannon & P. Collier (Eds.), *Natural resources and violent conflict: Options and actions* (pp. 17–42). Washington, DC: World Bank.

Sachs, J., & Warner, A. (1995). *Natural resources and economic growth*. Cambridge, MA: Harvard Institute for International Development.

Schnaiberg, A. (1980). *The environment: From surplus to scarcity*. New York: Oxford University Press.

Skytruth. (2009, December 1). *Mountaintop removal mining: Part 1. Measuring the extent of mountaintop removal in Appalachia*. Retrieved from http://blog.skytruth.org/2009/12/measuring-mountaintopremoval-mining-in.html.

Stedman, R. C., Parkins, J. R., & Beckley, T. M. (2004). Resource dependence and community well-being in rural Canada. *Rural Sociology*, *69*, 213–234.

Thomas, J. B. (2010). *An Appalachian reawakening: West Virginia and the perils of the New Machine Age, 1945–1972*. Morgantown: West Virginia University Press.

Tonts, M., Plummer, P., & Lawrie, M. (2012). Socio-economic well-being in Australian mining towns: A comparative analysis. *Journal of Rural Studies*, *28*, 288–301.

U.S. Census Bureau. (n.d.). *Model-based small area income & poverty estimates (SAIPE) for school districts, counties, and states*. Retrieved from http://www.census.gov/did/www/saipe/.

U.S. Department of Commerce. (2011, April). *Local area personal income and employment methodology*. Retrieved from http://www.bea.gov/regional/pdf/lapi2009.pdf#pagemode=bookmarks.

U.S. Department of Labor, Bureau of Labor Statistics. (2012). *Labor force statistics from the current population survey*. Retrieved from http://www.bls.gov/cps/lfcharacteristics.htm#unemp.

Ward, K., Jr. (2012, February 3). Alpha, Patriot announce coal production cuts. *Charleston Gazette*. Retrieved from http://wvgazette.com/News/201202030170.

West Virginia Office of Miners' Health Safety and Training (WVOMHST). (n.d.-a). *A brief history of coal and safety enforcement in West Virginia*. Retrieved from http://www.wvminesafety.org/History.htm.

West Virginia Office of Miners' Health Safety and Training (WVOMHST). (n.d.-b). *West Virginia coal mining facts*. Retrieved from http://www.wvminesafety.org/wvcoalfacts.htm.

Wilkinson, T. (1998). *Science under siege: The politicians' war on nature and truth*. Boulder, CO: Johnson.

Williams, J. A. (2002). *Appalachia: A history*. Chapel Hill: University of North Carolina Press.

Wilson, L. J. (2004). Riding the resource roller coaster: Understanding socioeconomic differences between mining communities. *Rural Sociology*, *69*, 261–281.

18

The Anti-Politics Machine*

"Development" and Bureaucratic Power in Lesotho

JAMES FERGUSON WITH LARRY LOHMANN

In the past two decades, Lesotho—a small landlocked nation of about 1.8 million people surrounded by South Africa, with a current gross national product (GNP) of US$816 million—has received "development" assistance from 26 different countries, ranging from Australia, Cyprus, and Ireland to Switzerland and Taiwan. Seventy-two international agencies and non- and quasi-governmental organizations, including CARE, the Ford Foundation, the African Development Bank, the European Economic Community, the Overseas Development Institute, the International Labour Organization, and the United Nations Development Programme, have also been actively involved in promoting a range of "development" programs. In 1979, the country received some $64 million in "official" development "assistance"—about $49 for every man, woman, and child in the country. Expatriate consultants and "experts" swarm in the capital city of Maseru, churning out plans, programs, and, most of all, paper at an astonishing rate.

As in most other countries, the history of "development" projects in Lesotho is one of "almost unremitting failure to achieve their objectives."[1] Nor does the country appear to be of especially great economic or strategic importance. What, then, is this massive and persistent internationalist intervention all about?

Constructing a "Developer's" Lesotho

To "move the money" they have been charged with spending, "development" agencies prefer to opt for standardized "development" packages. It thus suits the agencies to portray developing countries in terms that make them suitable targets for such packages. It is not surprising, therefore, that the "country profiles" on which the agencies base their interventions frequently bear little or no relation to economic and social realities.

In 1975, for example, the World Bank issued a report on Lesotho that was subsequently used to justify a series of major Bank loans to the country. One passage in the report—describing conditions in Lesotho at the time of its independence

* From the *Ecologist* 24, no. 5 (1994): 176–181. Used by permission of the *Ecologist*.

from Britain in 1966—encapsulates an image of Lesotho that fits well with the institutional needs of "development" agencies:

> Virtually untouched by modern economic development, . . . Lesotho was, and still is, basically, a traditional subsistence peasant society. But rapid population growth resulting in extreme pressure on the land, deteriorating soil and declining agricultural yields led to a situation in which the country was no longer able to produce enough food for its people. Many able-bodied men were forced from the land in search of means to support their families, but the only employment opportunities [were] in neighbouring South Africa. At present, an estimated 60 per cent of the male labour force is away as migrant workers in South Africa. . . . At independence, there was no economic infrastructure to speak of. Industries were virtually non-existent.[2]

The Invention of "Isolation"

To a scholar of Lesotho, these assertions appear not only incorrect but outlandish. For one thing, the country has not been a "subsistence" society since at least the mid 1800s, having entered the twentieth century as a producer of "wheat, mealies, Kaffir corn [*sic*], wool, mohair, horses and cattle" for the South African market.[3] Nor were the local Basotho people isolated from the market. When they have had surpluses of crops or livestock, the people have always known how to go about selling them in local or regional markets. According to *The Oxford History of South Africa*,

> In 1837 the Sotho of Basutoland . . . had grain stored for four to eight years: in 1844 white farmers "flocked" to them to buy grain. During 1872 (after the loss of their most fertile land west of the Caledon) the Sotho exported 100,000 *muids* [185-lb. bags] of grain, . . . and in 1877 when the demand for grain on the diamond fields had fallen, "large quantities" were held by producers and shopkeepers in Basutoland.[4]

Livestock auctions, meanwhile, have been held throughout the country since at least the 1950s, and animals from central Lesotho have been sold by the Basotho as far afield as South Africa for as long as anyone can remember. Far from being "untouched" by modern "development" at the time of independence, colonial rule had established a modern administration, airports, roads, schools, hospitals, and markets for Western commodities.

The decline in agricultural surpluses, moreover, is neither recent nor, as the Bank suggests, due to "isolation" from the cash economy. More significant is the loss by the Basotho of most of their best agricultural land to encroaching Dutch settlers during a series of wars between 1840 and 1869. Nor is migration

a recent response of a pristine and static "traditional" economy to "population pressure." As H. Ashton, the most eminent Western ethnographer of the Basuto, noted in 1952, "labour migration is . . . nearly as old as the Basuto's contact with Europeans"[5]—indeed, throughout the colonial period to the present, Lesotho has served as a labor reservoir exporting wage workers to South African mines, farms, and industry.

Lesotho Reality

In fact, far from being the "traditional subsistence peasant society" described by the Bank, Lesotho comprises today what one writer describes as "a rural proletariat which scratches about on the land."[6] Whilst the World Bank claims that "agriculture provides a livelihood for 85 per cent of the people,"[7] the reality is that something in the order of 70 percent of average rural household income is derived from wage labor in South Africa, while only 6 percent comes from domestic crop production.[8] Similar myth-making pervades a joint FAO / World Bank report from 1975, which solemnly states that "about 70 per cent of [Lesotho's] GNP comes from the sale of pastoral products, mainly wool and mohair." A more conventional figure would be 2 or 3 percent.[9]

Also false is the "development" literature's picture of Lesotho as a self-contained geographical entity whose relation with South Africa (its "rich neighbor") is one of accidental geographic juxtaposition, rather than structural economic integration or political subordination, and whose poverty can be explained largely by the dearth of natural resources within its boundaries, together with the incompleteness with which they have been "developed." If the country is resource poor, this is because most of the good Sotho land was taken by South Africa. Saying, as USAID does in a 1978 report, that "poverty in Lesotho is primarily resource-related" is like saying that the South Bronx of New York City is poor because of its lack of natural resources and the fact that it contains more people than its land base can support.

Rearranging Reality

A representation which acknowledged the extent of Lesotho's long-standing involvement in the "modern" capitalist economy of Southern Africa, however, would not provide a convincing justification for the "development" agencies to "introduce" roads, markets, and credit. It would provide no grounds for believing that such "innovations" could bring about the "transformation" to a "developed," "modern" economy which would enable Lesotho's agricultural production to catch up with its burgeoning population and cut labor migration. Indeed, such a representation would tend to suggest that such measures for "opening up" the country and exposing it to the "cash economy" would have

little impact, since Lesotho has not been isolated from the world economy for a very long time.

Acknowledging that Lesotho is a labor reserve for South African mining and industry rather than portraying it as an autonomous "national economy," moreover, would be to stress the importance of something which is inaccessible to a "development" planner in Lesotho. The World Bank mission to Lesotho is in no position to formulate programs for changing or controlling the South African mining industry, and it has no disposition to involve itself in political challenges to the South African system of labor control. It is in an excellent position, however, to devise agricultural improvement projects, as extension, credit, and technical inputs for the agriculture of Lesotho lies neatly within its jurisdiction, waiting to be "developed."

Taking the Politics out of "Development"

One striking feature of the "development" discourse on Lesotho is the way in which the "development" agencies present the country's economy and society as lying within the control of a neutral, unitary, and effective national government and thus almost perfectly responsive to the blueprints of planners. The state is seen as an impartial instrument for implementing plans and the government as a machine for providing social services and engineering growth.

Excluded from the Bank's analysis are the political character of the state and its class basis, the uses of official positions and state power by the bureaucratic elite and other individuals, cliques and factions, and the advantages to them of bureaucratic "inefficiency" and corruption. The state represents "the people," and mention of the undemocratic nature of the ruling government or of political opposition is studiously avoided. The state is taken to have no interests except "development": where "bureaucracy" is seen as a problem, it is not a political matter but the unfortunate result of poor organization or lack of training.

Political parties almost never appear in the discourse of the Bank and other "development" institutions, and the explicitly political role played by "development" institutions such as Village Development Committees (VDCs), which often serve as channels for the ruling Basotho National Party (BNP), is ignored or concealed. "The people" tend to appear as an undifferentiated mass, a collection of "individual farmers" and "decision makers," a concept which reduces political and structural causes of poverty to the level of individual "values," "attitudes," and "motivation." In this perspective, structural change is simply a matter of "educating" people or even just convincing them to change their minds. When a project is sent out to "develop the farmers" and finds that "the farmers" are not much interested in farming and, in fact, do not even consider themselves to be "farmers," it is thus easy for it to arrive at the conclusion that "the people" are

mistaken, that they really are farmers and that they need only to be convinced that this is so for it to be so.

In fact, neither state bureaucracies nor the "development" projects associated with them are impartial, apolitical machines which exist only to provide social services and promote economic growth. In the case of the Canadian and World Bank–supported Thaba-Tseka Development Project, an agricultural program in Lesotho's central mountains, Sesotho-language documents distributed to villagers were found to have slogans of the ruling Basotho National Party (BNP) added at the end, although these did not appear in any of the English-language versions. Public village meetings conducted by project staff were peppered with political speeches and often included addresses by a high-ranking police officer on the "security threat" posed by the opposition Basutoland Congress Party. Any money remaining after project costs had been repaid went to the BNP's Village Development Committees—leading one villager to note caustically, "It seems that politics is nowadays nicknamed 'development.'"

Inevitable Failure

Because the picture of Lesotho constructed by the Bank and other "development" agencies bears so little resemblance to reality, it is hardly surprising that most "development" projects have "failed" even on their own terms. Thus, after years of accusing local people of being "defeatist" or "not serious" about agriculture and even implying that wage increases at South African mines were "a threat" to the determination of farmers to become "serious," Thaba-Tseka project experts had to concede that local people were right that little beside maize for local consumption was going to come out of their tiny mountain fields and that greater investment in agriculture was not going to pay handsome rewards.[10]

Casting themselves in the role of politically neutral artisans using "development" projects as tools to grab hold of and transform a portion of the country according to a predetermined plan, "development" officials assumed that the projects were givens and all they had to do was "implement" them.

In the case of the Thaba-Tseka project, for example, planners assumed that it would be a relatively simple matter to devolve much of the decision making to a newly constituted Thaba-Tseka district, in order to increase efficiency, enable the project to be in closer touch with the needs of "the people," and avoid its becoming entangled in government bureaucracy. But what the planners assumed would be a simple technical reform led—predictably—to a whole range of actors using the reforms for their own ends.

The project's Health Division, for example, was partly appropriated as a political resource for the ruling National Party. Power struggles broke out over the use of project vehicles. Government ministries refused to vote funds to the project

and persisted in maintaining their own control over their field staff and making unilateral decisions on actions in the district. An attempt to hire a Mosotho to replace the project's expatriate Canadian director was rejected, since as long as the program's image remained "Canadian," there could be no danger of bringing about a real "decentralization" of power away from Maseru, Lesotho's capital.

Instead of being a tool used by artisans to resculpt society, in short, the project was itself worked on: it became like a bread crumb thrown into an ant's nest. Plans for decentralization were thus abandoned in 1982. Yet Thaba-Tseka's planners continued to insist that the project's failure resulted somehow from the government's failure to understand the plan or from the right organizational chart not having been found. Needing to construe their role as "apolitical," they continued to see government as a machine for delivering services, not as a political fact or a means by which certain classes and interests attempted to control the behavior and choices of others.

A Different Kind of Property

Another example of "failure" stemming from the "development" discourse's false construction of Lesotho is that of livestock "development." "Development" planners have long seen Lesotho's grasslands as one of the few potentially exploitable natural resources the country possesses[11] and the country's herds of domestic grazing animals as an inertia-ridden "traditional" sector ripe for transformation by the dynamic "modern" cash economy. What is required, according to planners, is to develop "appropriate marketing outlets," control grassland use to optimize commercial productivity through destocking and grazing associations, introduce improved breeds, and convince "farmers to market their nonproductive stock."[12]

Far from being the result of "traditional" inertia, however, the Basotho's reluctance to treat livestock commercially is deeply embedded in, and partly maintained by, a modern, capitalist labor-reserve economy. In Lesotho's highly monetized economy, an item such as a transistor radio or a bar of soap may be subject to the same market mechanisms of pricing, supply, and demand as it is anywhere else. Cattle, goats, and sheep, however, are subject to very different sorts of rules. Although cash can always be converted into livestock through purchase, there is a reluctance to convert grazing animals to cash through sale, except when there is an emergency need for food, clothes, or school fees.

This practice is rooted in, and reinforced by, a social system in which young working men are away in South Africa supporting their families for 10 or 11 months of the year. (Mines hire only men, and it is very difficult for women from Lesotho to find work in South Africa.) If a man comes home from the mines with cash in his pocket, his wife may present him with a demand to buy her a new dress, furniture for the house, or new blankets for the children. If, on

the other hand, he comes home with an ox purchased with his wages, it is more difficult to make such demands.

One reason that men like to own large numbers of livestock is that they boost their prestige and personal networks in the community, partly since they can be farmed out to friends and relatives to help with their field work. They thus serve as a "placeholder" for the man in the household and the community, symbolically asserting his structural presence and prestigious social position, even in the face of his physical absence. After he has returned to the household because of injury, age, or being laid off from the South African mines to "scratch about on the land," livestock begin to be sold in response to absolute shortages of minimum basic necessities. Grazing animals thus constitute a sort of special "retirement fund" for men which is effective precisely because, although it lies within the household, it cannot be accessed in the way cash can.

However useful and necessary the animals may be, moreover, livestock in Lesotho is less an "industry" or a "sector" than a type (however special) of consumer good bought with wages earned in South Africa when times are good and sold off only when times are bad. The sale of an animal is not "off-take" of a surplus but part of a process which culminates in the destruction of the herd. A drop in livestock exports from Lesotho is thus not, as the "development" discourse would have it, a sign of a depressed "industry" but of a rise in incomes. For instance, when wages were increased in South African mines in the 1970s, Basotho miners seized the opportunity to invest in cattle in unprecedented numbers, leading to a surge in import figures from 4,067 in 1973 to 57,787 in 1978. Over the same period, meanwhile, cattle export figures dropped from 12,894 to 574. A boom in exports, on the other hand, would be the mark of a disaster.

Not surprisingly, attempts to "modernize" Lesotho's "livestock sector" have met with resistance. Within one year of the Thaba-Tseka project attempting to fence off 15 square kilometers of rangeland for the exclusive use of "progressive," "commercially minded" farmers, for example, the fence had been cut or knocked down in many places, the gates had been stolen, and the area was being freely grazed by all. The office of the association manager had been burned down, and the Canadian officer in charge of the program was said to be fearing for his life.

This resistance was rooted in more than a general suspicion of the government and the "development" project. To join the official "grazing association" permitted to use the fenced-in land, stock owners were required to sell off many poor animals to buy improved ones, ending up with perhaps half as many. Such sales and restrictions in herd size were not appealing for most Basotho men. Joining the association not only meant accepting selection, culling, and marketing of herds. It also meant acquiescing in the enclosure of both common grazing land and (insofar as any Mosotho's livestock are also a social, shared domain of wealth) animals. It thus signified a betrayal of fellow stock owners who remained outside the organization, an act considered antisocial. Prospective association

members also probably feared that their animals—which represent wealth in a visible, exposed, and highly vulnerable form—might be stolen or vandalized in retaliation.

The Side Effects of "Failure"

Despite such disasters, it may be that what is most important about a "development" project is not so much what it fails to do but what it achieves through its "side effects." Rather than repeatedly asking the politically naive question "Can aid programs ever be made really to help poor people?" perhaps we should investigate the more searching question "What do aid programs do *besides* fail to help poor people?"

Leftist political economists have often argued that the "real" purpose of "development" projects is to aid capitalist penetration into Third World countries. In Lesotho, however, such projects do not characteristically succeed in introducing new relations of production (capitalist or otherwise), nor do they bring about modernization or significant economic transformations. Nor are they set up in such a way that they ever could. For this reason, it seems a mistake to interpret them *simply* as "part of the historical expansion of capitalism" or as elements in a global strategy for controlling or capitalizing peasant production.

Another look at the Thaba-Tseka project reveals that, although the project "failed" both at poverty alleviation and at extending the influence of international capital, it did have a powerful and far-reaching impact on its region. While the project did not transform livestock keeping, it did build a road to link Thaba-Tseka more strongly with the capital. While it did not bring about "decentralization" or "popular participation," it was instrumental in establishing a new district administration and giving the government a much stronger presence in the area than it had ever had before.

As a direct result of the construction of the project center and the decision to make that center the capital of a new district, there appeared a new post office, a police station, a prison, and an immigration control office; there were health officials and nutrition officers and a new "food for work" administration run by the Ministry of Rural Development and the Ministry of Interior, which functioned politically to regulate the power of chiefs. The new district center also provided a good base for the "Para-Military Unit," Lesotho's army, and near the project's end in 1983, substantial numbers of armed troops began to be garrisoned at Thaba-Tseka.

In this perspective, the "development" apparatus in Lesotho is not a machine for eliminating poverty that is incidentally involved with the state bureaucracy. Rather, it is a machine for reinforcing and expanding the exercise of bureaucratic state power, which incidentally takes "poverty" as its point of entry and

justification—launching an intervention that may have no effect on the poverty but does have other concrete effects.

This does not mean that "the state," conceived as a unitary entity, "has" more power to extract surplus, implement programs, or order around "the masses" more efficiently—indeed, the reverse may be true. It is, rather, that more power relations are referred through state channels and bureaucratic circuits—most immediately, that more people must stand in line and await rubber stamps to get what they want. "It is the same story over again," said one "development" worker. "When the Americans and the Danes and the Canadians leave, the villagers will continue their marginal farming practices and wait for the mine wages, knowing only that now the taxman lives down the valley rather than in Maseru."[13]

At the same time, a "development" project can effectively squash political challenges to the system not only through enhancing administrative power but also by casting political questions of land, resources, jobs, or wages as technical "problems" responsive to the technical "development" intervention. If the effects of a "development" project end up forming any kind of strategically coherent or intelligible whole, it is as a kind of "anti-politics" machine, which, on the model of the "anti-gravity" machine of science fiction stories, seems to suspend "politics" from even the most sensitive political operations at the flick of a switch.

Such a result may be no part of the planners' intentions. It is not necessarily the consequence of any kind of conspiracy to aid capitalist exploitation by incorporating new territories into the world system or working against radical social change or bribing national elites or mystifying the real international relationships. The result can be accomplished, as it were, behind the backs of the most sincere participants. It may just happen to be the way things work out.

What Is to Be Done? By Whom?

If, then, "development" cannot be the answer to poverty and powerlessness in Lesotho, what is? What is to be done, if it is not "development"? Any question of the form "What is to be done?" demands first of all an answer to the question "By whom?" The "development" discourse, and a great deal of policy science, tends to answer this question in a utopian way by saying, "Given an all-powerful and benevolent policy-making apparatus, what should it do to advance the interests of its poor citizens?" The question is often put in the form "What should *they* do?" with the "they" being not very helpfully specified as "Lesotho" or "the Basotho." When "developers" speak of such a collectivity, what they mean is usually the government. But the government of Lesotho is not identical with the people who live in Lesotho, nor is it in any of the established senses "representative" of that collectivity. As in most countries, the government is a relatively small clique with narrow interests. There is little point in asking what such entrenched

and often extractive elites should do in order to empower the poor. Their own structural position makes it clear that they would be the last ones to undertake such a project.

Perhaps the "they" in "What should they do?" means "the people." But again, the people are not an undifferentiated mass. There is not one question—What is to be done?—but hundreds: What should the mine workers do? What should the abandoned old women do? and so on. It seems presumptuous to offer prescriptions here. Toiling miners and abandoned old women know the tactics proper to their situations far better than any expert does. If there is advice to be given about what "they" should do, it will not be dictating general political strategy or giving a general answer to the question "What is to be done?" (which can only be determined by those doing the resisting) but answering specific, localized, tactical questions.

What Should We Do?

If the question is, on the other hand, "What should *we* do?" it has to be specified which "we"? If "we" means "development" agencies or governments of the West, the implied subject of the question falsely implies a collective project for bringing about the empowerment of the poor. Whatever good or ill may be accomplished by these agencies, nothing about their general mode of operation would justify a belief in such a collective "we" defined by a political program of empowerment.

For some Westerners, there is, however, a more productive way of posing the question "What should we do?" That is, "What should we intellectuals working in or concerned about the Third World do?" To the extent that there are common political values and a real "we" group, this becomes a real question. The answer, however, is more difficult.

Should those with specialized knowledge provide advice to "development" agencies that seem hungry for it and ready to act on it? As I have tried to show, these agencies seek only the kind of advice they can take. One "developer" asked my advice on what his country could do "to help these people." When I suggested that his government might contemplate sanctions against apartheid, he replied, with predictable irritation, "No, no! I mean development!" The only advice accepted is about how to "do development" better. There is a ready ear for criticisms of "bad development projects," only so long as these are followed up with calls for "good development projects." Yet the agencies that plan and implement such projects—agencies like the World Bank, USAID, and the government of Lesotho—are not really the sort of social actors that are very likely to advance the empowerment of the poor.

Such an obvious conclusion makes many people uncomfortable. It seems to them to imply hopelessness, as if to suggest that the answer to the question "What is to be done?" is "Nothing." Yet this conclusion does not follow. The state

is not the only game in town, and the choice is not between "getting one's hands dirty by participating in or trying to reform development projects" and "living in an ivory tower." Change comes when, as Michel Foucault says, "critique has been played out in the real, not when reformers have realized their ideas."[14]

For Westerners, one of the most important forms of engagement is simply the political participation in one's own society that is appropriate to any citizen. This is, perhaps, particularly true for citizens of a country like the US, where one of the most important jobs for "experts" is combating imperialist policies.

NOTES

1. Murray, C., *Families Divided: The Impact of Migrant Labour in Lesotho*, Cambridge University Press, New York, 1981, p. 19.
2. World Bank, *Lesotho: A Development Challenge*, World Bank, Washington, DC, 1975, p. 1.
3. "Basutoland," *Encyclopaedia Britannica*, 1910.
4. Wilson, M., and Thompson, L. (eds.), *The Oxford History of South Africa*, Vol. 1, Oxford University Press, New York, 1969.
5. Ashton, H., *The Basuto: A Social Study of Traditional and Modern Lesotho*, Oxford University Press, New York, 1967 (2nd ed.), p. 162.
6. Murray, C., op. cit., note 1.
7. FAO / World Bank, *Draft Report of the Lesotho First Phase Mountain Area Development Project Preparation Mission* (Vols. 1 and 2), FAO, Rome, 1975, Annex 1, p. 7.
8. Van der Wiel, A. C. A., *Migratory Wage Labour: Its Role in the Economy of Lesotho*, Mazenod Book Centre, Mazenod, Lesotho, 1977.
9. FAO / World Bank, op. cit., note 7, Annex 1, p. 7.
10. See CIDA, "Appraisal of Project Progress during the Pilot Phase and Review of Plans to Expand Agricultural Programs in Phase II of Project Operations," CIDA, Ottawa, 1978, p. 39.
11. See, for example, FAO / World Bank, op. cit., note 7, Annex 1, pp. 10–12. For a related South African history of government intervention into "traditional" livestock keeping, see Beinart, W., and Bundy, C., "State Intervention and Rural Resistance: The Transkei, 1900–1965," in Klein, M. (ed.), *Peasants in Africa*, Sage, Beverley Hills, CA, 1981.
12. CIDA, op. cit., note 10.
13. Quoted in Murphy, B., "Smothered in Kindness," *New Internationalist*, No. 82, 1979, p. 13.
14. Foucault, M., "Questions of Method: An Interview," *Ideology and Consciousness*, 8, 1981, p. 13.

This page intentionally left blank

SECTION 4

How Does Globalization Affect Environment and Culture?

What is globalization? Does it equally affect peoples and environments? How are conservation and sustainability influenced by globalization? Who is involved in and who is affected by forces of globalization? Does globalization cause culture "clash"? How does one go about studying global interconnections and their relationships to environmental processes? "Where," to quote Anna Lowenhaupt Tsing, "would one locate the global in order to study it?" (chapter 23 in this volume).

This section engages these questions, beginning with Peter J. Taylor and Frederick H. Buttel's discussion of the dual role of science and politics in both defining and doubting what count as global environmental problems. Their chapter opens with a review of *The Limits to Growth (LTG)* study—a series of computer simulations published in 1972 which projected that unchecked population growth, coupled with increasing pollution and consumer demands, would eventually run up against Earth's finite resources, causing environmental and economic collapse by the mid-twenty-first century. This study is credited not only with introducing the concept of anthropogenic climate change to a mass audience but also with helping to launch modern environmental computer modeling (Parenti 2012). We mentioned in the introduction to section 2 that the *Limits to Growth* model combined different countries' population and resource data into a single global aggregate. For better or worse, this aggregation globalized the discourse. And according to Taylor and Buttel, "we know [environmental problems] are global in part because scientists and political actors jointly construct them in global terms." This first selection emerges from the growing literature of science and technology studies and informs readers of the ways in which politics and science are mutually constructed—a point that is revisited by Melissa Checker in chapter 27.

Following Taylor and Buttel's dissection of the global environmental discourse, Richard R. Wilk brings our attention to a pervasive global business: the business of bottled water. His chapter investigates the ways in which cultural meanings associated with water have been shaped by historic ideas about humans' simultaneous connection to and mastery over nature. Wilk reviews some of the principles that give commodities their value and explores how these principles and historic cultural meanings are appropriated in the marketing and branding of bottled water. Such crafty cultural branding has successfully transformed "an abundant substance—which *falls from the sky for free*"—into a consumer good.

While citizens of rich nations like the United States are adding to the growth of the bottled water trade (avoiding tap water in favor of the bottled variety, which often *is* tap water and is generally no safer than what comes from the tap), citizens in poorer parts of the world continue to suffer from water-borne diseases and lack sufficient access to potable water. Wilk relates the conflict between bottled water and tap water to consumers' health anxieties and their changing perceptions of, and trust of, governments and corporations. Bottled water is a case, according to Wilk, "where sound cultural logic leads to environmentally destructive behavior" (2006: 303).

Sometimes environmentally destructive behavior can be more clearly blamed on corporate choices. In the next chapter, Suzana Sawyer recounts the struggles of indigenous communities to resist land privatization and petroleum "development" in the Ecuadorian Amazon. She chronicles the events leading up to and immediately following the momentous Villano Assembly in December 1993. The three-day assembly hosted by the Organization of Indigenous Peoples of Pastaza (OPIP) marked the beginning of the first serious dialogue over petroleum activity on Indian lands in Ecuador's seventy-year history of oil exploration. Of course, the dialogue did not simply occur between a united indigenous community on one side and the multinational Atlantic Richfield Corporation, or ARCO, on the other. Rather, the local community was divided between a handful of families loyal to OPIP and a larger group that was materially supported by ARCO. As Sawyer writes, "corporate operations both facilitated and profited from dividing indigenous loyalties." Though OPIP's struggle for environmental justice and participatory development is still an ongoing process, it is setting a precedent for decision making regarding indigenous livelihoods and territories not only in Ecuador but in the Amazon region as a whole.

In addition to petroleum exploration and exploitation, carbon trading is another "development" strategy that alarms many indigenous communities. Reducing Emissions from Deforestation and Degradation (REDD) initiatives aim to reduce greenhouse gas emissions and thereby mitigate climate change by altering forest management programs in developing countries. The "plus" appended to REDD (making it REDD+) refers to the incorporation of carbon trading in REDD programming. The idea behind REDD+ is that deforestation occurs because too little economic value is placed on intact forests. Offering money to help developing countries maintain their forests should, in theory, help preserve forests and encourage economic development in the Global South. Yet REDD+ is challenged by many indigenous people who contend that large construction, mining, logging, and plantation operations—not forest-dwelling peoples—are the real drivers of deforestation. And as Tamra Gilbertson and Oscar Reyes (2009: 59) argue, putting a price on forests could encourage governments and companies that stand to benefit from REDD funds to encroach into indigenous territories and grab public lands. In the next chapter, Anne M.

Larson et al. investigate the conditions under which REDD+ is a threat to local rights and the potential for REDD+ to offer opportunities for securing land tenure. Of course, when we speak about international conservation and development programs like REDD+, we are necessarily speaking about globalization. REDD+ is backed by the United Nations Development Programme (UNDP), the UN Environment Programme (UNEP), and the Food and Agriculture Organization (FAO) as well as the United States Agency for International Development (USAID) and the United Kingdom's Department for International Development (DFID). Transnational consortiums of private and public agencies have supported REDD+ programming in over twenty countries.

Anna Lowenhaupt Tsing writes that the concept of globalization, at its simplest, evokes images of "a world in which everything has become part of one single imperial system" (2005: xiii). Yet globalization is not so new as petroleum exploration or REDD+. According to Ann Kingsolver, "Globalization has been going on for many centuries—long before it has gone by this name—and it is neither good nor bad in itself" (2011: 2). Indeed, the term *globalization* simply describes processes of social, spatial, and economic interconnectedness. Revolutions in communication and transportation that facilitate the movement of people, ideas, and technologies have given the impression that the world is shrinking. Yet this impression is felt only by those who have power over and access to the resources of globalization and the "closer reach" that globalization seems to confer. That is not to say, however, that communities exist today that are untouched by globalization. Rather, all human cultures have been historically shaped by dynamic local-to-regional-to-global-and-back networks of meaning, trade, and power (Tsing, chapter 23 in this volume). As Kingsolver writes, "places imagined as 'backward' or 'in another time' . . . or otherwise detached from the momentum and decision making of globalization [are] every bit as much a part of those connected local and global processes as other sites around the planet" (2011: 3). As the chapters in this section aptly demonstrate, global processes have local consequences, and local actors have the agency to re-create or alter global discourse. But how do anthropologists go about studying these complex processes? In the final chapter in this section, Anna Tsing presents a framework for studying the transient "zones of awkward engagement" and "cultural friction" that constitute today's globalized field sites. When we theorize and study globalization in the manner proposed by Tsing, we move away from narrow views that globalization involves either a "united world" or a "clash" of cultures and toward an appreciation for the ways in which the global is produced through diverse and conflicting processes of cross-cultural and long-distance agreement and dissension, fragmentation and collaboration—in a word, friction.

Sections 5–7 flow naturally from this one by inviting readers to consider how globalization influences discursive representations of particular people and places as well as strategies for selling and/or conserving nature. While

globalization extends the reach of capitalist markets, policies, and ideologies, today's globalized media and institutions also enable some indigenous groups to find new sources of empowerment and tools with which to mobilize transnational networks for environmental reform and social justice.

REFERENCES

Gilbertson, Tamra, and Oscar Reyes. 2009. Carbon Trading: How It Works and Why It Fails. Critical Currents: Occasional Paper Series No. 7. Uppsala: Dag Hammarskjöld Foundation.

Kingsolver, Ann E. 2011. *Tobacco Town Futures: Global Encounters in Rural Kentucky*. Long Grove, IL: Waveland.

Parenti, Christian. 2012. The Limits to Growth: A Book That Launched a Movement. *Nation*. December 24–31.

Tsing, Anna. 2005. *Friction: An Ethnography of Global Connection*. Princeton, NJ: Princeton University Press.

Wilk, Richard R. 2006. Bottled Water: The Pure Commodity in the Age of Branding. *Journal of Consumer Culture* 6 (3): 303–325.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 19: "How Do We Know We Have Global Environmental Problems? Science and the Globalization of Environmental Discourse" by Peter J. Taylor and Frederick H. Buttel

1. What are some limitations of the LTG model?
2. How does today's science of global environmental change reproduce the language of LTG?
3. How have environmental activists appropriated the knowledge of global environmental change? How are others deconstructing the scientific framework and movement ideology of global environmental change?
4. What role have environmental groups played in the growth of international regimes, such as the United Nations and international development finance institutions? What does this have to do with globalization?
5. What is the debt regime? How does this impact environmental conservation and degradation in the Global South?

Questions to Accompany Chapter 20: "Bottled Water: The Pure Commodity in the Age of Branding" by Richard R. Wilk

1. How has water been differently imagined and portrayed in western European history? What do the different traditional representations of water have in common? Where do they diverge?
2. How are the different cultural meanings of water as well as changing ideas about the body, health, risk, and nature appropriated in advertising and labeling?
3. How does globalization figure into the bottled water industry?
4. How do Taussig and Helms's ideas about distance (physical, temporal, and social) and McCracken's "Diderot Effect" influence the marketing and sale of bottled water?
5. How can consumers express resistance to bottled water as a commodity? What are some of the obstacles to such resistance?
6. In what ways is the consumption of bottled water in and of itself an act of resistance?
7. How are public attitudes about government, risk, safety, business, and trust reflected in the consumption of bottled water?

Questions to Accompany Chapter 21: "Indigenous Initiatives and Petroleum Politics in the Ecuadorian Amazon" by Suzana Sawyer

1. What are some of the negative repercussions of petroleum exploration and extraction in Ecuador?
2. What are OPIP and ARCO, and what is their relationship?
3. What do *territorio* and *tierras* mean? How do these two terms differ, and what does this difference mean for those indigenous Ecuadorians who support and those who oppose ARCO's presence in Villano?
4. How does globalization factor into Sawyer's history of petroleum politics and indigenous initiatives in Ecuador?

Questions to Accompany Chapter 22: "Land Tenure and REDD+: The Good, the Bad, and the Ugly" by Anne M. Larson, Maria Brockhaus, William D. Sunderlin, Amy Duchelle, Andrea Babon, Therese Dokken, Thu Thuy Pham, I. A. P. Resosudarmo, Galia Selaya, Abdon Awono, and Thu-Ba Huynh

1. What is REDD, and what is REDD+?
2. What is the "No Rights, No REDD" movement?
3. What evidence suggests that REDD+ can support land tenure reform?
4. What evidence suggests that REDD+ can promote tenure problems?
5. What other problems are associated with REDD+?
6. What other benefits are associated with REDD+
7. What action have proponents taken to address the concerns associated with REDD+?

Questions to Accompany Chapter 23: "Friction: An Ethnography of Global Connection" by Anna Lowenhaupt Tsing

1. What are some challenges to global thinking, according to Tsing?
2. What does the term *friction* mean as Tsing applies it to the study of globalization?
3. How does the term *friction* incorporate concepts of hegemony and agency?
4. Why does Tsing advocate the study of "messy and surprising" features of global connection?

19

How Do We Know We Have Global Environmental Problems?*

Science and the Globalization of Environmental Discourse

PETER J. TAYLOR AND FREDERICK H. BUTTEL

Introduction

Since scientists a generation ago detected radioactive strontium in reindeer meat and linked DDT to the nonviability of bird eggs, science has had a central role in shaping what count as environmental problems. Over the last few years, environmental scientists and environmentalists have called attention, in particular, to analyses of carbon dioxide concentrations in polar ice, measurements of upper-atmospheric ozone depletion, remote sensing assessments of tropical deforestation, and, most notably, projections of future temperature and precipitation changes drawn from computation-intensive atmospheric circulation models. This current coalition of environmental activism and "planetary science" has stimulated a rapid rise in awareness and discussion of global environmental problems. A wave of natural and social scientific studies has followed on the effects of global environmental change on vegetation and wildlife, agriculture, world trade and national economic viability, and international security. We know we have global environmental problems because, in short, science documents the existing situation and ever tightens its predictions of future changes. Accordingly, science supplies the knowledge needed to stimulate and guide social-political action.

Science-centered environmentalism is, however, vulnerable to "deconstruction." Environmental problems, almost by definition, involve multiple, interacting causes, allowing scientists to question the definitions and procedures of other scientists, promote alternative explanations, and cast doubt on the certainty of predictions. In turn, people trying to make or influence policy often find the lack of scientific closure a potent weapon (Jasanoff, 1992). After an initial honeymoon period during the late 1980s, global climate modeling, estimates of biodiversity loss, and other studies of the implications of environmental change have become subject to scientific and consequent political dispute.

The purpose of this paper is not to add our own assessment of the reliability of global environmental science or of the severity of the problems this science is

* Reprinted from *Geoforum* 23, no. 3, pp. 405–416.

indicating. Instead, building on the sociology and social studies of science, we propose a different construction of the special relationship between environmental science and politics. The sociology and social study of science has, over the last 15 years, illuminated the social influences that shape what counts as scientific knowledge. Truth or falsity of the science is rarely sufficient to account for its acceptance, either within science or, as will be an equally important concern to us here, within the political realm. In this light, we make three propositions, each confounding the first answer above to the question of how we know we have global environmental problems:

(1) In science, certain courses of action are facilitated over others, not just in the use or misuse of science but in its very formulation—the problems chosen, categories used, relationships investigated, and confirming evidence required. Politics—in the sense of courses of social action pursued or promoted—are not merely stimulated by scientific findings; politics are *woven into* science at its "upstream" end. In the case of environmental problems, we know they are global in part because scientists and political actors jointly construct them in global terms.

(2) In global environmental discourse, two allied views of politics—the moral and the technocratic—have been privileged. Both views of social action emphasize people's *common* interests in remedial environmental efforts while, at the same time, steering attention away from the difficult politics that result from differentiated social groups and nations having different interests in causing and alleviating environmental problems. We know we have global environmental problems, in part, because we act as if we are a unitary and not a differentiated "we."

(3) Global environmental change, simultaneously a scientific framework and a movement ideology, is particularly vulnerable to deconstruction. The point is not that appeals to common or universal interests are without efficacy as a political tactic (as, for example, human rights campaigns in times of severe repression demonstrate). Rather, inattention to the national and localized political and economic dynamics of socio-environmental change will ensure that scientists, both natural and social, and the environmentalists who invoke their findings will be continually surprised by the unpredicted conflicts and unlikely coalitions. To the extent that "we" attempt to focus on global environmental problems, to stand above the formation of such coalitions and the conduct of such conflicts, "we" are more likely to be spectators, rather than engaged participants, in the shaping of our related but different futures.

To explore these propositions, we will begin with a reconstruction and overview of the interwoven science and politics of *The Limits to Growth* (LTG) study of the 1970s. This case is convenient not only for reasons of demonstrating historical continuity; there is also a vast literature on the topic and a long span of experience by which to assess its consequences. Although the study should be

familiar to most readers, we believe that our interpretation of the LTG is novel. From this beginning, we then make extensions to current studies of the human/social impacts of climate change. Finally, we discuss the possible sources of deconstruction of the globalization of environmental discourse, affecting both environmental action and the planetary science upon which it draws.

Global Modeling, 1970s Style

The LTG study was funded by the Club of Rome, an elite group of Western businessmen, government leaders, and scientists, and was conducted by system dynamics (SD) modelers at MIT (Meadows et al., 1972). The predictions from World 3, an SD model of the world's population, industry, and resources, were for population and economic collapse unless universal (coordinated, global-level) no-growth or steady-state policies were immediately established.

A major debate developed over the LTG study. Environmentalists applauded the attention the LTG drew to the finiteness of the Earth's resources, and the environmental movement took up notions such as finiteness of resources, "economic growth vs. the environment," growth control, and the steady-state economy as their major ideology and agenda. Economists, however, strongly criticized the LTG's pessimism. Scarcity, signaled in price changes, they contended, would stimulate technological advance and thus push back the limits of available resources. From a different vantage point, many leftists and social-justice-oriented progressives saw the LTG worldview as being insensitive to the needs of the poor and innocent of the realities of the penetration of multinational capital across the world. Others, particularly those skilled in the methodology of systems analysis, pointed to weaknesses in the model's empirical basis, structure, and validation.

Despite the initial firestorm of criticism, the system dynamicists never conceded that their modeling was in error (Meadows et al., 1973; Bloomfield, 1986). After the heated reaction to the LTG, they adopted a lower profile but continued to use SD in a wide variety of modeling and educational projects (e.g., Forrester, 1976), most notably in the explanation of broad modes of economic behavior—business cycles, inflation, and long waves (Kondratiev cycles). We can understand their continued belief in the validity of SD if we look more closely at construction of the LTG model of the world, noting that, whilst the system dynamicists were "doing science," they were also constructing interventions in that world. Both the representation of how that world works and the interventions proposed for improving it made each other seem more real.

System dynamics, pioneered by Jay Forrester at MIT in the 1950s, was used first to model individual firms, then to explain urban decay, and, by the end of the 1960s, to uncover the dynamics of the whole world. The origin of SD in the modeling of firms has significance for the subsequent applications. Managers

with whom Forrester had talked (recall that the LTG model and its predecessor models were developed at the Sloan School of Management at MIT) had observed repeated cycles of running up inventories, then laying off workers, and then once again accumulating a backlog of orders, adding labor and increasing production, only to find themselves overcompensating and running up inventories again. Instead of attributing this cycle to the business cycle, Forrester concluded that the causes were endogenous to the firm. Each decision of management was rational, but when coupled together and incorporating the unavoidable time delays between setting a goal and fulfilling it, the overshoot-undershoot cycle resulted. Given that the undesirable behavior was caused by the interactions among different sectors of the firm, the firm's overall management could overcome the cycling only if there were a superintending manager in a position to override the decisions of managers in the separate sectors of the firm. For example, the sector managers could be instructed to keep larger inventories and respond more slowly to changes in the backlog of orders than they would otherwise prefer to do.

SD for firms set the pattern for the subsequent urban, global, and other SD models. In general, the modeler does not rely solely on recorded data but instead invokes commonsense knowledge of how individuals work when they face a task with the usual information available. Computer games are often employed to convince players that they would not behave any differently from the people or other entities in the models (Sterman, 1987). Building on this commonsense validation of the separate decisions, SD then demonstrates that these locally rational decisions, when worked through feedbacks in the system model, generate unanticipated and undesired, or pathological, outcomes.

Using decision rules that look plausible to an individual, not only the LTG but almost all SD models exhibit undesirable cycles or positive-feedback-based exponential growth and collapse. These cycles are difficult to overcome by adjusting the parameter values, even if set as high as economic or technological optimists would like. SD modelers infer that this behavior is intrinsic to the structure of the system modeled, not in its detailed specifications. The actions of some individuals *within* the system cannot override the structure, even if those individuals understand the system as a whole. But in the case of the LTG "world system," unlike in firms, there is no superintending manager to enforce the required interrelated changes in or at this world level. Catastrophe is thus inevitable unless "everyone"—all people, all decision makers, all nations—can be convinced to act in concert to change the basic structure of population and production growth. In this fashion, SD models support either a moral response—everyone must change to avert catastrophe!—or a technocratic response—only a superintending agency able to analyze the system as a whole can direct the changes needed. There is no paradox here—moral and technocratic responses are alike in attempting to bypass the political terrain in which different groups

experience problems differently and act accordingly. Forrester has argued that global questions, such as the "feasibility" of continued growth of the world's population, capital stock, and resource usage, require global models (Forrester, 1976; see also Meadows et al., 1973, p. 238). When we examine, however, how events would develop if population growth proved "infeasible," a politicized alternative to the LTG's diagnosis becomes apparent. Consider two hypothetical countries. Country A has a relatively equal land distribution; country B has a typical 1970s Central American land distribution: 2% of the people own 60% of the land; 70% own 2%. In other respects, these countries are similar: they have the same amount of arable land, the same population, the same level of capital availability and scientific capacity, and the same population growth rate, say, 3%. If we follow through the calculations of rates of population growth, food production increase, levels of poverty, and the like, we find that five generations before anyone is malnourished in country A, all of the poorest 70% in country B already are. Food shortages linked to inequity in land distribution would be the likely level at which they, and by implication most of the world's population, would first experience "population pressure." Aggregation of the world's population and resources into the LTG's global model obscured the fact that crises will not emerge according to a strictly global logic, much less in any global form as such.

This simple example does not tell us how to analyze the politics of localities, nations, regions, or a world in which people contribute differentially to environmental problems. Our point here is simply to highlight the political dimension excluded by the science of SD in its analysis of global limits to growth. The LTG's moral and technocratic emphasis is, of course, by no means a unique characteristic of that study. Our critique of the LTG's science-politics can be extended to the current globalization of environmental discourse. Before doing so, let us first say a little more about this moral-technocratic alliance that such discourse generally presupposes.

In technocratic formulations, objective, scientific, and (typically) quantitative analyses are employed to identify the policies that society (in the case of the LTG, humanity) needs in order to restore order or ensure its sustainability or survival—policies to which individuals, citizens, and countries would then submit. In the LTG, these policies are deduced from the model structure, which is held to reveal a dynamic that the ordinary citizen, politician, or businessperson would not have recognized or specified. Moral formulations, in contrast, reject coercion and rely on each individual making the change needed to maintain valued social or natural qualities of life. Yet, in many senses, the moral and technocratic are allied. The solutions appeal to *common*, *undifferentiated* interests as a corrective to corrupt, self-serving, naive, or scientifically ignorant governance. Moreover, appearances notwithstanding, special places in the proposed social transformations are reserved for their exponents—the technocrat as analyst/policy advisor; the moralist as guide (Taylor, 1988).

Revealingly, the LTG report at numerous junctures combined managerial language and moral recruitment: "Until the underlying structures of our socio-economic systems are thoroughly analyzed, they cannot be managed effectively" (Meadows et al., 1972, p. 181); "The economic preferences of society are [to be] shifted more toward services" (p. 163); "We cannot say with certainty how much longer mankind can postpone initiating deliberate control of his growth" (p. 183); "The two missing ingredients are a realistic, long-term goal that can guide mankind . . . and the human will to achieve that goal" (p. 184). In short, the global society needs management to achieve control; mankind, like an individual person, needs a goal and a will to change.

Global Modeling Today

Global climate models—or, more precisely, general circulation models (GCMs) of the atmosphere—have, especially since the hot dry summer of 1988 in the United States, provided a new scientific basis for projections of imminent global environmental crisis. The actual modeling technique bears no similarity to system dynamics, but the language of the LTG lives on. More importantly for our argument, the science of global environmental change continues to reflect, and in turn reinforce, the moral-technocratic formulation of global environmental problems. Two observations about contemporary research will serve to illustrate this point and to remind us of alternative formulations that, as in the LTG case, tend to be obscured by globalized discourse.

First, consider the high premium that is currently being placed on reducing uncertainty about physical processes in GCMs. To date, GCMs concur in predicting an average global warming, but the projected magnitude of the increase varies among the models. Moreover, at the level of regional predictions, larger uncertainties and inconsistencies among the GCMs are evident. Indirect climatic feedbacks, creating new uncertainty, have now been added to the research agenda (Lashof, 1989).

Tightening long-term projections or highlighting their severity is not, however, the only means by which policy responses to climate change could be catalyzed. As Glantz (1988) has observed, extreme climate-related events, such as droughts, storms, and floods, already elicit socio-political responses that can be relatively easily studied. Recent and historical cases of climatic-related "natural hazards" shed light on the impact of different emergency plans, investment in infrastructure, and its maintenance and reconstruction schemes. Policy makers, from the local level up, can learn "by analogy" from experience and prepare for future crises. Instead of emphasizing the investigation of physical processes and waiting for uncertainty to be eliminated before action is taken from the top, this approach calls for systematic analysis of effective vs. vulnerable institutional arrangements. Such discussion of specific, local responses to climate change is

not absent. Nevertheless, the vast majority of funds for global change research is currently being devoted to improving GCMs and allied climatic studies.

This dominance of physical climate research over institutional analysis points to the second issue, the hierarchy of the physical over the life and social sciences. This hierarchy constitutes an environmental determinism: the physics and chemistry of climate change set the parameters for environmental and biological change; societies must then adjust as best they can to the change in their environment. The hierarchy is evident in the conceptual and temporal relationships of GCMs to other areas of environmental change research. GCM research is over two decades old. Building on the prominence given to GCMs in the late 1980s, a second tier of research arose which has generated scenarios of agricultural, vegetation, and wildlife changes. This research models the interaction of projected temperature and precipitation changes with regional soils, watersheds, timing of snowmelts, wildfire susceptibility, coastal upwelling, and so on. Following shortly after, a third tier of research was added which has been devoted to assessing the economic or security consequences of these biotic changes or of the more direct consequences of climate change, such as a rise in sea level. Modes of geopolitical response to the global climate change threat then began to be discussed by political scientists. Finally, and most recently, social scientists and humanists have begun investigating popular understanding of global climate change, furnishing the bottom rung on the ladder from the hard and physical down to the soft and personal.

Of course, global change researchers know that climate change is a social problem, since it is through industrial production, transport and electrical generation systems, and tropical deforestation that societies generate greenhouse gases. Nonetheless, it is *physical change*—the mechanical and inexorable greenhouse effect—that is invoked to promote policy responses and social change. Moreover, the research undertaken often belies the stated awareness of the social dimension of environmental problems. Natural scientists, Harte et al., for example, recognize that "designing conservation policies without considering the role of existing institutions or societal responses to climatic change will likely lead to failure" (1992). Yet the same authors advise that "models work best for predicting change when the important underlying [physical and biological] mechanisms are well understood." Natural scientists have benefited from the prestige and funding that have flowed down from the high-status climate simulations, fueling their confidence that political affairs can be influenced by technical knowledge without (or prior to) analysis of existing social arrangements. Harte et al.'s research reflects this sense of politics, not the earlier caveat.

Again, the physical-natural-social scientific hierarchy is not necessary in the construction of environmental problems. Over the last 15 years, fields such as geography, anthropology, and international development studies have become increasingly sophisticated at analyzing environmental change as

socio-environmental change. Processes such as deforestation, drought, land degradation, and migration of "environmental refugees" are shown to be, in their causes and their effects, social and environmental at one and the same time (Watts, 1983; Blaikie and Brookfield, 1987). The social dynamics are most apparent on the economic level: resource distribution determines whether and *for whom* a bad year becomes a drought. Inequities in land tenure and rural political power ensure that the rural poor will exploit land vulnerable to erosion, migrate to carve new plots from the forest, or add to the margins of burgeoning cities well before the resources of their original locale are exhausted. Industrialization and other opportunities for off-farm income can result in insufficient labor remaining to keep up traditional conservation practices. Such economic observations readily lead us to consider local particularity and historical contingency—in some areas traditional practices have resisted disruption by linkage into global markets and have instead contributed to environmental sustainability, while in other areas social organization has been rapidly restructured with significant environmental consequences (Little, 1987; Richards, 1985).

Sites of "Deconstruction" of Global Environmental Change

In highlighting the moral-technocratic construction of global environmental problems, we hope to steer the attention of scientists and environmentalists towards the differentiated politics and economics of socio-environmental change. There are, of course, other sources of opposition to global and political formulations of environmental issues which threaten to render global environment discourse, like science-centered environmentalism in general, vulnerable to deconstruction. In this section, we review some major places where globalization is disputed. Most of this opposition, it should be noted, centers more on disparities among nations than on the differentiated economic and political conditions within nations—a particular construction in its own right.

Global change knowledge was appropriated within the environmental activist community and employed to mobilize support for the movement's goals. The selective promotion of global change/warming increased support among prospective environmental supporters and minimized opposition among the political and corporate officialdoms in the advanced industrial countries. The popularization of the global warming notion was accompanied by, if not substantially based on, disproportionate stress on Third World sources of greenhouse gases, particularly tropical rainforest destruction. Tropical rainforest destruction probably accounts for less than 15% of global greenhouse gases and is a relatively minor source compared with industrial, transport, and other greenhouse gas emissions from the developed countries. The "rainforest connection" has, however, been central in the scientific and popular construction of global change knowledge. At the level of environmental science, it has led to greater stress on

the conservation biology of rainforest biodiversity, not only as a subordinate theme within the global environmental change framework but also as a glamour topic in its own right.

As awareness of global climate change and the biodiversity implications of rainforest destruction grew in tandem, environmentalists came to focus the bulk of their efforts at two interrelated levels: on one hand, considerable activity was focused on the UN system (particularly UNEP) and other "international regimes" in order to forge international conventions on climate change, biodiversity, and forest management (which were under investigation in preparation for a hoped-for ratification at the 1992 UN-sponsored "Earth Summit" in Rio de Janeiro); on the other, environmental groups have sought to influence, and to employ the influence of, the international development finance and assistance establishment, particularly the World Bank / IMF, because of the important role of these institutions in affecting economic activity in the tropics. Within both of these fora, as well as among the international development intelligentsia and NGOs, environmental groups have played an important role in shaping understandings and policies with regard to "sustainable development." In particular, there is a very strong stress on rainforest environments and biodiversity in sustainable development doctrine.

The rise of global-change-led international environmentalism occurred during a significant shift of the political center of gravity of the industrial world toward neoconservative regimes. Modern environmentalism has accommodated itself surprisingly readily to the global free-market resurgence. While international environmental groups yet reserve the right to criticize the World Bank and related institutions about the environmental destruction that results *from particular projects or types of projects* (especially dam and road construction and mining projects), environmental groups have generally worked with the Bank/IMF in a surprisingly harmonious manner in implementing conservation/preservation policies and programs in the Third World. There is a key coincidence of interest in the environmental group / World Bank / IMF relationship: the Bank and IMF gain legitimacy in the eyes of the citizens and political officialdoms of the advanced (increasingly "green"-oriented) countries by helping to implement environmental and conservation policies, while the implied threat of Bank or IMF termination of bridging, adjustment, and project loans is useful in securing developing-country compliance with environmental initiatives. Given this relationship, most environmental organizations have been disinclined to take on the world debt crisis, the net South-North capital drain, and the international monetary order (which is substantially regulated by the World Bank and IMF; Wood, 1986) as being fundamental contributors to environmental degradation.

The political economy of debt in the overall context of a stagnant world economy has become the principal parameter affecting both Third World develop-

ment prospects and its environmental performance. It has largely been through the "debt regime" that environmental agendas have been grafted onto Third World development planning. Only heavily indebted countries, for example, have debt that is sufficiently discounted on the secondary debt market to be attractive to environmental groups for purchase in debt-for-nature swaps. Likewise, heavily indebted countries are most subject to joint environmental group and development agency pressures to protect the environment. But as much as external debt has facilitated the implementation of environmental conservation policies, debt also serves to *exacerbate* environmental degradation. Third World countries that are most "debt-stressed," and thus which are most in need of hard-currency export revenues, are most likely to see little alternative but to aggressively "develop" their tropical rainforests and other sensitive habitats in order to maintain their balance of payments and service their debts. Environmental activism through the debt regime is thus likely to be a standoff: two steps forward and one or two steps back.

Given these political and economic conditions, it is not surprising that a strong force for deconstruction of global change/discourse is that of the growing Third World reaction to "environmental colonialism." Developing-country opposition to international environmental regulation is increasingly seen as being likely to frustrate, if not prevent, the appearance or reality of meaningful international environmental conventions. This Third World reaction is surprisingly broadly based. Growing quarters of the Third World intelligentsia and the NGO community stress, for example, that international environmental organizations have exaggerated the Third World contribution to global warming and that Western calculations of developing-country contributions to greenhouse gas emissions have failed to note a fundamental First World / Third World difference in the nature of these emissions: that between the "survival emissions" of the South and the "luxury emissions" of the North. But Third World criticism of global environmental regulation policies as "environmental colonialism" also includes increasingly forceful opposition by Third World politicians and business leaders to proposed global change conventions on the grounds of their being an unjust violation of "national sovereignty" (Pearce, 1991). As the Earth Summit drew near, there were strong indications that it would be dominated by North-South acrimony as much as by environmental science.

Deconstruction of the science and the action program of global climate change is by no means confined to dissenting Third World voices or to those who speak for the interests of the world's poor. Spurred by contrary evidence within Western planetary science, dissent on the part of the propertied and powerful has also been expressed; e.g., the Bush administration in the USA has largely remained a bulwark against rushing into a global climate change convention, invoking the lack of conclusive scientific evidence that there will be significant global warming to justify its position.

Conclusion

The current globalization of environmental discourse, like the LTG debate in the 1970s, steers attention away from the differentiated politics and economics of socio-environmental change. As should be evident from this commentary, we believe both the science and politics involving environmental change would benefit from a reversal of this trend. In drawing attention to the moral-technocratic construction of global environmental problems, we have also been promoting a sociological perspective on science, namely that interpretations and action, both scientific and social, are bound together, jointly reinforced by the formulation of problems, the tools available, the audiences being addressed and enlisted to act, the support (financial and otherwise) elicited, and so on. It follows that any reconstruction of science and politics must be a multifaceted process drawing upon many more strands than simply a reconceptualization such as ours of the relationship between the knowledge claims and views about desirable social action. Nevertheless, the critical perspectives we have introduced allow us to anticipate some ways in which global environmental discourse, although powerful, remains vulnerable to dispute and open to transformation.

REFERENCES

Blaikie, P., and Brookfield, H. (1987). *Land Degradation*. Methuen, London.

Bloomfield, B. P. (1986). *Modelling the World: The Social Constructions of Systems Analysts*. Basil Blackwell, Oxford, UK.

Forrester, J. W. (1976). Educational implications of responses to system dynamics models, In: *World Modeling: A Dialogue*, C. W. Churchman and R. O. Mason (Eds.). American Elsevier, New York.

Glantz, M. (Ed.) (1988). *Societal Responses to Regional Climatic Change: Forecasting by Analogy*. Westview, Boulder, CO.

Harte, J., Torn, M., and Jensen, D. (1992). The nature and consequences of indirect linkages between climate change and biological diversity, In: *Consequences of the Greenhouse Effect for Biological Diversity*, R. L. Peters and T. E. Lovejoy (Eds.). Yale University Press, New Haven, CT.

Jasanoff, S. (1992). Science, politics, and the renegotiation of expertise at EPA, *Osiris* (n.s.), 8, 194–207..

Lashof, D. (1989). The dynamic greenhouse: Feedback processes that may influence future concentrations of atmospheric trace gases, *Climate Change*, 14, 213–242.

Little, P. (1987). Land use conflicts in the agricultural/pastoral borderlands: The case of Kenya, In: *Lands at Risk in the Third World: Local Level Perspectives*, pp. 195–212, P. Little, M. Horowitz, and A. Nyerges (Eds.). Westview, Boulder, CO.

Meadows, D. H., Meadows, D. L., Randers, J., and Behrens, W. W. (1973). A response to Sussex, In: *Models of Doom: A Critique of the Limits to Growth*, H. S. D. Cole, C. Freeman, M. Jahoda, and K. L. R. Pavitt (Eds.). Universe Books, New York.

Meadows, D. H., Randers, J., Meadows, D. L., and Behrens, W. W. (1972). *The Limits to Growth*. Universe Books, New York.

Pearce, F. (1991). North-South rift bars path to summit, *New Scientist*, 132, 23 November, 20–21.

Richards, P. (1985). *Indigenous Agricultural Revolution*. Hutchinson, London.

Sterman, J. (1987). Testing behavioral simulation models by direct experiment, *Management Science*, 33, 1572–1592.

Taylor, P. J. (1988). Technocratic optimism, H. T. Odum and the partial transformation of ecological metaphor after World War II, *Journal of the History of Biology*, 21, 213–244.

Watts, M. (1983). On the poverty of theory: Natural hazards research in context, In: *Interpretations of Calamity from the Viewpoint of Human Ecology*, pp. 231–262, K. Hewitt (Ed.). Allen & Unwin, Boston.

Wood, R. E. (1986). *From Marshall Plan to Debt Crisis*. University of California Press, Berkeley.

20

Bottled Water*

The Pure Commodity in the Age of Branding

RICHARD R. WILK

Because water is such an abundant substance—which *falls from the sky for free*—critics of marketing have no trouble finding absurdities and contradictions when water becomes a valuable consumer good. Survey after survey shows that bottled water is generally no safer or purer than what comes from the tap. . . . Though people claim they can easily taste the differences between tap and bottled waters, in blind tests many are unable to—especially because sometimes the liquid sold in bottles *is* tap water. In some places the tap water consistently wins in blind tasting against bottled brands, and local water authorities have taken out trademarks to keep citizens from bottling and selling what comes from their tap. Clearly taste is not the main motivation behind the continuing inexorable increase in the bottled water trade. . . .

This article will focus on bottled water as a commodity, on the way water is embedded in historically grounded cultural meanings which have become raw material for both marketers who want to sell bottled water and those who would resist it. . . . My goal is to show that while cultural branding has successfully turned water into a consumer good, to the point where it is ubiquitous and widely accepted, it has not ended moral debate about rights and inequality. The stark imbalances across the globe in access to basic clean water and the continuing high death rates in many places from water-borne disease make this an issue that will not go away. In concluding, I argue that the progressive expansion of water as a commodity is as much the result of a failure of governments to fulfill public obligations as it is due to the craftiness of the marketers of bottled water.

History, Nature, and Cultural Meaning

Both those selling water in bottles and those for whom water is a universal right portray water as a substance that comes from nature. Water is more than a

* From *Journal of Consumer Culture* 6, no. 3 (2006): 303–325. Used by permission of SAGE Publications.

symbol of the natural world; it is usually seen as the very substance of the natural world. Nature, after all, has been likened to a popular secular religion in the West (Dunlap, 2004). In western Europe there are deep historical roots for the idea that water has magical power to heal and confer vitality, power rooted in sacred springs and wells that were seen as sources of spiritual knowledge and wisdom (Strang, 2004: 98). The power of water to connect people to the power of nature was transmitted through the contagious magic of baptism, libation, bathing, and drinking, both in pagan and Christian traditions.

On top of this long tradition, we can identify another historical layer of meaning that emerges from the scientific project of defining and measuring water and the modernist industrial theme of "control of water" as the mastery or conquest of nature (Hamlin, 2000). Heroic films about the damming of great rivers and the taming of floods expressed the power of industrial society over untamed nature. Modernism imposes human will (and governmentality) on nature by channeling, damming, chemical treatment, purification, and organized distribution. Because today bottled water can draw on both traditions, it has the unusual capacity to disemically carry and transmit the magic and power of nature *and* modern technology at the same time. In a world where floods and tidal waves still prove the imperfection of human control over the natural power of water, every bottle of water is a visual metaphor for control and at the same time a reminder that without water, people cannot exist. . . .

Most water advertising and labeling today uses images from nature, especially the mountains that formed the first major object of romantic European nature worship in the late 18th and early 19th centuries (Löfgren, 1999). The predominant color for labels is blue, and bottles are almost always transparent—you never see water in brown bottles. But this form of nature is still, like medicinal waters with their long lists of minerals, mediated by scientific artifice. A typical example is an advertisement for RealPure, which says its water is "straight from the source at RealPure's state-of-the-art plant atop a natural spring." . . . A 1999 report by the Natural Resources Defense Council (NRDC) gleaned a list of keywords used by water brands on labels or in marketing, of which some of the most common were "pure," "pristine," and "natural."

Some have argued that nature has recently become a kind of "super commodity" that provides a kind of connection between consumers and producers that has largely been lost in the confusion of industrial capitalism (Descola and Pálsson, 1996). But there are clearly many aspects of nature (and water) that resist commodification, and it is just this resistance that makes Perrier water bottled at the ancient source or Lourdes water in a tiny vial or fresh spring water from a mountain freshet different from the generic stuff flowing from the tap. At the same time, while most consumers in rich countries may enjoy the *thought* of pure water flowing in a mountain stream, most would be terrified to actually *drink* it without some kind of purification. . . .

Purity of the Body, Purity of the Home

The other side of thinking about how bottled water has come to represent nature and purity is the equally important question of how public water has come to be seen as dangerous and dirty. One way to think of it is through a structuralist and symbolic analysis like that of Mary Douglas, who initially studied food taboos. If we think of the house and home as extensions of the body, personal and intimate, then anything that crosses the boundary between the public world and the house is potentially dangerous and impure. Douglas says that the moment of greatest danger is when food crosses boundaries into and out of the body, or when substances cross the threshold from the public world into the private space of the home (Douglas, 1966). Food and waste can also become liminal, and therefore capable of betrayal and corruption, so they must be regulated. Public drinking water, coming from anonymous sources through the hands of unknown agents, has just this disruptive potential for the body.

We can move this same analysis to the social level of the relationship between the home and the community. Utility lines are potentially transgressive connections between private and public, bringing materials in and removing waste. In research on California electricity customers, we found that all public utilities, including water and gas, are seen by homeowners as intrusions into private space that carry unnamed dangers (Wilk and Wilhite, 1984). People focused many of their anxieties about dependency, pollution, and potential catastrophe on the flow of power into their houses. Many whom we interviewed thought wistfully of a life "off the grid" as a utopian existence free from greedy power companies and their nuclear dangers. At the time water was taken for granted, but now it too has become problematized, contested in much the same way. Utility lines connect the intimate world to the welter of unknown powers that inhabit a world of commerce and government. The more hostile and dangerous people perceive that world to be, the more attention they focus on the flow of power and material in and out of their homes. We see this reflected in the great attention and moral significance given to what scientists and risk analysts consistently find to be vanishingly small risks from power lines, piped water, impure food, and waste disposal.

New Cultural Horizons

Given all the rich meanings and associations, and the manifest social and ideological dangers presented by water, how do companies actually sell water in the marketplace? They have built on the positive historical meanings of water, but they have also appealed to other aspects of body and identity which rival the importance of the cultural realms of risk, health, and nature. Most obvious of these are social distinctions of wealth and class, which have after all been

used for centuries to sell European bottled waters in restaurants around the world. Now there are much finer gradations of price and perceived quality, from unbranded generic bulk water in large, refillable containers and mass-market treated tap waters sold by large soft-drink companies, through the "midmarket" and onward to more expensive and exotic "premium" brands. The basic social distinctions of age and gender are also reflected in the marketing of water for male athletes, water "specifically formulated for a woman's special needs," and brands for children (vitamin-fortified Kid Fuel in small blue bottles for boys and pink for girls) and active teens.

Health as a cultural realm in the West is also an arena for the conflict between nature and science, and while some waters advertise their natural sources, others make health claims based on scientific additives. In the USA there are now several brands like Physique Power Water, "enhanced with 'nutraceuticals'"; there are also vitamin waters, nicotine, aspirin, and caffeine waters, sports water, "smart" water, a "diet" water called Skinny, and even a special water for pets. Some of these products make extravagant claims, like "eVamor® alkaline artesian water," which "works to neutralize acid and delivers antioxidants and minerals that burn fat" (ad in *Beverage Industry News*, May 2003). . . .

Cross-cultural studies by anthropologists have found that in a wide variety of cultures, rare substances with distant, exotic origins are especially powerful and are often the source of medicines with extraordinary powers to affect the body (Helms, 1988; Taussig, 1987). While globalization has broken down the effects of distance to some extent, its power still adheres to water from distant places, such as icebergs and glaciers, and there are still rare additives including ancient air bubbles from deep inside glaciers and flakes of gold.

Modern consumer culture is full of devices that maintain the exclusive, exotic, and mysterious nature of goods to enhance their value. To understand some of the richness and variety of value-enhancing exoticizing modes, I asked a roomful of about 25 marketing professionals, professors, and graduate students in a major US business school to think of new ways to sell water. Within 15 minutes they produced a long list that included the following:

- Water from each of the great rivers of the world
- Meltwater from named glaciers, or assorted waters from sets of glaciers in a region, which become more expensive as the glaciers get smaller
- Cave waters, including water from the deepest, longest, darkest, etc.
- Great underground aquifers—in the USA many have heard of the great Oglala aquifer
- Carbon-dated and fossil waters, for example, water that last fell to earth 6 million years ago
- Oasis water—from the famous deserts such as the Sahara, Gobi, and Kalahari
- Water gathered from particular named storms and hurricanes, with the potential for collection sets or keeping special vintages

- Water from the childhood homes of movie stars, the water that made them who they are today
- Kinky waters—from the island of Lesbos, for example
- Waters of the seven continents
- Waters for different parts of the body—stomach, skin, hair water

Some of the group's suggestions were already on the market. . . .

The most intriguing thing about this list is that almost all of them depend on very old forms of value which would have been familiar to 16th-century Europeans, the ancient Greeks and Romans, and many of the ancient and contemporary cultures discussed by Taussig (1987) and Helms (1988) in their work on the powers of exotic goods. Each one in some way manipulates *distance*, either increasing or decreasing it in geography, time, or social proximity. Geographically, value adheres to places far away (deserts) or those that represent the consumer's own imagined location (USA, hometown). Fossil water from the distant past stretches time, in contrast to the immediate present represented by water from a particular wedding. Personal water is the "zero point" of social distance, while water associated with celebrities or royalty maximizes the social gap. . . .

Another principal at work here is McCracken's well-known "Diderot Effect," where objects are formed into sets, with the implication that a complete set (seven continents) has much more value than the total of all its parts. Buying one of the set can then easily lead into an exploration of the entire group, and this can even build upwards into "sets of sets" or higher-ranked sets, in the progression well known to those who study collecting. Again this is an ancient principal in human relationships with material culture that probably predates the market; ancient Mayan nobles seem to have collected "sets" of pottery from particular artists and workshops.

None of these principles that give value to water is specific to water as a commodity or even to market societies, the West, or modern times. But all of these meanings have today been captured by commodities, and as such they are all antithetical to any ideal of water as a free good, a natural right and therefore the absolute opposite of a commodity. This is the contradiction that leads to resistance to any kind of bottling, branding, labeling, advertising, and selling of water in commodity packages. This points out that in some ways, it's the wrapper, the label, and the packaging that elicits resistance, not the water itself. . . .

Resistance

. . . Many consumers never have the opportunity to choose from a vast array of waters because of corporate concentration and consolidation in the industry and narrow retail channels where shelf space is limited and expensive. Large

retailers develop close relationships with a few brand suppliers, who can meet their demands for just-in-time delivery, product tracking, and small profit margins. Because of exclusive distribution contracts, it is impossible to find more than one or two brands of water in many businesses, schools, universities, and restaurants in the USA and Canada. . . .

Therefore, most consumers never have the opportunity to express resistance by choosing, for example, a fair-traded water, an ethical water, a green water, or a water that donates money from each bottle to build potable systems in poor countries. For many other commodities, such as coffee and organic vegetables, consumers can "vote" in the marketplace *against* what they dislike and *for* the preferred options at the same time. But water in some ways disenfranchises the consumer-citizen of the modern "consumers' republic" (Cohen, 2003). You can only make an almost invisible choice "against" by drinking tap water; the only way to announce publicly that you abhor bottled water is to carry a refillable plastic bottle around, and even this can be ambiguous and impractical. The vote "for" bottled water in contrast is conspicuously all around us in the daily litter of empty bottles and cans and in the hands of people walking on the street. . . .

More active voices against bottled water can easily be elicited. I surveyed my "Global Consumer Culture" class in the fall of 2005, most of whom were 18 and 19 years old, and asked them, "Do you ever buy bottled water?" and if they said no, I asked them to explain why. About 34 percent of the class never bought bottled water, and the reasons ranged from outrage at the price ("it's a rip-off") and preference for other beverages to environmental critiques of the use of plastic and objections to profit-making by large corporations ("why should I give more money to Coca-Cola?").

Resentment and suspicion is also expressed on many websites and blogs, where hate and ridicule is aimed at bottled water and the unthinking or deluded people who drink it.[1] The whole idea of paying for water is offensive to many people on political, ecological, and economic grounds, providing a rich field for dark humor and satire, well displayed in places such as the "dehydrated water" website or the one which advertises water from the planet Mars.[2]

This emotional response towards water as a commodity helps explain the satisfied tone of many of the reports and comments on Coca-Cola's unsuccessful launch of Dasani brand of water in the UK in March of 2004. The water was recalled because of a high level of bromate, a chemical that would probably do little harm to drinkers, but the real focus of most news stories was the "discovery" that Dasani water was no more than filtered London tap water (hardly a secret since it is the general industry practice). It was clear that the press and their audience enjoyed the unmasking of a large corporation, suggestive of corporate corruption and public delusion, confirming the feelings of mistrust, of being exploited and manipulated, that are so common in consumer culture. . . .

Safety and Risk

It is clear that anxieties about bottled water are related to a whole family of consumer emotions and movements in capitalism. We should not forget that capitalism has met with principled moral resistance in many times and places, including Luddites smashing factory machines in 1811, colonial Vietnamese peasants driving merchants and moneylenders from their villages (Scott, 1976), and the Salvation Army marketing "ethical" matches that did not cause phosphorus poisoning to workers in 1891 (Emsley, 2000). These were protests over the decay of a "moral" economy of public goods, grazing the commons, and customary obligation, in the face of the conversion of common land into private property. The idea that bottled water may represent a form of resistance to the relentless commodification of the world pursued by capitalist industry poses an alternative to Beck's well-known concept of the "risk society" (1992). If we follow Beck's logic, consuming bottled water is an attempt to deal with a generalized fear of the "uncontrollable human-generated hazards" that characterize late modernity. Tap water, then, represents the human interference with nature that poses "new and extreme hazards to life." The bottle is a reassurance that one small piece of nature has been protected from the hovering danger of chemicals and microorganisms. . . .

The whole complex issue of the role of the state in modern capitalism is contained in every bottle of water. On one side, utilities make a moral and political argument about the common good, and on the other, bottlers tell people to look out for their own interests, because governments are not doing a very good job of it. The problem with water is that the only option to trusting government is trusting a profit-making corporation. With a sandwich or a motorcar, the buyer has some hope of gauging quality on his or her own, but with water, danger can be completely invisible. What is truly surprising is the extent to which, even in countries such as the UK, where people still believe their government *should* be responsible for social welfare (unlike the USA, where a majority seem to think government only interferes with the benefits provided by free markets), people are willing to trust the bottle and the label to maintain the purity of nature, the private agent, more than the state agencies or relatively faceless private water companies. With pervasive privatization, people do not know really who is responsible anymore for safety. . . .

More than being a symptom of a pervasive "risk society," water from taps and bottles raises issues of trust and distrust, of balancing contradictory messages from different parties, and of being caught in the middle between powerful forces with their own agendas and interests. The question for many people is not so much which message to trust but which one they *distrust the least*, which is a very different kind of judgment, with no wholly satisfactory outcome.

NOTES

1. Almost any web search for information on bottled water will turn up sites that critique bottled water from a number of directions. Just enter "bottled water stupid" into a Google search and see what comes up.
2. For dehydrated water go to http://www.buydehydratedwater.com/, and Mars water is at http://www.iamlost.com/features/mars/.

REFERENCES

Beck, Ulrich (1992) *Risk Society: Towards a New Modernity*. London: Sage.

Cohen, Lizabeth (2003) *A Consumers' Republic: The Politics of Mass Consumption in Postwar America*. New York: Knopf.

Descola, Philippe, and Pálsson, Gísli (eds.) (1996) *Nature and Society: Anthropological Perspectives*. London: Routledge.

Douglas, Mary (1966) *Purity and Danger: An Analysis of the Concept of Pollution and Taboo*. London: Routledge and Kegan Paul.

Dunlap, Thomas R. (2004) *Faith in Nature: Environmentalism as Religious Quest*. Seattle: University of Washington Press.

Emsley, John (2000) *The Shocking History of Phosphorus: A Biography of the Devil's Element*. London: Macmillan.

Hamlin, Christopher (2000) "'Waters' or 'Water'? Master Narratives in Water History and Their Implications for Contemporary Water Policy," *Water Policy* 2:313–25.

Helms, Mary (1988) *Ulysses' Sail: An Ethnographic Odyssey of Power, Knowledge, and Geographical Distance*. Princeton, NJ: Princeton University Press.

Löfgren, Orvar (1999) *On Holiday: A History of Vacationing*. Berkeley: University of California Press.

Scott, James (1976) *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia*. New Haven, CT: Yale University Press.

Strang, Veronica (2004) *The Meaning of Water*. Oxford, UK: Berg.

Taussig, Michael (1987) *Shamanism, Colonialism, and the Wild Man: A Study in Terror and Healing*. Chicago: Chicago University Press.

Wilk, Richard R., and Wilhite, Harold (1984) "Household Energy Decision Making in Santa Cruz County, California," in B. Morrison and W. Kempton (eds.), *Families and Energy: Coping with Uncertainty*, pp. 449–59. East Lansing: Michigan State University, College of Human Ecology.

21

Indigenous Initiatives and Petroleum Politics in the Ecuadorian Amazon*

SUZANA SAWYER

We don't want "la compañía" to dirty our rivers, destroy our forests and divide our people. We oppose the so-called petroleum "development" that has poisoned communities to the north and demand recognition as indigenous nationalities, as a people whose ancestral territory is one.
—Marta Gualinga, Quichua female leader speaking at the Villano Assembly, December 16, 1993

Along with 250 other lowland Indians, Marta Gualinga trekked through the rainforest for three days before reaching Villano—the site of ARCO's exploratory wells. Lowland Quichua representing 133 indigenous communities throughout Ecuador's central Amazonian province of Pastaza gathered for an assembly called by OPIP (Organization of Indigenous Peoples of Pastaza). For three days in mid-December 1993 participants debated oil exploration and imminent production in Indian lands. Young men with starkly painted torsos and faces angrily denounced ARCO; more experienced leaders cautiously measured alternatives. Petroleum "development" had indelibly transformed the northern Ecuadorian Amazon, where scant industrial restrictions over the past 25 years caused significant social and environmental degradation. As hydrocarbon operations moved south, OPIP-affiliated communities weighed how best to prevent similar effects in their lands.

The Villano Assembly launched OPIP's "Campaña Tungui"—invoking the drum rhythm which called allied groups to war centuries ago. The campaign outlined the conditions under which ARCO might proceed with its activities in Indian lands and declared a 15-year moratorium on further petroleum activity in the province. OPIP pressed for indigenous participation in environmental and social planning and monitoring, as well as the economic benefits of ARCO oil operations. Héctor Villamil, OPIP's president, rallied under the corrugated tin roof of a one-room school, "This assembly affirms our democratic zeal, for participation is precisely what we demand. We denounce current petroleum politics and insist that ARCO respect the territories of the indigenous

* From *Cultural Survival Quarterly* (Spring 1996): 26–30. Used by permission of New York University Press.

peoples of Pastaza." A helicopter transporting drilling mud to ARCO's well flew overhead.

In a pattern repeated wherever oil operates in Ecuador, the local community was divided. A handful of families loyal to OPIP invited Assembly participants to Villano. Yet a larger group materially supported by ARCO vehemently criticized the assembly and threatened participants. Indigenous opposition introduced risk to continued hydrocarbon activity. Tensions rose as OPIP leaders obstinately asserted their rights to convene in the area and overly zealous young men boasted of occupying ARCO wells, now militarized with 70 counterinsurgency troops. Villano encapsulated the political-economic reality animating petroleum development throughout the Oriente: state dependency on oil, unmitigated military protection, multinational carte blanche, and local factionalism. Despite the power of corporate economic interests and indigenous peoples' circumscribed structural position, however, the Villano Assembly spurred into motion a process which ultimately conditioned—for the first time in Ecuador's 70-year history of oil exploration—serious dialogue between indigenous peoples and a multinational over petroleum activity in Indian lands. OPIP leadership and community members began to rearticulate the relations between multinationals and local communities and influence the particular pattern of resource extraction in their territory.

The Crude Challenge

In 1967, Ecuador launched itself into the industrial world with Texaco's discovery of a sizable oil reserve in the northern Oriente (as the Ecuadorian Amazon is called). Rainforest lands, previously seen as "empty," "barren," and awaiting colonization, became the source of Ecuador's black gold and the key to national modernization. In 1973, under the newly established military regime, Ecuador joined OPEC, and petroleum became a national security concern. With the influx of new petro-dollars and swollen aspirations to develop the country, the small Andean state became woefully dependent on petroleum. Today, oil revenues account for 50% of the national budget. All major petroleum reserves reside in the Oriente; transformations have been most acute in the northern lowland provinces of Napo and Sucumbios. There the exploitation of large oil fields has inscribed rainforest landscapes with seismic grids, over 300 productive wells, more than 600 open waste pits, numerous pumping stations, an oil refinery, and the bare-bones infrastructure essential for petroleum operations. A network of roads links oil towns and parallels the pipeline for 500 km across the Andes to the Pacific. For the most part, oil companies have bought off local communities to facilitate the smooth flowing of their operations.

The negative repercussions of petroleum exploration and extraction are slowly becoming documented. In a comprehensive study of Texaco's 25 years

of operation, Judith Kimerling calculates that since production began in 1972, Ecuador's trans-Andean pipeline has spilled an estimated 16.8 million gallons of crude—one and a half times that spilled by the Exxon *Valdez*. Likewise, petroleum operations discharge 4.3 million gallons of toxic waste daily. Recent studies document an increase in skin and intestinal disease, headaches, and fevers among local inhabitants and contaminants in drinking water which reached levels 1,000 times the safety standards recommended by the U.S. EPA. Despite public protest by Indians, colonists, and environmental activists, President Sixto Durán Ballén initiated a formidable campaign to expand production. In 1992, Ecuador withdrew from OPEC in order to produce in excess of the cartel's quotas. All signs indicate that hydrocarbon activity will only intensify.

Consolidating the Commons

Pastaza Province stretches from the central Andes eastward to the Peruvian border, covering 30,000 sq. km. Along the western-most portion, a 30 km-wide plateau flanks the foothills. Here, 30 years of colonization has transformed once forested indigenous land into a patchwork of pasture and agriculture. A network of roads connects smaller hamlets and colonist parcels to the provincial capital, Puyo. Down the escarpment bordering the plateau's eastern rim, indigenous-claimed territory begins—two million hectares of dense, yet managed, rainforest. The terrain is rugged, cut through with numerous river basins by the more than four meters of annual rainfall. Except for one 8 km dirt road completed in 1993, there are no vehicular routes into the region. The indigenous populations living in the area inhabit dispersed settlements, the larger built around missions, schools, and health dispensaries. Agriculture is largely subsistence with increasing production and harvest for market. This scenario markedly differs from the social and political-economic reality of the provinces directly to the north.

OPIP officially formed in 1978 as state pressure to colonize and develop Pastaza led to greater indigenous displacement. The Indian federation denounced state modernization strategies as destructive of cultural and ecological systems. Gaining communal title to Indian territory was the first step in asserting control over the processes negatively affecting indigenous livelihoods. Through the 1980s, OPIP actions halted colonization at the plateau and curtailed further incursions onto indigenous lands. It was not until 1992, however, when 2,000 Pastaza Indians marched to Quito demanding communal land rights, that indigenous peoples acquired legal title to over one million hectares of their territory. "The March" gained unprecedented popular support throughout Ecuador and signaled a sophisticated indigenous politics of resource use and territorial control. Significantly, it further crystallized the formation of an ethnic-national identity in the region, where livelihood forest management practices inform visions of resource use and social justice in the rainforest.

Yet, while land title precluded the further colonization of Indian lands, it provided no legal control over petroleum activities within them. Indians gained surface rights. Subterranean resources, of which petroleum is the most coveted, belong to the state, which retains the right to develop them as it deems necessary. In 1988, ARCO acquired rights to explore an oil concession located in eventually adjudicated Quichua territory in Pastaza. In 1989, Quichua actions paralyzed ARCO exploration for one year. OPIP communities opposed to hydrocarbon activity charged that dynamite detonated during seismic exploration destroyed agriculture, scared away animals, and killed fish. Operations resumed in 1990, however, allowing ARCO to identify pro-oil communities in the interim. In 1992, the company publicly announced its discovery of the province's first productive oil field. As it became increasingly evident that OPIP could not stop oil operations in Pastaza, the federation focused on how best to influence its development.

From OPIP's perspective, all attempts to negotiate with ARCO had decisively failed, despite moments of promise. ARCO refused to recognize OPIP as the legitimate representative body of indigenous inhabitants of the region. Instead, the multinational recognized and materially supported the pro-oil indigenous group that claimed to represent the three communities near the Villano wells. OPIP leaders interpreted ARCO's choice to legitimate a local "organization" newly formed in the summer of 1993 as an affront to their integrity and 15-year struggle to consolidate an indigenous politic. ARCO argued that the company felt compelled to support the communities closest to and most directly impacted by their operations. Yet multinational representatives dismissed the fact that their presence spurred the emergence and continued existence of an anti-OPIP entity; corporate operations both facilitated and profited from dividing indigenous loyalties.

Beyond launching the Campaña Tungui, the Villano Assembly sought to demonstrate through practice how indigenous people envision their territory. Importantly, Indians spoke of *territorio* ("territory") or *tierras* ("lands"—in plural). This terminology reflects an understanding of landscape and property distinct from that of the state, where *tierra* ("land") refers to a commoditized, individualized, alienable object. *Territorio* ("territory"), by contrast, refers to ancestral space, the site of historically belonging within a lived landscape. More than simply connoting the physical contours of a region, *territorio* encompasses moral-cosmological and political-economic complexes which shape social relations with it. Forest management and resource use regimes reciprocally sustain these relations. Indigenous territory "belongs" to no one individual, as with free hold, who independently controls it. Rather, territory belongs to everyone; decision over processes affecting multiple inhabitants would have to be debated by all. Consequently, Indians espousing OPIP politics had just as much right to determine what was to occur in their lands as individuals who supported

ARCO's presence in Villano. "The people near the oil wells do not own this land," explained Leonardo Viteri, the director of Amazanga (OPIP's research institute), during debate at Villano. "Nor does petroleum simply affect one community. ARCO's [concession] is 200,000 hectares; we all manage this land and will all be affected by oil." While concerns of those living near oil wells might take special consideration, proximity in and of itself granted no special rights. According to OPIP, a group of pro-production individuals lacked the authority to decide the future of petroleum activity in Indian lands. OPIP-affiliated communities gather in Villano to demonstrate that point.

Cultivating Coalitions

Yet dialogue between a multinational oil company and an Indian federation grew out of a broader trajectory of strategic coalition building between indigenous and environmental groups. In 1990, Acción Ecológica (Ecuador's most consistently programmatic environmental group) launched its "Amazon for Life" campaign, a watchdog effort to denounce, document, and redress the environmentally and socially degrading effects of oil development in the northern Oriente. Over the following years, Acción Ecológica and indigenous groups coordinated specific target actions with key support from U.S. and European environmental and human rights groups (especially Oxfam America and the Rainforest Action Network). Through an elaborate transnational network, Indian federations and Acción Ecológica heightened national and international scrutiny of multinationals' operations in Ecuador. Momentum snowballed in November 1993, when indigenous and nonindigenous inhabitants of the northern Oriente filed a $1.5 billion class-action lawsuit against Texaco in U.S. federal courts. Plaintiffs charged that the company's deliberate use of substandard technology to maximize profit in Ecuador over 25 years resulted in the massive contamination of the northern Oriente. Given the money involved and the press received, the suit and popular actions have alerted foreign companies that ignoring indigenous and ecological concerns has consequences.

One month after the Villano Assembly, OPIP members in coordination with CONAIE (Confederation of Indigenous Nationalities of Ecuador), CONFENIAE (Confederation of Indigenous Nationalities of the Ecuadorian Amazon), and Acción Ecológica occupied the Quito offices of the Minister of Energy and Mines. Their action fell on January 24, 1994, the day the Ecuadorian government opened bidding for nine new oil concessions in the Oriente; four of the nine were located in Pastaza. Fifteen individuals positioned themselves inside the ministerial quarters, refusing passage until the minister agreed to discuss their concerns. Outside, approximately 150 protesters formed a human chain, impeding all traffic in and out of the building. In the city park across the way,

demonstrators pitched tents and strung protest banners, symbolizing their resoluteness. As Luis Macas, the president of CONAIE, asserted, the occupation was in protest of the state's "incoherent petroleum policy," which "is contemptuous of indigenous peoples and provokes social, cultural, and environmental conflicts." Protesters' politics were encapsulated in the broad green letters of a banner suspended between trees: "The Defense of Nature and Social Justice Are Inseparable."

After a five-hour standoff, the minister met with protesters. Despite threats, the police were never called; keen on attracting foreign investors, the government did not wish to call attention to popular protest. Among the five demands presented to the minister was the need for transparent and direct negotiations between ARCO and OPIP. The following morning, the minister personally oversaw a meeting between ARCO and OPIP, clarifying the multinational's responsibility to engage in dialogue with the federation. While short of a ministerial mandate, this meeting led haltingly to the eventual formation of a fragile, tripartite commission in September 1994 to design and monitor petroleum development in the Pastaza. Significantly, the commission includes representatives of an indigenous front of OPIP and anti-OPIP/pro-production groups, ARCO, and the state petroleum company. Important changes from the prior pattern of oil exploitation discussed include no road construction into indigenous territory; directional drilling allowing for multiple wells to radiate off one perforation; and containment of industrial chemicals, muds, and solvents. Final outcomes of dialogues to mitigate negative social and cultural consequences of oil work are still pending.

Dialogue is still in its early stages. To date, ARCO and the state have not finalized details for the construction of a pipeline carrying crude to Pacific ports. Until that point, the company reasons it is unable to make future commitment with indigenous groups. ARCO has agreed, however, to finance an environmental impact study of the exploratory phase of their work. While a standard procedure in the U.S., an environmental impact study of their operations to date is not legally required under Ecuadorian law. This step is significant, theoretically, as an evaluation of the social impact of ARCO operations must accompany analysis of environmental effects. Yet more significantly, OPIP succeeded in insisting that their communal lands be treated as indivisible territory; all Indians, not simply a small group near ARCO wells, must debate oil operations. Dialogue represents the recognition of the commons—the fact that local resource use and access regimes differently structure decision-making processes over activity within a landscape. While an incomplete and unpredictable process, OPIP's struggle against environmental injustice and for participatory engagement is slowly controlling the processes affecting indigenous livelihood and territory, setting precedence in Ecuador and for the Amazon region.

Further Reading

Acción Ecológica. 1993. *Investigación sobre cuatro estudios de caso de poblaciones afectadas por TEXACO*. Quito, Ecuador: Acción Ecológica.

Center for Economic and Social Rights. 1994. *Rights Violations in the Ecuadorian Amazon: The Human Consequences of Oil Development*. New York: Center for Economic and Social Rights.

Kimerling, Judith. 1991a. *Amazon Crude*. Natural Resources Defense Council.

———. 1991b. Disregarding Environmental Law: Petroleum Development in Protected Natural Areas and Indigenous Homelands in the Ecuadorian Amazon. *Hastings International & Comparative Law Review* 14 (849).

———. 1993. *Crudo Amazonico*. Quito, Ecuador: Abya Yala.

Jochnick, Chris. 1995. Amazon Oil Offensive. *Multinational Monitor* 16 (1–2), Jan.–Feb.

Sawyer, Suzana. Forthcoming. Marching to Nation across Ethnic Terrain: The 1992 Indigenous Lowland Mobilization in Ecuador. *Latin American Perspectives.*

Switkes, Glen. 1994. Ecuador: The People vs. Texaco. *NACLA* 28 (Sept.–Oct.): 6–10.

22

Land Tenure and REDD+*

The Good, the Bad, and the Ugly

ANNE M. LARSON, MARIA BROCKHAUS, WILLIAM D. SUNDERLIN, AMY DUCHELLE, ANDREA BABON, THERESE DOKKEN, THU THUY PHAM, I. A. P. RESOSUDARMO, GALIA SELAYA, ABDON AWONO, AND THU-BA HUYNH

REDD is a performance-based mechanism whereby funds will be used to compensate developing countries for the reduction of forest carbon emissions as compared to a national baseline; the "plus" refers to the inclusion of carbon stock enhancement. It is likely to involve both funds and compliance markets. . . .

At the same time, forest tenure issues have been increasingly recognized as important:

- The essence of REDD+ is to reward those who maintain or enhance the carbon sequestration of forests and compensate them for lost opportunities; this includes direct payment schemes, which require not only clear rights to land but also the ability to demonstrate exclusion rights, which includes the right and means to prevent third parties from changing land cover.
- The right holders to forest carbon must be held accountable in the event that they fail to fulfill their obligation—the "conditional" part of conditional incentives.
- When tenure is unclear or not formalized, forest people may be excluded from forests and/or from participation in REDD+ benefits; also, if REDD+ increases the value of standing forests, it may lead to a resource rush that places the rights of current residents at risk.
- REDD+ will inevitably prohibit certain uses of forest resources; this must be done with due process and compensation, and without increased hardship, for poor forest peoples (Sunderlin et al., 2014).

If tenure clarity and security are broadly recognized as an important requirement for REDD+, significant attention should be given to resolving tenure conflict and clarifying tenure rights in preparation strategies. In practice, however,

* Reprinted from *Global Environmental Change* 23, no. 3, pp. 678–689, copyright © 2013, with permission of Elsevier.

research suggests that progress has been slow. With regard to equity concerns, the question of resolution also raises the issue as to who will benefit from "clarification" or reform policies.

This article assesses the experience with REDD+ strategies at national and project levels so far to understand the opportunities and risks regarding land tenure. It discusses the primary tenure problems being faced in each country and how these are being recognized and addressed both at the national level and at the project level. The findings suggest that in most cases REDD+ has clearly provided some new opportunities for securing local tenure rights but that piecemeal interventions by project proponents at the local level are insufficient in the absence of broader, national programs for land tenure reform. The potential for substantial changes in the status quo appear unlikely, though Brazil—the only one with such a national land tenure reform program—offers useful insights. Also, REDD+ may have put the issue of rights for indigenous and local people on the international and national agendas as never before.

The research findings presented here are drawn from the Center for International Forestry Research (CIFOR) Global Comparative Study (GCS) on REDD+, drawing on data collected from 2009 to early 2012. The project has studied national-level processes in 12 countries and 23 project interventions in six. This article focuses on the six countries studied at both national- and project-level scales. Those are Brazil, Cameroon, Indonesia, Tanzania, and Viet Nam; national-scale data is available for Peru, but project-level information is only preliminary. . . .

"'No Rights No REDD": Taking Stock

The "No rights no REDD" movement has arisen primarily in response to the failure of climate negotiations to guarantee a binding commitment to indigenous rights and safeguards for indigenous and other forest people.

Declarations from movement advocates since the December 2012 COP in Durban, South Africa, refer to potential for REDD+ "to result in 'the biggest land grab of all time,' . . . threatening the very survival of indigenous peoples and local communities," and vulnerability to "carbon cowboys, without adequate and binding mechanisms to ensure that the rights of indigenous peoples and local forested and agricultural communities are respected" . . . At the heart of these concerns is the insecurity of forest land tenure rights and the failure to assure free prior and informed consent in all matters affecting indigenous lands; the legal foundation for these rights demands is the UN Declaration on the Rights of Indigenous Peoples and International Labour Organization Convention 169 (Tauli-Corpuz et al., 2009). . . .

The forms and extent of rights recognition has been very varied, in some cases involving the titling of, or formal granting of secure long-term rights to, large

indigenous territories; in others, the "transition" has consisted of land grants to small community forests, while in the most timid reforms communities have received new, temporary use rights that are an improvement over the past but are far from constituting substantial reform (Larson, Barry, et al., 2010). Some countries that have made significant strides in recognizing community forest rights have tried to roll back these policies more recently (RRI, 2011).

In addition, policies of "rights recognition" and formalization have been used historically at least as often to usurp lands as to secure them for local people, or to secure them for powerful elites; these policies continue today (Peluso and Lund, 2011), including in the name of conservation. Conservationists have had a complex relationship with local people, sometimes helping secure rights but probably more often seeking to exclude (Agrawal and Redford, 2009; Roe, 2008). This history has important implications for REDD+. In a recent REDD-related study, Beymer-Farris and Bassett (2012) argue that who gets rights depends on how "the problem" is framed. . . .

REDD+ may present risks for local tenure rights, but it can also be an opportunity to support tenure reform. For example, REDD+ funds could be used to secure the borders of indigenous territories, where the primary driver of deforestation and forest degradation is illegal land invasions (Larson, Corbera, et al., 2010). Several high-level actors on the REDD+ stage have begun to argue that tenure security for local communities is a requirement for REDD+. The United Kingdom's climate change minister stated, "Securing fair land tenure must be the foundation of REDD"; his reasons referred not only to ethics but also to business, suggesting a stronger constituency in support of reform (Barker, 2011). In an unprecedented move and in a very strong probusiness context, the chair of Indonesia's REDD task force stated, "Finding the appropriate land tenure arrangement is a prerequisite for sustainable development and livelihood" and strongly recommended recognizing customary rights in forests (Mangkusubroto, 2011).

Methods

GCS-REDD is a four-year research project (2009–2013) that aims to provide policy and technical guidance to REDD+ stakeholders. The research reported in this paper presents a combination of results from Component 1, which addresses national-level stakeholders, policies, and processes, and Component 2, which focuses on subnational REDD+ project sites. The results are not meant to be representative of all REDD+ sites, as the choice of both countries and projects was not random. Rather, the emphasis was on early-mover REDD+ countries and projects that were recently initiated (see criteria below), in order to extract lessons for those starting later. Most importantly, the countries and sites do not—nor were intended to—represent the vast variation in land tenure situations across the globe. Nevertheless, the sites represent key REDD+ countries and an

important cross-section of the kinds of projects being undertaken, and hence also the kind of tenure regimes found at many project sites.

Initially six study countries were selected on the basis of the following criteria: large tropical forest countries where REDD+ is being pioneered and that have many project sites (Brazil, Indonesia); diversity of stages on the forest transition curve (e.g., high deforestation in Indonesia and forestry recovery in Viet Nam); convenience of a CIFOR office in the country (Bolivia, Brazil, Cameroon, Indonesia, Viet Nam); and strong donor interest (Brazil, Indonesia, Tanzania). When the government of Bolivia ceased being involved in REDD+, Peru was added as a research country, which by 2011 was the country with the third-highest concentration of subnational REDD+ pilot projects (19) in the world, after Indonesia (44) and Brazil (36) (Lin et al., 2012). The two project components share this set of six countries (Brazil, Peru, Cameroon, Tanzania, Indonesia, and Viet Nam), though Component 1 includes another six; of the latter, only some aspects of the Papua New Guinea case have been included here to enrich the analysis.

In analyzing national REDD+ policy . . . , researchers developed five areas of inquiry. These include a country profile, media analysis, policy network analysis, policy content analysis, and a policy study with a focus on political economy questions. The national-level analysis reported here involved results from country profiles, media analysis, and policy network analysis. . . .

The Component 2 research aims to provide robust empirical evidence of the performance of REDD+ through a counterfactual approach called BACI (before-after/control-intervention) (Jagger et al., 2010). This method permits the comparison of intervention (REDD+) and control (non-REDD+) villages both before and after the introduction of REDD+ conditional incentives. The field research includes 22 project sites and over 170 control and intervention villages and 3,500 household surveys. This article reports on interviews with 19 proponents and early process outcomes in 71 intervention villages.

Four villages were selected at each project site (with two exceptions: one project only had two villages, and in another, five were selected). These villages were selected from a sample frame of up to 15 intervention villages. The research was conducted through formal survey interviews with the technical staff of proponent organizations and with village respondents. Two survey forms were used with proponents: a proponent appraisal compiling general information about the project intervention strategies and containing several general questions on tenure; and a survey on participation and tenure going into depth on these issues. At least one technician per project was interviewed in these two surveys. The village interviews were conducted by first gathering secondary data from people judged knowledgeable about the village and then holding a focus group meeting with 10–15 villagers (see Sunderlin et al., 2010, for a detailed explanation of the methods).

TABLE 22.1. Forest Tenure Distribution

Country	Public (millions of has, %)		Private[a] (millions of has, %)	
	Administered by government	Designated for use by communities and indigenous people	Owned by communities and indigenous people	Owned by individuals and firms
Brazil[b]	88.6 (21%)	25.6 (6%)	109.1 (26%)	198.0 (47%)
Peru	42.3 (67%)	2.9 (5%)	12.6 (20%)	5.3 (8%)
Cameroon	20.1 (95%)	1.1 (5%)	0 (0%)	0 (0%)
Tanzania	31.8 (89%)	1.6 (4%)	2.1 (6%)	0.1 (0%)
Indonesia	121.9 (98%)	0.2 (0%)	0 (0%)	1.7 (1%)
Viet Nam	9.7 (73%)	0 (0%)	3.5 (26%)	0.1 (0%)

Source: Sunderlin et al. (2008), except for Viet Nam (Dahal et al., 2011).
[a] "Ownership" according to the Rights and Resources Initiative and in this research includes titled lands and those granted unconditionally through long-term, secure mechanisms other than titles (see Sunderlin et al., 2008).
[b] Other sources have found that 24% of the Amazon is unclassified public land, and 13% is comprised by land settlement projects for individual landholders (Börner et al., 2010).

Evidence from the Field

In five of the six countries studied, forests are primarily public and formally administered by the state (table 22.1). The exception is Brazil, where 73% of forests were owned by individuals, firms, communities, and indigenous people in 2008; official data show a shift of almost 200 million from public to private hands from 2002 to 2008 (Sunderlin et al., 2008). The other countries have far less private land. In five of six countries, a portion of public land has been assigned for temporary use by communities and indigenous people, as well as by individuals in Brazil.

National-Level Problems and Policy

Research at the national level identified serious problems with land tenure in all of the countries studied (table 22.2). The results presented here draw on the country profiles, media discourse analysis, and policy network analysis, described above. Common issues include overlapping titles or claims, land grabbing and elite capture, outdated or nonexistent land cadastres, among others. In particular, in Indonesia, Viet Nam, Cameroon, Tanzania, and to some degree in Peru, there is a substantial gap between formal and customary rights. . . .

Governance and tenure issues in particular are largely absent from REDD+ discourse as identified in national media in most of the researched countries (Di Gregorio et al., 2013). An analysis of more than 500 national newspaper articles on REDD+ published between 2005 and 2009 in five of the six countries

TABLE 22.2. Primary Tenure Problems and Policy and Project Initiatives

Country	National tenure problems	National policies	Project-level problems	Project-level initiatives
Brazil	Unclear tenure rights, overlapping rights, extensive areas claimed by squatters (24% of Brazilian Amazon as unclassified public land) Pressures on indigenous areas in spite of clear borders and rights (though in a minority of cases) Major inconsistencies in interpretation of the law, failure to implement regulations Lack of sufficient funding and staff for land regularization; very slow progress	National Institute for Colonization and Agrarian Reform (INCRA) has undertaken three major revisions of the land cadaster, in 1999, 2001, and 2004 Formal process of indigenous lands recognition Terra Legal program (2009) linking Amazon regularization to environmental compliance	Difficulty of conducting regularization (large areas, revision of past claims) Land concentration Titles and land use plans required for environmental regulation Customary limits not always respected in regularization Ongoing insecurity and conflict due to histories of land conflict Removal of colonists from indigenous area	Technical, financial, and other support for titling Support for land use planning Project land tenure regularization activities in line with national policies and in collaboration with federal and state institutions
Indonesia	Contradictory laws regarding land and forest rights, failure to recognize community customary rights in forests Limits on customary use rights in favor of business use of forests Absence of rules and procedures for registering community forests Inaccurate maps Conflicting claims, boundary disputes, and forest encroachment	Chair of REDD panel has proposed releasing village and customary land from state forests Proposed project to unify all national land/forest maps	Potential conflicts with palm oil interests Potential conflicts with logging concession holders Failure to recognize community customary claims Unclear tenure	Negotiation with government at all levels Variety of mechanisms to provide village communities with clear tenure Negotiation with concession holders Land use planning
Viet Nam	Gap between national and customary laws; customary tenure not recognized Overlaps between indigenous and colonist land claims Lack of human and financial resources for forest land allocation (FLA) Technological problems leading to inaccurate maps Inequity in forest allocation; land grabbing Limited understanding by forest users of rights and responsibilities associated with FLA	Forest Land Allocation (FLA) process (since 1983) to allocate land users up to 30 ha of forest land in production and protection forests for up to 50 years Land Law (2003) Upcoming National Forest Inventory	Conflicting community versus household forest management Notable discrepancy between local people's perceptions / customary rights and the government's perceptions Unclear land boundaries Ambiguous land rights and lack of understanding of the meaning of Red Book titles Breakdown of traditional living styles influencing land tenure arrangements	Establishment of a technical working group on land issue at provincial and district levels Local fund on participatory forest management will discuss how to distribute payment Exploring mechanisms to test how to integrate tenure and carbon Contributions to land use planning at commune and district levels

Cameroon	Conflict between customary and formal law; formal law limits local rights to use rights Community forestry represents an attempt to make a formal link between communities and forests without recognizing customary claims Only the elite have the means to register land, which is the only formally recognized ownership right Zoning has resulted in constant conflict among stakeholders State authorizes overlapping rights and obligations among sectors (forest, tenure, mining, water, etc.)	Forest policy reform process begun in 1993, including the creation of community forests Forest law reform process under way Consultations with stakeholders on land use including boundary definition Shift from ad hoc programs to possible national policy on marginalized populations	No guarantee of carbon rights on customary land Mismatch between statutory community forest and customary rights leading to conflict Bantu traditional claims and incursions Tenuous nature of community forest rights Border conflicts with national park Conflicts between indigenous and migrant populations	Helping community develop community forest management plan and strengthen local institutions Implement a tenure strategy with stakeholders consistent with national policy Support attempts to improve community rights to forests (revision of the forest law)
Tanzania	Some government bodies interpret formal land categories in such a way that the state owns much of village land (e.g., Forestry & Beekeeping Division) Conflicts between farmers and pastoralists Conflicts over evictions of pastoralists for environmental purposes Contested and overlapping tenure regimes and risk of elite capture	Village Land Act (1999) recognizing customary tenure whether or not land is registered Draft National REDD Strategy classifying village land as state land ("general land") if not registered	Carbon rights not addressed at national level Land within village boundaries classified as general land; lack of land certificates Boundary disputes among villages Unclear or insecure individual rights Short or unclear time frame for management rights	Border clarification In process of obtaining village land certificates Establish clear and longer-term time frame for CFM contracts (Little attention to individual claims)
Peru	Native peoples have alienable land rights rather than broader inalienable territory rights Overlapping titles and lack of land cadaster Statute authorizes overlapping rights and obligations among sectors (forest, tenure, mining, water, etc.) Reserves and other forest categories declared on paper but without defined borders	New law of Forests and Wildlife approved and awaiting implementing regulations Law establishes that rights to ecosystem services belong to the title holder, transferable to concession holder, and subject to government tax	[preliminary data] No legal way to obtain rights in protected area Little to no exclusion rights Possession contract is temporary and easily reversible Overlapping concessions by different government offices	[preliminary data] Demarcate and register concession areas

Note: For sources, see the original publication.

(Perla Alvarez et al., 2012; Kengoum, 2011; May et al., 2011a; Pham, 2011; Cronin and Santoso, 2010; data on Tanzania is not yet available) demonstrates that governance issues did not feature prominently in the way media articles were "framed" in any of the countries. . . . A closer look at subtopics related specifically to tenure reform and carbon rights under the meta topic "Politics and policy making" confirmed their absence. Only in Indonesia and Brazil were media articles explicitly framed around these issues. . . .

Nevertheless, by examining individual position statements of advocates or adversaries who responded to the issues framed in these articles, we identified a number of stances related to governance. In Indonesia, Brazil, and Peru, actors stated that REDD+ will require major governance and institutional reform. In Indonesia, more than 10% of all positions expressed (27 of 258) demonstrated concern that REDD+ risks dispossessing or reducing access to forest resources and harming traditional forest users. These findings indicate that although articles are rarely framed around these concerns, a number of actors position themselves around them. These actors are mainly from international environmental nongovernmental organizations and domestic civil society organizations.

Project-Level Tenure

The GCS research assessed tenure problems at the project scale through interviews with proponents and at the village level through focus group interviews with villagers, as well as observation. Proponents identified the main tenure challenges at their sites and their plans for addressing them in a proponent appraisal survey and a follow-up survey on participation and tenure. Villagers in focus groups were asked about land tenure conflict and insecurity, degree of rule compliance, exclusion rights, and the presence of external forest users, regarding the land their village uses specifically.

Most of the land at REDD+ project sites in this study is formally owned by the state. In Indonesia, Cameroon, and Peru, the vast majority of land in the villages studied is officially owned and administered by the government. In Brazil, in research villages, this state land has primarily been assigned to individuals or is unclassified public land; in Viet Nam, public land has been allocated to individuals through long-term certificates. In Tanzania, most of the REDD+ sites are located in areas assigned to or owned by villages or in process toward village assignment or ownership. Each country will be considered in turn.

In Indonesia (five projects), projects are taking place on lands that are formally owned by the state, but much of the land in the research villages is under customary claims. . . . In the study villages, a small portion of land (4%) is held by households with land certificates, and very recently three villages obtained *hutan desa* management rights—a legal designation permitting village management of state forests; but the vast majority of village land consists of de jure state forests

under the de facto use of households and villages. Problems stem from overlapping claims on these lands, including inactive logging concessions (which may be revived in order to contest carbon rights), small-scale loggers, and larger oil palm, mining, and logging interests. . . .

In Brazil (four projects), most lands in the GCS REDD+ project sites are state owned, and almost all of the lands in our study villages have been assigned to individuals residing in land reform settlement projects or occupying unclassified public lands. This type of tenure represents a small portion of Brazil's forest land but is an important choice for REDD+ projects due to often high deforestation rates in these areas. Two of the project sites are in areas with a history of serious land and resource conflicts, but settlement and tenure regularization actions have been under way for several years to resolve these problems. A third site has been essentially a "no man's land" in terms of formal land tenure, until very recently, when REDD+ has provided an incentive for regularization as a readiness activity. . . .

Tanzania REDD+ projects (six projects) are being developed in areas where an important portion of the land has been assigned to or is owned by communities. This is in line with the national REDD+ strategy, which identifies REDD+ funds as a way to increase the area under participatory forest management programs. Hence, although some 89% of Tanzania's forests are owned and managed by the government, REDD pilot projects are taking place in the 6% share that is, or is in the process of being, owned and managed by communities through Community Based Forest Management agreements, or in the 4% share of government owned and managed forests that are assigned to communities through Joint Forest Management agreements. Tenure problems at the project sites stem primarily from the lack of formal village land certificates in the assigned lands, which leaves lands formally under state ownership, and border disputes.

In Cameroon (two projects), the land in the project sites is predominantly state owned and de facto managed by communities and individuals; both projects include an area officially assigned to communities. One project focuses on a community forest, which is granted for community use under a 25-year management agreement. Nevertheless, the management plan has to be renewed every five years and can be canceled if the Ministry of Forestry and Wildlife deems that the community is not complying with regulations. In addition . . . , tenure problems include overlapping, traditional claims of Bantu families and conflicts among village members over preexisting claims and which families fall in and outside the borders of the community forest area. The second site is located on the borders of a national park. Tenure problems there are associated with boundary conflicts between villages and the park, as well as land claims by an agroindustrial firm.

In Viet Nam (one project), the forests in the four villages studied, in one project site, are owned by the government and have been allocated to individuals,

though in one village a portion of forest is allocated to the village as a whole for protection. The allocation of state lands to individuals is mainly . . . for 50 years. These land certificates have generated problems, however, as rights holders do not always understand their limitations (such as that the right cannot be transferred to a different piece of land). Other challenges lie in fully informing local people, especially the poor, about their rights, how to access the land, and how to derive full benefits under existing policies and laws. In reality, most ethnic minority households have yet to take full advantage of the policies. Moreover, land allocation in Viet Nam has been based on the ability to invest in the land, with labor and capital, but most poor people, including the ethnic minorities that comprise the majority of forest-dependent people, lack both of these. Customary land rights are strong, but there are significant differences between government and villager perceptions and understanding. There is an important illegal land market and also problems with unclear boundaries and different community versus household modes of forest management.

In Peru (two projects), the project sites are both located in state lands, one in a national protected forest and the other an area of Brazil nut concessions; both are under de facto individual use. The national protected forest has been invaded by colonists who are the primary users but who by law cannot have legal land rights, whereas individual users in the other site have a 40-year concession contract. Tenure problems at the sites include overlapping claims, land trafficking, ongoing land invasions, and illegal logging. Government policy is a source of conflict, as different government agencies have given out overlapping concessions to the same forest area to different stakeholders. . . . Regional and municipal authorities frequently promote roads and infrastructure inside the protected forest and productive activities in direct contradiction to legal norms (ParksWatch, 2003).

Proponent Interventions

. . . Virtually all project proponents identified tenure problems at their project sites and recognized the associated concerns for moving forward with their REDD+ strategies. Early actions they have taken included identifying the sources of insecurity and conflict and addressing the causes where possible; securing land titles for local stakeholders where this was appropriate and possible or in other cases securing management rights; clarifying unclear village and forest boundaries if needed; and identifying and delimiting the forest area to be set aside (Sunderlin et al., 2014). Clarifying land tenure rights specifically has often involved negotiating or working closely with government entities in charge of land and sometimes supporting those agencies through technical assistance or funding. Also, in a few cases the proponents are government entities, as in Acre, Brazil, and in every study site in Brazil the proponents are working with

the Terra Legal Program to demarcate and register properties in project villages (Duchelle et al., 2014).

Where existing mechanisms to secure rights are inadequate, some proponents have played an advocacy role, such as to reform the community forest concessions in Cameroon, which only provide rights for five-year intervals. A few are promoting strategies to clarify carbon rights. . . . In sites where there are important overlapping claims—such as palm oil or other concessionaires in Indonesia—proponents are devoting an important part of their energy on tenure to addressing these contradictions. In Peru, early evidence suggests that REDD+ has brought attention to the complex problem of land grabbing and trafficking, especially in protected areas, but projects are facing challenges for pursuing land regularization and titling because of weak intersectoral coordination at national and regional government levels.

Only about half of proponents interviewed (nine out of 19) are satisfied with the outcome of attempts to address tenure issues at their sites, three were both satisfied and dissatisfied, and five were unsatisfied (two did not have an opinion). Even those who were satisfied, however, stated that there is still much more to be done. In some sites, such as one in Tanzania, the proponent stated that they had been forced to exclude some areas because problems with tenure were not resolvable (Sunderlin et al., 2014).

REFERENCES

Agrawal, A., Redford, K., 2009. Conservation and displacement: An overview. Conservation and Society 7 (1), 1–10.

Barker, G., 2011. Speech given during the Eleventh RRI Dialogue in London, UK, 12 October 2011. http://www.rightsandresources.org/documents/index.php?pubID=2693 (accessed 1 May 2012).

Beymer-Farris, B.A., Bassett, T.J., 2012. The REDD menace: Resurgent protectionism in Tanzania's mangrove forests. Global Environmental Change 22, 332–341.

Börner, J., Wunder, S., Wertz-Kanounnikoff, S., Tito, M.R., Pereira, L., Nascimento, N., 2010. Direct conservation payments in the Brazilian Amazon: Scope and equity implications. Ecological Economics 69, 1272–1282.

Cronin, T., Santoso, L., 2010. REDD+ Politics in the Media: A Case Study from Indonesia. CIFOR Working Paper 49. CIFOR, Bogor, Indonesia.

Dahal, G.R., Atkinson, J., Bampton, J., 2011. Forest Tenure in Asia: Status and Trends. EU FLEGT Facility, Kuala Lumpur, Malaysia.

Di Gregorio, M., Brockhaus, M., Cronin, T., Muharrom, E., Santoso, L., Mardiah, S., Büdenbender, M., 2013. Equity and REDD+ in the media: A comparative analysis of policy discourses. Ecology and Society 18 (2), 39. http://dx.doi.org/10.5751/ES-05694–180239.

Duchelle, A.E., Cromberg, M., Gebara, M.F., Guerra, R., Melo, T., Larson, A.M., Cronkleton, P., Borner, J., Sills, E., Bauch, S., May, P., Selaya, G., Sunderlin, W.D., Wunder, S., 2014. Linking Forest Tenure Reform, Environmental Compliance and Incentives: Lessons from REDD+ Initiatives in the Brazilian Amazon. World Development 55 (1), 53–67.

Jagger, P., Sills, E.O., Lawlor, K., Sunderlin, W.D., 2010. A guide to learning about livelihood impacts of REDD+ projects. Occasional paper 56. CIFOR, Bogor, Indonesia.

Kengoum, D.F., 2011. REDD+ Politics in the Media: A Case Study from Cameroon. Working Paper 51. CIFOR, Bogor, Indonesia.

Larson, A.M., Barry, D., Dahal, G.R., 2010. New rights for forest based communities: Understanding processes of forest tenure reform. International Forestry Review 12 (1), 78–96.

Larson, A.M., Corbera, E., Cronkleton, P., van Dam, C., Bray, D., Estrada, M., May, P., Medina, G., Navarro, G., Pacheco, P., 2010. Rights to Forests and Carbon under REDD+ Initiatives in Latin America. Infobrief 33. CIFOR, Bogor, Indonesia.

Lin, L., Pattanayak, S.K., Sills, E.O., Sunderin, W.D., 2012. Site selection for forest carbon projects. In: Angelsen, A. (Ed.), Analyzing REDD+: Challenges and Opportunities. CIFOR, Bogor, Indonesia.

Mangkusubroto, K., 2011. Speech given at the International Conference on Forest Tenure, Governance and Enterprise in Lombok, Indonesia, 12 July. http://ukp.go.id/pidato/35-importance-of-land-and-forest-tenure-reforms-in-implementing-a-climatechange-sensitive-development-agenda (accessed 1 May 2012).

May, P.H., Calixto, B., Gebara, M.F., 2011a. REDD+ Politics in the Media: A Case Study from Brazil. Working Paper 55. CIFOR, Bogor, Indonesia.

ParksWatch, 2003. Perfil Área Protegida—Perú, Bosque de Protección Alto Mayo. Center for Tropical Conservation, Durham, NC.

Peluso, N.L., Lund, C., 2011. New frontiers of land control: Introduction. Journal of Peasant Studies 38 (4), 667–681.

Perla Alvarez, J., Freundt Montero, D., Burga Barrantes, E., Postigo Takahashi, T., Menton, M., 2012. Políticas REDD+ y los medios de comunicación: Caso de estudio en el Perú. Working Paper 101. CIFOR, Bogor, Indonesia.

Pham, T.T., 2011. REDD+ Politics in the Media: A Case Study from Vietnam. Working Paper 53. CIFOR, Bogor, Indonesia.

Roe, D., 2008. The origins and evolution of the conservation-poverty debate: A review of key literature, events and policy processes. Oryx 42 (4), 491–503.

RRI, 2011. Pushback: Local Power, Global Realignment. Rights and Resources Initiative, Washington, DC.

Sunderlin, W.D., Larson, A.M., Duchelle, A.E., Resosudarmo, I.A.P., Huynh, T.B., Awono, A., Dokken, T., 2014. How are REDD+ proponents addressing tenure problems? Evidence from Brazil, Cameroon, Tanzania, Indonesia, and Vietnam. World Development 55 (1), 37–52.

Sunderlin, W.D., Larson, A.M., Duchelle, A., Sills, E.O., Luttrell, C., Jagger, P., Pattanayak, S., Cronkleton, P., Ekaputri, A.D., 2010. Technical Guidelines for Research on REDD+ Project Sites. CIFOR, Bogor, Indonesia.

Sunderlin, W.D., Hatcher, J., Little, M., 2008. From Exclusion to Ownership. Rights and Resources Initiative, Washington, DC.

Tauli-Corpuz, V., de Chavez, R., Baldo-Soriano, E., Magata, H., Golocan, C., Bugtong, M.V., Enkiwe-Abayao, L., Cariño, J., 2009. Guide on Climate Change and Indigenous Peoples. Tebtebba, Baguio City, Philippines.

23

Friction*

An Ethnography of Global Connection

ANNA LOWENHAUPT TSING

Something shocking began to happen in Indonesia's rainforests during the last decades of the twentieth century: species diversities that had taken millions of years to assemble were cleared, burned, and sacrificed to erosion. The speed of landscape transformation took observers by surprise. No gradual expansion of human populations, needs, or markets could possibly explain it; besides, the products of these forests had been globally marketed for hundreds of years. Corporate growth seemed unaccountably chaotic, inefficient, and violent in destroying its own resources. Stranger yet, it seemed that ordinary people—even those dependent on the forest for their livelihood—were joining distant corporations in creating uninhabitable landscapes.[1]

Within Indonesia, this ugly situation came to stand for the dangers of imperialism and the misdeeds of a corrupt regime. Opposition to state and corporate destruction of forest peoples' livelihoods became a key plank of the emergent democratic movement of the 1980s and 1990s. An innovative politics developed linking city and countryside, bringing activists, students, and villagers into conversation across differences in perspective and experience. The insights and vicissitudes of this mobilization have not been much appreciated outside the country. Yet they speak to central dilemmas of our times: Why is global capitalism so messy? Who speaks for nature? What kinds of social justice make sense in the twenty-first century?

None of these questions can be addressed without an appreciation of global connections. Indonesian forests were not destroyed for local needs, only through the instigation and support of a global movement. Yet popular stories of global cultural formation are of little help in understanding these phenomena. There is no triumph of global integration here; both the chaotic melee of landscape destruction and the searing protests of radical critics are forged in dissension, fragmentation, and regional inequality. We see the unexpectedly persistent effects of particular historical encounters. A villager shows a North American miner some gold; a Japanese model of trade is adopted for plywood; students

banned from politics take up hiking; a minister is inspired by a United Nations conference on the environment: these narrowly conceived situations lay down tracks for future "global" developments. . . .

Emergent cultural forms—including forest destruction and environmental advocacy—are persistent but unpredictable effects of global encounters across difference. This proposition extends my earlier research, in which I explored how even seemingly isolated cultures, such as rainforest dwellers in Indonesia, are shaped in national and transnational dialogues (Tsing 1993). Scholars once treated such cultures as exemplars of the self-generating nature of culture itself. However, it has become increasingly clear that all human cultures are shaped and transformed in long histories of regional-to-global networks of power, trade, and meaning. With new evidence of these histories entering the academy from every direction, it has become possible for scholars to accept the idea that powerless minorities have accommodated themselves to global forces. But to turn that statement around to argue that global forces are themselves congeries of local/global interaction has been rather more challenging.

The challenges arrive from several directions. Some powerful conventions of thinking get in the way of research on this theme. Most theories of globalization, for example, package all cultural developments into a single program: the emergence of a global era. If globalization can be predicted in advance, there is nothing to learn from research except how the details support the plan. And if world centers provide the dynamic impetus for global change, why even study more peripheral places? Creative studies of the periphery are also hamstrung. Powerful social sciences directives catalogue and compare developments in the global south under a distancing imperial gaze, keeping us out of the arena where cultural outcomes really matter. If Indonesia is only a scrap of data, it might inform cosmopolitan readers, but its global encounters can never shape that shared space in which Indonesians and non-Indonesians jointly experience fears, tensions, and uncertainties. In this shared space, the contingency of encounters makes a difference. To guide us there, I must clear a theoretical path that extends far beyond Indonesia's forests. Yet can one gain an ethnographic purchase on global connections? Where would one locate the global in order to study it? Even those who are determined to conduct this kind of research still struggle to figure out how it is done. . . .

I begin with the idea that the messy and surprising features of such encounters across difference should inform our models of cultural production. In reaction to popular overenthusiasm for programmatic predictions, I emphasize the unexpected and unstable aspects of global interaction. To enrich the single-mindedness of cultural explanation focused only on internal blueprints for reproduction and growth, I stress the importance of cross-cultural and long-distance encounters in forming everything we know as culture (e.g., Clifford 1997). Cultures are continually coproduced in the interactions I call "friction":

the awkward, unequal, unstable, and creative qualities of interconnection across difference. . . .

Speaking of friction is a reminder of the importance of interaction in defining movement, cultural form, and agency. Friction is not just about slowing things down. Friction is required to keep global power in motion. It shows us (as one advertising jingle put it) where the rubber meets the road. Roads are a good image for conceptualizing how friction works: roads create pathways that make motion easier and more efficient, but in doing so they limit where we go. The ease of travel they facilitate is also a structure of confinement. Friction inflects historical trajectories, enabling, excluding, and particularizing.

The effects of encounters across difference can be compromising or empowering. Friction is not a synonym for resistance. Hegemony is made as well as unmade with friction. Consider rubber. Coerced out of indigenous Americans, rubber was stolen and planted around the world by peasants and plantations, mimicked and displaced by chemists and fashioned with or without unions into tires and, eventually, marketed for the latest craze in sports utilities vehicles.[2] Industrial rubber is made possible by the savagery of European conquest, the competitive passions of colonial botany, the resistance strategies of peasants, the confusion of war and technoscience, the struggle over industrial goals and hierarchies, and much more that would not be evident from a teleology of industrial progress. It is these vicissitudes that I am calling friction. Friction makes global connections powerful and effective. Meanwhile, without even trying, friction gets in the way of the smooth operation of global power. Difference can disrupt, causing everyday malfunctions as well as unexpected cataclysms. Friction refuses the lie that global power operates as a well-oiled machine. Furthermore, difference sometimes inspires insurrection. Friction can be the fly in the elephant's nose.

Attention to friction opens the possibility of an *ethnographic* account of global interconnection. Abstract claims about the globe can be studied as they operate in the world. We might thus ask about universals not as truths or lies but as sticky engagements.

NOTES

1. Rates of deforestation in Kalimantan over the last twenty-five years have recently been discovered to be far higher than ever imagined. Curran et al. (2004) document increasing deforestation in officially designated "protected areas." Between 1985 and 2001, they show, Kalimantan's protected lowland forests declined by more than 56 percent.
2. Many fascinating books have been written about the frictions of the rubber trade. Michael Taussig's *Shamanism, Colonialism, and the Wild Man* (1987) and Lucile Brockway's *Science and Colonial Expansion* (2002) are great places to begin.

REFERENCES

Brockway, Lucile. 2002. *Science and colonial expansion: The role of the British botanic gardens*. New Haven, CT: Yale University Press.

Clifford, James. 1997. *Routes: Travel and translation in the late twentieth century*. Cambridge, MA: Harvard University Press.

Curran, L.M., S.N. Trigg, A.K. McDonald, D. Astiani, Y.M. Hardiono, P. Siregar, I. Caniago, and E. Kasischke. 2004. Lowland forest loss in protected areas of Indonesian Borneo. *Science* 303 (February 13): 1000–1003.

Taussig, Michael. 1987. *Shamanism, colonialism, and the wild man*. Chicago: University of Chicago Press.

Tsing, Anna Lowenhaupt. 1993. *In the realm of the diamond queen*. Princeton, NJ: Princeton University Press.

SECTION 5

How Do Identities Shape Ecological Experiences?

What does cultural diversity have to do with human-environment interactions? Are environments perceived and experienced similarly by different people in different places? How do social inequalities yield competing environmental narratives? This section considers the role of identities—the historically contingent politics of difference that constitute, constrain, and reform subjects (Gupta and Ferguson 1997)—in shaping collective and individual perceptions of, and interactions with, the environment.

People imagine and address environmental problems on the basis of how they conceptualize and understand the environment. And people's views of the environment are shaped by intersecting social variables such as race, class, ethnicity, nationality, religion, gender, age, and so on. Each of these "axes of difference" (Nightingale, chapter 26 in this volume) acts as a lens through which people see and experience the world.

For example, in comparing farmers' and environmental professionals' views of *Pfiesteria* (a microscopic marine organism that killed tens of thousands of fish in the lower Pocomoke River in the late 1990s), Michael Paolisso and R. Shawn Maloney show how occupation and professional identities can influence individuals' views of the environment (Checker 2005). These anthropologists found that farmers on Maryland's Eastern Shore understood nature to be complicated and unpredictable, and accordingly, they viewed the toxic bloom of *Pfiesteria* as "another seemingly unpredictable response from nature, requiring flexible solutions" (Paolisso and Maloney 2000: 216). The farmers regarded themselves as "the 'real' environmentalists because they live with nature every day" and because they "have a personal and economic stake in maintaining [its] quality" (Paolisso and Maloney 2000: 214). Meanwhile, environmental professionals working with state and federal agencies, universities, and nongovernmental organizations believed that scientific methods, models, and theories could diagnose and resolve the region's environmental problems; they tied the *Pfiesteria* bloom to agricultural runoff, categorized the farmers as polluters, and advocated new regulations for nitrogen- and phosphorus-based nutrient management practices. This example, along with the six chapters in this section, show how different and/or overlapping shared identities, knowledge, beliefs, values, and experiences contribute to diverse conceptualizations of, and responses to, environmental problems (Paolisso and Maloney 2000: 209).

This section begins with a review of cultural theory and a reminder of the ways in which the study of culture can improve our understanding of ecosystems, advance strategies for achieving sustainability, and help address environmental issues. The author of this first chapter, Kay Milton, states that "one of the clearest messages that anthropologists can give to environmentalists is that humans have no 'natural' propensity for living sustainably with their environment." She goes on to state that "primitive ecological wisdom is a myth."

In the following chapter, J. Peter Brosius provides an example that illustrates how this myth gets cultivated. Brosius recounts the steps through which objectivist conceptions of indigenous knowledge get transformed during environmentalist campaigns for rainforest protection so as to align with Western meanings and categories and how indigenous groups may "adopt and deploy transnational environmentalist rhetoric" in turn. In so doing, Brosius provides a rich example—one that bolsters the argument made by Milton—of the ways in which anthropology can inform environmental discourse. This chapter also serves to warn young anthropologists that ethnographic writing, like any writing, is sometimes misappropriated, manipulated, and utilized in ways not intended by the anthropologist/author.

Of course, indigeneity is not the only marker of identity that mediates humans' relationships with nature. And *indigenous knowledge* is not the only term that anthropologists must unpack whenever they research human-environment interactions. This section also invites readers to question the meaning of the word *natural*, to consider how *hazards* and *risks* are currently defined, and to contemplate the ways in which multiple axes of difference—even the culture of "science" itself—can foster widely diverse and changing environmental experiences.

In the next chapter, Andrea Nightingale reviews historical developments in theorizing about one such axis of difference: gender. She describes the contributions as well as the limitations of (1) essentialist, (2) materialist, and (3) feminist political ecological thinking about gender and environment, as well as the implications of each vein of theory for international development. Building on the work of Rocheleau, Thomas-Slayter, and Wangari from chapter 4, Nightingale recommends that gender be reconceptualized as a process and that the gender-environment nexus be understood as dynamic. In other words, gender does not precede humans' differentiated experiences of nature, nor does nature precede the behaviors, roles, and responsibilities we prescribe to particular genders; the two are mutually constitutive and mutually reinforcing.

Turning to other dimensions of identity in the chapter that follows, Melissa Checker offers an ethnography of a low-income African American community in Augusta, Georgia, and its struggle to navigate the scientific environmental risk assessment process. Checker's work contributes to the literature on environmental racism—that is, the unequal distribution of environmental benefits and burdens on the basis of race and the processes by which nonwhites are

disproportionately exposed to pollution. Elsewhere, Checker has described how the different experiences of middle-class whites and poor persons of color condition different perceptions of the environment. In *Polluted Promises: Environmental Racism and the Search for Justice in a Southern Town* (NYU Press, 2005), Checker notes that, for white Americans, the environment is something that needs to be protected. But "for the residents of Hyde Park, . . . the environment . . . was poisonous, and they needed to be protected from it" (Checker 2005: 88). Whereas whites might imagine open spaces, national parks, endangered species, and the need to recycle/reduce/reuse whenever they hear the word *environment*, that same term mentioned to adults in Hyde Park "prompted them to tell of the dust that covered their walls and reappeared as fast as they could wipe it off, . . . of the toxic release sirens coming from Thermal ceramics, . . . of how they had permanent tickles in their throats and how their children were never far from their inhalers" (Checker 2005: 87). The social movement that emerged in response to such environmental inequality is called environmental justice (Sze and London 2008). As the U.S. Environmental Protection Agency (EPA) describes it, environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (U.S. EPA 2012).

Whereas Checker studies environmental racism and environmental justice in the United States, the next contributor, Marc Edelman, focuses on food sovereignty, land tenure, rural social movements, and the rights of peasants in the Global South. His chapter chronicles the history of peasant movements, beginning in the 1980s with the world farm crisis. It centers on Vía Campesina, a transnational coalition of peasant and small-farmer organizations concentrating on "human rights, agrarian reform, environment and sustainable agriculture, biodiversity and genetic resources, state reform, and trade, among other issues." This selection complements the previous readings on globalization by demonstrating how ordinary individuals employ some of the instruments of globalization (e.g., increased connectivity facilitated by advances in transportation and telecommunications technologies and the formation of international organizations) to cultivate coalitions based on experiences and worldviews that counter the neoliberal policies and prescriptions of the World Bank, the IMF, and other agents of "development." For many indigenous peoples, this movement has cultivated an identity of pan-Indianism; this is an example of what Richard Falk (1997) and Arun Appadurai (2000) call "grassroots globalization," or "globalization from below."

This section's final contributor, Alex Carr Johnson, employs a style of writing that is reminiscent of the processual approach to understanding nature and society proposed by Nightingale. In this chapter, Johnson writes reflexively about searching for the line between "what is Nature and what is Human." He brings

his experiences as a queer man into conversation with his culture's socially constructed definitions of *Nature* and *natural* sexuality. In so doing, he invites the reader to "imagine an infinite number of possible Natures" and offers a further testament to the ways in which the many aspects of social difference can color and condition diverse human-nature dynamics.

Like the readings in section 3, the readings in this section also invite readers to explore the connections between ecological anthropology and other fields of inquiry—including medical anthropology, science and technology studies, queer theory, critical race theory, and the study of social movements.

REFERENCES

Appadurai, Arun. 2000. Grassroots Globalization and the Research Imagination. *Public Culture* 12 (1): 1–19.

Checker, Melissa. 2005. *Polluted Promises: Environmental Racism and the Search for Justice in a Southern Town*. New York: NYU Press.

Falk, Richard. 1997. Resisting "Globalisation from Above" through "Globalisation from Below." *New Political Economy* 2 (1): 17–24.

Gupta, Akhil, and James Ferguson. 1997. Culture, Power, Place: Ethnography at the End of an Era. In *Culture, Power, Place: Explorations in Critical Anthropology*. Akhil Gupta and James Ferguson, eds. Pp. 1–29. Durham, NC: Duke University Press.

Paolisso, Michael, and R. Shawn Maloney. 2000. Recognizing Farmer Environmentalism: Nutrient Runoff and Toxic Dinoflagellate Blooms in the Chesapeake Bay Region. *Human Organization* 59 (2): 209–221.

Sze, Julie, and Jonathan K. London. 2008. Environmental Justice at the Crossroads. *Sociology Compass* 2 (4): 1331–1354.

U.S. EPA (United States Environmental Protection Agency). 2012. Environmental Justice Key Terms. http://www.epa.gov/region07/ej/definitions.htm.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 24: "Cultural Theory and Environmentalism" by Kay Milton

1. In what ways can anthropological knowledge inform environmental discourse?
2. What are "transcultural" discourses? In what ways is environmentalist discourse "transcultural"?

Questions to Accompany Chapter 25: "Endangered Forests, Endangered People: Environmentalist Representations of Indigenous Knowledge" by J. Peter Brosius

1. In what ways does Brosius's description of the Malaysian state of Sarawak and the relationship of Penan hunter-gatherers to the Sarawak environment differ from those of Davis and Henley?
2. What does Brosius mean when he refers to the "'Plotkinization' of the discourse of indigenous knowledge of medicinal plants"? How does this relate to the concept of globalization, which is discussed in the previous section?
3. What are the effects, according to Brosius, of the metacommentary that reduces the whole of indigenous knowledge down to "the sacred" or "the ineffable"?
4. How do environmentalists' representations of indigenous knowledge, as described by Brosius, relate to the science of global environmental change, as described by Taylor and Buttel (chapter 19)?

Questions to Accompany Chapter 26: "The Nature of Gender: Gender, Work, and Environment" by Andrea Nightingale

1. How has the relationship between gender and the environment been theorized over the years? What are the contributions and limitations of essentialist, materialist, and political ecological thinking about gender and the environment? How is Nightingale's conceptualization of this relationship different from other theorists'?
2. What is the difference between "gender roles" and "subjectivities"? What does this difference mean for our theorizing of human-environment interactions?
3. In what ways do theories of gender and environment inform development policy?

Questions to Accompany Chapter 27: "'But I Know It's True': Environmental Risk Assessment, Justice, and Anthropology" by Melissa Checker

1. Why do Hyde Park residents refer to their neighborhood as a "toxic donut"?
2. What are the four stages in a typical EPA risk assessment methodology? What problems does Checker identify with each stage?
3. In addition to this problematic four-stage assessment strategy, what were some other issues that HAPIC identified with regard to both the EPA's testing procedures and residents' interactions with health officials?
4. What other risks do Hyde Park residents face beyond the exposure to toxic substances? What effects do these risks have on residents' everyday lives?
5. In what ways can anthropologists contribute to the risk assessment process?
6. What are the benefits of a community-based approach to environmental justice?

Questions to Accompany Chapter 28: "Bringing the Moral Economy Back in . . . to the Study of 21st-Century Transnational Peasant Movements" by Marc Edelman

1. What was the impetus behind cross-border organizing by peasants and small farmers? What does this have to do with globalization?
2. What is the basis of Vía Campesina's demand to "take agriculture out of the WTO"?
3. What is "food sovereignty"? How does it differ from "food security"?
4. What is a "moral economy"? How are moral economic norms and sensibilities reflected in the discourse of transnational peasant and small-farmer coalitions?

Questions to Accompany Chapter 29: "How to Queer Ecology: One Goose at a Time" by Alex Carr Johnson

1. What does Johnson mean when he proposes "queering Nature"? What does queering nature add to contemporary discussions of nature and society?
2. Based on Johnson's essay but also based on what we have learned from reading scholars like Fairhead and Leach (chapter 3), Robbins and Sharp (chapter 16), Igoe and Brockington (chapter 30), Brosius (chapter 25), Nightingale (chapter 26), and Checker (chapter 27), how is it that "Nature, and the corresponding definition of 'natural,'" can "betray reality," as Johnson suggests?
3. In reacting to a review of Peter Matthiessen's book *The Birds of Heaven: Travels with Cranes,* Johnson proclaims, "Writing about nature means accepting that it will prove you wrong. And right. And render you generally confused." He later writes that "no man can categorize . . . relations without lying." Do you see any similarities between the ideas Johnson poses here and those that were presented in the other readings from this section? How might these proclamations help or hinder our thinking and writing about human-nature relationships?

24

Cultural Theory and Environmentalism*

KAY MILTON

Anthropology can benefit the environmentalist cause; . . . it can help us to identify our responsibilities for protecting the environment and work towards their fulfillment. Environmentalists have operated largely in ignorance of what anthropology has to offer. In particular, their understanding of the human-environment relationship has not been informed by a knowledge of how culture mediates this relationship, and the absence of this knowledge has seriously undermined the arguments presented in the global environmental debate. . . . The study of culture can help environmentalists to a better understanding of human ecology and a more informed discourse on the search for sustainable ways of living.

Dispelling the Myths

One of the clearest messages that anthropologists can give to environmentalists is that human beings have no "natural" propensity for living sustainably with their environment. Primitive ecological wisdom is a myth, not only in the anthropological sense, as something whose truth is treated as a dogma, but also in the popular sense, as something that is untrue, a fantasy. The reasons why the myth persists are easy to understand. In some contexts it provides support for political arguments, against industrialism and its associated developments, and in favor of autonomy for indigenous and traditional communities. But perhaps the main reason for its persistence is that it gives environmentalists hope that there is a ready-made solution to environmental problems, albeit one that is very difficult to achieve. The myth implies that if industrial societies could "get back" to a more "natural" existence, by emulating the practices and cultural perspectives of nonindustrial peoples, then our difficulties would be solved. The knowledge generated by the comparative analysis of human cultures indicates that this is not so.

Does this mean that the message anthropology brings to environmentalism is essentially pessimistic? Not necessarily, for the message is not that

* From Kay Milton, *Environmentalism and Cultural Theory: Exploring the Role of Anthropology in Environmental Discourse*, © 1996 by Routledge. Used by permission of Taylor & Francis.

environmentally benign cultures do not or cannot exist but that identifying them is not as easy as pointing to nonindustrial peoples. An understanding of cultural diversity can be a source of ecological wisdom, but nowhere is this wisdom ready-made. It has to come from a knowledge of the range of possibilities and an understanding of how human cultures and the environments in which they develop impact upon each other. It may be possible to manufacture sustainable ways of living out of bits and pieces selected from diverse cultures, but it would be unwise to attempt this without first understanding them in their original contexts and appreciating the consequences of taking them out of those contexts. The discussion in this book does not point to a clear way forward. Anthropology could not, in any case, do this on its own—hence the need for "multidisciplinary" approaches that include the physical as well as the social sciences. But the arguments and evidence presented here do indicate ways in which anthropological knowledge might inform environmental discourse.

First, and most important, the assumption that some cultures are more natural than others is a damaging distraction and should be abandoned. It fuels established prejudices, reinforcing the divisions that sustain discrimination and conflict. It also creates the misleading impression that creating a sustainable way of life is a matter of "going back," and this makes it harder to persuade many people of its value, particularly those who, in the minds of many environmentalists, most need to be persuaded: those who pursue the equally distracting ideal of "progress" in the form of economic growth. The alternative is to see nature as the all-encompassing scheme of things to which all human cultures and practices, as well as nonhuman species and physical processes, belong. In this view, a dam built by people is as natural as one built by beavers, computer technology is as natural as collecting fruit from the rainforest. There is no other nature to get back to. This is it—we are already there. This frees us to examine all human practices and cultural phenomena without prejudice. It enables us to consider their ecological value without assuming from the outset that some are "naturally" better than others.

Second, we need to be aware of the fundamental character of culture and therefore of cultural variation. It is not just a matter of different symbols with similar meanings, different ways of expressing the same things. Cultures can differ radically in the way they allocate power within the universe, the way they perceive or conceptualize time, the way they define humanity and the relationship between life and death. The acceptability of environmentalist arguments can depend on these variations. The concept of extinction is likely to be very differently received by those for whom cross-species reincarnation is an indisputable fact than it is by Western scientists. The idea of protecting the environment makes little sense to people who see it as their protector.

Third, and following from the previous point, we need to appreciate the way in which the different components of cultural perspectives are related to one

another: how fundamental assumptions about the world relate to values, goals, norms, and so on. These relationships again affect the extent to which environmentalist arguments can be accommodated. People's receptiveness to the idea of environmental protection depends on the relationship between their understanding of power, the way they allocate responsibility, both within human society and between human and nonhuman forces, the way they think about time, and the extent to which they envisage and plan for the future. These relationships also affect the extent to which cultural phenomena can be imported from one context into another. It might seem like a good idea for industrial societies to emulate the Dogon respect for trees, for instance. But this is not an isolated phenomenon; it is part of a cultural complex whose other components do not fit easily into an industrial context.

A great deal of knowledge which could provide environmentalists with a better understanding of human ecology is already present in the anthropological literature, though not always in a form that is accessible to nonanthropologists. One way of making this knowledge more available is for anthropologists to participate more fully in environmental discourse (cf. Rayner 1989). But moves can also be made by environmentalists. Efforts to introduce new conservation measures, to formulate new environmental policies, and to change damaging practices are usually preceded by research to determine the nature of the problems and identify possible solutions. The arguments presented in this book are intended to communicate the message that problems and solutions are as much cultural as they are physical or biological and that cultural research should be a part of the package.

Cultural Analysis and Global Discourse

The same principles and methods that are used to compare cultures and cultural perspectives, and to reveal their underlying assumptions and fundamental commitments, are also relevant for understanding what I have called "transcultural" discourses and perspectives, those generated by communication across cultural boundaries. Environmentalist discourse is clearly transcultural in this sense, as are the dominant perspectives that compete and overlap within it. The analysis is inconclusive on the question of which transcultural perspective, globalist or antiglobalist, anthropocentric or ecocentric, holds out the best prospect for an environmentally sustainable future. This is inevitable, since this kind of judgment depends on knowing what such a future might be, and this knowledge cannot come from anthropology alone. Again, this is why we need a mixture of disciplines. But cultural analysis reveals other things that have implications for global environmental discourse.

It reveals, for instance, that the diverse perspectives share a certain amount of common ground, that there is potential for agreement among globalists,

antiglobalists, and ecocentrists on some practical environmental measures, despite their fundamental disagreements on other things. It reveals that, while both globalists and antiglobalists claim to respect the cultures of nonindustrial peoples, they differ in their commitment to this claim. The antiglobalists see this respect as central to the creation of a sustainable future, but in doing so they tie their arguments to a faith in the myth of primitive ecological wisdom, which anthropological knowledge exposes as untenable. The globalists, on the other hand, seek to impose an overarching hegemony which renders more or less worthless their claim to respect cultural diversity and which reveals their understanding of culture to be particularly naïve and uninformed. It also calls into question their commitment to democratic principles.

Cultural diversity becomes particularly important when viewed in the context of observations made above. If no human culture holds the key to ecological wisdom, then it is essential to conserve the greatest possible number of ways of interacting with the environment if we are to maximize the chances of survival, both of our own species and of those with which we share the planet. To this extent, I agree with the antiglobalist view that protecting cultural diversity might offer the best chance of conserving biodiversity, though I would not accept the argument presented by some antiglobalists, that cultural diversity can guarantee the protection of biodiversity. Neither the antiglobalist nor the globalist perspective has identified the political circumstances in which cultural diversity can be effectively conserved.

That environmentalist arguments can be ill founded and inconsistent is not itself a surprising revelation. Environmental discourse is essentially political, shaped by vested interests struggling to control the future and shrouded, therefore, in a great deal of "expressive propaganda" (Douglas 1992). In such contests, it matters more to be convincing than to conform to standards of truth and logic. But cultural analysis can demonstrate in what ways arguments are ill founded and inconsistent. It can, in Douglas's words, "dispel the fog," by replacing a general cynicism towards, and suspicion of, political debate with a more precise understanding of why we should be unconvinced by some arguments and, perhaps, cautiously receptive to others. If participants in the discourse are willing to listen, then such understanding can only force environmentalist argument on to a franker plane.

REFERENCES

Douglas, M. (1992). *Risk and Blame: Essays in Cultural Theory*. London: Routledge.
Rayner, S. (1989). "Fiddling, While the Globe Warms?," *Anthropology Today* 5, 6:1–2.

25

Endangered Forests, Endangered People*

Environmentalist Representations of Indigenous Knowledge

J. PETER BROSIUS

Dawat took a deep breath and came wondrously alive. His eyes and arms almost danced as he made an impassioned plea for his forest and his people. For nearly an hour the power of the forest spoke through him, and when he ended there was an abrupt silence. For a few moments all of us sat quietly as the jungle sounds of distant birds and drumming cicadas filled the air. Although the details of what he said came only several months later when the interview was translated, we all sensed in our hearts that we had heard something both poetic and profound. (Henley, 1990, p. 94)[1]

Introduction

In the early 1980s, timber companies in the Malaysian state of Sarawak, on the island of Borneo, began moving into interior upland areas inhabited by various groups of Penan hunter-gatherers. In 1987, the Penan began to actively resist these incursions by establishing a series of blockades. Since that time, the Penan have become the focus of a broad-based international environmental campaign to assert their land rights and preserve the Sarawak rainforest. This campaign has been very high profile indeed, covered widely in the media, and supported by numerous political figures and celebrities. . . . What is perhaps most remarkable about this campaign is that it is not the product of central coordination but instead developed almost spontaneously as the situation of the Penan became more widely publicized. . . . In a series of interviews I conducted with European and American environmentalists, Penan resistance to logging was repeatedly cited as an exemplar of how indigenous peoples can assert control over their own destinies and, in the process, halt the loss of global biodiversity. In short, the Penan have become icons of resistance for environmentalists worldwide.[2]

In the present discussion, I consider the rhetoric of this campaign. In particular, I examine the ways in which Western environmentalists have constructed Penan land rights with reference to Penan knowledge of the landscape and of the biotic elements which exist there. Further, I consider how environmentalists

* From *Human Ecology* 25, no. 1 (1997): 47–69. Used by permission of Springer.

have drawn on ethnographic accounts in the process of constructing or describing certain domains of indigenous knowledge and how those accounts are transformed in the process of generating images deployed in the campaign. I focus on one text in particular, a book entitled *Penan: Voice for the Borneo Rainforest* by ethnobotanist Wade Davis and environmental activist Thom Henley (Davis and Henley, 1990b).[3] Through focusing on the work of Davis and Henley, and to a lesser extent on other works by Davis (Davis, 1992, 1993), this discussion applies to environmental and indigenous rights rhetoric more broadly: the Penan case is but one instance of a more general discourse. . . .

The Penan, Blockades, and the Growth of the International Campaign

The Penan of Sarawak are divided into two distinct populations, the Eastern and Western Penan (Needham, 1972, p. 177).[4] The Eastern Penan comprise all those groups living to the north and east of the Baram River, as well as in the upper Limbang watershed. The Western Penan include all those in the Belaga District, as well as communities in the Silat River watershed and at Leng Beku. Though in broad outline the forest adaptations of Eastern and Western Penan are similar, there are significant differences between these two groups with regard to subsistence technology, settlement patterns, social organization, and the tenor of social relationships (see Brosius, 1990, 1991a, 1992, 1993a; Needham, 1972). Western Penan communities are characterized by long-term stability and a strong sense of internal cohesion. Eastern Penan bands, on the other hand, are much more fluid with respect to composition and much more ephemeral with respect to long-term historical identity. Western Penan communities tend to be much larger than those of Eastern Penan, with 60 to 200 members.[5] Eastern Penan communities average only 20–40 members. Western Penan bands occupy much larger foraging areas than do Eastern Penan, on the order of 1,500 km^2, as opposed to 400 km^2 for Eastern Penan. Both Eastern and Western Penan conceive of their territories as a shared corporate estate over which all members of a community have rights.

Logging has a dramatic effect on the lives of Penan, both nomadic and settled.[6] The most immediate effect is on the forest resources upon which they depend for subsistence and trade. Sago palms (*Eugeissona utilis*) are uprooted by bulldozers, fruit trees are felled and rattan destroyed, and severe river siltation occurs. It is this situation and the blockades that have resulted from it that have attracted worldwide media attention.

Almost without exception, all the communities that have resisted logging with blockades have been Eastern Penan. Western Penan, by comparison, have been conspicuously acquiescent to the activities of logging companies. The reasons for this contrast are complex and derive from a mix of political, historical, and social

factors. One such factor has been that the Baram and Limbang Districts—those areas occupied by Eastern Penan—have been visited by numerous Malaysian and Western environmental activists.

This began in 1982 when the Malaysian environmental organization Sahabat Alam Malaysia (SAM, Friends of the Earth Malaysia) set up a field office in the upriver town of Marudi. Then, in 1984, Swiss artist Bruno Manser took up residence with a group of nomadic Eastern Penan in the upper Tutoh River area. He remained among various nomadic groups for over six years. It is Manser, along with Sahabat Alam Malaysia, who is most responsible for bringing the situation of the Penan to world attention. Beginning in 1985, Manser began sending letters out to a range of environmental organizations, and it was not long before reporters, filmmakers, and environmentalists began to seek him out in the forest. As Manser was making their situation known outside of Sarawak, he was simultaneously acting as an instrument of encouragement for the normally retiring Eastern Penan to resist. Manser traveled widely throughout the Baram and Limbang areas and arranged large meetings which were attended by representatives from numerous communities. Along with SAM, Manser provided Penan the opportunity to internationalize their cause.

It was after striking images of the Penan blockades began to circulate in 1987 that the Penan began to become more well-known and a concerted international campaign began to be waged, both by Manser and by SAM.[7] The first Penan blockades were established not long after the founding of the Rainforest Action Network, which highlighted the plight of the Penan in its earliest campaigns. Numerous other rainforest groups were also forming in Europe, the United Kingdom, Australia, and Japan, in response to a more general awareness of the scale of tropical deforestation.[8] The Penan became iconic of forest destruction for many of these organizations.

Associated with the acceleration of the international Sarawak campaign were efforts by numerous individual environmentalists to visit Eastern Penan in order to gain firsthand information on their situation and document it for international distribution. A number of Western environmentalists managed to sneak into what had become a closed security zone. In their visits to Penan communities, these individuals frequently told Penan of efforts made on their behalf in Europe, Australia, and the U.S. Their mere presence (and in many cases it was indeed merely a presence, since Penan describe numerous visits by persons with whom they were unable to communicate) confirmed for the Penan the legitimacy of their cause.

Davis and Henley were two such visitors. Henley traveled to Sarawak twice in 1989 in order to visit Penan. It was on his second visit that he was joined by Davis. Davis and Henley stayed both with settled Eastern Penan living in the vicinity of Long Bangan, Long Iman, and Batu Bungan and with nomadic Penan in the Ubung River. During this visit, Davis collected information on medicinal

plants, and it was his wish to conduct further ethnobotanical research. This proved impossible because of the tense political situation in the area. In early 1993, Davis traveled to Sarawak again with a screenwriter from Warner Brothers in conjunction with plans to produce a film telling the story of Bruno Manser. On the basis of these brief trips, Davis and Henley published a series of items on the Penan (Davis, 1992, 1993; Davis and Henley 1990b). In each of these accounts there is a considerable degree of textual overlap.[9]

The Representation of Penan Knowledge: Resource Management, Landscape, and Medicinal Plants

In examining environmentalist discourse on the significance of indigenous knowledge it is necessary to consider precisely what is meant by the word *knowledge* itself. In fact, we can identify two rather distinct conceptions of indigenous knowledge: one which we might term the objectivist conception, and one the environmentalist conception.

As it is used by ethnoecologists, the word *knowledge* is generally applied to discussions of indigenous understandings of the natural world: systems of classification, how various societies cognize or interpret natural processes, what such groups know about the resources they exploit, and so forth. Brush has suggested that the forms that the study of indigenous knowledge has taken have changed considerably and that four distinct, historically situated approaches can be discerned: descriptive historical particularism, cultural ecology, cognitive anthropology, and human ecology (1993, p. 658). Each of these presupposes a different set of starting assumptions regarding the nature of indigenous knowledge and the purposes and epistemological bases for studying it. Central to the latter two approaches in particular has been a concern with the structural or systemic nature of indigenous knowledge (ibid., p. 658) and its utilitarian or adaptive significance (ibid., p. 659). Such is the objectivist notion of knowledge.

Brush also describes how, after 1980, addition of the word "indigenous" produced a more politicized discourse which is concerned with the issue of rights and which has culminated in contemporary controversies over indigenous intellectual property rights (1993, pp. 659–660).[10] Politicized though it was (and is), the discourse of indigenous intellectual property rights has adhered strongly to the objectivist conception of knowledge. This is necessary given the goal of defining indigenous knowledge as an entity subject to statutory recognition and framed with reference to metropolitan forms of legal textualization.

In certain other forms of environmentalist discourse, on the other hand, *knowledge* is transformed into something quite different. My purpose here is to focus on the nature of that transformation by examining what it is that writers such as Davis and Henley have defined and represented to their audience as "indigenous knowledge."

In order to understand how this transformation occurs, it is necessary first to recognize the sources from which such representations of indigenous knowledge emerge. For the most part, they derive from two sources. First, environmentalist representations of indigenous people and the landscapes they inhabit are often based on travel to those areas by activists, generally for periods of weeks or months. Such individuals often lack knowledge of local languages and are thus not able to communicate effectively with indigenous peoples. They are nevertheless able to document current conditions and, perhaps with the help of a translator, to record local perceptions and concerns and collect accounts of abuses by government authorities.[11] Second, environmentalists frequently draw upon available ethnographic information in order to enrich their accounts and lend them an aura of authority. In point of fact, environmentalist texts seem very often to result from a combination of personal and ethnographic accounts, producing a textual interweaving of personal travel narrative and ethnographic minutiae. This is the strategy employed by Davis and Henley.

Such texts and images, once produced, are dispatched. The course they may take thereafter is quite variable: they may go through numerous transformations as they are repeatedly produced, reproduced, and at last distributed to a larger audience through networks such as the Internet and Econet, through faxes, through documentaries picked up by television networks, by fundraising letters, and in books such as that by Davis and Henley.[12]

These are not texts or images produced for mere aesthetic appreciation. They are deployed to make an argument and mobilize support and are intended to empower those they represent. They are, in short, tools of persuasion: they may be asking us to write letters, to send money, or to provide some other form of support. In order to serve as such tools of persuasion, they must *present* the Penan (or the Kayapo or the Asmat) in ways that make us care and want to do something. They must also connect them to that other thing that is endangered: the forest.

There are any number of ways to achieve these ends. Arguments have been made about the value of the rainforest in terms of global warming, the preservation of biodiversity, and the potential for discovering new medicines. This is still evolving: new arguments continually emerge. Perhaps the most prevalent argument, and the one in which the most direct linkage is made between the fate of forests and peoples, is to assert the importance of indigenous knowledge for preserving biodiversity and to raise the specter of its loss. According to activist Alan Durning, indigenous peoples "possess, in their ecological knowledge, an asset of incalculable value: a map to the biological diversity of the earth on which all life depends. Encoded in indigenous languages, customs, and practices may be as much understanding of nature as is stored in the libraries of modern science" (1992, p. 7).

A second strategy is to link indigenous knowledge to the sacred or ineffable, partaking of a semantic shift that transforms "knowledge" into wisdom, spiritual insight, or some other such quality. This sort of shift is evident in a 1991 *Time* magazine cover story entitled "Lost Tribes, Lost Knowledge" (Linden, 1991). The subtitle of this story is "When native cultures disappear, so does a trove of scientific and medical wisdom." According to Linden,

> The prevailing attitude has been that Western science . . . has little to learn from tribal knowledge. The developed world's disastrous mismanagement of the environment has somewhat humbled this arrogance, however, and some scientists are beginning to recognize that the world is losing an enormous amount of basic research as indigenous peoples lose their culture and traditions. Scientists may someday be struggling to reconstruct this body of wisdom to secure the developed world's future. (ibid., p. 48)

Both of these valorizing strategies—one linking indigenous knowledge to the preservation of biodiversity, the other transforming "knowledge" into "wisdom"—require the deployment of a discourse that places indigenous knowledge at its center. It is the latter transformation in particular that I examine here.

In the following discussion, I provide several examples of the transformation that occurs as ethnographic texts are transformed into environmentalist texts and how in the process the substantive properties of indigenous knowledge are also transformed. In doing so, I focus on three examples: (1) Penan resource management, particularly as it applies to the *molong* concept, (2) knowledge of the landscape, and (3) the rhetoric of medicinal plants. I focus on these topics because, except in the case of medicinal plants, I myself first documented much of this and published it in a number of articles (Brosius, 1986, 1988, 1990, 1991a, 1991b). This material was subsequently picked up and elaborated on by environmentalists, Davis and Henley among them, and incorporated into campaign materials. With respect to the case of medicinal plants, I provide this example because it illustrates the kind of rhetorical traffic that occurs when indigenous peoples themselves adopt and deploy transnational environmental rhetoric.

Resource Management and the *Molong* Concept

Sago, derived from the palm species *Eugeissona utilis*, is the carbohydrate staple of both Eastern and Western Penan. The factor which more than any other determines the nature of their distinctive settlement systems—the location of camps and the frequency and distance of movement—is the availability of sago. Penan have a clear idea of the relative abundance and location of sago groves throughout their foraging areas and locate themselves in proximity to sago

concentrations. Rather than simply harvesting *Eugeissona*, Penan exploit it in a manner which maintains its long-term availability.

I first described the principles underlying Western Penan resource use in a 1986 article in the *Sarawak Museum Journal* entitled "River, Forest and Mountain: The Penan Gang Landscape" (Brosius, 1986). When I first wrote about these principles, in particular the *molong* concept, they had not yet been described. My primary purpose in writing this article—at a time when an increasing number of Penan communities were being dispossessed by the activities of logging companies—was to demonstrate that they did not wander aimlessly through the forest, as was supposed by so many government authorities, but rather had well-established principles of land tenure and a sophisticated system of resource management. I deliberately published this article in a local journal so that it would be available to civil servants and government officials in Sarawak.

In this article, I described Penan conceptions of landscape, particularly with respect to the role that rivers play in organizing landscape knowledge. I also described the significance of trees, and it was in this context that I first described the *molong* concept:

> The Penan landscape is filled with particular trees which are either the property of the whole community or which are recognized as belonging to specific individuals. Of significance here is the concept of *molong*, to preserve.[13] This generally applies to fruit trees of various types, to sago clumps, or, for instance, to large trees which are suitable for boat building. Frequently when traveling in the forest a person will spot a tree which has not been claimed, and will then mark it in some manner, thus reserving it for future harvest or use. In the case of fruit trees, whether they are *molong* by an individual or by the community is dependent on the particular species. . . . Even young children actively claim trees, and by adulthood may have accumulated several dozen fruit trees and sago clumps. Significantly, there are a large number of trees . . . which are specifically named.
>
> . . . Many of these trees are recognized as having been *molong* by long-dead ancestors and are thus a further source of continuity between past generations and the present. (Brosius, 1986, pp. 175–176)[14]

Having defined the *molong* concept, I then proceeded to describe the process of sago production, contextualizing this with reference to the reproductive ecology of *Eugeissona*. I described how *Eugeissona* reproduces both by seeds and vegetatively and concluded that

> while the processing of sago in a particular area over a period of several months may lead to temporary depletion, this harvesting strategy does not negatively affect its long-term growth. It appears likely that the thinning of *Eugeissona* in the

> process of exploitation may actually enhance the production of starch and viable seed. . . . This is not to say that *Eugeissona* cannot be over-harvested and thus depleted. Indeed it can, particularly when the harvesting cycle in a particular sago stand is too short and clumps are not allowed to sufficiently recover before being re-harvested. For this reason the Penan are concerned to maintain a sound harvesting strategy which avoids a foreshortened harvest cycle. When the sago in one area has been depleted, it is left to recover over a period of years. The Penan attitude with regard to *Eugeissona* resources is one of explicit stewardship. (Brosius, 1986, p. 177)

Finally, I discussed the implications of Penan resource use for development policy. My purpose in doing so was to demonstrate "the inadequacy of the notion of the Penan as a people without a sense of place, existing in an anonymous landscape" (Brosius, 1986, p. 179). I noted that "a sense of stewardship constantly informs the manner in which they exploit their environment" (ibid., p. 179) and ended with the statement that "the Penan are conscientious resource managers, fully aware of sustained-yield principles. They exploit their environment in a way that preserves its long-term ecological integrity" (ibid., p. 182). Given the intent of the article (which also contained a number of specific policy recommendations and suggestions for principles upon which Penan land claims might be legally encoded), I felt it was important to make a clear case for the validity of Penan principles of resource management. Whatever the shortcomings of this article, the information provided is firmly grounded in field research and constitutes an accurate description of Penan landscape knowledge and principles of resource use. Let us now turn to the way that this description has been transformed in the process of Davis and Henley's (re)presentation.

In each of Davis's individual essays (Davis, 1990, 1992, 1993) and in the essay coauthored by Davis and Henley (1990a), the issue of Penan resource management is addressed. In one essay, referring generally to the significance of Penan botanical knowledge, Davis states that "for the Penan all of these plants are sacred, possessed by souls and born of the same earth that gave birth to the people" (Davis, 1990, pp. 98–99). In reference to the usage of *Eugeissona*, Davis and Henley state that "if there is a pattern to the Penan migration, it is determined by the sacred growth cycle of the sago palm. It is a journey that may take twenty years to complete, an itinerary first described by the ancestors at a time when the earth was young and still wet with the innocence of birth" (1990a, p. 106). Broadening this description to general principles of resource use, they suggest that "their biological adaptation, together with their spiritual beliefs, demand that they exploit the forest in a sustainable manner. Central to their worldview is a sacred obligation to bequeath to the following generations a healthy forest fully capable of providing life to its human inhabitants" (ibid.,

p. 107). Finally, Davis and Henley provide a rather embellished description of the *molong* concept:

> This Penan notion of stewardship is encapsulated in *molong*, a concept that defines both a conservation ethic and a notion of resource ownership. To *molong* a sago palm is to harvest the trunk with care, insuring that the tree will sucker up from the roots. *Molong* is climbing a tree to gather fruit, rather than cutting it down, harvesting only the largest fronds of the rattan, leaving the smaller shoots so that they may reach proper size in another year. Whenever the Penan *molong* a fruit tree, they place an identifying sign on it, a wooden marker or a cut of a machete. It is a notice of effective ownership and a public statement that the natural product is to be preserved for harvesting at a later time. In this way, through time, the Penan have allocated specific resources—a clump of sago, fruit trees, dart poison trees, rattan stands, fishing sites, medicinal plants—to individual kin groups. The Penan acknowledge these as familial rights that pass down through the generations. In many cases the identifying mark on a particular tree takes the form of two parallel sticks—a sign that acknowledges ownership while inviting the wayfarer to share at the proper time in the bounty of the resource. It is the equivalent of a private property sign that reads "please share wisely" rather than "no trespassing." (ibid., p. 114)

Close examination of the preceding statements reveals a number of inaccuracies: the fact that Davis and Henley do not acknowledge the distinction between Eastern and Western Penan, that they infer a system of direct inheritance, and that they include such things as fishing sites and medicinal plants in their discussion of the *molong* concept. More disconcerting, however, is an apparent need to embellish their description with reference to a form of ecological etherealism that is derived entirely from the Western romantic tradition and has little relation to any set of ideas that would be recognizable to Penan.

Concepts of Landscape

The same characteristics present in Davis and Henley's description of resource management are also evident in the way they describe Penan concepts of landscape. Again this is derived largely from material published by this author. In my 1986 article, I described something of the depth of Penan knowledge of the landscape: the richness of vocabulary for talking about landforms and rivers, the way in which rivers form the skeleton around which environmental knowledge is organized, and how river names incorporate geographical, ecological, historical, and genealogical information.

My intent was to demonstrate how Penan encode ecological information in the naming of landscape features and to demonstrate the coherence existing

between the physical landscape, history, genealogy, and the identities of individuals and communities. I described Penan landscape knowledge as follows:

> A conspicuous feature of the Penan environment is rivers. . . . The importance of rivers to the Penan can scarcely be underestimated. In an environment where visibility seldom exceeds 200 ft, these rivers and streams form the skeleton around which environmental knowledge is organized. . . . When traveling in the forest, Penan are always cognizant of their precise location relative to various rivers. This keen sense of spatial relationships derives from an awareness of the relative size of rivers, the angle of flow of one river to another, the topography between particular rivers, the proximity of headwaters of different rivers, and other sorts of environmental cues. . . . To Penan however, the landscape is more than simply a vast, complex network of rivers. Above all it is a reservoir of detailed ecological knowledge and a repository for the memory of past events. (Brosius, 1986, pp. 174–175)

I then proceeded to describe how rivers are named—for persons, for landscape features, for ecological features, or for particular events—and how, in turn, the deceased are spoken of with reference to rivers. I also described the significance of such naming practices in establishing the "cultural density" of the landscape:

> The landscape itself serves as an idiom of the maintenance of historical and genealogical information. This idiom is more than a trivial mode of expressing nostalgia. . . . It is an important mnemonic device for the maintenance of social relationships. . . . At the same time it serves to establish the rights of Penan communities to exploit the resources of a given area. The rivers in which the ancestors are buried are the source of livelihood for their living descendants. (Brosius, 1986, p. 175)

This discussion of the nature of Penan knowledge of the landscape is altogether transformed by Davis and Henley. Davis states that "for the Penan this forest is alive, pulsing, responsive in a thousand ways to their physical needs and their spiritual readiness" (Davis, 1990, p. 98). Trees are "blessed with spirits, the animals imbued with magical powers" (ibid., p. 99). Discussing the Penan's skill as "naturalists," Davis suggests that it exists because they identify "both psychologically and cosmologically with the rainforest" (ibid., p. 99). Further, "for Penan, every forest sound is an element of a language of the spirit" (ibid., p. 99). Davis states that "to walk in God's forest is to tread through an earthly paradise where there is no separation between the sacred and the profane, the material and the immaterial, the natural and the supernatural" (ibid., p. 99).

Davis and Henley maintain that "fearful of the heat of the sun, ignorant of the seas, insulated from the heavens by the branches of the canopy, their entire

cognitive and spiritual world became based on the forest" (1990a, p. 106). Finally, in a more recent work, Davis asserts that "the Penan view the forest as an intricate, living network. Imposed from their imagination and experience is a geography of the spirit that delineates time-honored territories and ancient routes that resonate with the place names of rivers and mountains, caves, boulders, and trees" (1993, p. 25).

What we observe in the statements above is a strategy by which a pattern of recognizing landscape and encoding knowledge about that landscape is transformed into an obscurantist, essentializing discourse which in fact elides the substantive features of that knowledge. The implications of this will be considered in the discussion to follow.

The Rhetoric of Medicinal Plants

A central element of environmentalist rhetoric on rainforest preservation concerns the value of such forests for the potential medicines they might provide Western science and the importance of indigenous knowledge as a key to the discovery of those medicines. In the film *The Penan: A Disappearing Civilization in Borneo*,[15] the narrator provides the following commentary:

> The greatest reason for protecting this rainforest is perhaps found in the Penan's knowledge of forest products with medicinal purposes. The stem of a certain leaf cures stomach pains, the inner bark of a tree reduces headache and fever within seconds of being applied to one's forehead. When asked if there are any plants nearby that are good for medicine, the Penan will reach for a dozen or more where they stand and explain their use.
>
> With more than 40,000 years of experimentation and observation, the Penan have enormous medical knowledge which Western scientists cannot duplicate. Today less than 1% of the world's tropical forest plants have been tested for pharmaceutical properties. Yet 25% of all our medicine comes from the rainforest. Three-quarters of all anti-cancer drugs are rainforest derivatives. As hundreds of thousands of acres of Sarawak's primary forests are succumbing to chainsaws, the world is coming to realize that this is the tragedy affecting us all.

Though in these cases referring to the Penan, such statements are common in contemporary rainforest conservation rhetoric more generally.

Given Davis's background in ethnobotany and ethnopharmacology, he was particularly interested in documenting Penan knowledge of medicinal plants. On his first visit to Sarawak, Davis devoted considerable attention to collecting medicinal plants and to talking with Penan about their uses. According to Davis and Henley, "Preliminary ethnobotanical surveys suggest that the Penan employ over fifty medicinal plants which they harvest from the primary forest. . . . The

first challenge in assessing the potential of other Penan pharmacopoeia entails understanding the belief system that mediates their use of medicinal plants" (1990a, p. 117). Davis and Henley then proceed to expand on what they mean by "belief system": "In general indigenous medicine is based on a thoroughly non-western conception of the etiology of disease in which health is defined as a coherent state of equilibrium between the physical and spiritual components of the individual. Health is wholeness, which in turn is perceived as something holy" (ibid., p. 117). They proceed to discuss a melange of Penan/indigenous theories of disease and, in so doing, again make a plea for the preservation of Penan medicinal knowledge:

> With a spirit world that is alive, the Penan quest for healing and well being is rooted both in magico-religious belief and a perspicacious knowledge of pharmacologically active plants. Understanding their folk medicine and identifying those of their plants that may ultimately serve the needs of all human societies is a complex and time consuming task. Unfortunately, as in the case of indigenous societies throughout the world, the traditional knowledge is being lost at a tremendous rate. Logging activities are destroying the source of the medicines even as the forces of acculturation disrupt the integrity of the belief system itself. (ibid., p. 118)

Finally, referring to the complaints of one Penan featured in their 1990 book about the ineffectiveness of medicines provided by the government, Davis and Henley state, "What Dawat is saying is that a synthetic drug cannot replace the spirit of the plants, imbued as they are with the power to heal" (ibid., p. 118).

One of the more interesting consequences of the environmentalist rhetoric of medicinal plants—evident in the preceding quote—is that this rhetoric has itself suffused back to the Penan and been adopted by them as their own. When one visits Penan today, in those areas where blockades have occurred, one of the consequences of forest destruction they most commonly decry is the loss of medicinal plants. As my data collection among Eastern Penan in blockade areas proceeded, I was struck by the frequency with which I heard such statements. In three years with Western Penan in the 1980s—in a nonblockade area, and in a mostly preblockade era—I rarely heard medicinal plants mentioned or discussed in any context. Certainly Western Penan knew of several, but these tended to be few and to be used for a very broad range of illnesses. I encountered none of the nonstop commentary on the value of traditional medicinal plants that is so evident today when one walks through the forest with Eastern Penan. When I first began working among Western Penan, I fully expected that I would hear much more on this subject. In 1980, I conducted fieldwork among Pinatubo Atya in the Philippines, who have an enormous knowledge of medicinal plants (Fox, 1952) and who constantly pointed them out. What struck me about Western Penan in the 1980s is that they showed so little interest in medicinal plants.

In the 1990s, Western Penan in the Belaga District still did not, yet Eastern Penan in the Baram District—that is, in those areas visited by environmentalists—did so with remarkable consistency.[16]

Davis and Henley are not alone in stressing the richness of Penan knowledge of medicinal plants. Other environmentalists writing about the Penan also frequently mention this. Part of the reason for this is that they are told about such plants by Penan. I believe that what we are observing here is what might be termed the "Plotkinization" of the discourse of indigenous knowledge of medicinal plants. Mark Plotkin, of course, has been a leading figure in developing an awareness of the depth of ethnobotanical knowledge of medicinal plants among indigenous peoples in Amazonia.[17] This awareness has diffused into the rhetoric of rainforest conservation in many ways: it has now become standard practice to describe the depth of knowledge of medicinal plants of particular rainforest societies. Such knowledge may exist in other indigenous societies, but it is much less significant among Penan than recent statements would lead one to expect. This is a kind of ethnographic hall of mirrors; drawing on rhetorics derived from an Amazonian context, environmentalists have brought assumptions derived from a familiarity with Plotkin's work to the Penan, who then repeat it back to other environmentalists, who take it as an exemplar of the depth of indigenous knowledge. Precisely how this has occurred is nearly impossible to reconstruct, but it would seem that it occurs in the myriad conversations that have occurred between Penan and the environmentalists who have visited them. Penan take note of the Western gaze on medicinal plants and turn it back to them as commentary.

Discussion

Drawing mostly on the writings of Davis and Henley as an exemplar of a more general phenomenon, I have attempted to show in one ethnographic context how indigenous "knowledge" is represented and transformed. It has not been my goal to simply provide a particularistic critique of how one group of people have been portrayed and to describe what Penan are "really" like. Nor is this discussion intended as a critique of Western representations of the "other." That would hardly be very original. Rather, this case raises several fundamental questions about how objective conceptions of knowledge are appropriated and deployed in environmental campaigns and what the consequences of this might be.

There are, in fact, several ways in which the objectivist conception of knowledge has been transformed in the texts I have provided. I have focused on one in particular in the first two cases discussed above: how indigenous "knowledge" is linked to the sacred or ineffable. As noted, it is transformed into wisdom, spiritual insight, or some other such quality. This transformation serves a certain purpose. In describing peoples such as the Penan, the problem for

environmentalists and indigenous rights activists is twofold. First, how does one make a society narratable? That is, what must one do to be able to talk about it? However one defines indigenous knowledge, it is not easily accessible. It is not something that can be picked up in a few short weeks, particularly for individuals lacking linguistic competence. The problem for environmentalists is how, nevertheless, to create texts about peoples such as the Penan and how to talk about the knowledge which they hold to be so valuable without actually comprehending much about that knowledge. Second, how does one create value? Environmentalist and indigenous rights campaigns are generally concerned with peoples who are "endangered" precisely because they, their institutions, and their systems of land tenure are disvalued by national governments. The Malaysian government considers the Penan a national embarrassment, a people who represent precisely those things they are trying to overcome in their national development efforts. The goal of environmentalists then is axiological: to demonstrate both to the government and to Western audiences what is at stake if the forest and the Penan are destroyed.

By reducing Penan knowledge to the sacred or ineffable, the Penan are made both narratable and valuable. In linking knowledge to the sacred, commentators acquire a way to construct metacommentaries about the *meaning* of a body of knowledge, rather than about that knowledge itself. The danger, of course, is that such meanings may only be interpolated and may, in fact, be Western in origin.

In short, the discourse of the sacred serves to make Penan narratable, all the while serving to elide gaps in understanding. At the same time it also imbues them with value: a value that authors themselves feel in a most profound way but cannot otherwise articulate. It makes land, resources, and people inviolable, and it does this by appealing to preexisting categories of value: the endangered, the last whisper of an ancient past. As David Suzuki said of one Penan, "Listen to Dawat. He is what we once were" (1990, p. 8).

The metacommentary on the sacred or ineffable has a number of pernicious effects. The most obvious is that it imposes meanings on Penan "knowledge" that may be quite imaginary. In imposing some meanings, it expunges others. Penan certainly have some sense of the ineffable, and this is expressed in a range of concepts relating to power, avoidance, respect, and so forth (see Brosius, 1992, 1995, 1995–1996). But it is nothing like the obscurantist sanctity Davis and Henley describe. Reducing the ineffable to "sacred" transforms and distorts it.

Second, it paradoxically makes generic precisely the diversity that it is trying to advance. Whatever else sanctity is, it is not a universal category. In presenting Penan knowledge as wisdom or insight having a sacred quality, one is imposing a falsely universalized quality on a range of peoples and thereby collapsing precisely the diversity that defines them. The Penan are transformed into a homogeneous "indigenous people" or "forest people." This is a very common—and often

quite explicit—element in contemporary commentaries on indigenous rights. For instance, Durning states that "amid the endless variety of indigenous belief, there is striking unity on the sacredness of ecological systems" (1992, pp. 28–29). According to Native American activist Winona LaDuke, "Traditional ecological knowledge is the culturally and spiritually based way in which indigenous peoples relate to their ecosystems. This knowledge is founded on spiritual-cultural instructions from 'time immemorial' and on generations of careful observation within an ecosystem of continuous residence" (1994, p. 127).

Suzuki and Knudtson describe "this ancient, culturally diverse aboriginal consensus on the ecological order and the integrity of nature [which] might justifiably be described as a 'sacred ecology'" (1992, p. 18). Barreiro asserts that "indigenous cultures are rich in ecological concept. 'Our Mother the Earth' is a reality in the cosmologies of virtually every native people in the world. . . . It is one of the currents of thought that make up Pan-Indigenous philosophy and a basic message of the Indian peoples (1991, p. 200). And Wade Davis describes the Penan as "related in spirit to the Mbuti pygmies of Zaire and the wandering Maku of the Amazon" (1993, p. 24).

The discourse of medicinal plants is something else again. I do not mean to suggest that Eastern Penan lack knowledge of medicinal plants. Rather, what is significant is the way in which Penan presently emphasize and elaborate on this domain of knowledge as a central element of their objections to logging, a product of environmentalist involvement with Penan. Indigenous knowledge of medicinal plants forms a highly narratable domain and invests environmentalist statements about the Penan with an aura of authority. As such, it becomes a locus around which environmentalists and Penan can converse. One might argue that those domains of indigenous knowledge that are most accessible in this manner are elevated to a particularly important status in the discourse of endangered knowledge.

In the preceding discussion, I have attempted to show how, in an effort to make a people narratable and to create value (all the while essentializing them as "forest people"), environmentalist discourse about indigenous knowledge has the potential to transform that knowledge into something it is not. To save something, or to mobilize an audience to want to save something, requires that it be made beautiful or profound or have some transcendent value. In creating that value, however, the thing itself is transformed. Thus the rich, if generally mundane, Penan knowledge of the forest landscape, by being transformed into something that is sacred, valued, and thus to be saved, is constructed in terms of categories that are Western in origin. We see here a hall of mirrors of representation—simulacra—as Penan knowledge is transformed into something that it is not, and Western discourses are transported to Penan, who again convey them to Western interlocutors. The essential—and diverse—qualities of indigenous knowledge are lost along the way. As the future of the forests, other

biomes, and indigenous peoples is negotiated in the years ahead in a plethora of post-Rio international fora, the issue of who talks for whom and who constructs representations of whom is critical.

NOTES

1. I translated this interview in 1989 for the Davis and Henley volume for which Dawat Lupung, the individual interviewed, was awarded the Reebok Human Rights Award.
2. In the following discussion, reference to *environmentalists* should be understood to refer both to representatives of environmental organizations such as World Wide Fund for Nature and Greenpeace, as well as to representatives of indigenous rights organizations such as Survival International and Cultural Survival. Though these two types of organizations have at times been at odds, there has been some movement in recent years toward a convergence of interests.
3. Davis received his PhD in ethnobotany from Harvard University under the supervision of the prominent ethnobotanist Richard Schultes and is most well-known as the author of *The Serpent and the Rainbow* (Davis, 1985). In the late 1980s, a controversy developed around Davis's work on Haitian voodoo (see Booth, 1988; Yasumoto and Kao, 1986). Henley, before he became involved in the Sarawak issue, was instrumental in organizing the campaign to protect the Queen Charlotte Islands, one of Canada's most historically significant environmental campaigns. Within the context of the Sarawak campaign, Henley's most active role was in organizing the 1990 Voices for the Borneo Rainforest World Tour, a series of events that brought two Penan and one Kelabit activists to Australia, Japan, North America, and Europe—some 18 countries in all. Henley and Davis, along with several other individuals, cofounded the Endangered Peoples Project, a foundation "dedicated to the promotion of biological and cultural diversity" (Henley, 1990, p. 93).
4. Eastern and Western Penan in Sarawak together number some 7,000 individuals. The Eastern Penan total some 4,500 in approximately 50 communities, while Western Penan total some 2,500 in 18 communities. These figures are updated from figures I have provided in previous publications and reflect estimations of population growth since 1987, when I carried out a census of Western Penan. In addition to Eastern and Western Penan, there are also several small groups of Penan who have been settled for a century or more and who have little interaction with either Eastern or Western Penan. These include the Penan Nyivung, Penan Bok, Penan Suai, and Penan Jelalong (for more information on Penan in Sarawak, see Arnold, 1958; Brosius, 1986, 1988, 1990, 1991a, 1991b, 1992, 1993a, 1993b, 1995, 1995–1996; Harrisson, 1949; Huehne, 1959; Kedit, 1978, 1982; Langub, 1972a, 1972b, 1974, 1975, 1984, 1988, 1989, 1990; Needham, 1954a, 1954b, 1954c, 1954d, 1965, 1972; Nicolaisen, 1976a, 1976b, 1978; Urquhart, 1951, 1957, 1959).
5. These figures refer to band size prior to settlement. Both Eastern and Western Penan communities tend to experience growth once settlement occurs (see Arnold, 1958; Needham, 1972; Urquhart, 1951).
6. Among both Eastern and Western Penan, the trend toward sedentism has accelerated greatly since about 1960. I estimate that in 1960, 70%–80% of all Eastern and Western Penan were still nomadic. Of 7,000 Eastern and Western Penan today, fewer than 400 Eastern Penan in the vicinity of the Magoh, Tutoh, and upper Limbang River areas remain fully nomadic, approximately 5% of the total. The last nomadic Western Penan settled ca. 1970.
7. In addition to SAM, another local NGO, the Sarawak Indigenous Peoples Alliance (SIPA), also played a key role in the campaign for a short time. SIPA was forced to disband by the Sarawak government in 1992 after founder Anderson Mutang Urud was arrested.

8. Among the environmental and indigenous rights organizations who have been involved in the Sarawak campaign are Rainforest Action Network (U.S.), Friends of the Earth, Greenpeace, Western Canada Wilderness Committee, Japan Tropical Forest Action Network, Rettet den Regenwald (Germany), Robin Wood (Germany), Society for Threatened Peoples (Austria, Germany, Switzerland), ProRegenwald (Germany), Nepenthes (Denmark), Global 2000 (Austria), Bruno Manser Fonds (Switzerland), and the Rainforest Information Center (Australia). Their activities have ranged from letter-writing campaigns to attempts at tropical timber boycotts, protests at Malaysian embassies, ship blockades in Europe and Australia, and direct actions in Sarawak itself.
9. As this article was under review, I received from Davis a copy of his most recent book on the Penan, coauthored with Ian Mackenzie and Shane Kennedy (Davis, Mackenzie, and Kennedy, 1995). Though it retains some of the romanticized language that appears in previous works by Davis and Henley, in this most recent piece an effort was made to provide a more realistic portrait of the Penan by a more balanced use of ethnographic material and by the inclusion of numerous translated Penan commentaries.
10. See Brush and Stabinsky (1996) for a comprehensive overview of issues involved in establishing a legal basis for the recognition of indigenous intellectual property rights.
11. Bruno Manser is a conspicuous exception here; having lived with Penan for over six years, he became a fluent speaker of the Eastern Penan language.
12. The process by which campaigns develop is extremely complex, particularly with respect to the relationship between the initial analysis of a particular context, decisions about how to proceed in a campaign, and the representations that are ultimately produced and deployed. Most environmental and indigenous rights organizations are self-consciously aware of the contrast between the images they purvey and the realities of a given situation, but they must also necessarily provide persuasive images. In any event, it is a mistake to equate the often bold simplicity of campaign images with the processes of analysis and debate that both precede and follow their deployment.
13. Since providing this initial definition "to preserve," I have further clarified the semantic content of the term *molong* (Brosius, 1991a, 1992, 1993a). It conveys the sense of fosterage as well as preservation. The *molong* concept does not constitute ownership of resources: rather, it encompasses a somewhat individuated, proprietary concept of stewardship. Other members of the community may exploit resources which are individually claimed, but they must inform the individual who has claimed that resource. The *molong* system does two things: (1) it serves as a way to monitor information on the availability of resources over vast tracts of land, and (2) it prevents the indiscriminate cutting of fruit trees and sago, resources which might otherwise be seriously depleted. In one sense, the entire Western Penan settlement system may be seen as a temporalized manifestation of the *molong* concept.
14. It should be noted that Eastern Penan do not *molong* resources to the same degree as Western Penan. Eastern Penan do employ the word *molong* (and the synonym *mulah*), but the concept plays a relatively minor role in Eastern Penan notions of resource management, particularly in its individual aspects. This is not to say that Eastern Penan lack any sense of stewardship over the resources in their foraging areas. It is simply that Eastern Penan concepts of resource management are less formalized and individuated than those of Western Penan.
15. Produced by the Endangered People's Project (Mill Valley, CA) and the Congressional Human Rights Foundation (Washington, DC), written by Thom Henley, and released in 1989.
16. I do not mean to imply that the Penan are lacking ethnobotanical knowledge. Indeed, their knowledge of forest plants is considerable. However, this knowledge tends to focus on plants whose utility is rather mundane: fruit trees, trees that are suitable for firewood, varieties of

rattan useful for making particular types of items, and the like. It is for this reason that the contemporary Eastern Penan emphasis on the threat to medicinal plants is so remarkable.

17. Like Davis, Plotkin was trained by Richard Schultes. Long before the theme of indigenous knowledge of medicinal plants became an element of rainforest conservation rhetoric, Schultes impressed upon his students the potential importance of studies focusing on this topic among native Amazonians.

REFERENCES

Arnold, G. (1958). Nomadic Penan of the upper Rejang (Plieran), Sarawak. *Journal of the Malayan Branch of the Royal Asiatic Society* 31, pt. 1 (181): 40–82.

Barreiro, J. (1991). Indigenous peoples are the "miner's canary" of the human family. In Willers, B. (ed.), *Learning to Listen to the Land*. Island, Washington, DC, pp. 199–201.

Booth, W. (1988). Voodoo science. *Science* 240 (4850): 274–277.

Brosius, J. P. (1986). River, forest and mountain: The Penan Gang landscape. *Sarawak Museum Journal* 36 (57, n.s.): 173–184.

Brosius, J. P. (1988). A separate reality: Comments on Hoffman's *The Punan: Hunters and Gatherers of Borneo*. *Borneo Research Bulletin* 20 (2): 81–106.

Brosius, J. P. (1990). Penan hunter-gatherers of Sarawak, East Malaysia. *AnthroQuest* 42:1–7.

Brosius, J. P. (1991a). Foraging in tropical rainforests: The case of the Penan of Sarawak, East Malaysia (Borneo). *Human Ecology* 19 (2): 123–150.

Brosius, J. P. (1991b). Thrice told tales: A review of *The Nightbird Sings: Chants and Songs of Sarawak Dayaks*. *Borneo Research Bulletin* 22 (2): 241–267.

Brosius, J. P. (1992). The Axiological Presence of Death: Penan Geng Death-Names. Unpublished doctoral dissertation, Department of Anthropology, University of Michigan.

Brosius, J. P. (1993a). Contrasting subsistence ecologies of Eastern and Western Penan foragers (Sarawak, East Malaysia). In Hladik, C. M., et al. (eds.), *Food and Nutrition in the Tropical Forest: Biocultural Interactions and Applications to Development*. UNESCO—Parthenon Man and the Biosphere Series, Paris, pp. 515–522.

Brosius, J. P. (1993b). Penan of Sarawak. In Miller, M. S. (ed.), *State of the Peoples: A Global Human Rights Report on Societies in Danger*. Beacon (for Cultural Survival, Inc.), Boston, pp. 142–143.

Brosius, J. P. (1995). Signifying bereavement: Form and context in the analysis of Penan death names. *Oceania* 66 (2): 119–146.

Brosius, J. P. (1995–1996). Father dead, mother dead: Bereavement and fictive death in Penan Geng society. *Omega: Journal of Death and Dying* 32 (3): 197–226.

Brush, S. (1993). Indigenous knowledge of biological resources and intellectual property rights: The role of anthropology. *American Anthropologist* 95 (3): 653–671.

Brush, S., and Stabinsky, D. (eds.) (1996). *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights*. Island, Washington, DC.

Davis, W. (1985). *The Serpent and the Rainbow*. Simon and Schuster, New York.

Davis, W. (1990). A way to stay. In Davis, W., and Henley, T. (eds.), *Penan: Voice for the Borneo Rainforest*. Western Canada Wilderness Committee, Vancouver, BC, pp. 97–101.

Davis, W. (1992). *Shadows in the Sun: Essays on the Spirit of Place*. Lone Pine, Edmonton, AB.

Davis, W. (1993). Death of a people: Logging in the Penan homeland. In: Miller, M. (ed.), *State of the Peoples: A Global Human Rights Report on Societies in Danger*. Beacon (for Cultural Survival, Inc.), Boston, pp. 23–32.

Davis, W., and Henley, T. (1990a). Beyond the images. In Davis, W., and Henley, T. (eds.), *Penan: Voice for the Borneo Rainforest*. Western Canada Wilderness Committee, Vancouver, BC, pp. 103–142.

Davis, W., and Henley, T. (eds.) (1990b). *Penan: Voice for the Borneo Rainforest*. Western Canada Wilderness Committee, Vancouver, BC.

Davis, W., Mackenzie, I., and Kennedy, S. (1995). *Nomads of the Dawn: The Penan of the Borneo Rain Forest*. Pomegranate Artbooks, San Francisco.

Durning, A. (1992). *Guardians of the Land: Indigenous Peoples and the Health of the Earth*. Worldwatch Paper 112, Worldwatch Institute, Washington, DC.

Fox, R. B. (1952). The Pinatubo Negritos: Their useful plants and material culture. *Philippine Journal of Science* 81 (3–4): 173–414.

Harrisson, T. (1949). Notes on some nomadic Punans. *Sarawak Museum Journal* 5 (1, n.s.): 130–146.

Henley, T. (1990). Encountering Dawat. In Davis, W., and Henley, T. (eds.), *Penan: Voice for the Borneo Rainforest*. Western Canada Wilderness Committee, Vancouver, BC, pp. 93–96.

Huehne, W. H. (1959). A doctor among "nomadic" Punans. *Sarawak Museum Journal* 9 (13–14, n.s.): 195–202.

Kedit, P. M. (1978). *Gunong Mulu Report: A Human-Ecological Survey of Nomadic/Settled Penan within the Gunong Mulu National Park Area, Fourth/Fifth Division, Sarawak*. Sarawak Museum Field Report Series No. 1, Sarawak Museum, Kuching, Malaysia.

Kedit, P. M. (1982). An ecological survey of the Penan. *Sarawak Museum Journal* (Special Issue No. 2), 30 (51, n.s.): 225–279.

LaDuke, W. (1994). Traditional ecological knowledge and environmental futures. In *Endangered Peoples: Indigenous Rights and the Environment. Colorado Journal of International Environmental Law and Policy*. University Press of Colorado, Niwot, pp. 127–148.

Langub, J. (1972a). Adaptation to a settled life by the Punans of the Belaga Subdistrict. *Sarawak Gazette* 98 (1371): 83–86.

Langub, J. (1972b). Structure and progress in the Punan community of Belaga Subdistrict. *Sarawak Gazette* 98 (1378): 219–221.

Langub, J. (1974). Background report on potential for agricultural and social extension service in the Penan community of Belaga District. *Sarawak Gazette* 100 (1395): 93–96.

Langub, J. (1975). Distribution of Penan and Punan in the Belaga District. *Borneo Research Bulletin* 7 (2): 45–48.

Langub, J. (1984). Tamu: Barter trade between Penan and their neighbors. *Sarawak Gazette* 110 (1485): 11–15.

Langub, J. (1988). The Penan strategy. In Denslow, J., and Padoch, C. (eds.), *People of the Tropical Rain Forest*. University of California Press, Berkeley, pp. 207–208.

Langub, J. (1989). Some aspects of life of the Penan. *Sarawak Museum Journal* (Special Issue No. 4), pt. 3, 40 (61, n.s.): 169–184.

Langub, J. (1990). A journey through the nomadic Penan country. *Sarawak Gazette* 117 (1514): 5–27.

Linden, E. (1991). Lost tribes, lost knowledge. *Time*, September 23, Vol. 138 (12): 46–56.

Needham, R. (1954a). Penan and Punan. *Journal of the Malayan Branch, Royal Asiatic Society* 27 (1): 73–83.

Needham, R. (1954b). A Penan mourning usage. *Bijdragen tot de Taal-, Landen Volkenkunde* 110:263–267.

Needham, R. (1954c). Reference to the dead among the Penan. *Man* 54:10.

Needham, R. (1954d). The system of teknonyms and death-names of the Penan. *Southwestern Journal of Anthropology* 10:416–431.

Needham, R. (1965). Death-names and solidarity in Penan society. *Bijdragen tot de Taal-, Landen Volkenkunde* 121:58–76.

Needham, R. (1972). Punan-Penan. In Lebar, F. M. (ed.), *Ethnic Groups of Insular Southeast Asia, Vol. 1: Indonesia, Andaman Islands, and Madagascar*. Human Relations Area Files Press, New Haven, CT, pp. 176–180.

Nicolaisen, J. (1976a). The Penan of Sarawak: Further notes on the neo-evolutionary concept of hunters. *Folk* 18:205–236.

Nicolaisen, J. (1976b). The Penan of the Seventh Division of Sarawak: Past, present and future. *Sarawak Museum Journal* 24 (45, n.s.): 35–61.

Nicolaisen, J. (1978). Penan death-names. *Sarawak Museum Journal* 26 (47, n.s.): 29–41.

Suzuki, D. (1990). Foreword. In Davis, W., and Henley, T. (eds.), *Penan: Voice for the Borneo Rainforest*. Western Canada Wilderness Committee, Vancouver, BC, pp. 7–8.

Suzuki, D., and Knudtson, P. (1992). *Wisdom of the Elders: Sacred Native Stories of Nature*. Bantam Books, New York.

Urquhart, I. A. N. (1951). Some notes on jungle Punans in Kapit District. *Sarawak Museum Journal* 5 (13, n.s.): 495–533.

Urquhart, I. A. N. (1957). Some Kenyah/Pennan relationships. *Sarawak Museum Journal* 8 (10, n.s.): 113–116.

Urquhart, I. A. N. (1959). Nomadic Punans and Pennans. In Harrisson, T. (ed.), *The Peoples of Sarawak*. Sarawak Museum, Kuching, Malaysia, pp. 73–83.

Yasumoto, T., and Kao, C. Y. (1986). Tetrodotoxin and the Haitian zombie. *Toxicon* 24 (8): 747–749.

26

The Nature of Gender*

Work, Gender, and Environment

ANDREA NIGHTINGALE

Introduction

Gender has long been recognized as important within environmental issues, but exactly how it is relevant and in what contexts have been hotly debated. Some feminists have argued that there is a natural or essential connection between women and nature which gives women an innate understanding of ecosystems and environmental protection (Diamond and Orenstein, 1990; Shiva, 1988). This kind of essentialist thinking has been challenged by other feminists who instead focus on the material practices that bring women closer to nature and which thus give them learned, practical knowledge of ecosystems (Agarwal, 1992; Warren, 1987). Within geography, many political ecologists have embraced a historical-materialist argument and focus on gender as one relation through which access to and distribution of natural resources is differentiated within societies (Carney, 1994; Fortmann, 1996; Freidberg, 2001b; Gururani, 2002; Mackenzie, 1995; Rocheleau et al., 1996; Schroeder and Suryanata, 1996). In this work, gender is closely linked to biological sex and understood as culturally defined male-female roles. Such studies have documented how women are denied access to new technologies, training, and other benefits of development projects and given limited access to and control over land and natural resources (Barker, 2000; Carney, 1996; Deere and de Leal, 1981; Moser, 1993; Nathen, 1995). What remains generally unaddressed, however, is how such inequality is maintained over time and space, particularly in societies in which women shoulder the bulk of the agricultural work.

In this paper I explore the production of social inequalities and environments by examining how and when gender and other forms of difference become enrolled in environmental issues. I draw on definitions of gender that imagine it as a process by which subjectivities are produced and shift over time and space (Butler, 1990, 1997; Connell, 1987; Mahoney and Yngvesson, 1992; Mehta and Bondi, 1999), rather than as part of power-laden systems of social structures.

* From *Environment and Planning D: Society and Space* 24, no. 2 (2006): 165–185. Used by permission of Pion Ltd., London (www.pion.co.uk and www.envplan.com).

The meaning and relevance of gender are thus produced in space and in part constitute that space such that neither can preexist the other (Bondi and Davidson, 2004; Massey, 1994; McDowell, 1999; Pratt and Hanson, 1994). If gender is unable to preexist its context, then the focus of gender environment studies needs to shift to how gender becomes relevant in environmental disputes and how gendered subjectivities are (re)produced in environments (see Bondi and Davidson, 2004).

This conceptualization emphasizes that gender is not constant and predetermined materially or symbolically but rather becomes salient in environmental issues through work, discourses of gender, and the performance of subjectivities. Not only are inequalities between men and women a consequence of environmental issues; gender is a cause of environmental change in the sense that gender is inextricably linked to how environments are produced. When gender is conceptualized as a process, the complex interplay between gender, environment, and other relevant aspects of social and cultural processes can be analyzed. . . .

Gender and Environment

In this section I highlight three key strands discernable in existing work on gender and environment to demonstrate how gender has been treated conceptually and the complexity of thinking within this literature (for good reviews see Agarwal, 1992; Moeckli and Braun, 2001; Nesmith and Radcliffe, 1993; Rocheleau et al., 1996). First, I briefly discuss the contributions as well as the limitations of essentialist thinking about gender and environment (see Bondi and Davidson, 2004). In this strand there is an assumption of an "inherent" or "natural" connection between women and the land, providing women with privileged knowledge of environmental change and privileged roles in redressing environmental destruction (Diamond and Orenstein, 1990; Mies and Shiva, 1993; Shiva, 1988). Second, I outline work that emphasizes the material practices that shape the relationships between gender and environment. This strand argues for a contingent, production-based relationship between gender and environmental knowledge and action (Agarwal, 1992; Plumwood, 1991; Warren and Cheney, 1991). Third, I discuss more recent work . . . that brings together these perspectives with insights from political ecology to highlight gendered knowledges, rights, and politics in the context of environmental issues (Freidberg, 2001b; Rocheleau et al., 1996).

Essentialist Conceptualizations of Gender Environment

In the mid-1970s feminist scholars began to examine the dualistic associations that aligned women with nature and men with culture (Griffin, 1978; Ortner, 1974). These associations were linked to a host of binary structures such as men are rational and women are emotional, women are nurturing whereas men are

competitive (Haraway, 1991; Merchant, 1982; Ortner, 1974). In response to this some feminists embraced the idea that women are closer to nature and, in the context of the growing environmental movement, argued that women inherently have a better understanding of the importance of environmental protection (Diamond and Orenstein, 1990; Mies and Shiva, 1993; Shiva, 1988). This ecofeminist thinking was premised on the idea that the domination of women was linked to environmental destruction and other problematic social inequalities such as racism. Griffin's (1978) book *Women and Nature: The Roaring Inside Her* was an important piece of lyrical writing that helped to inspire ecofeminism. In this book Griffin uses poetry and evocative writing to equate the violence done to the land with violence done to women. Importantly, she puts forward the idea that women, like nature, could fight back and were doing so using their "nature."

This kind of work promoted an essentialist notion of women that was common within feminism at the time. "Women" was a largely undifferentiated category, and it was assumed that all women would have the same kind of sympathies and understandings of environmental change as a consequence of their close connection to nature. Shiva's (1988) book *Staying Alive: Women, Ecology, and Development* is perhaps one of the most famous examples to come out of this kind of thinking. This book discusses the grassroots Chipko movement in northern India and the symbolic resources which women involved drew upon to save forests from commercial loggers.

In it she argues that Indian women have an inherent connection to nature, and the power that arises from that connection inspires them to risk their lives in front of logging machinery. Although women are oppressed and marginalized in modern Indian society, Shiva draws from ancient religious beliefs and stories to suggest that women are in fact more powerful than men and certainly have a more profound understanding of environmental change. This work was incredibly important in promoting the idea that uneducated people (especially women) could have a better understanding of environmental protection than scientists and policy makers. It was also important in advocating a global women's movement, linked together by threats to women's home environments (see Seager, 1993). Shiva asserted that the inherent understanding women have of their environments would help to bridge cultural gaps and provide a focus around which they could join together globally. Although heavily criticized both within India and by other feminists for inaccuracies in her work and for problematic assumptions about different women's experiences, Shiva's work has inspired women all over the world to defend environmental resources and was central in making "Chipko" a household name in many places.

Other key ecofeminists focused on the ideological assumptions of modern science that are based upon dominating "mother nature" (Merchant, 1982; Mies and Shiva, 1993; Plumwood, 1991; Warren, 1987). They argued that there are close

connections between patriarchy and modern transformations of environments. Thus the reversal of environmental destruction cannot fully occur without the emancipation of women. In this kind of conceptualization, gender, based on biological sex, is the foundational relation that serves to support other problematic relations such as race, class, and heterosexism (Plumwood, 1991; Warren, 1987).

Materialist Conceptions of Women-Environment

Conceptualizing the relationship between women and nature as an essential one thus helped to define a global women's environmental movement and challenged the hegemony of (male) scientific knowledge as the privileged source of information about environmental change. However, as other feminists argued, essentialist conceptualizations of women ignored very real differences that exist between women and, worse, rely on the notion of an essential female nature (Cuomo, 1998). Women of color in the United States were some of the first feminists to challenge the white, middle-class bias in feminism (hooks, 1984; Moraga and Anzaldúa, 1988). Latino and African American women argued that in many contexts race was more salient in shaping their experiences of inequality and thus that the intersections of race, class, and gender need to be theorized (hooks, 1990; Kobayashi and Peake, 1994; Moraga and Anzaldúa, 1988).

In India, Agarwal (1992) challenged Shiva's essentialist rendering of the women and environment nexus, drawing from her own work on women and fuelwood issues in the Himalayas. She argued that, although a relationship between women and their motivation to protect the environment could indeed be identified, this relationship was based on their material realities and not on some inherent, close connection to nature. Many Indian women are responsible for the food and fuel needs of their families, which require them to tend the land and gather products from forests (Agarwal, 1994; Gururani, 2002). These activities give them intimate knowledge of their ecosystems and a strong need to ensure that resources are used sustainably; failure to do so results in increased work burdens for themselves (Agarwal, 1994, 1997). She named this brand of theorizing "ecological feminisms" to distinguish it from the essentialist conceptions of women that were beginning to dominate the ecofeminism literature (Agarwal, 1992).

Ecological feminisms argued for a clear focus on gender, defined as the differences between men's and women's experiences and knowledge in relation to their environment. This focus illuminates the importance of material practices, in particular men's and women's work practices, and of culturally specific gender roles in shaping the gender-environment nexus. It also builds on ideas already put forward by Shiva and others that rural women's environmental knowledge is valid and important. By basing this claim on material practices, Agarwal helped

to give an empirical basis to the idea that women have unique environmental knowledge and, significantly, brought a political-economic analysis into the debate around gender and environment. She argued that the material conditions of people's lives are complicit in producing particular kinds of environmental problems, and these problems place extra burdens on women responsible for the subsistence needs of their families. Thus attention to political economy as well as to cultural expectations and behavior around gender is important in analyzing environmental issues.

Feminist Political Ecology

Building from ecofeminism and ecological feminism, the book *Feminist Political Ecology* edited by Rocheleau et al. (1996) laid out what they saw as the three key themes to emerge from feminist theorizing on gender and environment and recent political-ecology work:

1. Gendered knowledge, or the ways in which access to scientific and ecological knowledge is structured by gender.
2. Gendered environmental rights and responsibilities, including differential access by men and women to various legal and de facto claims to land and resources.
3. Gendered politics and grassroots activism, including an examination of women within and as leaders of environmental movements. . . .

Most of the work done within feminist political ecology demonstrates how gender, understood as culturally defined male-female sex roles, structures access to particular types of knowledge, space, resources, and social-political processes (compare Carney, 1996; Freidberg, 2001b; Rocheleau et al., 1996). The focus on these structures provides an important foundation for arguing that men and women have differential opportunities and challenges in relation to environmental change and development. Feminist political ecology provides tools for political ecologists to examine gender and emphasizes the importance of considering gender in the context of a variety of natural-resource issues. The emphasis within feminist political ecology, however, has largely remained on women, and, indeed, in places in Rocheleau et al.'s book (1996) "gender" seems synonymous with "women." There is a danger in such a conceptualization of falling back into essentialist understandings of women and their "natural" connection to the land. This kind of essentialism masks a variety of political-economic, cultural, and symbolic processes by which gender is produced by environmental issues as well as being implicated in the construction of the "issue" itself. In short, what is still not sufficiently highlighted is a clear understanding of how gender has come to be relevant in these contexts at all.

Towards a Reconceptualization of Gender-Environment

Within the mainstream development literature, gender politics are assumed to be most salient at local scales. Feminist political ecology has shown how women's knowledge, differential access, and rights are important at a variety of scales, yet the larger political-ecology literature continues to treat gender as primarily relevant only within households and communities (compare Bryant, 1998; Peet and Watts, 1996b). Schroeder's (1997) work on gender and development in the Gambia has been an important corrective to this and has illustrated how gender is salient at the level of international policy. He demonstrates how gender relations are contested in the context of development projects through an examination of international projects designed to benefit women. These projects were undermined by subsequent projects that had an explicit environmental focus, leading to the demise of gains made by the women-centric projects (see also Mackenzie, 1995; Schroeder, 1997; Schroeder and Neumann, 1995; Schroeder and Suryanata, 1996). Through gendered property rights, men were able to reassert their claims to land that women had improved under earlier women's projects (Schroeder, 1997). This kind of analysis demonstrates how gender relations become significant in shaping environmental disputes and can lead to unexpected outcomes (Carney, 1996; Freidberg, 2001a, 2001b, Gururani, 2002; Rocheleau and Edmunds, 1997). It further shows how gendered rights and access to land are reconfigured through development projects. In this case, and in that of Carney's work on the Gambia (1994, 1996), women's rights to particular plots of land and their labor-input requirements were renegotiated as development projects promoted new cultivation regimes and access to markets. As a consequence not only were men's and women's roles reconfigured, but environmental change was closely linked to these struggles over roles and resources.

In India Gururani (2002) has argued for the need to reconceptualize nature in relation to gender. She draws from poststructuralist thinking on nature (Braun and Castree, 1998; Haraway, 1991; Latour, 1993; Swyngedouw, 1999) to suggest that "forests" are formed from the social politics of work, access, and control as well as from the biophysical aspects of them. . . . In her work there is an implicit understanding that social relations constitute environments and are transformed through daily interactions of people, forests, and work, providing an excellent foundation from which to examine the mutual constitution of social relations and environments. In her work, however, the focus is on reconceptualizing nature, and the meanings of gender are not made entirely explicit.

My analysis here builds on this work in examining not only the ways in which gender relations shift within community forestry in Nepal but also how gender and other subjectivities, such as caste, are constituted and contested. What I am suggesting is that there is a need to examine not only how gender roles change but also how gender as a socially constructed concept is reinscribed by struggles

over resources. How does the construction of subjectivities, such as gender and caste, become significant in shaping the outcome of environmental issues? Through what struggles and contestations are these subjectivities (re)defined? Although Carney, Schroeder, and Gururani examine how gender roles and social relations are reconfigured, they fall short of demonstrating how what it means to be a man or a woman is (re)inscribed by the struggles they describe.

My argument also links explicitly to ecological conditions to examine how these struggles in part produce environments materially and symbolically (see Gururani, 2002). Many political-ecology studies treat the ecological environment as a background or context (Bryant, 1998; Escobar, 1995; Peet and Watts, 1996a; Sundberg, 1998), although some more recent work has attempted to engage more directly with ecological change (Sneddon, 2000; Swyngedouw, 1999; Zimmerer, 2000). Within mainstream environmental debates it is the environment that is the focus of attention. If the environment is at risk, it is difficult to make a clear argument about why we need to care if men and women have a different experience and knowledge of that risk, especially when the consequences of such differences vary from context to context. But if gender is a process that becomes significant in contingent and specific ways with variable and unpredictable ecological outcomes, then gender relations need to be analyzed as both a fundamental cause and a consequence of environmental issues.

Nature, Work, and Gender

Thus, I suggest that work on gender and environment needs to move away from an explicit focus on how gender structures development and environmental outcomes to a focus on how gender and environment are mutually constituted. This requires an engagement with the relationships between development projects, subjectivities, and (re)productive activities, as well as material transformations of ecosystems.

As argued above, gender in this context refers to the processes by which subjectivities are produced. Unlike "gender roles" (see Connell, 1987), subjectivities are performed and contested through social interactions that are always imbued with power (Butler, 1997; Mahoney and Yngvesson, 1992). Gender thus does not refer to women or to differences between men and women. Rather, gender is the process through which differences based on presumed biological sex are defined, imagined, and become significant in specific contexts (Butler, 1992, 1997; Mahoney and Yngvesson, 1992; Mehta and Bondi, 1999; Scott, 1991). As Butler (1990, 1997) has argued, gender is performed by subjects, and it is only through this performance that gender takes on any meaning at all. Yet these performances are imbued with power, and attempts to resist culturally prescribed performances are somewhat contradictory. As Mahoney and Yngvesson (1992) have argued, in order to resist gender domination, subjects must first accept and

internalize aspects of this domination. For example, . . . it is only by accepting a notion of "women's work" that women can call on aspects of their work to resist new work expectations placed upon them. Central to this understanding is the notion that the contradictory performance of gender leads to its (re)inscription (Butler, 1990) and, in combination with the performance of other subjectivities including class, race, caste, and ethnicity, is embedded within the (re)production of material and symbolic social inequalities (Kobayashi and Peake, 1994). . . .

It is . . . critical to explore the contexts within which gender and other social relations are performed, contested, and (re)produced. The gender-environment nexus is one such context and an important one within development (see Harris, 2006). Many development projects in agrarian societies are targeted at various aspects of the environment, whether to improve agricultural yields or to protect soils, forests, and wildlife; most of these projects neglect gender (Adams, 1990; Batterbury et al., 1997; Blaikie and Brookfield, 1987; Escobar, 1995; West and Brechin, 1991).Yet, as political ecologists have shown, all environmental actions are embedded within social fields of power and political economies that shape both the social and ecological outcomes of such interventions (Bebbington and Batterbury, 2001; Bryant, 1998; Escobar, 1995; Peet and Watts, 1996a; Swyngedouw, 1999). I suggest that, because gender and subjectivity cannot preexist the environments in which they emerge, attention to the performance of gender and to other aspects of social difference is crucial for understanding how environmental issues come to be "environmental" in the first place and why they take the social and ecological shape that they do. Applying this argument to an explicit examination of ecological issues means that it is possible to explore how and why similar processes, such as rainforest logging or conservation projects, produce radically different ecological and social consequences in different places. . . .

Conclusion

In this paper I have outlined the importance of gender and the production of other subjectivities as central analytical tools for analyzing human-environment interactions. The political-ecology literature has emphasized that access to, control over, and the distribution of resources are at the core of most environmental issues, both in terms of social inequities and in terms of ecological decline. Who is responsible for creating harvesting rules, who actually does the work, and what contestations result are key aspects of environmental issues. Uncovering the processes by which these occur is critical if we hope to challenge the overexploitation of both land and people. The feminist literature on gender and on the performance of other forms of difference provides an analytical entry point for exploring how subjectivities both constitute and are produced by environmental issues. . . .

When gender is conceptualized as a linear or structuring relation, a consideration of gender in environmental issues leads primarily to the promotion of strategies to equalize the impact on men and women. Although such measures can be important, they do not always produce the anticipated outcomes because of the dynamic relationship between gender, environment, and other aspects of social and cultural life. Once gender is reconceptualized as a process, these relationships can be brought into view and examined within environmental debates. . . . Analyzing gender in this way demonstrates how ecological conditions are transformed and reproduced both materially and symbolically in contradictory ways through the process of contesting social hierarchies. To take this work further it is necessary to ask, what opportunities for positive ecological and social change are produced by understanding the complexities of these processes?

Recognizing the mutual constitution of social relations and environment requires that planners reevaluate how they formulate development programs. Rather than having separate gender, basic needs, or environmental programs, it is necessary to reconceptualize these not as additive processes but as embedded within each other. In addition, it is crucial to recognize the contingent relationships that intersect at the social-relations-environment nexus. It is not possible to develop one formula for the implementation of community forestry that will be sensitive to gender and caste relations in all contexts. In some contexts, other relations such as political-party membership or class may be more salient for defining labor relations and contestations over resources; the critical issue is how subjectivities become significant and are played out within development projects and in relation to environmental change. This analysis points to the need for more attention to how projects are implemented and the importance of allowing for sufficient flexibility and attention to the shifting relationships between environment, development, and difference.

REFERENCES

Adams W M, 1990 *Green Development* (Routledge, New York)

Agarwal B, 1992 "The gender and environment debate: Lessons from India" *Feminist Studies* 18:119–158

Agarwal B, 1994 *A Field of One's Own: Gender and Land Rights in South Asia* (Cambridge University Press, Cambridge)

Agarwal B, 1997 "Environmental action: Gender equity and women's participation" *Development and Change* 28:1–43

Barker D K, 2000 "Dualisms, discourse, and development" in *Decentering the Center: Philosophy for a Multicultural, Postcolonial, and Feminist World* ed. U Narayan, S Harding (Indiana University Press, Bloomington) pp. 177–188

Batterbury S, Forsyth T, Thomson K, 1997 "Environmental transformations in developing countries: Hybrid research and democratic policy" *Geographical Journal* 163:126–132

Bebbington A, Batterbury S, 2001 "Transnational livelihoods and landscapes: Political ecologies of globalization" *Ecumene: A Journal of Cultural Geographies* 8:369–380

Blaikie P, Brookfield H, 1987 *Land Degradation and Society* (Methuen, London)

Bondi L, Davidson J, 2004 "Troubling the place of gender" in *Handbook of Cultural Geography* ed. K Anderson, M Domosh, S Pile, N Thrift (Sage, London) pp. 325–343

Braun B, Castree N, 1998 *Remaking Reality: Nature at the Millennium* (Routledge, New York)

Bryant R L, 1998 "Power, knowledge and political ecology in the Third World: A review" *Progress in Physical Geography* 22:79–94

Butler J, 1990 *Gender Play: Feminism and the Subversion of Identity* (Routledge, New York)

Butler J, 1992 "Contingent foundations: Feminism and the question of 'postmodernism'" in *Feminists Theorize the Political* ed. J Butler, J Scott (Routledge, London) pp. 3–21

Butler J, 1997 *The Psychic Life of Power* (Stanford University Press, Stanford, CA)

Carney J, 1994 "Contracting a food staple in the Gambia" in *Living under Contract: Contract Farming and Agrarian Transformation in Sub-Saharan Africa* ed. P Little, M Watts (University of Wisconsin Press, Madison) pp. 167–187

Carney J, 1996 "Converting the wetlands, engendering the environment" in *Liberation Ecologies: Environment, Development, Social Movements* ed. R Peet, M Watts (Routledge, New York) pp. 165–186

Connell R W, 1987 *Gender and Power: Society, the Person and Sexual Politics* (Polity, in association with Blackwell, Oxford, UK)

Cuomo C J, 1998 *Ecological Feminism: An Ethic of Flourishing* (Routledge, London)

Deere C D, de Leal M L, 1981 "Peasant production, proletarianization, and the sexual division of labor in the Andes" *Signs* 7:338–360

Diamond I, Orenstein G F, 1990 *Reweaving the World: The Emergence of Ecofeminism* (Sierra Club Books, San Francisco)

Escobar A, 1995 *Encountering Development: The Making and Unmaking of the Third World* (Princeton University Press, Princeton, NJ)

Fortmann L, 1996 "Gendered knowledge: Rights and space in two Zimbabwe villages: Reflections on methods and findings" in *Feminist Political Ecology: Global Issues and Local Experiences* ed. D Rocheleau, B Thomas-Slayter, E Wangari (Routledge, New York) pp. 211–223

Freidberg S E, 2001a "Gardening on the edge: The social conditions of unsustainability on an African periphery" *Annals of the Association of American Geographers* 91:349–369

Freidberg S E, 2001b "To garden, to market: Gendered meanings of work on an African urban periphery" *Gender, Place and Culture* 8:5–24

Griffin S, 1978 *Woman and Nature: The Roaring Inside Her* (Harper and Row, New York)

Gururani S, 2002 "Forests of pleasure and pain: Gendered practices of labor and livelihood in the forests of Kumaon Himalayas, India" *Gender, Place and Culture* 9:229–243

Haraway D, 1991 *Simians, Cyborgs, and Women* (Routledge, New York)

Harris L M, 2006 "Irrigation, gender, and the social geographies of the changing waterscapes of Southeastern Anatolia" *Environment and Planning D: Society and Space* 24:187–213

hooks b, 1984 *Feminist Theory: From Margin to Center* (South End, Boston)

hooks b, 1990 *Yearning: Race, Gender, and Cultural Politics* (South End, Boston)

Kobayashi A, Peake L, 1994 "Unnatural discourse, 'race' and gender in geography" *Gender, Place and Culture* 1:225–243

Latour B, 1993 *We Have Never Been Modern* (Harvard University Press, Cambridge, MA)

Mackenzie F, 1995 "Selective silence: A feminist encounter with environmental discourse in colonial Africa" in *Power of Development* ed. J Crush (Routledge, New York) pp. 100–112

Mahoney MA, Yngvesson B, 1992 "The construction of subjectivity and the paradox of resistance: Reintegrating feminist anthropology and psychology" *Signs* 18:44–73

Massey D, 1994 *Space, Place, and Gender* (University of Minnesota Press, Minneapolis)

McDowell L, 1999 *Gender, Identity, and Place: Understanding Feminist Geographies* (University of Minnesota Press, Minneapolis)

Mehta A, Bondi L, 1999 "Embodied discourse: On gender and fear of violence" *Gender, Place and Culture* 6:67–84

Merchant C, 1982 *The Death of Nature: Women, Ecology and the Scientific Revolution* (Wildwood House, Aldershot, UK)

Mies M, Shiva V, 1993 *Ecofeminism* (Kali for Women, London)

Moeckli J, Braun B, 2001 "Gendered natures: Feminism, politics, and social nature" in *Social Nature: Theory, Practice and Politics* ed. N Castree, B Braun (Blackwell, Oxford, UK) pp. 112–132

Moraga C, Anzaldúa G (eds.), 1988 *This Bridge Called My Back: Writings by Radical Women of Color* (Women of Color Press, New York)

Moser C O N, 1993 *Gender Planning and Development: Theory, Practice and Training* (Routledge, London)

Nathen D, 1995 *A Gender Framework for Resource Management* (Asian Watershed Management Network, Kathmandu, Nepal)

Nesmith C, Radcliffe S, 1993 "(Re)mapping Mother Earth: A geographical perspective on environmental feminisms" *Environment and Planning D: Society and Space* 11:379–394

Ortner S, 1974 "Is female to male as nature is to culture?" in *Women, Culture, and Society* ed. L Lamphere (Stanford University Press, Stanford, CA) pp. 67–87

Peet R, Watts M, 1996a *Liberation Ecologies: Environment, Development, Social Movements* (Routledge, New York)

Peet R, Watts M, 1996b "Liberation ecology: Development, sustainability, and environment in an age of market triumphalism" in *Liberation Ecologies: Environment, Development, Social Movements* ed. R Peet, M Watts (Routledge, New York) pp. 1–45

Plumwood V, 1991 "Nature, self, and gender: Feminism, environmental philosophy, and the critique of rationalism" *Hypatia* 6:3–27

Pratt G, Hanson S, 1994 "Geography and the construction of difference" *Gender, Place and Culture* 1:5–29

Rocheleau D, Edmunds D, 1997 "Women, men and trees: Gender, power and property in forest and agrarian landscapes" *World Development* 25:1315–1371

Rocheleau D, Thomas-Slayter B, Wangari E, 1996 "Gender and environment: A feminist political ecology perspective" in *Feminist Political Ecology: Global Issues and Local Experiences* ed. D Rocheleau, B Thomas-Slayter, E Wangari (Routledge, New York) pp. 3–26

Schroeder R A, 1997 "'Re-claiming' land in the Gambia: Gendered property rights and environmental intervention" *Annals of the Association of American Geographers* 87:487–508

Schroeder R A, Neumann R P, 1995 "Manifest ecological destinies: Local rights and global environmental agendas" *Antipode* 27:321–324

Schroeder R A, Suryanata K, 1996 "Gender, class power in agroforestry systems: Case studies from Indonesia and West Africa" in *Liberation Ecologies: Environment, Development, Social Movements* ed. R Peet, M Watts (Routledge, New York) pp. 188–204

Scott J, 1991 "The evidence of experience" *Critical Inquiry* 17:773–797

Seager J, 1993 *Earth Follies: Coming to Feminist Terms with the Global Environmental Crisis* (Routledge, New York)

Shiva V, 1988 *Staying Alive: Women, Ecology, and Development* (Zed Books, London)

Sneddon C S, 2000 "'Sustainability' in ecological economics, ecology and livelihoods: A review" *Progress in Human Geography* 24:521–549

Sundberg J, 1998 "NGO landscapes in the Maya biosphere reserve, Guatemala" *Geographical Review* 88:388–412

Swyngedouw E, 1999 "Modernity and hybridity: Nature, *regeneracionismo*, and the production of Spanish waterscape, 1890–1930" *Annals of the Association of American Geographers* 89:443–465

Warren K J, 1987 "Feminism and ecology: Making connections" *Environmental Ethics* 9:3–20
Warren K J, Cheney J, 1991 "Ecological feminism and ecosystem ecology" *Hypatia* 6:179–197
West P C, Brechin S R, 1991 *Resident Peoples and National Parks: Social Dilemmas and Strategies in International Conservation* (University of Arizona Press, Tucson)
Zimmerer K S, 2000 "The reworking of conservation geographies: Nonequilibrium landscapes and nature-society hybrids" *Annals of the Association of American Geographers* 90:356–369

27

"But I Know It's True"*

Environmental Risk Assessment, Justice, and Anthropology

MELISSA CHECKER

In September 1993, over 200 residents living in the Hyde Park area of Augusta, Georgia, gathered in the Jenkins Elementary School cafeteria. Residents had come together that night to attend a meeting with officials from the Environmental Protection Agency (EPA). The meeting's purpose was to announce the results of a $1.2 million EPA study of the area's air, groundwater, and soil. Data from this study had provided the basis for a health consultation, compiled by the Agency for Toxic Disease Registry (ATSDR), the results of which were also to be discussed that evening. The health consultation was of primary concern to meeting attendants, as it would determine whether and to what degree their health was at risk from environmental contaminants. Although most of the people living in the area were homeowners, they could not afford to move unless they sold their homes for a competitive price. Rumors of contamination and the area's general economic and social decline (Hyde Park was especially known to be a drug-dealing hub) made selling homes extremely difficult. The results of the ATSDR's risk assessment would determine whether or not residents would find assistance—either from the U.S. government or through legal action—to move out of a neighborhood that they firmly believed was contaminated by the surrounding industries.

The EPA's Field Investigation divided the Hyde Park area into five neighborhoods. Investigators found high levels of arsenic, chromium, and dioxin in the surface soils and groundwater of two of those. In all five neighborhoods, they found significant levels of PCBs and lead. However, the ATSDR announced that night that these chemicals did not constitute a significant threat to residents' health unless they "inadvertently ingested it on a daily basis for many years" (ATSDR 1994). Residents received this news in a fury. At one point in the meeting, one man presented the EPA's division director with a four-gallon bucket of sludge he had just taken from the ditch in his backyard. Offering the EPA official the sludge, the man asked him to smell it and then say whether he would want to live anywhere close to it. The crowd in the packed cafeteria shouted,

* From *Human Organization* 66, no. 2 (2007): 112–124. Used by permission of the Society for Applied Anthropology.

"Answer, answer," and the official replied, "No." Over the next few minutes, tensions continued to escalate until one man threw a chair onto the Jenkins stage, marking the culmination of three years' worth of mounting frustrations, tensions, and fear.

When they tell this story, Hyde Park residents shake their heads and chuckle. They argue for a little while over who threw the chair. Yet, eight years later, they still puzzle over why the EPA and its sister agency, the ATSDR, are unable to correlate unusually high levels of contaminants with high local rates of certain illnesses. "But I know it's true" is the oft-repeated refrain of environmental justice communities across the country, who similarly find dangerous chemicals in their soil, air, or water. Although these people know that they and their neighbors suffer from uncommon health problems, they have been unable to secure scientific proof that the chemicals are the cause. Because governmental and legal decision makers rely on environmental science to determine whether they are going to assist environmental justice communities, scientific methods and procedures are, for some people, a matter of "life and death."

Over the past two decades, the environmental justice movement has called attention to the disproportionate siting of hazardous waste facilities in neighborhoods of color. In so doing, environmental justice activists have expanded their definition of the environment to include all of the resources (i.e., adequate housing, education, employment, etc.) to which they have historically been denied access (Adamson, Evans, and Stein 2002; Checker 2002, 2005; Cole and Foster 2001; Novotny 2000). Similarly, environmental risks include an array of social categories—health, justice, science, and community—all of which are culturally contingent and socially constructed (Haenn 2003). Because it is beyond the scope of this paper to address all of these categories in depth, I limit my focus to science, environment, and justice. From that vantage point, I also problematize the ways that hazards and risks are currently defined. It is my contention that environmental science, as it is currently practiced and conceptualized, does not necessarily serve environmental justice (Brullel and Pellow 2006). . . .

Anthropological Perspectives on Risk Assessment

Hyde Park residents joke that they live on the wrong side of *two* tracks. In other words, their neighborhood is lined on both its east and west sides by railroad tracks. For approximately 30 years, a large, unsightly junkyard abutted the backyards of residents living on Walnut, Hyde Park's westernmost street. Just down the street from the junkyard is a Georgia Power plant, and beyond it rises a large smokestack belonging to Thermal Ceramics, an industrial ceramics factory. About a half a mile away lies the site of a former wood-preserving factory, which closed in 1988 several years after it was found to be leaking chemicals into its immediate vicinity. Two auto repair shops and a brickyard complete the

neighborhood's industrial perimeter. Inside that perimeter, the homes of approximately 200 mostly low-income African American families spread across seven streets. It is no wonder that Hyde Park residents refer to their neighborhood as a "toxic donut."

Hyde Park's development began in the 1940s. Only six miles from the heart of downtown Augusta, the neighborhood lay on the edge of the city and was within walking distance of a number of local industries. Because the land was swampy and had extremely low value, African American sharecroppers from nearby rural areas could afford to buy it. Lots were relatively large, and families were able to raise enough vegetables to sustain them while working in the surrounding factories or as domestics in Augusta's wealthier neighborhoods. As people settled in, they invited relatives from the country to join them, and many households in Hyde Park remain "kin" to one another.

Despite its proximity to downtown, Hyde Park did not have running water, gas lines, streetlights, or paved roads until 1970. Residents pumped their own water and used outhouses. This lack of infrastructure, however, paled in comparison to the fact that the neighborhood would flood with each heavy rain. Floods were so bad that residents could not get in or out of the neighborhood and children could not get out to attend work or school until the waters receded. In 1968, one resident initiated the formation of a neighborhood association called the Hyde and Aragon Park Improvement Committee (HAPIC) to lobby for improved living conditions. Within two years, HAPIC had made itself known to county commissioners and other local lawmakers and successfully secured running water, paved streets, street lights, sewer lines, and drainage ditches.

Throughout the 1970s and 1980s, however, as the blue-collar jobs that had helped keep Hyde Park families afloat left Augusta, the neighborhood began to decline. In 1998, approximately 61 percent of Hyde Park's 200 families owned their homes; yet 77 percent of them earned less than $20,000 per year (Sociology Research Methods Students 1998). . . .

In 1988, routine soil tests at Southern Wood Piedmont (SWP), a wood-preserving factory located approximately one-half mile from Hyde Park, revealed unsafe levels of arsenic, chromium, and lead in the soil surrounding the plant (Georgia Governor's Task Force 1996). Soon after, the EPA ordered a major cleanup of the factory area. Sometime around 1990, HAPIC leaders discovered that the mostly white residents of Virginia Subdivision (another neighborhood bordering SWP) had filed a lawsuit charging SWP with contaminating their properties. The plaintiffs in this lawsuit had just received a small settlement. Recognizing that ditches from SWP's property ran directly into Hyde Park, HAPIC leaders began alerting their neighbors to possible contamination. Soon after, two local attorneys approached them and started to organize a class action lawsuit. Hyde Park residents believed that they had been left out of the initial

settlement because they were black. HAPIC, which had always considered itself a civil rights organization, now made environmental justice its main priority. . . .

Eight years later, in September 1998, I began 14 months of fieldwork in Hyde Park. During that time, I volunteered as a full-time staff member for HAPIC and focused my research on that organization. . . .

Risky Business: Critiquing Environmental Science Methodologies

When the EPA conducted its 1993 study to determine the degree to which Hyde Park had been contaminated, testers took 93 soil samples and 14 groundwater samples. They then isolated the chemicals they found and measured them. Next, they compared chemical levels to EPA/ATSDR standards for toxicity. While most levels fell below the toxicity threshold, one area had an arsenic level of 59 mg/kg (ATSDR 1994). The ATSDR has determined that a cancer risk exists at 1.5 mg/kg of arsenic, ingested per day; however, their final assessment was that there were not enough instances of levels in the hazardous range to constitute a significant health risk. The agency based its conclusions upon a typical four-stage risk assessment methodology: hazard assessment or identification; hazard characterization or dose-response analysis; exposure assessment; and risk characterization. The final stage in this process deals with consolidating and communicating the findings of the first three, which are ostensibly its most objective. Yet, as I will argue in the following section, each of these phases can be biased or based on uncertain assumptions.

Lab v. Real World: Determining Which Chemicals Are Hazardous

Hazards identification determines whether a particular substance causes a disease or other adverse health effect. Generally, hazard identification focuses on one health effect at a time, called an "endpoint." Endpoints can include cancer, reproductive and developmental disorders, central nervous system symptoms, trauma, infections, and rashes (Israel 1995: 483). Currently, it is up to individuals (who may be subject to a variety of influences) to decide which endpoint to use. For example, because cancer tends to be particularly sensitive, is easy to identify, and is a prominent public concern, it is frequently chosen as an endpoint over other possible harms (Anglin 1998; Israel 1995).

The next stage of the risk assessment process moves to a lab to study dose response. These experiments are primarily based on animal studies and then extrapolated to humans, despite the fact that animals and humans can react very differently to chemicals. The tests are also performed at high doses and then extrapolated to low-dose situations; yet this process, too, is plagued with uncertainty. First, because the costs of such tests are high, only a few hundred

animals are used. Second, individual chemical sensitivities vary widely in both animals and humans—many chemicals often leave large segments of a population untouched (Dark 1998; Tesh 2000: 27–28). The smaller the pool of animals, the more difficult it is to spot adverse health effects. Third, many lab rodents are bred to be genetically similar. This uniformity makes them even less comparable to genetically and geographically diverse people (Douglas and Wildavsky 1982; Schettler et al. 2002).

Most studies extrapolate using healthy white male workers as a standard (Israel 1995: 486). The ATSDR study on Hyde Park, for instance, analyzed fish samples from a nearby fishing pond. Estimating the likelihood that a 70 kg adult who consumed 18 grams of fish a day for more than one year would get sick, they found that the fish posed no danger (Agency for Toxic Disease Registry 1994). However, it is well-known that people of color (including children, the elderly, and sick people) consume closer to 20 to 24 grams of fish per day (West et al. 1992). In other words, standard comparison techniques fail to provide information on the range of ways women, children, elderly, or already sick people—far more susceptible subgroups—might react to a chemical.

Fourth, environmental hazards are studied under "normal" conditions in laboratories rather than as they are released or disposed of. As a result, scientists often base their assessments of risk on conditions that are actually very different from those a particular community is experiencing (Novotny 1998: 141). Finally, high-dose studies concentrate on immediate responses to exposures. But many diseases have long latency periods, and their link to harmful chemicals may not become evident for many years. For example, birth defects have especially delayed onsets, and many cancers do not show up for 20 to 40 years. Thus, it is difficult to estimate a chemical's potential for harm without studying it over long periods of time (Fitchen 1988). In sum, although scientists might be able to establish cause-and-effect relationships between one chemical and one disease under controlled conditions, the chances of establishing definitive cause-and-effect relationships in the real world are slim (Montague 2003).

A Matter of Multiplicity: Assessing Exposures

As difficult as it is for scientists to resolve the precise level at which a chemical will pose a risk to humans (Wigley and Shrader-Frechette 1996), perhaps the most significant problem with risk assessment comes in its third phase—exposure assessment. When asked to evaluate environmental exposures in a particular community, environmental scientists follow the same procedures I mentioned earlier, isolating data and focusing on one chemical at one time (Anglin 1998; Bryant 1995; U.S. EPA 2003; Wigley and Shrader-Frechette 1996). This procedure thus emphasizes the determination of whether one chemical is harmful, at what dose it is harmful, and whether community members are

exposed to the chemical at that dose (Kriebel et al. 2001). However, many environmental justice communities are exposed to dozens of different chemicals from a number of different existing and abandoned factories, not to mention particles emitted from cars, trucks, and trains (Novotny 1998).

For example, . . . approximately six factories and plants surround Hyde Park, and nearly all of them produce some kind of toxins. In addition to living in the middle of these factories, many residents have worked in them. According to these people, their working conditions were far from hazard free. For example, those who worked in the industrial ceramics factory report leaving their jobs covered in a fine, white dust. As one man said, "black as I am, I used to come out white." Others who worked at the wood-preserving factory complained of frequent headaches and suspicious-tasting water at the plant.

Up until 1970, when the neighborhood received access to public utilities, a common chore for Hyde Park children was to go into SWP's field, gather leftover creosote-treated wood chips, and then take them home to fuel wood-burning stoves. And, until Hyde Park got its water lines, residents pumped bathing and drinking water from underground wells in their backyards. Annie Wilson, one of Hyde Park's first residents recalled, "That water one year, it was . . . so stinking they couldn't take a bath in it."

Regular exposure to groundwater occurred outside of people's homes as well as inside. As I mentioned, Hyde Park is a flood plain, and major floods have been so bad that residents have literally had to leave the neighborhood by boat. Particularly severe floods often left suspicious debris in their wake. Hyde Park resident David Jackson remembered, "My yard used to flood out more than anybody in this whole area because all the water from the junkyard would flow right in my yard. And when it leave, it leave all kinds of grease-filled and black looking dirt with the oil and stuff that just shot up in here." . . .

. . . Hyde Park residents were thus exposed to chemicals in their workplaces, in their homes, and outside of their homes over a period of several decades before they began to agitate for environmental justice. . . .

Not only do risk assessments generally overlook the kinds of multiple exposures that Hyde Park residents faced, but even if those exposures were included, scientists are still only beginning to learn about the cumulative effects of toxins. In recent years, the EPA has acknowledged the need to address cumulative risk and has begun to develop mechanisms for its inclusion in the risk assessment process. . . . However, the EPA also recognizes that it has only taken initial steps, partly because methodologies for the quantification of combined risks are only in their nascent stages (U.S. EPA 2003).

Making things even more complex, the illnesses that many environmental justice communities like Hyde Park complain of, such as developmental disorders, asthma, and circulatory and respiratory problems, generally result from a range of genetic, environmental, and social factors. Indeed, in some cases, they

may not be directly related to a particular chemical; but these health disorders are exacerbated by toxic exposure. For example, two common health problems in low-income African American communities are hypertension and diabetes. Hypertension can lead to kidney disease, and diabetes creates metabolic impairments. Both situations then inhibit the body's ability to process toxic exposures (Israel 1995: 506). In sum, measuring whether the level of contaminants in one ditch on one particular day is linked to one particular disease provides little insight into the cumulative picture of whether, and to what degree, a community's health is at risk, especially if that community faces a host of other risks related to their socioeconomic status.

Scientific Slants

Despite all of the uncertainties and biases I have mentioned, our social valuations of science persistently overestimate its abilities to provide an objective resolution to issues like environmental risk assessment. . . . Moreover, societies that place a high value on science see scientific knowledge as a one-way process, where information flows from scientists to passive recipients (Martin 1994). Rather, as environmental justice activists frequently point out, science is embedded in power relations and subjective interests (Brullel and Pellow 2006: 103). . . .

As mentioned earlier, much of environmental science is based on probabilities that certain chemicals will cause harm. But as Mary Douglas and Aaron Wildavsky emphasize in their classic cultural analysis of risk, "There is a delusion that assigning probabilities is a value-free exercise" (1982: 71). . . . For example, in addition to choosing which endpoints to study, risk assessors also choose from a variety of toxic indices as they develop their analyses. A recent study conducted by several geographers and reported in the *American Journal of Public Health* applies six toxic indices to the same area and finds that they yield widely varying results. The study concludes that "comparing findings across studies and developing generalizations about levels of risk to low-income and minority populations is difficult, if not impossible" (Cutter et al. 2002: 420). The fact that individual risk assessors can choose which indices and models they will base their evaluations on raises important questions about cultural constructions of science and the biases that may lie hidden in those constructions (Oliver-Smith 1996: 320). For instance, when assessors estimate the risk that a contaminant poses to a community, in addition to making assumptions about the age and size of the "typical" exposed individual, they must also presume what kind of clothes that person wears and how sensitive he or she will be to that pesticide. If assessors are unfamiliar with the community they are evaluating, they may rely upon cultural stereotypes when determining such factors.

More concrete biases also underlie risk assessments and the development of research on toxic chemicals more generally. For example, most risk assessments are prepared when a business, an agency, or a corporation seeks to initiate or continue a hazardous activity. These entities hire the risk assessment agency to conduct their evaluations, making assessors highly vulnerable to pressure (O'Brien 2000). Political motivations can also weight scientific testing. In 2006, this issue came to an unprecedented head when union leaders representing EPA scientists issued a letter to the EPA administrator alleging that pesticide-industry officials and agency managers were pushing them to skip steps in their testing, compromising "the integrity of the science upon which agency decisions are based" (Fialka 2006: A4; Griffith 1999). . . .

Challenging and Critiquing Science

HAPIC activists did not passively accept the EPA's 1993 test results. First, they investigated the consulting firm that conducted the study and discovered it had contracted with the polluting factory in the past. They then filed a complaint with the EPA. Second, the EPA designed its tests according to the protocols I have described, which do not generally include community input. Hyde Park residents immediately called attention to this fact, arguing that it skewed the test's results. For instance, in many cases, in collecting surface soil samples, testers had actually sampled new dirt that residents had imported and put over their old, contaminated dirt. David Jackson explained, "They sent out some people to do that testing out here and they scooped a little bit of dirt with spoons on the ground. Hey, I done put dirt on top of dirt trying to get rid of the floods and things we been having out here for years." As Jackson describes, he "put dirt on top of dirt" to protect his home and his family. After this instance, Hyde Park activists found their own testing agency and conducted another set of soil studies to counter the EPA's. This time, they directed boring depths and locations; indeed, these tests yielded much more dangerous chemicals levels, which were later determined to be hazardous to human health. . . .

Activists also found that health officials seemed to be biased against them. Reverend Bobby Truitt, for example, described how at an early visit to the Richmond County Health Department, officials acted "hostile" and told residents that their health complaints were "a figment of [their] imagination." Similarly, other environmental justice activists I have worked with find that health officials often allow stereotypes about the poor eating, smoking, and exercise habits of low-income minorities to cloud their willingness to link health problems with toxic contamination (Checker 2001). As one man succinctly put it, "Often those [health officials] who are passing judgment on the community do not live in the community." . . .

A Heavy Knot

. . . This history, combined with the daily struggles they continue to face as poor, black Americans, led Hyde Park residents to perceive their risks as multiple. In other words, not only are they being exposed to toxic chemicals on a daily basis, but also, due to biases against them, they do not believe that they will find much relief or remedy for their problems.

Toxic exposures and institutional barriers to accessing relief from those exposures are only two aspects of the total risks that Hyde Park residents faced. For instance, when they develop asthma or experience skin conditions from lupus or arsenic keratosis, many residents have to rely on Medicaid, which in Augusta is inefficient and does not usually cover the full cost of expensive inhalers or skin creams. In addition, as the years wore on and they increasingly realized that they were unable to leave a neighborhood which they strongly believed was contaminated, residents' mental health was compromised. Certain activists, who had devoted themselves to the cause of relocation throughout the 1990s, fell into severe depressions. In the late 1990s, mental health disorders in the neighborhood were becoming of such concern that the health department added psychiatric studies to its health assessment.

Ill health in Hyde Park also led people to lose educational and employment opportunities. Developmental delays and severe bouts of asthma caused some children to miss school. In turn, parents had to stay home from work to care for sick children. One mother, whose middle child developed a rare cancer at the age of seven and whose youngest child was born with debilitating asthma, quit a stable job in 1996 to care for her children and lived on public assistance. Finally, as I mentioned earlier, with news of contamination, the property that Hyde Park residents had invested in became valueless. Residents had extreme difficulty selling their homes, and they complained that they had problems getting home insurance as well as bank loans. Because many people either worked in low-wage jobs or lived on fixed incomes, they teetered on the edge of impoverishment. In short, Hyde Park residents face a "heavy knot" of risks that derive from both ecological and social circumstances (Cernea 2000: 31).

Economically and politically marginalized communities like Hyde Park often depend upon social institutions, especially those that might bring them out of their current environmental predicament. One resident said, "When we first heard about the EPA study, it was like the cavalry was coming in." Instead of controlling their risks, however, these institutions compound them by denying community claims. As a result, residents' extant mistrust of governmental agencies increases. . . . Moreover, their experiences of race and class exclusions were foundational to activists' ideas that environmental justice meant engaging in a participatory and holistic process.

Yet agency communication tends to be unidirectional. In other words, not only do they deny community claims, but they neglect to solicit community input or recognize the value of local knowledge (Liebow 1988; Wolfe 1988). . . . Over the past few years, the EPA and the ATSDR in particular have taken steps to improve risk communication and to develop somewhat more holistic accounts of community environmental problems. . . .

As environmental justice activists work toward engendering paradigmatic shifts in the prevention, management, and control of environmental risks, and as government agencies move toward broader conceptions of risk, anthropologists have ample opportunities to contribute by combining their expertise with those of others. . . .

Into the Breach: Roles for Anthropologists

Anthropological research demonstrates how ethnographic information can offer an important complement to the risk-assessment process (Griffith 1999). Anthropologist Michael Cernea, for instance, studies risk among refugees and displaced people in various parts of the world and calls for on-the-ground assessments that account for the multiple contexts in which people experience risk. As Cernea cautions, however, risk identification is not enough: it must also lead to risk reversal (Cernea 2000). Accordingly, Cernea has developed the impoverishment risks and reconstruction (IRR) model, which has a dual emphasis on assessing risks to be prevented *and* on implementing reconstruction strategies and policies (ibid.: 20). I would argue that we might address environmental risk assessment in the United States from a similar perspective and add to it a third component of theoretical innovation. Below, I outline my recommendations for a three-pronged anthropological approach to the problem of risk assessment and environmental justice.

On the reform side, anthropologists can continue to advocate for the expedited implementation of cumulative risk assessment strategies. In other words, until federal officials relinquish the idea of risk assessment, and while environmental justice communities continue to reside in life-threatening conditions, anthropologists can work together with environmental scientists to develop more comprehensive and accurate assessments of risk. One means of doing this is to facilitate the pairing of scientific and lay expertise in developing risk assessments (Brown 1992, 1995; Brown and Mikkelsen 1997; Brullel and Pellow 2006; Clapp 2002; Dove 2001; Scoones 1999).

For not only do community members hold invaluable local knowledge about their risk exposures and histories, but they also have the greatest motivation for compiling that knowledge and monitoring their environmental conditions. In Hyde Park, community residents could be trained to collect cumulative

exposure data, create records of neighborhood health complaints and illnesses, and track signs of contamination such as foul odors, discolored water, or changes in local fauna.

In addition, residents and scientists could partner to draw random samples, design questionnaires, and collect and analyze data according to more empirical traditions (Brown 1992, 1995; Brown and Mikkelsen 1997; Brullel and Pellow 2006; Bryant 1995: 589; Clapp 2002; Kroll-Smith and Floyd 1997). Community members can then present the final research product to the EPA and ask it to reconsider their eligibility for federal assistance. The end result is that residents share control of the research process. A community-based, participatory research model not only improves the quality of the risk assessment, but it also increases community members' environmental literacy. In other words, participating in environmental research equips community members with the knowledge and awareness they need both to remedy their current conditions and to develop prevention strategies.

Another benefit of participatory research is that it can help communities improve their relations with governmental agencies. As they conduct research in partnership with scientific and governmental agencies, greater understandings between communities and officials will develop and solidify. But, more immediately, anthropologists can strengthen the quality of community-agency communications to prevent scenes like the EPA meeting debacle I described earlier. For instance, federal and state offices are highly segmented and can only address specific issues. However, community members often grow frustrated that various departments and agencies do not cooperate with one another to create more effective resolutions. When governmental officials encounter such frustrations, they may view community members as irrational, overly angry, and/or uninformed. One way that anthropologists can apply their research to this problem is by "studying up," or investigating the practices of scientists, extension agents, field managers, and governmental officials (Scoones 1999: 479).

Returning to Hyde Park, for example, there is much to learn about the various entities—Georgia Environmental Protection Division, EPA Region IV, ATSDR, and industries—that affect the neighborhood's situation. Ethnographic study with these entities enables the researcher to gain a greater understanding of how environmental issues are conceptualized and acted upon. The tools of ethnography are especially important here in that they elicit a diversity of perspectives that may not be evident in more quantitative surveys and questionnaires. Anthropologist Terre Satterfield notes, environmental values are "typically articulated discursively; they are embedded in the contextually, emotively, and morally rich stories and conversations through which we define ourselves and our actions in relation to natural systems" (2002: 170; see also Griffith 1999). After developing a better understanding of all aspects of a particular issue, anthropologists can work with each side to find some basis for negotiation and compromise.

Once again, the kinds of intervention I am proposing here represent only a first step toward building the communication capacity of both communities and agencies. Community members can and should speak for themselves. However, until federal, state, and local officials are willing to value community perspectives and voices to a much greater extent than they currently do, some communities may still find it helpful to have a mediator. . . . Simultaneously, anthropologists and residents can lobby for the meaningful inclusion of community members in environmental decision-making processes. . . .

This move toward more inclusive, democratic action leads to the policy arena, which constitutes the final prong in Cernea's reform-oriented research model. Here, anthropologists can combine their research findings with those of "hard" scientists and residents and work preemptively to make specific recommendations and strategies for how to reduce a community's current risk exposure. Creative and preventive policy solutions are a particularly important component of risk assessment reform. If we succeed in convincing decision makers and corporations to accept cumulative assessments of risk that give local knowledge equal status with scientific knowledge, it follows that a far greater number of communities will be classified as "at risk." In turn, such classifications mean that some entity becomes responsible for alleviating that community's risk—a potentially expensive process. We may stand a better chance of substantively reforming risk assessment, therefore, if we can develop and promote less costly ways to relocate or clean up communities.

Finally, innovative policy solutions serve as a point of departure for new theories of environmental justice. In this paper, I have problematized conceptions of both science and justice and presented ways that each is culturally contingent. However, we have much more to learn about how "justice" is constructed cross-culturally if we are to develop new environmental justice paradigms. Here again, by investigating how different groups of people understand and perceive justice, anthropological research can combine with other forms of local and professional scientific expertise to contribute to broadly conceived and workable solutions for abating disproportionate environmental risk and creating a more environmentally just society.

REFERENCES

Adamson, Joni, Mei Mei Evans, and Rachel Stein, eds. 2002. The Environmental Justice Reader: Politics, Poetics, and Pedagogy. Tucson: University of Arizona.

Agency for Toxic Substances Disease Registry (ATSDR). 1994. Petitioned Public Health Assessment Addendum, Southern Wood Piedmont Augusta, Richmond County, Georgia, Appendix 3–March 1994 Health Consultation.

Anglin, Mary. 1998. Dismantling the Master's House: Cancer Activists, Discourses of Prevention, and Environmental Justice. Identities 5:183–217.

Brown, Phil. 1992. Toxic Waste Contamination and Popular Epidemiology: Lay and Professional Ways of Knowing. Journal of Health and Social Behavior 33:267–281.

Brown, Phil. 1995. Popular Epidemiology, Toxic Waste and Social Movements. *In* Health, Medicine and Risk: Sociological Approaches. J. Gabe, ed. Pp. 91–112. Oxford, UK: Blackwell.

Brown, Phil, and Edwin J. Mikkelsen. 1997. No Safe Place: Toxic Waste, Leukemia, and Community Action. Berkeley: University of California Press.

Brullel, Robert, and David Pellow. 2006. Environmental Justice: Human Health and Environmental Inequalities. Annual Review of Public Health 27:103–124.

Bryant, Bunyan. 1995. Pollution Prevention and Participatory Research as a Methodology for Environmental Justice. Virginia Environmental Law Journal 14:589–611.

Cernea, Michael M. 2000. Risks, Safeguards, and Reconstruction: A Model for Population Displacement and Resettlement. *In* Risks and Reconstruction: Experiences of Resettlers and Refugees. Michael M. Cernea and Christopher McDowell, eds. Pp. 11–55. Washington, DC: World Bank.

Checker, Melissa. 2001. "Like Nixon Coming to China": Finding Common Ground in a Multiethnic Coalition for Environmental Justice. Anthropological Quarterly 74:135–146.

———. 2002. "It's in the Air": Redefining the Environment as a New Metaphor for Old Social Justice Struggles. Human Organization 61:94–105.

———. 2005. Polluted Promises: Environmental Racism and the Search for Justice in a Southern Town. New York: NYU Press.

Clapp, Richard W. 2002. Popular Epidemiology in Three Contaminated Communities. Annals of the American Academy of Political and Social Science 584:35–46.

Cole, Luke, and Sheila R. Foster. 2001. From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement. New York: NYU Press, 2001.

Cutter, Susan, Michael S. Scott, and Arleen A. Hill. 2002. Spatial Variability in Toxicity Indicators Used to Rank Chemicals. American Journal of Public Health 92:420–422.

Dark, Alx. 1998. Public Sphere Politics and Community Conflict over the Environment and Native Land Rights in Clayoquot Sound, British Columbia. Ph.D. dissertation, New York University.

Douglas, Mary, and Aaron Wildavsky. 1982. Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers. Berkeley: University of California Press.

Dove, Michael. 2001. Interdisciplinary Borrowing in Environmental Anthropology and the Critique of Modern Science. *In* New Directions in Anthropology and Environment: Intersections. Carole Crumley, A. Elizabeth van Deventer, Joseph J. Fletcher, eds. Pp. 90–112. Lanham, MD: AltaMira.

Fialka John J. 2006. EPA scientists cite pressure in pesticide study: Union files letter blasting agency managers, industry over tests on toxics family. *Wall Street Journal*, May 25, p. A4.

Fitchen, Janet. 1988. Anthropology and Environmental Problems in the U.S.: The Case of Groundwater Contamination. Practicing Anthropology 10 (3–4): 5–20.

Georgia Governor's Task Force. 1996. Governor's Task Force on the Long-Term Health Care Needs for Southern Wood Piedmont Residents. Augusta, Georgia. Author's files.

Griffith, David. 1999. Exaggerating Environmental Health Risk: The Case of the Toxic Dinoflagellate Pfiesteria. Human Organization 58:119–128.

Haenn, Nora. 2003. Risking Environmental Justice: Culture, Conservation, and Governance at Calakmul, Mexico. *In* Social Injustice in Latin America. Susan Eckstein and Timothy Wickham-Crawley, eds. Pp. 81–102. New York: Routledge.

Israel, Brian. 1995. An Environmental Justice Critique of Risk Assessment. New York University Environmental Law Journal 3:469–522.

Kriebel, David, Joel Tickner, Paul Epstein, John Lemons, Richard Levins, Edward L. Loechler, Margaret Quinn, Ruthann Rudel, Ted Schettler, and Michael Stoto. 2001. The Precautionary Principle in Environmental Science. Environmental Health Perspectives 109:871–876.

Kroll-Smith, Steven, and Hugh Floyd. 1997. Bodies in Protest: Environmental Illness and the Struggle over Medical Knowledge. New York: NYU Press.

Liebow, Edward. 1988. Permanent Storage for Nuclear Power Plant Wastes: Comparing Risk Judgments and Their Social Effects. Practicing Anthropology 10:10–12.

Martin, Emily. 1994. Flexible Bodies: Tracking Immunity in American Culture—from the Days of Polio to the Age of AIDS. Boston: Beacon.

Montague, Peter. 2003. Environmental Justice Requires Precautionary Action. Testimony before the California Environmental Protection Agency Advisory Committee on Environmental Justice.

Novotny, Patrick. 1998. Popular Epidemiology and the Struggle for Community Health in the Environmental Justice Movement. *In* The Struggle for Ecological Democracy: Environmental Justice Movements in the United States. Daniel Faber, ed. Pp. 137–158. New York: Guilford.

———. 2000. Where We Live, Work, and Play: The Environmental Justice Movement and the Struggle for a New Environmentalism. Westport, CT: Praeger.

O'Brien, Mary. 2000. Making Better Environmental Decisions: An Alternative to Risk Assessment. Cambridge, MA: MIT Press.

Oliver-Smith, Anthony. 1996. Anthropological Research on Hazards and Disasters. Annual Review of Anthropology 25:303–328.

Satterfield, Terre. 2002. Anatomy of a Conflict: Identity, Knowledge, and Emotion in Old-Growth Forests. East Lansing: Michigan State University.

Schettler, Ted, Katherine Barrett, and Carolyn Raffensperger. 2002. The Precautionary Principle: Protecting Public Health and the Environment. *In* Life Support: The Environment and Human Health. Michael McCally, ed. Pp. 239–256. Cambridge, MA: MIT Press.

Scoones, Ian. 1999 New Ecology and the Social Sciences: What Prospects for a Fruitful Engagement? Annual Review of Anthropology 28:479–507.

Sociology Research Methods Students, Kim Davies, Robert Johnston, Ernestine Thompson, Robin Bengtson, Sarah Firman, Albert Jimenez, Karen Jones, and Regina Murray. 1998. The 1998 Hyde Park Neighborhood Survey Report. Department of Sociology, Augusta State University, Augusta, Georgia.

Tesh, Sylvia Noble. 2000. Uncertain Hazards: Environmental Activists and Scientific Proof. Ithaca, NY: Cornell University Press.

U.S. Environmental Protection Agency, Risk Assessment Forum (U.S. EPA). 2003. Framework for Cumulative Risk Assessment. Washington, DC: U.S. Government Printing Office.

West, Patrick C., J. Mark Fly, Frances Larkin, and Robert W. Marans. 1992. Minority Anglers and Toxic Fish Consumptions: Evidence from a Statewide Survey in Michigan. *In* Race and the Incidence of Environmental Hazards: A Time for Discourse. Bunyan Bryant and Paul Mohai, eds. Pp. 100–113. Boulder, CO: Westview.

Wigley, Daniel, and Kristin Shrader-Frechette. 1996. Environmental Racism and Biased Methods of Risk Assessment. Risk: Health, Safety and Environment 7:55–88.

Wolfe, Amy. 1988. Risk Communication: Who's Educating Whom? Practicing Anthropology 10 (3–4): 13–14

28

Bringing the Moral Economy Back in . . . to the Study of 21st-Century Transnational Peasant Movements*

MARC EDELMAN

Peasant movements in different countries and regions that only a decade ago barely knew of one another's existence now routinely exchange information and delegations and mount joint lobbying, research, and protest actions. The success of the Brazilian Landless Movement (Movimento dos Trabalhadores Rurais sem Terra [MST]) in pressing for agrarian reform has influenced peasant organizations throughout the Americas and as far away as South Africa. Global networks of peasant and small-farmer organizations such as Vía Campesina and APM-Mondial (Réseau Mondial Agricultures Paysannes, Alimentation et Mondialisation) link coalitions of national groups that operate within Europe, Latin America, Asia, and Africa. With their own sometimes-meager resources and additional backing from European (and a few other) nongovernmental organizations (NGOs) and foundations, they have come to have a high profile in the global justice movement, including the World Social Forums in Porto Alegre and Mumbai and the anti-WTO protests in Seattle, Cancún, and elsewhere (Edelman 2003). Their member organizations have also contributed to toppling national governments, as in Ecuador in 2000 and Bolivia in 2003.

The history of the formation of transnational peasant and small-farmer networks and movements can only be outlined here.[1] The main impetus for cross-border organizing by peasants and small farmers was the 1980s world farm crisis sparked by the rapid liberalization of global agricultural trade. Small agriculturalists' organizations feared—largely correctly, as it turned out—that a more liberal trade regime would lead to lower commodity prices, the consolidation of giant agribusinesses, a homogenization of the global food system, and the erosion of supply management mechanisms and public-sector supports for farmers. Some small agriculturalists . . . adapted to the newly globalized economy by entering specialized, export-oriented market niches. Many more, as Scott (1976: 59) had indicated regarding an earlier period in Asia, found the insecurities of the new economic situation much greater than those they traditionally faced in protected local or national markets.

* Reproduced by permission of the American Anthropological Association from *American Anthropologist* 107, no. 3 (September 2005): 331–345. Not for sale or further reproduction.

Transnational networking by small agriculturalists occurred not only as a result of growing market-based threats but also from a globalization of moral economic norms. In the late 1980s and early 1990s, in Europe, North America, and Central America, the advance of regional economic integration led small agriculturalists to form cross-border coalitions with counterparts in nearby countries. In India, peasant organizations questioned whether life forms that small farmers had selectively bred over hundreds of years, such as basmati rice or the seeds of the neem tree (which produced an excellent pesticide), could be privately appropriated or patented. Their protests brought worldwide attention to the Trade-Related Intellectual Property Agreement (TRIPS, part of GATT [General Agreements on Tariffs and Trade], which became the WTO in 2004). European farmers sparred with giant corporations that sought to claim exclusive ownership of age-old cheese cultures or that counterfeited local cheeses. In the early 1990s in Europe, the final round of GATT talks sparked huge demonstrations, some of which were attended by farmers from Asia, Africa, and the Americas, as well as from all over Europe. In 1993, as anti-GATT protests mounted in Europe, representatives of peasant and small-farmer organizations from several dozen countries met in Belgium and founded a transnational coalition called Vía Campesina (Edelman 2003: 204–205).[2]

In just a few years, Vía Campesina had affiliated around 80 organizations in some 50 countries. Its membership is highly heterogeneous, "ranging from small dairy farmers in Germany to landless peasants in Brazil, from farm surplus-producing farmers in Karnataka (India) to land-poor peasants in Mexico, from farm workers in Nicaragua to rice farmers in South Korea" (Borras 2004: 9). Ideologically, Vía Campesina is also diverse, and participating groups frequently disagree over strategy, although all share a broad opposition to neoliberalism (albeit for sometimes different reasons and with different degrees of flexibility or intransigence). Since 1995, when Vía Campesina representatives attended the Global Assembly on Food Security in Quebec City, the coalition has had a rising international profile (Desmarais 2002: 103). Over the next decade, Vía Campesina and its member organizations have organized and participated in dozens of "parallel summits," NGO forums, and international conferences on food, agriculture, and land questions. Although member groups have at times lobbied and pressured national governments around human rights and agrarian reform issues (Edelman 2003: 206–212), Vía Campesina still sees its principal political strategy as mass mobilization (Borras 2004: 24). At the same time, however, the coalition and most of its constituent organizations engage in a conscious practice of tactical flexibility and "venue shifting," seeking the local, national, or international locations—institutional and geographical—which will permit them to exercise effective pressure or otherwise attain key objectives.[3]

What are the projects of these transnational peasant and small-farmer organizations, and how do they reflect moral economic sensibilities? Here again, for

reasons of space, I can only begin to sketch out an answer. The demands and political campaigns of Vía Campesina focus on human rights, agrarian reform, environment and sustainable agriculture, biodiversity and genetic resources, state reform, and trade, among other issues. Many of these interrelated efforts are indicative of the continuing salience of moral economies in understanding peasant protest, although just two will be considered here. The first is the call to remove agriculture from the purview of the WTO; the second is the quest for "food sovereignty," a concept to which I will return shortly.

The demand to "take agriculture out of WTO," heard with increasing frequency since the 1999 Seattle protests and the commencement of the Doha WTO round in early 2000, is based on several premises: (1) that agricultural production is not about just producing commodities but is a means of livelihood and nourishment for peasants and small farmers;[4] (2) that because most of the world's agricultural output is consumed domestically, global trade rules should apply only to that portion that is traded internationally;[5] (3) that "there is no 'world market' of agricultural products" (Vía Campesina 2001: 6) but, rather, an international trade in surpluses of milk, cereals, and meat dumped primarily by the European Union, the United States, and members of the Cairns Group;[6] and (4) that "the WTO is undemocratic and unaccountable, has increased global inequality and insecurity, promotes unsustainable production and consumption patterns, erodes diversity, and undermines social and environmental priorities" (Vía Campesina 2001: 6). For Vía Campesina and its supporters, "taking agriculture out of the WTO" means not just scrapping the Agreement on Agriculture (AoA) but removing or amending relevant clauses in all other WTO accords, including TRIPS, the General Agreement on Trade in Services (GATS), Sanitary and Phytosanitary Measures (SPS), Quantitative Restrictions (QRs), and Subsidies and Countervailing Measures (SCM).

Although the AoA allows national governments some leeway in protecting their producers and provides for "special and differential treatment" for less-developed WTO member nations, its overall thrust is toward a rapid phasing out of tariffs and dramatically accelerated trade liberalization. The European Union and the United States, however, have been required to make only minor reductions in their vast subsidy programs, largely because they have been able to argue that direct income supports for farmers that are "decoupled" from production levels or prices have at worst only minimal trade-distorting effects. Vía Campesina has maintained, in contrast, that such "green box" subsidies are really hidden export subsidies and that they go, in any case, primarily to large producers, who are then unfairly advantaged.[7] Its activists reserve special scorn for the AoA article that prevents member countries from invoking WTO dispute-settlement rules intended to provide protection from dumping. Although the WTO prohibits dumping (albeit with weak sanctions) as one of the most unfair and distorting trade practices, the problem persists as a result of EU and U.S. subsidy

policies. In general, however, the peasant organizations have been reluctant to attack developed-country farm subsidies except as they impact international commodity prices, dumping, and market access. This reluctance does not stem from concern that the subsidy question could be a fault line separating farmer organizations in developed countries, especially Europe, from those in poorer countries (even though in Europe, as in the United States, the vast majority of subsidies go to large producers). As Rafael Alegría, Honduran activist and Vía Campesina coordinator (1996–2004), explained in an interview,

> As an organization we can't be against subsidies, since that's precisely one thing that permits the European agriculturalists to live, to survive. More important than subsidies, though, are just prices. And the French and other European agriculturalists are very conscious of that. They say, "we'll renounce subsidies but we want good prices, just prices that we don't have now." And isn't it precisely the multinationals that get most of the subsidies? They take advantage of us and buy cheap, store it, and then sell. We're for reorienting the agro-export model, the industrial agriculture model, in favor of an agriculture that's more sustainable and based more on the internal market. Because that other [export-oriented] model of Europe or the industrialized countries is exactly what destroys local and national markets. It's what produces social and economic dumping, as we call it. (Alegría, interview with author, 2001)

Alegría's remarks are suggestive of the fundamentally moral bases of contemporary transnational peasant mobilization. "Just prices," in particular, is a demand that parallels the moral economic principles Scott described for early-20th-century Southeast Asia. Here, though, it is invoked as a transnational or even universal norm, rather than a local or national one. Some of the actors have changed and the relevant social field has widened to encompass global markets, but "just" behavior by the more powerful is an aspiration that still forms part of contemporary peasant activists' implicit moral economy. The language employed—more complex than in the early 20th century—indicates familiarity with esoteric aspects of trade policy; "dumping," for example, despite its colloquial origin, has come to have a technical definition in global trade accords (see above). As in earlier moral economy discourses, the state is viewed ambivalently, here as a benevolent provider of direct and indirect price supports, but also as an antagonist and promoter of a destructive model of production and commerce. The goal of reorienting agriculture toward the internal market would require a shoring up of the state—which, earlier, was one of the peasants' main adversaries—as a bulwark against supranational forces. The multinationals, in Alegría's view, epitomize the market actor whose weight is so great that it unfairly appropriates resources that ought to go to small producers. The rule-governed local market figures as an endangered space, the only one in which peasants

have a real chance of making an adequate living. Most significant, though, for Vía Campesina, is that an antisubsidy stance, particularly one that opposed payments for limiting production or for environmental services, would contradict the demand for "food sovereignty."[8]

"Food sovereignty" was first raised as a demand by Vía Campesina in the mid-1990s, notably at the 1996 FAO Food Security Conference in Rome. The concept later received greater theoretical elaboration at an international conference in 2001 in Havana attended by dozens of APM and Vía Campesina member organizations, in meetings in 2002 and 2003 sponsored by the Tuscan regional government and the International Commission on the Future of Food and Agriculture ([ICFFA] 2003), and in other new networks of civil society and NGOs, such as the International Planning Committee for Food Sovereignty. The FAO's definition of "food security" refers to a situation—at the world, national, or household level—in which all people at all times have physical and economic access to adequate nutritious food. Although FAO officials speak of "food security" as an "entitlement," Vía Campesina activists maintain that technical balances based on supplies and mouths to feed ought to be replaced with a commitment to "food sovereignty." "Food sovereignty," a broader concept that considers food a human right rather than primarily a commodity, prioritizes local production and peasant access to land and upholds nations' rights to protect their producers from dumping and to implement supply management policies. On the one hand, according to Peter Rosset of the Institute for Food and Development Policy, which works closely with Vía Campesina, "food security . . . says nothing about where . . . food comes from or how it is produced" (2003: 1). On the other hand, "food sovereignty does not negate trade, but rather . . . promotes the formulation of trade policies and practices that serve the rights of peoples to safe, healthy and ecologically sustainable production" (Vía Campesina 2001: 2).

Peasant and farm activists have pressed for "food sovereignty" in international organizations, particularly the FAO, which since 1996 regularly invites them to its conferences. They have also staged a number of events that build on longer peasant traditions and current social-movement practices of theatricality and carnivalesque protests, among them José Bové's famous "dismantling" of a half-built McDonald's restaurant in southern France, Indian peasants' attacks on the Bangalore offices of multinational grain giant Cargill, Brazilian MST supporters' uprooting of genetically modified crops, and the involvement of Basque, French, Brazilian, and Honduran activists in actions in support of Palestinian olive farmers (Edelman 2003). . . .

In conversations with peasant and farmer activists in Latin America, North America, and Europe, I have often questioned them about the feasibility of food sovereignty and of taking agriculture out of the WTO. Defining how a bushel of wheat can be produced under different rules for export or for domestic consumption or when an agricultural product ceases to be agricultural and becomes

an industrial product subject to WTO rules are but two of the numerous thorny issues that would have to be resolved.

The activists' responses, however, tend not to focus on such intricacies but, rather, on two main themes: (1) that conditions were better before the founding of the WTO and (2) that WTO rules are profoundly hypocritical and especially so for agriculturalists in developing countries. Karen Pedersen, a young Saskatchewan beekeeper and Canadian National Farmers Union activist, attended the 2001 FAO "Rome+5" meeting on food security as part of a Vía Campesina delegation. "How practical is it to keep agriculture in the WTO?" she asked, recounting discussions at the Rome conference.

> At some point we have to stop and look at our rural system the way that it is and say, "You know what? It's not working. . . . It's not distributing food. It's producing more and more food, it's exporting more and more food, but it is not distributing it. We're not gaining on world hunger." If we leave agriculture there in WTO? I mean all we're gonna have is, we're going to have lost all our small farmers and when the system collapses we're not going to have any expertise to rebuild the system. . . . Agriculture is the food industry. And I'm not convinced that you should be shipping, for example, hogs around the world. It's not just that that's the problem. Shipping bacon is also a problem. Is the making of bacon considered industry? Yeah, it is. But does it need to be removed [from WTO] too? Yes, it does. So to me, it's not enough to just take the raw product out. That's not just the agriculture. Agriculture is—you know, we like to call it agri-industry now or agribusiness—but we used to call it agriculture, and that's what it is. It's just we've changed the terminology. (Pedersen, interview with author, November 20, 2002)

Pedersen's comments, like Alegría's, invoke moral norms against the rules and bureaucratic structures that govern global markets: "distribution" as opposed to production; "elimination of hunger" rather than exports; and the identification of "agriculture" with food, sustenance, and local places. Small farmers, she asserts, have expertise that large industrial operators lack, and they are more respectful of the land. Finally, language itself—the definition of *agriculture*—has to be reclaimed to wrest power from agribusiness corporations and supranational governance institutions, such as the WTO. The activists have proffered various proposals for alternative institutional frameworks for managing global agricultural trade. Vía Campesina has pointed to Article 11 of the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR), which establishes the human right to food, and interpreted it as recognizing peasant communities' right to retain access to productive resources (Verhagen 2004: 16).[9] Some Vía Campesina organizations are hopeful that the FAO or the UN Conference on Trade and Development (UNCTAD) can assume some regulatory functions in agricultural trade. French farm activist José Bové, a Vía Campesina

supporter, has called for an International Trade Tribunal modeled on the International Human Rights Court (Bové 2001: 95–96). Underlying these discussions, which involve arcane aspects of the supranational governance bureaucracies, is an older and more fundamental discourse about rights: whether the ICESCR's recognition of a human right to food or the more generalized demand for "just prices," unaffected by the unethical trade practices of the rich and powerful. Here are echoes of earlier peasant demands and struggles, much like those described by Scott in *The Moral Economy of the Peasant*, but infused with the sorts of specialized expertise that contemporary transnational social movements frequently generate (Keck and Sikkink 1998: 30).

The projects of "food sovereignty" and removing agriculture from the WTO may or may not be quixotic or utopian. They may even smack of the atavism that elites have almost always considered typical of agrarian movements. But the discourse of "rights" and justice, of a "reliable subsistence," and of a "moral economy" reembedded in society—albeit global society—are clearly their central pillars.

Conclusion

The organizational and historical continuities and links between local, national, regional, and transnational peasant activism—as well as the political experiences of the transnational activists, which often traverse these varied levels—provide a means through which to grasp the continuing salience of moral economic demands in peasant struggles. The connection between plummeting prices at the farm gate and subsidy and trade policies that encourage dumping, for example, is now widely comprehended among peasants and farmers of the most diverse circumstances in the most varied places. In the lifetime of a single activist, the struggle may have moved from seeking justice from local elites to defending a public-sector development bank against privatization to helping stall a WTO negotiating round. The old moral economic discourses about just prices, access to land, unfair markets, and the greed of the powerful have echoes in today's struggles against global trade liberalization, the World Bank's market-based agrarian reform programs, and corporate efforts to gain greater control of the food supply and plant germplasm. State and market—the antagonists of old—still threaten peasant livelihood today, along with the new suprastate forms of governance. Just as Scott described for the former, so also are the latter "forces [that] cut through the integument of subsistence customs and traditional social relations to replace them with contracts, the market, and uniform laws" (1976: 189).

The rise of transnational peasant activism draws on a deep, historical reservoir of moral economic sensibilities as well as on old protest repertoires and agrarian discourses. For the activists, however, the pressures of globalized

markets and the demands of transnational collective action have required new degrees of political sophistication, new alliances, and movement through strikingly different geographical and institutional spaces. These leaps in the space of politics may occur over the course of a lifetime, but, at times, they happen in a single week. They reflect both the density of cross-border networking and the increasingly global and complex character of agriculture itself. Asserting moral economic demands in new political spaces has given participants in the transnational peasant and farmer networks an unprecedentedly dynamic sense of themselves as political actors. Empowered with new knowledge, conceptions of solidarity, and tools of struggle, they are passionate about moral economic sensibilities; however, in most other respects, they are as dissimilar as can be imagined from the unsophisticated rustics that urban elites and academics still often imagine them to be.

NOTES

1. More detailed treatments include those by Borras (2004), Desmarais (2002, 2003), and Edelman (1998, 2002, 2003).
2. *Vía Campesina* may be roughly translated as "peasant road"; even non-Spanish speakers, however, refer to the organization by its Spanish name. Its activists deliberately use the terms *farmer* and *peasant* interchangeably to highlight the common problems of small agriculturalists in developed and less-developed countries. . . .
3. Van Rooy (2004: 20) points out that all social movements engage in "venue shifting" but that this tends to intensify when they participate in transnational networks. Borras (2004: 4–5) describes Vía Campesina organizations as "polycentric"—with centers of power located at international, regional, national, and local levels. The networks that link them, such as Vía Campesina, are, he says, both "actors" and "arenas of actions," because they engage in mobilizations and other pressure tactics while simultaneously serving as a forum for debates and exchanges of experiences among participating groups and individuals (Borras 2004: 4–5).
4. Similarly, the Vía Campesina agrarian reform campaign, which seeks to present an alternative to the World Bank's market-based agrarian reform model, states that it rejects "the ideology that only considers land as merchandise" (Borras 2004: 11). The argument is reminiscent of Polanyi's concept of "fictitious commodities": "What we call land is an element of nature inextricably interwoven with man's institutions. To isolate it and form a market out of it was perhaps the weirdest of all undertakings of our ancestors" ([1944] 1957: 178; see also 72–73).
5. Vía Campesina and its supporters frequently suggest that only 10 percent of world agricultural output is traded internationally (Coordination Paysanne Européenne [CPE] 2004; Simpson et al. 2004; Vía Campesina 2001: 6). The FAO reports, however, that "around one-third of world [agricultural] output is traded internationally" (2000). The proportion of total output traded internationally varies greatly by commodity, from 94 percent of coffee (in 1996) to 20 percent of wheat and 5 percent of rice (FAO 2000).
6. The Cairns Group consists of 17 countries (including Argentina, Australia, Brazil, Canada, Chile, Indonesia, Malaysia, New Zealand, and South Africa) with modern agricultural export sectors and minimal farm subsidies. In international trade talks, it has pushed for the reduction and elimination of export and other agricultural subsidies.

7. The WTO categorizes most kinds of agricultural subsidies in "amber," "green," and "blue boxes." The "amber box" (like the caution signaled by the amber color of a traffic light) includes subsidies that are considered trade distorting and that must be reduced over time, such as support prices or subsidies directly related to production output. Permitted "green box" subsidies are mainly programs of direct income support not tied to particular products as well as payments to farmers for environmental conservation. The "blue box" contains "amber box"–type subsidies that require agriculturalists to limit production. "Green" and "blue" box subsidies are not subject to overall national limits. Approximately two-thirds of U.S. subsidies are now in the "green box" and one-third in the "amber box," while EU programs are approximately one-half in the "amber box" and one-quarter each in the "green" and "blue" boxes.
8. Rosset (2003: 3) provides a succinct statement of what is probably the majority position within Vía Campesina: subsidies per se are not the enemy. Their merit depends on how much the subsidies cost, who gets them, and what they pay for. So subsidies paid only to large corporate producers in the North, leading to dumping and the destruction of rural livelihoods in the Third World, are bad. But subsidies paid to family farmers to keep them on the land and support vibrant rural economies, and subsidies that assist with soil conservation, the transition to sustainable farming practices, and direct marketing to local consumers, are good. The real enemy of farmers is low prices.
9. Article 11 commits signatories of the Convention to "recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions." It also calls for "recognizing the fundamental right of everyone to be free from hunger" and for programs "to improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources." Finally, it calls for "taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need" (Office of the High Commissioner for Human Rights [OHCHR] 1976).

REFERENCES

Borras, Saturnino M. 2004 La Vía Campesina: An Evolving Transnational Social Movement. TNI Briefing Series (Transnational Institute, Amsterdam) No. 6:32. Also electronic document, http://www.tni.org/reports/newpol/campesina.pdf, accessed April 15, 2005.

Bové, José 2001 A Farmers' International? New Left Review 12:89–101.

Coordination Paysanne Européenne (CPE) 2004 At the WTO, Rischler and Lamy Betrayed the European Farmers and Those from the Southern Countries, to the Only Advantage of the Transnational. Press release, 3 August, Brussels. 2 pp. Electronic mailing list, agri-trade@yahoogroups.com, posted by Alexandra Strickner, accessed August 5, 2004.

Desmarais, Annette-Aurélie 2002 The Vía Campesina: Consolidating an International Peasant and Farm Movement. Journal of Peasant Studies 29 (2): 91–124.

——— 2003 The Vía Campesina: Peasants Resisting Globalization. Ph.D. dissertation, Department of Geography, University of Calgary.

Edelman, Marc 1998 Transnational Peasant Politics in Central America. Latin American Research Review 33 (3): 49–86.

——— 2002 Toward an Anthropology of Some New Internationalisms: Small Farmers in Global Resistance Movements. Focaal—European Journal of Anthropology 40:103–122.

——— 2003 Transnational Peasant and Farmer Movements and Networks. *In* Global Civil Society 2003. Mary Kaldor, Helmut Anheier, and Marlies Glasius, eds. Pp. 185–220. Oxford: Oxford University Press. Also electronic document, http://www.lse.ac.uk/Depts/global/Yearbook/outline2003.htm, accessed April 15, 2005.

Food and Agriculture Organization of the United Nations (FAO) 2000 Trends in World and Agricultural Trade. *In* Multilateral Trade Negotiations on Agriculture: A Resource Manual. Rome: FAO. Also electronic document, http://www.fao.org/docrep/003/x7351e/x7351e00.htm, accessed April 15, 2005.

International Commission on the Future of Food and Agriculture (ICFFA) 2003 Manifesto on the Future of Food. San Rossore, Italy: ICFFA. Also electronic document, http://www.navdanyainternational.it/images/manifesti/cibo/cibo_ing.pdf , accessed March 30, 2005.

Keck, Margaret E., and Kathryn Sikkink 1998 Activists beyond Borders: Advocacy Networks in International Politics. Ithaca, NY: Cornell University Press.

Office of the High Commissioner for Human Rights (OHCHR) 1976 International Covenant on Economic, Social and Cultural Rights. Electronic document, http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx, accessed March 30, 2005.

Polanyi, Karl (1944) 1957 The Great Transformation: The Political and Economic Origins of Our Time. Boston: Beacon.

Rosset, Peter 2003 Food Sovereignty: Global Rallying Cry of Farmer Movements. Food First Backgrounder 9 (4): 1–4. Also electronic document, http://www.nyeleni.org/IMG/pdf/FoodSovRosset.pdf, accessed April 15, 2005.

Scott, James C. 1976 The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia. New Haven, CT: Yale University Press.

Simpson, Alan, et al. 2004 Letter from Alan Simpson, MP, 69 other parliamentarians, 47 organizations, and seven individuals to Ambassador Tim Groser, Chairperson, WTO Committee on Agriculture, Geneva, 14 July. Electronic mailing list, agri-trade@yahoogroups.com, posted by Aksel Naerstad, accessed July 20, 2004.

van Rooy, Alison 2004 The Global Legitimacy Game: Civil Society, Globalization and Protest. London: Palgrave.

Verhagen, Nico 2004 Commentary on Land and Rural Development Policies of the World Bank. Vía Campesina. 17 pp. Electronic document, http://viacampesina.org/en/index.php/main-issues-mainmenu-27/agrarian-reform-mainmenu-36/83-commentary-on-land-and-rural-development-policies-of-the-world-bank2, accessed April 15, 2005.

Vía Campesina 2001 Priority to Peoples' Food Sovereignty (November 1). 10 pp. Electronic document, http://www.voiceoftheturtle.org/library/2001-11-1%20Peoples%20foodsovereignty-en.htm, accessed April 15, 2005.

29

How to Queer Ecology*

One Goose at a Time

ALEX CARR JOHNSON

I once thought I knew what nature writing was: the pretty, sublime stuff minus the parking lot. The mountain majesty and the soaring eagle and the ancient forest without the human footprint, the humans themselves, the mess.

Slowly, fortunately, that definition has fallen flat. Where is the line between what is Nature and what is Human? Do I spend equal times in the parking lot and the forest? Can I really say the parking lot is separate from the forest? What if I end up staying in the parking lot the whole time? What if it has been a long drive and I really have to pee?

The problem is, the Nature/Human split is not a split. It is a dualism. It is false.

I propose messing it up. I propose queering Nature.

As it would happen, I'm queer. What I mean is this: (A) I am a man attracted to men. (B) Popular culture has told me that men who are attracted to men are unnatural, and so (C) if my culture is right, then I am unnatural. But (D) I don't feel unnatural at all. In fact, the love I share with another man is one of the most comfortable, honest, real feelings I have ever felt. And so (E) I can't help but believe that Nature and the corresponding definition of "natural" betray reality. From my end of the rainbow, this thing we call Nature is in need of a good queering.

Step #1: Let Go of Ecological Mandates

Not so long ago, I read David Quammen's essay "The Miracle of the Geese." In the essay, Quammen says this: "wild geese, not angels, are the images of humanity's own highest self" (1998: 234). By humanity, I can only assume that he means all humans, collectively, over all of time. "They show us the apogee of our own potential," Quammen says. "They live by the same principles that we, too often, only espouse. They embody liberty, grace, and devotion, combining those three contradictory virtues with a seamless elegance that leaves us shamed and inspired" (ibid.). Quammen seems to be on to something. Who could possibly be against liberty, grace, or devotion? But then he starts talking about sex. How

* From *Orion Magazine*, March–April 2011. Used by permission of author.

geese are monogamous. How a male goose will in fact do better evolutionarily if he is loyal to his mate. "They need one another there, male and female, each its chosen mate, at all times," he says. "The evolutionary struggle, it turns out, is somewhat more complicated than a singles' bar." I'm a little concerned about the evolutionary struggle thing, but I'm still tracking. Life sure is complicated. And then he says this: "I was glad to find an ecological mandate for permanent partnership among animals so estimable as *Branta canadensis*."

Boom. There it is. Geese are wild. Geese are pure. They aren't all mixed up with the problems of civilization and humanity. What we really need is to behave more like geese. If you are a male, then you must find a female. You must partner with that female, provide for that female, fertilize that female, and love that female for the rest of your life. If you are a female, well, you'll know what to do.

When I first read about Quammen's geese, I'd been out as bisexual for a year. It was around the second Bush election, and I was writing very serious letters to my conservative grandparents about my sexuality and politics. Now I know why his essay, so considerate, so passionate, so genteel, hit me in the gut. I was not natural.

Step #2: Stop Generalizing

My instinct is to give Quammen the benefit of the doubt; it was the late '80s after all. Regardless of his intentions though, Quammen's notion that Canada geese offer humans an ecological mandate not only reinforces a Nature-as-purity mythos (*against* which humans act), but at an even more basic level, his assumptions are simply inaccurate: plenty of geese aren't straight.

In 1999, Bruce Bagemihl published *Biological Exuberance*, an impressive compendium of thousands of observed nonheteronormative sexual behaviors and gender nonconformity among animals. Besides giraffes and warthogs and hummingbirds, there's a section on geese. Researchers have observed that up to 12 percent of pairs were homosexual in populations of *Branta canadensis*. And it's not because of a lack of potential mates of the opposite gender. "In one case," says Bagemihl, "a male harassed a female who was part of a long-lasting lesbian pair and separated her from her companion, mating with her. However, the next year, she returned to her female partner and their pairbond resumed" (1999: 485).

Red squirrels are seasonally bisexual, mounting same-sex partners and other-sex partners with equal fervor. Male boto dolphins penetrate each other's genital slits as well as blow holes. Primates exhibit all sorts of queer behavior between males and males and females and females. Observing queer behavior in non-humans is as easy as a trip to the nearest primate house, or a careful observation of the street cats, or the deer nibbling on your shrubs, or the mites on your skin.

The world itself, it turns out, is *so queer*.

Quammen assumed that geese are straight because it was easy to do. It was easy to assume I was straight, too; I did so for the first eighteen years of my life. But generalizing about the habits of both humans and the more-than-human living world not only denies that certain behavior already exists; it limits the potential for that behavior to become more common and more commonly accepted.

Step #3: Honk

I don't mean to insist that there is an ecological mandate for being gay. My interest in queering ecology lies in enabling humans to imagine an infinite number of possible Natures. The living world exhibits monogamy. But it also exhibits orgies, gender transformation, and cloning. What, then, is natural? All of it. None of it. Instead of using the more-than-human world as justification for or against certain behavior and characteristics, let's use the more-than-human world as a humbling indication of the capacity and diversity of all life on Earth.

So many of us humans are queer. Across all social, political, and physical boundaries, 2 to 10 percent of people take part in nonheteronormative behavior. Beyond the scope of sexuality, humans are capable of any number of imaginable and unimaginable behaviors. That I do not eat bull testicles does not mean that that behavior is any less human than my eating of baby back ribs. Why then, if I cohabitate with another man, sharing the same bed, yes even having sex in that bed with that man, am I somehow less human?

A goose is a goose is a goose.

Step #4: Acknowledge the Irony

In a review of Peter Matthiessen's book *The Birds of Heaven: Travels with Cranes*, Richard White indicts the "relentless and blinkered earnestness" of nature writing. White claims that because of its "reluctance to deal with paradox, irony, and history, much nature writing reinforces the worst tendencies of environmentalism." White points out that Matthiessen's unflinchingly sincere narrative baldly contradicts the circumstances: "The birds are immortal, timeless, and they transport us back into the deep evolutionary past," writes White. "But then Matthiessen gives us the details. He is sitting in a loud and clattering helicopter during this particular trip to the Eocene."

If you depict cranes as pure and ancient, with no place in this modern world, then you must ignore all those species that have done quite well in the rice paddies. Writing about nature means accepting that it will prove you wrong. And right. And render you generally confused. Nature is mysterious, and our part in

the pageant is shrouded in mystery as well. This means contradiction and paradox and irony. It means that there will always be an exception. Nature has always humiliated the self-congratulatory scientist.

Let's stop congratulating ourselves. Instead, let's give a round of applause to the delicious complexity. Let us call this complexity *the queer*, and let us use it as a verb. Let us queer our ecology. Cranes can be ancient, but they can also be modern. Might their posterity extend past ours?

We've inherited a culture that takes its dualisms seriously. Nature, on the one hand, is the ideal, the pure, the holy. On the other hand, it is evil, dangerous, and dirty. The problem? There's no reconciliation. We accept both notions as separate but equal truths and then organize our world around them. Status quo hurrah! Irony be damned.

Take sexuality, for instance:

We have come to believe, over our Western cultural history, that heterosexual monogamy is the norm, the *natural*. People who call gays unnatural presume that Nature is pure, perfect, and predictable. *Nature intended for a man and a woman to love each other*, they say. *Gays act against Nature*. And yet: we rip open the Earth. We dominate the landscape, compromising the integrity of the living world. We act as though civilization were something better, higher, more valuable than the natural world.

Our culture sets Nature as the highest bar for decorum, while simultaneously giving Nature our lowest standard of respect. Nature is at our disposal, not only for our physical consumption but also for our social construction. We call geese beautiful and elegant and faithful until they are shitting all over the lawn and terrorizing young children. Then we poison their eggs. Or shoot them.

What I'm getting at is this: those who traditionally hold more power in society—be they men over women, whites over any other race, wealthy over poor, straight over queer—have made their own qualities standard, "natural," constructing a vision of the world wherein such qualities are the norm. And in so doing, they've made everyone else's qualities *perverse, against Nature, against God*. Even Nature—defined impossibly as the nonhuman—becomes unnatural when it does not fit the desired norm: *the gay geese must be affected by hormone pollution*!

A man who has sex with a man must identify himself by his perversion, by his difference. If straight is the identity of *I am*, then gay becomes *I am not*. Women are not men. Native people are not white. Nature is not human.

Instead of talking about nonconformity, I want to talk about possibility and unnameably complex reality. What queer can offer is the identity of *I am also*. I am also human. I am also natural. I am also alive and dynamic and full of contradiction, paradox, irony. Queer knocks down the house of cards and throws them into the warm wind.

Step #5: Don't Fear the Queer

If theses were still in vogue, I would tell you my thesis is queer ecology. But as Zapatista leader Subcomandante Marcos told Pierluigi Sullo from the forest of southeast Mexico (and probably from a table in a house in a village in that forest), "I sincerely believe that you are not searching for a solution, but rather for a discussion." He's right.

So what discussion am I looking for?

Well, first, one that is happening at all. I've met many kind people (aren't we all sometimes?) who are so afraid of being politically incorrect that they don't speak at all—well, at least not about race or gender or sex (this on top of the three taboos of religion, politics, and money). How do I know how I should refer to Indians? Or blacks? Or gays? Or bums, for that matter? It's just all so complicated now. Queer, then, remains a gesture of hands under the table. A wink.

In the recent past, conversationalists have at least had the weather to fall back on. But the record heat of late with its strange winds of change have whipped away that golden ticket of banality too. So people stop talking, at least about difference, or flux, or complication, altogether. And the floor is left to those who are the loudest and quickest and who never had any intention of complicating their conversation with anyone or anything that doesn't conform to their tidy but limited worldview.

Step #6: Enjoy the Performance

The problem with unnameably complex reality is that it's really hard to pin down and even harder to write about. Yet anyone who gives a damn about the ecological health of life on Earth knows that there's no time for dillydallying.

In the late nineteenth century, a Danish scientist named Eugen Warming first used the term *ecology* to describe the study of interrelationships between living things. Henry Chandler Cowles, a doctoral candidate at the University of Chicago, brought ecology across the Atlantic with the 1899 publication of his treatise on the succession of the plant life of the Indiana Dunes. Instead of static forests and static lakes and static prairies, Warming and Cowles recognized that these features of the physical world were in flux. As Cowles wrote in his introduction, "Ecology, therefore, is a study in dynamics" (1899: 3).

Queer ecology, then, is the study of dynamics across all phenomena, all behavior, all possibility. It is the relation between past, present, and future.

Yes, we need to act. But we also must recognize that any action is also a performance, and possibly in drag. Any writer who chooses the more-than-human world as subject must acknowledge both the complexity and paradox contained within the subject of nature, as well as the contradictions wrapped up within the writer's very self. Such a writer will write about the parking lot and the invasive

knapweed and the unseasonably warm weather and how he or she is undeniably mixed up in the complications. The poet James Broughton calls it "the mystery of the total self" (1994: 14). Henry Chandler Cowles called it ecology.

It is the relation within the human and the natural and the god and the geese and the past, present, future, body-self-other. A queer ecology is a liberatory ecology. It is the acknowledgment of the numberless relations between all things alive, once alive, and alive once again. No man can categorize those relations without lying. Categories offer us a way of organizing our world. They are tools. They are power.

Acknowledge the power. Acknowledge the lie.

Step #7: I'm Done with Steps

Not so long ago, my father and I drove out of the city of Chicago going east on the Skyway.

On a map, the eastern boundary of the city is clean. It curls southeast along the shore of Lake Michigan, then cuts south at Indiana as straight as a longitudinal line. On the other side of the state line are Whiting, East Chicago, and Gary, towns that only gamblers and family members visit. Everybody else just lives there.

In reality, the eastern boundary of the city has no boundary at all. It continues its concrete, steel, and electrical-line unfurling along the southern shore of the great lake of Michigan. We were two white men, hurtling on four rubber wheels down the concrete Skyway, a corridor of semis and freight trains and transistors and faceless industrial complexes blinking out toward the lake.

I don't recall what my father and I were talking about. I do recall looking out the window onto the gray April sweep of the old glacial lake bed.

Then I saw the geese. More of them than I had ever imagined could gather. V after V after W after I after V. One after another, each flock waved several hundred feet above the ground. It was spring, and they all flew east along the metal and concrete corridor. They flew along the shore of the lake.

Less than half an hour later, we reached the Indiana Dunes. There were trees: oaks mostly. We opened our car doors to the calls of sandhill cranes. They were calls neither ancient nor modern. They were calls from the deepest present. As we stood in the parking lot, the car engine still pinging, the half dozen cranes swung across the opening above us and out of sight.

My father and I made eye contact, then looked up from the parking lot into the trees where the cranes had gone. Then we both went off to pee.

REFERENCES

Bagemihl, Bruce. 1999. *Biological Exuberance: Animal Homosexuality and Natural Diversity*. New York: St. Martin's.

Broughton, James. 1994. Gaiety of Soul. In *Gay Soul: Finding the Heart of Gay Spirit and Nature with Sixteen Writers, Healers, Teachers, and Visionaries*. Mark Thompston, ed. Pp. 7–16. San Francisco: Harper San Francisco.

Cowles, Henry Chandler. 1899. *The Ecological Relations of the Vegetation on the Sand Dunes of Lake Michigan*. Chicago: University of Chicago Press.

Quammen, David. 1998. The Miracle of the Geese: A Bizarre Sexual Strategy among Steadfast Birds. In *The Flight of the Iguana: A Sidelong View of Science and Nature*. Pp. 233–240. New York: Scribner.

SECTION 6

Can Biodiversity Be Conserved?

How have conservation strategies changed during the past several decades? How have the fields of ecology, economics, and anthropology engaged with conservation practices over the years? Who speaks for nature? Who has rights to nature, and whose knowledge gets prioritized in international efforts to manage natural resources? For whom is biodiversity conserved? And who benefits from its conservation? What are the impacts of conservation on local people? How do cultural meanings affect groups' support for, or resistance to, conservation efforts? Does biodiversity even exist?

In an influential article titled "Whose Knowledge, Whose Nature? Biodiversity, Conservation, and the Political Ecology of Social Movements," Arturo Escobar asked, "Is there a discrete reality of 'biodiversity' different from the infinity of living beings, including plants, animals, microorganisms, homo sapiens, and their interactions, attraction and repulsion, co-creations and destructions?" (1998: 54). In articulating a framework for studying the conservation of biodiversity, Escobar put forth three propositions. First, he argued that "although 'biodiversity' has concrete biophysical referents, it must be seen as a discursive invention of recent origin. This discourse fosters a complex network of actors, from international organizations and northern NGOs to scientists, prospectors, and local communities and social movements. This network is composed of sites with diverging biocultural perspectives and political stakes" (53). Second, Escobar emphasized the importance of social movements in redefining cultural and ethnic identities and articulating counterdiscourses (54). Third, he argued that debates over biodiversity take on new dimensions when they are viewed from the perspective of social movements. "When seen from this perspective," Escobar writes, "particular issues within biodiversity debates (territorial control, alternative development, intellectual property rights, genetic resources, local knowledge, and conservation itself) . . . can no longer be reduced to the managerial and economizing prescriptions offered by dominant views. . . . Marginal sites, such as local communities and social movements, come to be seen as emergent centers of innovation and alternative worlds" (54).

Escobar's writing lays the groundwork for this section, which explores biodiversity conservation from a number of perspectives. Taken together, the readings in this section invite readers to ask questions that extend beyond the mechanics of environmental management. Readers must ask, to whom do natural resources belong, and who is responsible for their future? Building on the

previous readings, this section's contributors recognize the power of discourse, the importance of identity, and the role of global networks in establishing conservation priorities. In the words of the first reading's authors, Jim Igoe and Dan Brockington, the readings in this section demonstrate that "the social side of conservation should be as empirically driven as the ecological side."

Igoe and Brockington open this section by considering the ways in which neoliberal ideologies influence the landscapes, policies, practices, and effects of biodiversity conservation. The term *neoliberalism* refers to the reigning economic philosophy—ardently promoted by the World Bank and International Monetary Fund (IMF)—which promotes private enterprise and growth in the NGO sector by rolling back states' capacity to regulate them. As Sonia Patten explains, in order to receive a loan from one of these international lending agencies, countries must follow a structural adjustment program (SAP), which typically calls for

> (1) cuts in spending for health, education and all forms of social welfare; (2) privatization of all state-owned enterprises; (3) opening the economy to foreign competition and direct foreign investment; (4) allowing the market to determine interest rates; (5) managing currency exchange rates to keep them stable. Additionally, governments are to broaden the tax base in order to collect more revenue, deregulate labor markets, and stop using public monies to subsidize commodities, thus increasing the cost to consumers. (2012: 146)

The assumption behind this philosophy, according to Igoe and Brockington, "is that corrupt and inefficient states restrict free trade, free assembly, free speech, and free press. It follows that if the states were less intrusive in these matters, people's lives would naturally improve." Neoliberal conservation, then, is the process by which neoliberal practices such as deregulation, decentralization, and privatization are tools for successful conservation. Igoe and Brockington assert that the discourse of neoliberal conservation seems to promise everything—environmentally conscious and profitable green business for companies, increased democracy and economic opportunity for local residents—in short, a simple solution to complex problems. Yet the outcome of neoliberal conservation is not so clear-cut. As Igoe and Brockington reveal, it frequently tends to cause problems for both nature and society. They explain that when neoliberal conservation actually does benefit either the environment or local communities, these benefits are actually just unintended consequences. This makes sense because, as a principle, neoliberalism refers to the restructuring of political, economic, and "development" mechanisms to facilitate the spread of free markets; this principle does not need to benefit the environment or the poor in order to thrive.

Recently, scholars studying conservation in Mexico have elaborated different forms of neoliberalism from those described by Igoe and Brockington. In addition to the "roll-back" neoliberalism defined in the previous chapter, these scholars have also found examples of "roll-out" neoliberalism wherein the state actually expands its reach in order to facilitate free market practices (Haenn et al. 2014; Castree 2010; Peck and Tickell 2002). For instance, Nora Haenn et al. write that, where conservation programs encounter social resistance and fail to achieve sustainable development, state actors may attempt to manage these social pressures by applying subsidy programs that are "disguised and promoted as 'projects' for conservation" (2014: 112).

The next chapter offers an example of this dynamic while also discussing the ways in which divergent cultural meanings fuel conservation conflicts. Here, Haenn reviews local reactions to measures implemented inside and on the periphery of Mexico's Calakmul Biosphere Reserve. Drawing on Virginia D. Nazarea's ethnoecology (chapter 5), Haenn explores how the different meanings that farmers, foreign researchers, urban-dwelling environmentalists, and local and national leaders assign to ecological systems lead to disagreements over conservation strategies. While farmers view the environment as a powerful entity and as a place of work, researchers and politicians imagine the environment as pristine and devoid of human activity. These different cultural understandings foster competing ideas about the role of governments in land stewardship. If, for instance, the environment is conceptualized as a place of work, then human activities are viewed as a necessary, even defining, element in forest growth. But if people and forests are understood as separate, then governments are obliged to adopt a "fortress" model of conservation that places strict limits on hunting, farming, and other subsistence activities.[1]

Haenn concludes that the tenuous nature of conservation in Calakmul actually afforded advantages to the many different actors involved. For instance, some of the same farmers who resist regulations that restrict hunting, swidden burns, and the felling of trees will, in a seeming contradiction, publicly espouse environmentalism in order to garner development aid from governmental and international circles. In return for gubernatorial votes, Calakmul's residents received programs in agroforestry, sustainable timber harvesting, organic agriculture, intensive cattle ranching, and wildlife management. Monthly meetings of the Regional Council charged with administering these programs drew hundreds of attendees and became "a natural place for disseminating government directives."

In another study of conservation conflict, the environmental historian Libby Robin describes the history of scientific ecology in Australia. Focusing on the 1950s—a period some people call "a lost decade in environmental history"—Robin chronicles the work of Australia's leading alpine ecologist, Alec Costin. Costin is not an academic—"his career has been constructed almost entirely

outside the university system"—but his work with the Commonwealth Scientific and Industrial Research Organization (CSIRO) Alpine Ecology Unit in the Snowy Mountains helped establish the credibility of science and scientists in conservation matters. In the early 1950s, Costin's research helped protect river catchments supplying water to the surrounding area by encouraging a ban on livestock grazing in the fragile alpine country above the snow line. In the late 1950s, Costin and a number of senior scientists pressured the fledgling Kosciusko State Park Trust to oppose a nonessential dam and aqueduct project proposed by "the 'great development leader' in Australia at the time": the Snowy Mountains Authority. Costin and his colleagues understood that this project would interrupt the revolutionary test plots that he had established for the glaciological study of Mount Kosciuszko. Notably, the ecologists' petition to the Kosciusko State Park Trust called for the preservation of the Kosciuszko Tops for *scientific*, rather than purely aesthetic, purposes. In this case, Robin writes, conservation *was* ecology, and "the campaigns of the 1950s established the right of scientists to speak on behalf of nature." In the years following this "lost decade," the conservation community in Australia witnessed increasing division between professional ecologists and activist "greenies." These conflicts center on who will influence Australian environmental policies, and they reveal different interpretations of environmental problems. Yet the two groups share a heritage that traces back to the activist ecology of Alec Costin.

That scientists and activists can still work together is proved by the next chapter, which takes us from 1950s Australia to present-day Africa. This entry is authored by an interdisciplinary team of scientists, activists, reporters, development agents, and policy makers. Their Rapid Response Assessment (RRA) summarizes the extent of the illicit trade in great apes and calls on governments to put an end to the international traffic in endangered species. Authors Daniel Stiles, Ian Redmond, Doug Cress, Christian Nellemann, and Rannveig Knutsdatter Formo estimate that as many as 22,218 wild great apes were lost to the illegal trade between 2005 and 2011. This trade has shifted, they write, from an informal by-product of logging, mining, and bushmeat operations to a "more sophisticated business driven by demand from international markets." Yet efforts to combat the trade remain limited. The loss of gorillas, chimpanzees, bonobos, and orangutans "could have serious consequences for the biodiversity of key regions, given the important role great apes play in maintaining healthy ecosystems." The authors conclude with a series of recommendations for reducing consumer demand, bolstering law enforcement, and discouraging organized trafficking.

This section closes with an anthropological call for attention to difference. The politics of difference are, of course, at the heart of conservation conflicts. But difference can also galvanize justice and equality. Noting the rise in the number

of environmental movements throughout the developing world, this section's final author, Arturo Escobar, identifies two important things that these movements have in common: "First, they often pit rich against poor. . . . Second, they invariably involve the questioning of capitalistic economic models, on the one hand, and some sort of mobilization around, or defense of, local cultures, on the other." He therefore argues that we should seek to understand the relationship between difference and equality though the interrelated and equally important perspectives of economic, ecological, and cultural distribution conflicts—that is, the ways that economic factors, ecological conditions, and cultural meanings promote inequalities in social power that determine how (and by whom) nature is appropriated and utilized. Escobar's contribution is also a call to action: "Modernity and development have been built through unfair distribution and unequal exchange on all these three levels, and it is time to redress it." If we are to live in a peaceful and just social world, Escobar writes, "we can no longer deny people their rights to their own cultures, ecologies, and economies" (2006: 6).

NOTE

1. It is worth noting here that the "fortress" model of conservation actually originated in the United States, where conservations like John Muir severely underestimated the role of indigenous peoples in creating the iconic landscape of the American West. Indeed, some of the most "natural" places on the planet—the Great Plains, the Amazon rain forest, the Serengeti—are actually anthropogenic landscapes molded by centuries of human subsistence activities. The mistaken and decidedly racist notion that there are uninhabited "wildernesses" that need to be preserved through the construction of national parks (of which Yellowstone and Yosemite were the first) has led to the displacement and impoverishment of Native Peoples across the globe (see Igoe 2004; Dowie 2009).

REFERENCES

Castree, Noel. 2010. Neoliberalism and the Biophysical Environment 2: Theorizing the Neoliberalization of Nature. *Geography Compass* 4 (12): 1734–1746.

Dowie, Mark. 2009. *Conservation Refugees: The Hundred-Year Conflict between Global Conservation and Native Peoples*. Cambridge, MA: MIT Press.

Escobar, Arturo. 1998. Whose Knowledge, Whose Nature? Biodiversity, Conservation, and the Political Ecology of Social Movements. Journal of Political Ecology 5:53–82.

Escobar, Arturo. 2006. Difference and Conflict in the Struggle over Natural Resources: A Political Ecology Framework. *Development* 49 (3): 6–13.

Haenn, Nora, Elizabeth A. Olson, Jose E. Martinez-Reyes, and Letica Durand. 2014. Introduction: Between Capitalism, the State, and the Grassroots: Mexico's Contribution to a Global Conservation Debate. *Conservation and Society* 12 (2): 111–119.

Igoe, Jim. 2004. *Conservation and Globalization: A Study of National Parks and Indigenous Communities from East Africa to South Dakota*. Belmont, CA: Wadsworth/Thompson Learning.

Patten, Sonia. 2012. Malawi versus the World Bank. In *Conformity and Conflict: Readings in Cultural Anthropology*. James Spradley and David W. McCurdy, eds. Pp. 145–149. London: Pearson.

Peck, Jamie, and Adam Tickell. 2002. Neoliberalizing Space. *Antipode* 34 (3): 380–404.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 30: "Neoliberal Conservation: A Brief Introduction" by Jim Igoe and Dan Brockington

1. What is neoliberalism/neoliberalization?
2. What is reregulation? How is reregulation achieved in neoliberal conservation?
3. What is territorialization? How is territorialization achieved in neoliberal conservation?
4. Why is it difficult for big international NGOs (or BINGOs) to take a hard stand on environmental issues?
5. Who benefits from neoliberal conservation? How does territorialization aid them in this process?
6. Why do Igoe and Brockington state that any benefits to people and/or the environment are not an intended consequence of neoliberalism? What is an *intended* consequence of neoliberalism?
7. How does neoliberalism's emphasis on competition affect local people?

Questions to Accompany Chapter 31: "The Power of Environmental Knowledge: Ethnoecology and Environmental Conflicts in Mexican Conservation" by Nora Haenn

1. How does the field of ethnoecology inform Haenn's research?
2. Citing Kay Milton, Haenn recalls some of the many ways in which people may conceptualize the environment. What are some of these different ways?
3. How do Campeche's farmers conceptualize the environment? How have their attitudes been affected by evangelical Catholicism? And how are their attitudes and conceptualizations affirmed through ecological processes, through farmers' interaction with the environment, and through farmers' identification as campesinos?
4. How do campesino land classifications differ from scientific ones?
5. Haenn notes that "Calakmul's *campesinos* may have a more detailed awareness of divergent knowledge systems" than the other actors involved in the Calakmul Biosphere Reserve. Why might this be the case?
6. How is environmental knowledge implicated in power systems? And how have farmers translated their particular conceptualization of the environment into an argument for sustainable resource use?
7. How does Haenn's case study of conservation in Mexico compare and contrast with the overview of neoliberal conservation provided by Igoe and Brockington?

Questions to Accompany Chapter 32: "Radical Ecology and Conservation Science: An Australian Perspective" by Libby Robin

1. How is it that ecology was caught "in the cross-fire" between engineering and conservation in the case described by Robin?
2. Why, according to Robin, have Australian ecologists historically tended to drift to other fields?
3. How did Australian ecology change from the 1950s to the 1990s?
4. How is it that ecology came to be synonymous with conservation?

Questions to Accompany Chapter 33: "Stolen Apes: The Illicit Trade in Chimpanzee, Gorillas, Bonobos, and Orangutans" by Daniel Stiles, Ian Redmond, Doug Cress, Christian Nellemann, and Rannveig Knutsdatter Formo

1. How are great apes trafficked?
2. To whom are they marketed?
3. How do experts go about estimating the number of great apes that have been captured from the wild for illegal trade?

4. How many great apes do they estimate were lost to the illegal trade between 2005 and 2011? What species makes up the majority of that estimation?
5. If the current situation is left unchanged, how much ape habitat is predicted to remain by 2030?
6. Who are the primary offenders and profiteers of the illicit trade in live apes?
7. What actions do the authors of this report recommend be taken in order to counter the live trade in great apes?

Questions to Accompany Chapter 34: "Difference and Conflict in the Struggle over Natural Resources: A Political Ecology Framework" by Arturo Escobar

1. What do struggles over natural resources in different parts of the world all have in common?
2. How does Escobar define economic, ecological, and cultural distribution conflicts?
3. How do environmental economics and ecological economics differ in their treatment of the ecological and social costs, or externalities, of production? What are the limitations of either approach for the study of distribution conflicts? And how does the study of cultural meanings and processes enhance our understanding of distribution conflicts?
4. What is the academic and applied value of Escobar's focus on difference and distribution conflict?

30

Neoliberal Conservation*

A Brief Introduction

JIM IGOE AND DAN BROCKINGTON

The phenomenon of global neoliberalism, which revolves around the restructuring of the world to facilitate the spread of free-markets, is currently the subject of much debate in the social sciences. . . .

Neoliberal conservation . . . promises increased democracy and participation by dismantling restrictive state structures and practices. It promises to protect rural communities by guaranteeing their property rights and helping them enter into conservation-oriented business ventures. It promises to promote green business practices, by demonstrating to corporations that green is also profitable. Finally, through ecotourism, it promises to promote environmental consciousness for Western consumers by encouraging them to fall in love with the environment through direct connections to it. . . .

. . . At the heart of these appealing promises is another one that is even more fundamentally appealing: a simple solution to complex and difficult problems. In the words of Grandia (2007), it promises a world in which it is possible to "eat one's conservation cake and get a development dessert too." This is an apt metaphor, since neoliberal discourses often present the world as a pie that can grow bigger until everyone can have a piece. This metaphor is literally reflected in the growing size of conservation organizations and conservation interventions. Protected areas are increasingly designed to provide mitigating services to offset the spread of environmentally destructive commercial activities, while simultaneously facilitating the spread of economic benefits from commerce to wider areas. . . .

. . . This is a world in which it is possible to create value ad infinitum (Sonnenfeld & Mol 2002; Harvey 2005; Büscher & Whande 2007; Castree 2008a, 2008b), meaning that there are no losers (or at least no excuse for people to be losers) and little need for compromise, since there are no longer any fundamental conflicts. In this putative world, every new problem becomes an opportunity for profit and economic growth (Liverman 2004). Nature is protected through investment and consumption (Hartwick & Peet 2003), and conservation can be

* From *Conservation and Society* 5, no. 4 (2007): 432–449.

achieved without addressing the difficult and systemic inequities and power relationships that are inextricably linked to so many of our global environmental problems today (McAfee 1999). As Grandia points out, neoliberal conservation moves beyond a world of win-win solutions to a world of win-win-win-win-win-win . . . solutions that benefit corporate investors, national economies, biodiversity, local people, Western consumers, development agencies, and the conservation organizations that receive funding from those agencies to undertake large interventions. . . .

In contrast to the rosy scenarios described by those broad-brushed assertions, . . . fine-grained case studies . . . reveal a world that is much messier than the neoliberal ideal suggests. . . . Unfortunately, relevant studies are often inaccessible to many conservation practitioners, especially those who are non-social scientists. . . . Therefore, we seek to outline some of the most salient features of neoliberal conservation. We illustrate these with specific examples of how they may manifest themselves in specific local contexts. Our central motivation in doing this is to reinforce that the social side of conservation should be as empirically driven as the ecological side. Accordingly, we believe that conservation with equity can only be achieved by moving beyond the illusion of certainty presented by rigorously formulated technocratic solutions. Doing so represents a crucial first step in effectively engaging with the uncertainties, paradoxes, and complex inequities of undertaking conservation in a rapidly neoliberalizing world.

Neoliberalization, Territorialization, Commodification, and Conservation

The term *neoliberalism* is frequently associated with the abstract jargon used by critical theorists. However, this is no reason for dismissing neoliberalism. Its power and ubiquity are such that we can no longer afford to ignore its implications for conservation. In order to better understand these implications, it makes sense to conceptualize neoliberalism less as a thing than as a bundle of processes—to speak of "neoliberalization," rather than neoliberalism in the abstract (Heyden & Robbins 2005; Castree 2008a, 2008b). Neoliberalization is a global process that varies from location to location. . . .

One of the processes popularly associated with neoliberalization is deregulation, the scaling back of states and their capacity to regulate. The assumption is that corrupt and inefficient states restrict free trade, free assembly, free speech, and free press. It follows that if the states were less intrusive in these matters, people's lives would naturally improve. . . .

Conservation's relationship to these processes has been consistently ambiguous. While conservationists frequently decry corrupt and inefficient states as a major hindrance to their project, state-sponsored protected areas (Smith et al. 2003) have remained the mainstay of international conservation. In fact, during

the past twenty years of neoliberal ascendancy, state-sponsored protected areas proliferated on a global scale (West & Brockington 2006; West et al. 2006). This global trend is evident in . . . Tanzania, with approximately 30 percent of its total land set aside as protected areas; Belize with 50 percent; Guatemala with 30 percent; and Panama and Costa Rica, each with 25 percent. It can also be seen in megaprotected areas like the Greater Limpopo Transfrontier Park and the MesoAmerican Biological Corridor. At the same time, deregulation, decentralization, and privatization were increasingly heralded as the key to conservation success. Private game reserves proliferated, and transnational conservation NGOs began openly brokering conservation-oriented business ventures (Langholz 2003; Igoe 2007).

These apparently confusing conditions are better understood from the perspective that neoliberalization does not entail *deregulation* as much as it entails *reregulation:* the use of states to transform previously untradable things into tradable commodities (Castree 2008b). This may be achieved through privatization (Vandergeest & Peluso 1995), as in the instance of Zanzibar's Environmental Management and Sustainable Development Act, which delegates management authority over protected areas to "any person qualified to exercise these powers" (Levine 2007). It may also be achieved through the subdivision of collectively held land; for instance, article 27 of the Mexican Constitution, allows private investors and conservation NGOs to buy up land throughout Yucatán (Berlanga & Faust 2007; also cf. Luke 1997). Conversely, it may be achieved by presenting collective legal titles to rural communities, allowing them to enter business ventures with outside investors (Lemos & Agrawal 2006). . . . Finally, it may be achieved through state-controlled territories being made available to investors through rents and concessions, as in the case of the Greater Limpopo Transfrontier Park (Büscher & Dressler 2007). These types of territorialization also appear to add new types of value to areas that have not been directly territorialized, as with the real estate booms in St. John and Yucatan that have coincided with the creation of new protected areas . . . and the rapid spread of tourist resorts. . . .

These types of changes are closely associated with what Vandergeest and Peluso (1995) call territorialization—the demarcation of territories within states for the purposes of controlling people and resources. Territorialization, which is essential to state-making, obviously predates neoliberalization. . . . If states were declining under neoliberalism, however, one would expect territorialization to also decline. In fact, however, just the opposite has occurred. Territorialization has intensified under neoliberalization, as seen in the proliferation of protected areas. . . .

Neoliberal forms of territorialization are also characterized by increased direct involvement from for-profit businesses and NGOs. Corporate involvement is especially evident in Africa, where the Africa Parks Foundation (APF), indirectly bankrolled by SHV Gas in the Netherlands and Wal-Mart in the United States,

seeks to restore parks and set them up as secure businesses. The APF was implicated in the eviction of residents of Nech Sar National Park in Ethiopia (Pearce 2005a, 2005b). It has similarly caused discontent in South Africa by evicting farm workers from land it wishes to add to protected areas (Goenewald & Macleod 2004). In Tanzania, the African Wildlife Foundation has taken over a previously state-run livestock ranch, which it now runs as a protected area (Igoe 2007; Igoe & Croucher 2007). Meanwhile a private company called Ngrumeti Reserves Ltd., bankrolled by American futures trader Paul Tudor Jones, has taken over the management of two state-sponsored game reserves (Igoe 2007). Even in the United States, private support for parks has become increasingly essential over the past twenty-five years, as the Parks Service is operating with a backlog of $4.8 billion (Fortwangler 2007a). The Virgin Islands National Park could not fulfill its mandate without such support. It receives millions of dollars in support every year from Friends of the Virgin Islands, a nonprofit, which received forty-five corporate contributions in 2005, in addition to the use of luxury island homes for their fundraisers (Fortwangler 2007b). This includes donations from Disney Cruise Lines, Hawaiian Tropics, and three resorts on the island.

On the world stage, these processes are associated with the rise of the a few large conservation NGOs (BINGOs—big nongovernmental organizations), which have come to dominate the funding available for environmental causes. They are some of the world's biggest NGOs, collectively controlling billions of dollars, employing tens of thousands of people worldwide, and adopting increasingly corporate strategies, organization, and cultures. There is also concern that they have become too closely allied to corporate interests and fail to oppose some initiatives because they rely on the companies involved for funds (Chapin 2004; Price et al. 2004; Romero & Andrade 2004; Dowie 2005, 2006). Corporate environmental offenders like Chevron, DuPont, ExxonMobil, and Monsanto can also be environmental donors (Dowie 1996). Dorsey (2005) has noted that the boards of directors of major conservation NGOs in the United States are now dominated by the chief executive officers of major corporations, making it increasingly difficult for BINGOs to take a hard stand on environmental issues that might contradict the interests of their corporate sponsors / board members. . . .

But this is only part of the story. In the context of global neoliberalism, institutions like states, corporations, multilateral financial institutions, and conservation BINGOs are increasingly interlinked by dense networks of actors, ideas, and money. In fact, it has become increasingly difficult to distinguish where these institutions end and the networks that connect them begin. (Escobar 1995; Vandergeest & Peluso 1995; Goldman 2001; Li 2002; Ferguson 2006; Sodikoff 2007). . . .

In spite of the extensiveness of these networks, however, they are also highly exclusive. Flows of money within them—be they investments, multilateral loans, or conservation funding—tend to stay within them. In the case of wildlife

management areas, only a handful of people at the community level realized any significant benefit. . . . Another example is the Friends of Virgin Islands National Park "friendly links" website, which links together networks of investors, tourists, park officials, and philanthropists but hardly any local people. . . .

Ferguson (2006) argues that the increasing power and pervasiveness of these kinds of networks creates a situation in which capital and development benefits do not spread as posited, for instance, by the idea that the Greater Limpopo Transfrontier Park would spread World Cup 2010 revenues to rural Mozambique and Zimbabwe. Instead, he counters, capital and development "hop" over areas of low potential value directly to areas of high potential value. Territorialization of these valuable areas commoditizes them and transforms them into intensely guarded enclaves. In this way, they become transnationalized spaces, governed according to the needs and agendas of transnational networks of actors and institutions, rather than according to the development needs of specific countries. . . .

Conclusion

. . . We obviously believe in the importance of investigating the consequences of neoliberalism. However, we are also mindful that the explosion of writing and attention to these impacts is introducing a lack of precision to the debate. The term *neoliberalism* is at risk of becoming nothing more than a vehicle for academics who like to criticize things that they do not like about the world. Indeed, some would argue that it already has (e.g., Barnett 2005). Castree, while more sympathetic to the intellectual value of the term, has observed that critics of neoliberalism are still a long way from mounting a coherent attack on it and that we still only have a disparate collection of excellent but individual studies to draw upon (Castree 2008a, 2008b). Accordingly, it is important that we continue to pay attention to the types of patterns that emerge from these studies so that we may begin to generalize more effectively about neoliberalism and its impacts.

Such a project begs a nuanced appreciation of the diversity of ways in which neoliberalism can affect conservation policy. We have found . . . that the outcomes of neoliberal policies can be problematic for conservation goals and local livelihoods. But the reverse is also quite possible. For instance, Castree (2008b) observed that the withdrawal of sugar farming subsidies in Florida created all sorts of space for nature. Outcomes which were problematic for sugar farmers were highly advantageous for many conservation interests. Anderson (2001) has documented the expansion of reindeer populations in the far north of Russia following the imposition of structural adjustment programs, which withdrew state support for reindeer farming. The animals have been left to their own devices and gone feral. The consequences of this state deregulation has prompted a campaign from the World Wild Fund for Nature to save the "last great wild reindeer

herd in Europe" with plans to establish large new protected areas to contain them, which would allow indigenous hunting.

Whatever neoliberalism's impacts, however, the important point is that it does not automatically benefit local people and the environment. . . . Most parsimoniously, we can say that neoliberalism opens up new spaces in ways that could either harm or benefit the environment, in ways that can either present opportunities or liabilities to local people. While it is important to understand the types of conditions under which it is likely to benefit local people and/or the environment, it is equally important to remember that such benefits are not an intended consequence of neoliberalism. Neoliberalism is about restructuring the world to facilitate the spread of free markets. Proponents of neoliberalism hold that this will automatically benefit local people and the environment; . . . this is an invalid assumption.

More ambitiously, we can say that neoliberalism's emphasis on competition, along with its rolling back of state protection and the social contract, creates spaces in which local people are not often able to compete effectively in the face of much more powerful transnational interests. They simply lack the resources to play the neoliberal game effectively. This does not mean that they never will, just that the deck is heavily stacked against them. By the same token, neoliberalism may benefit nature to the extent that some spaces are deemed as lacking adequate value for extractive enterprises. To the extent that such value exists, however, it will be difficult to promote biodiversity conservation over large-scale extractive enterprises.

The bottom line is that neither protectionist conservation nor neoliberal economic development *needs to benefit the rural poor* in order to thrive (Brockington 2003). In fact, both thrive quite happily when poor people are displaced. Whether or not conservation has an ethical obligation to benefit rural communities is a question of values to be negotiated and debated from the community level to the forums of transnational conservation. But such negotiations and debates can never be effective as long as they take place in the context of a "discursive blur," which holds that free markets and the commodification of nature will produce outcomes that benefit everyone without significant social and ecological costs or compromises. The case studies presented . . . provide the sort of empirically grounded understanding of neoliberalized conservation that we believe will be necessary for these negotiations and debates to begin to take place.

REFERENCES

Anderson, D.G. 2001. Hunting caribou and hunting tradition: Aboriginal identity and economy in Canada and Siberia. In: *Parks, Property, and Power: Managing Hunting Practice and Identity within State Policy Regimes*, Senri Ethnological Studies 59 (eds. D.G. Anderson and K. Ikeya), pp. 7–25. National Museum of Ethnology, Osaka.

Barnett, C. 2005. The consolations of "neoliberalism." *Geoforum* 36:7–12.

Berlanga, M., and B.B. Faust. 2007. We thought we wanted a reserve: One community's disillusionment with government conservation management. *Conservation and Society* 5 (4): 450–477.

Brockington, D. 2003. Injustice and conservation: Is local support necessary for sustainable protected areas? *Policy Matters* 12:22–30.

Büscher, B., and W. Dressler. 2007. Linking neoprotectionism and environmental governance: On the rapidly increasing tensions between actors in the environment-development nexus. *Conservation and Society* 5 (4): 586–611.

Büscher, B., and W. Whande. 2007. Whims of the winds of time? Emerging trends in biodiversity conservation and protected area management. *Conservation and Society* 5 (1): 22–43.

Castree, N. 2008a. Neoliberalizing nature: The logics of de- and reregulation. *Environment and Planning A* 40 (1): 131–152.

Castree, N. 2008b. Neoliberalizing nature: Processes, effects and evaluations. *Environment and Planning A* 40 (1): 153–173.

Chapin, M. 2004. A challenge to conservationists. *World Watch Magazine* November–December: 17–31.

Dorsey, M. 2005. Conservation, collusion and capital. *Anthropology News* October: 45–46.

Dowie, M. 1996. *Losing Ground: American Environmentalism at the Close of the 20th Century*. MIT Press, Cambridge, MA.

Dowie, M. 2005. Conservation refugees: When protecting nature means kicking people out. *Orion* November–December: 16–27.

Dowie, M. 2006. Problems in paradise: How making new parks and wildlife preserves creates millions of conservation refugees around the world. *San Francisco Chronicle* June 11.

Escobar, A. 1995. *Encountering Development: The Making and Unmaking of the Third World*. Princeton University Press, Princeton, NJ.

Ferguson, J. 2006. *Global Shadows: Africa in the Neoliberal World Order*. Duke University Press, Durham, NC.

Fortwangler, C. 2007a. Friends with money: Private support for a national park in the US Virgin Islands. *Conservation and Society* 5 (4): 504–533.

Fortwangler, C. 2007b. *Producing and Preserving Park Island: Transforming St. John, U.S. Virgin Islands into a Leisure-Oriented Space*. Ph.D. diss., University of Michigan.

Goenewald, Y., and F. Macleod. 2004. Park plans bring "grief." *Weekly Mail and Guardian*, 25 June.

Goldman, M. 2001. Constructing an environmental state: Eco-governmentality and other transnational practices of a "green" World Bank. *Social Problems* 48 (4): 499–523.

Grandia, L. 2007. Between Bolivar and bureaucracy: The Mesoamerican biological corridor. *Conservation and Society* 5 (4): 478–503.

Hartwick, E., and R. Peet. 2003. Neoliberalism and nature: The Case of the WTO. *Annals of the American Academy, AAPSS* 590:188–211.

Harvey, D. 2005. *A Brief History of Neoliberalism*. Oxford University Press, Oxford.

Heyden, N., and P. Robbins. 2005. The Neoliberalization of Nature: Governance, Privatization, Enclosure, and Valuation. *Capitalism, Socialism, Nature, Socialism* 16 (1): 5–8.

Igoe, J. 2007. Human rights, conservation, and the privatization of sovereignty in Africa: A discussion of recent changes in Tanzania. *Policy Matters: The Journal of the IUCN Commission on Environmental, Economic and Social Policy* 14:241–254.

Igoe, J., and B. Croucher. 2007. Conservation, commerce, and communities: The story of community-based wildlife management areas in Tanzania's northern tourist circuit. *Conservation and Society* 5 (4): 534–561.

Langholz, J. 2003. Privatizing conservation. In: *Contested Nature: Promoting International Biodiversity Conservation with Social Justice in the Twenty-First Century* (eds. S.R. Brechin, P.R. Wilshusen, C.L. Fortwangler, and P.C. West), pp. 117–135. State University of New York Press, Albany.

Lemos, C., and A. Agrawal. 2006. Environmental governance. *Annual Review of Environment and Resources* 31:297–325.

Levine, A. 2007. Staying afloat: State agencies, local communities, and international involvement in marine protected area management in Zanzibar, Tanzania. *Conservation and Society* 5 (4): 562–585.

Li, T. 2002. Engaging simplifications: Community-based natural resource management, market processes, and state agendas in upland Southeast Asia. *World Development* 30 (2): 265–283.

Liverman, D. 2004. Who governs, at what scale, and at what price? Geography, environmental governance, and the commodification of nature. *Annals of the Association of American Geographers* 94 (9): 734–738.

Luke, T. 1997. *Ecocritique: Contesting the Politics of Nature, Economy, and Culture*. University of Minnesota Press, Minneapolis.

McAfee, K. 1999. Selling nature to save it? Biodiversity and green developmentalism. *Environment and Planning D: Society and Space* 17:133–154.

Pearce, F. 2005a. Big game losers. *New Scientist* 16 April 2005: 21.

Pearce, F. 2005b. Laird of Africa. *New Scientist* 13 August 2005: 48–50.

Price, S.V., S. Reichle, R.E. Rice, E.T. Niesten, C. Romero, and G.I. Andrade. 2004. Letters concerning ICO approaches to tropical forest conservation. *Conservation Biology* 18:1452–1455.

Romero, C., and G.I. Andrade. 2004. International conservation organisations and the fate of local tropical forest conservation initiatives. *Conservation Biology* 18:578–580.

Smith, R.J., R.D.J. Muir, M.J. Walpole, A. Balmford and N. Leader-Williams. 2003. Governance and the loss of biodiversity. *Nature* 426:67–70.

Sodikoff, G. 2007. An exceptional strike: A micro-history of "people versus park" in Madagascar. *Journal of Political Ecology* 14: 10–33.

Sonnenfeld, D., and A. Mol. 2002. Globalization and the transformation of environmental governance: An introduction. *American Behavioral Scientist* 45 (9): 1318–1339.

Vandergeest, P., and N. Peluso. 1995. Territorialization and state power in Thailand. *Theory and Society* 24 (3): 385–426.

West, P., and D. Brockington 2006. An anthropological perspective on some unintended consequences of protected areas. *Conservation Biology* 20 (3): 609–616.

West, P, J. Igoe, and D. Brockington 2006. Parks and people: The social impact of protected areas. *Annual Review of Anthropology* 35:251–277.

31

The Power of Environmental Knowledge*

Ethnoecology and Environmental Conflicts in Mexican Conservation

NORA HAENN

Introduction

In Lawrence S. Grossman's summary of political ecology theories, he described this diverse body of research as tending to emphasize how "agriculture and environmental change are influenced by state policy, regional trading blocks . . . , investments by transnational capital, penetration of the market, and the social relations of production" (Grossman, 1998, p. 18). Other researchers also suggest that the effects of power systems on environmental outcomes stem from the outcome of competing interests among various parties (Blaikie & Brookfield, 1987; Peluso, 1991; Schmink & Wood, 1987; Stonich, 1993; Stonich & DeWalt, 1996). While supportive of these approaches, this article also draws on recent work describing the importance of the meanings assigned to ecological systems (Escobar, 1999; Rocheleau et al., 1996) to question how epistemological differences contribute to environmental conflicts. Following calls to examine the interface between environmental knowledge and action (Nazarea, 1999b, p. 7; see chapter 5 in this volume), consideration is given to ethnoecological constructs of forests in Campeche state on Mexico's southern Yucatán peninsula to explore how these constructs frame opposition to conservation activities.

Southeast Campeche is home to the Calakmul Biosphere Reserve, Mexico's largest protected area for tropical ecosystems. Declared in 1989, the Reserve's existence was communicated a year later to the 25,000 migrant, swidden farmers, or *campesinos*, who now live in its buffer zone.[1] After an initial period of intense local opposition to the Reserve and newly imposed restrictions on subsistence activities (hunting, and burning and felling forests), government agents and farm leaders brokered a settlement in which farmers would receive increased economic aid in the form of sustainable development projects. Government aid calmed public expression of anticonservationist sentiment, while farmers privately continued to resist the application of conservation measures outside Reserve limits. In this resistance, farmers describe tensions surrounding conservation as centering on competing class interests in resource

* From *Human Ecology* 27, no. 3 (1999): 477–491. Used by permission of Springer.

control and on conflicting ideas regarding the government's appropriate role in land stewardship.

Farmers, urban-dwelling environmentalists, foreign researchers, and local and national government agents all participate in ongoing negotiations regarding land use in and around the Reserve. In addition to the offices of government agencies, these negotiations take place in everyday places such as the restaurants of the region's administrative center and farmers' fields and homes, where many sustainable development projects are carried out. Participants in these negotiations employ different meanings and definitions of Calakmul's environment. Often, these definitions are tangential to negotiations that otherwise focus on land use. Nevertheless, these categories frame environmental conflicts at Calakmul, and the following discussion explains how that is the case. In the conclusion of this article, the possibilities for alternative environmentalisms at Calakmul on the basis of local ethnoecologies are explored.

The Setting

The Calakmul Biosphere Reserve encompasses 1,787,000 acres of seasonal tropical forests. Located near Mexico's borders with Guatemala and Belize, the Reserve connects with protected areas in these countries as part of a 5-million-acre extension of lowland forest (Mansour, 1995).

Researchers generally characterize southern Yucatán forests according to height and amount of leaf loss in the dry season (table 31.1). As a seasonal tropical ecosystem, the Reserve and its 608,000-acre buffer zone experience markedly different dry and wet seasons.[2] Data show that on the average, rainfall in 1 of 4 years falls below 800 mm, creating drought conditions (Folan, 1991). Water shortages create particular difficulties for Calakmul's residents, who rely on rain-fed agriculture and standing water sources.[3] During times of water scarcity, communities use water delivered from some of the region's larger lagoons. The author's 14 months of participant observation in Calakmul began in the fall of 1994, at the end of a drought year when many families required food aid to subsist. The following year, two hurricanes buffeted the region, flooding crops and forcing farmers to turn again to government relief for survival.

TABLE 31.1. Tropical Forests of Calakmul Region

Type	Description
High evergreen	Canopy greater than 30 m
Medium semievergreen	25%–50% leaf loss in dry season; canopy 15–30 m
Medium subdeciduous	50%–75% leaf loss in dry season; canopy 15–30 m
Low semievergreen	25%–50% leaf loss in dry season; canopy less than 15 m
Low subdeciduous	50%–75% leaf loss in dry season; canopy less than 15 m

Sources: Boege, 1995; Ericson, 1996; Gates, 1993.

Although scientific descriptions provide an overview of Calakmul's ecology, much remains to be learned about the specifics of forest growth and regeneration at Calakmul. Throughout this century, the forests of southeast Campeche have been heavily exploited for forest products. During the 1980s, regional sawmills ceased operation because of a lack of harvestable timber. Botanical investigations of the region began in the early 1990s, at which time researchers encountered a forest lacking older trees. Photographs from the 1950s show taller trees of greater diameter than can be found today (Beltrán, 1958).

Current scientific understandings of Calakmul's environment are rarely communicated to the region's people. Instead, the governmental and nongovernmental administrators of regional conservation and development projects tend to speak in generalities about the need to protect forests and prevent animal extinctions. These generalities are part of a larger picture in which competing, sometimes conflicting, ideas of the regional environment coexist.

Ethnoecologies at Calakmul

Because southeast Campeche is home to migrants from all regions of Mexico (Haenn, 1999), farmers use a variety of constructs to understand their new environment. However, despite their many differences, Campeche's farmers generally agree that the physical environment is a powerful entity and a place of work.

The notion that the environment is a powerful entity is an analytical construct based on Milton's suggestions for reconsidering the way anthropologists understand how people conceptualize the environment. "As well as giving environments," she writes, "we might be able to identify passive environments, vindictive environments and so on" (1996, p. 119). In accordance with this, Milton points to the existence of "non-industrial societies which do not recognize a human responsibility to protect the environment" (p. 133) because the environment as a force in itself lies outside the human domain. In these cases, the environment may be understood as powerful or having an independent vitality which challenges human ability to create a social order within it.

Spirits, known as *duendes* or *aluxes*, may live anywhere, but farmers associate them most commonly with forests and Mayan ruins. *Duendes* are tricksters said to carry away children lost in the forest. Farmers in one village described how a 3-year-old child became inexplicably lost for 2 days in the small woods immediately adjacent to her house. When the search party finally found her, she said her "brother" had cared for her during that time. Villagers believed this "brother" was a spirit.

Evangelical faiths have taken up the *duendes* as part of their proselytizing efforts. To counter syncretic Roman Catholic beliefs, evangelicals demonized *duendes* and, not coincidentally, reinforced the notion of forests as dangerous, asocial space. In their reconstruction of Genesis, evangelicals explained that

when Satan was driven out of Heaven, he came to Earth and now lives in forests in the form of *duendes*. By accepting evangelical teachings, converts become immune to the power of *duendes*, although the spirits continue to lurk in the forests. Forest spirits are part of a larger depiction of forests as "ugly," untamed wilderness. Calakmul's farmers regularly describe people who live in the forest as "dangerous." Forests are thus not only powerful but can be essentially threatening to social order.

For many farmers, the power of forests lies in the way they "always grow back." Felling forests and farming are actions that bring land under social control, thereby limiting the forest's power. Attitudes toward this aspect of environmental power fall into two general areas. In the first area, people tend to see cultivated and wild plants as different ends of a continuum. Where cultivated plants now exist, weeds will take over, and eventually taller, secondary growth will emerge. Within this configuration, creating agricultural fields brings forests under human control only temporarily. Forest regeneration remains desirable because it enriches land for future farming.

In the second area, farmers view forests in direct opposition to cultivation and wealth. For them, the existence of forests marks the absence of productive activities, and they describe a need to permanently fell forest: "When I fell forests, it's for good." Before migrating, farmers in this group often had occupied positions in industrial agriculture. They came from areas in the states of Veracruz and Tabasco where large-scale deforestation in the 1950s and 1960s created landscapes with little more than patchy remnants of once extensive forests. For these farmers, a natural landscape is one that has been markedly modified by human activities. They tend to view the forest's power as predominantly negative.

In addition to the concept of a powerful environment, interviews conducted with 10 men of distinct state and ethnic origin elicited common themes of how the environment is a place of work. Fields are "where we work" (Murphy, 1998). Forests are future farmlands "where we're going to work." Interestingly, a separate category consisted of those places "where we cannot work," including protected areas and archaeological ruins (which Mexican law prohibits people from altering in any way).

Within this general framework, the men evaluated specific landscape features according to what kinds of work took place there in the past and what possibilities that place offered for future work. Using forest height and tree diameter to measure length of time since a felling, they described the forest as being in one of three categories. *Acahuales*, or forest felled within the last 5 to 10 years, with immature trees having narrow trunks, require less work to clear and are preferred sites for future farming. The second category, *monte*,[4] is forest felled within approximately the last 10 years. The labor demands in felling *monte* obviously are greater, and in addition to the ubiquitous machete, farmers may need to use one of the few functioning chain saws locally available in order to clear

land covered in *monte*, which is a secondary preference for future farming sites. The final category, *montaña*, is forest that farmers recognize as never having been felled. Without access to a chain saw, farmers must exert considerable labor in axing *montaña*, which makes it the least preferred site for farming.

Although a variety of local ethnoecologies has been distilled into two generalizations, in Calakmul's political arena this variety underwent further narrowing. Farmers and government agents translated the notion of environment as a place of work into an argument for sustainable resource use. This argument is explored in greater detail later. Here the focus is on the salience of an ethnoecology based on work in a region that is home to a diverse, sometimes divided, farm community.

Nearly all of Calakmul's current population have migrated to southeast Campeche in the last 30 years. Although most people moved from neighboring tropical states, at least 23 of Mexico's 32 states are represented. State of origin is an important identifier among farmers, as is affiliation with an indigenous group. However, despite this diversity, farmers are able to rally around their common identity as *campesinos*. Although *campesinos* are people who farm, the word also indicates a class identity. *Campesinos* are people who do not receive a regular salary. Their poverty makes them vulnerable to powerful outsiders. Farmers use this common identity, especially when dealing with government agents and urban and international environmentalists. As *campesinos*, they present a united front in pressing for access to various resources. Common understandings of the environment as a place of work coincide with a common identity based on subsistence farming. As farmers struggle to negotiate differences among themselves and between themselves and outsiders, this shared identity and ethnoecology are powerful tools for organizing messy social fields.

Contrasting Ecologies

Campesino land classifications are not that distinct from the scientific categories underpinning the Calakmul Biosphere Reserve. Both systems use forest height as a focal point for organization. At the same time, the systems exhibit two basic differences. Campeche's farmers understand forests as asocial places where people's proper role is to carry out subsistence work, and forest height marks past human activities. This contradicts the botanical categories circulated in policy and research papers on Calakmul, which generally depict forest growth from the perspective of an absence of human activity. In conservation settings, the notion that ecology is best understood without consideration of human activities often is translated into the concept that an ideal environment is one devoid of human presence (Hunter, 1996).

The second difference centers on the way the two systems conceptualize change over time. The idea that a healthy forest is one that achieves full growth

potential with little disturbance tends to carry an additional understanding of short-term, engineered change as detrimental to ecosystem health. For Campeche's farmers, ideas of environmental quality vary with changing economies. Short-term changes in forest composition that meet current market trends make the most sense. In the long run, flexibility in access to a variety of resources is the most desirable strategy.

Because of the contrasts between these two environmental models, one might expect conflict in the application of conservationist ideas to land use in southeast Campeche. Indeed, farmers bristle against regulations that restrict hunting, swidden burns, and the felling of older-growth forest. At the same time, they publicly espouse environmentalism in order to cultivate financial aid in governmental and international circles. The following sections explore how this contradiction developed and, in particular, how farmers and certain government agents have promoted forest use under the mantle of sustainable development.

Environmental Conflicts at the Regional Council

Calakmul's first Reserve director, Deocundo Acopa, described a broad division in the conservation community between those who support the sustainable use of resources and those who believe environmental protection requires a strict separation of people from protected areas. He characterized this latter position as the *no tocar*, or "do not touch," approach. The debate between resource use and resource preservation in Mexico has documented connections with similar disagreements over the wise use of natural resources in U.S. conservation history (Simonian, 1996). As described by Acopa and members of Calakmul's farm community, this debate resonates with the knowledge systems outlined earlier. At the same time, advocates of the two positions occupy different positions of power, and in general, those who promote preservation tend to have greater education and financial means than Calakmul's farmers (Deocundo Acopa, personal communication, July 3, 1995). In this way, Acopa saw environmental knowledge as implicated in power systems. He was very interested in power structures and viewed his principal work as Reserve director as managing competing interests to the benefit of both Calakmul's forests and its people.

Acopa's was the most influential government office in southeast Campeche, and he sponsored regular meetings in which representatives of regional farm organizations, nongovernmental environmental groups, and various government offices met to communicate (and, to a lesser extent, coordinate) their actions. In these meetings, Acopa usually was partisan to the positions held by regional farmers. Acopa was a nationalist and sympathetic to the *campesinos*' poverty. He saw farmer control of resources as part of a larger struggle for *campesino* self-determination. At the same time, on receiving his appointment to the Reserve directorship, Acopa was given the mandate to win Calakmul's inhabitants over

to Mexico's ruling Partido Revolucionario Institucional (PRI) party. In the words of one government agent, Acopa's job was to "get the politics in the palm of his hands." His partisanship in conservation was part of a larger goal of strengthening PRI support in Calakmul.

Acopa had ample resources to use in addressing the dual agendas of conservation and electoral politicking. Soon after the Reserve's declaration, government agents representing the PRI quieted antienvironmentalist sentiment by offering a deal. In return for votes in a gubernatorial election, Calakmul's residents would receive increased development aid. Farmers agreed to this votes-for-development deal in 1991. Both the agreement and the subsequent development programs were couched in neopopulist rhetoric of self-help and personal empowerment. In a personal visit to the region, former Mexican president Carlos de Salinas charged farmers with "caring for the Reserve." In the following years, *campesinos* received programs aimed at both protecting standing forests and encouraging self-sufficiency in the farm sector. These programs included agroforestry, sustainable timber harvesting, organic agriculture, intensive cattle ranching, and wildlife management, among others (Acopa & Boege, 1998).

Although paid for with federal funds, the programs were administered by the Xpujil Regional Council, a farmers' organization supervised by Reserve director Acopa. At the time of the author's field work, the Regional Council was a powerful player in southeast Campeche's political scene. The Council's budget rivaled that of any government agency working in the region, and its programs reached into more than 40 of the 72 villages then located in the Reserve's buffer zone.

Council assemblies were a meeting ground of conflicting ideas about environmental management. During assemblies, village representatives met to oversee the work of the Council's board of directors. As many as 300 men and women attended the monthly meetings, making the Regional Council a natural place for disseminating government directives (e.g., on fire control during the burning season) or for cultivating support within the broader farm community.

At Council assemblies, Acopa encouraged farmers to take advantage of funding for environmental programs while elaborating his notion of conservation. Acopa described biodiversity as "diversity in use." He believed that if *campesinos* received financial gain by exploiting an array of forest resources, then they would be motivated to protect those diverse resources. Acopa simplified this idea into repeated admonitions that Council programs aimed to protect the environment so that people might use it.

Acopa pressured researchers and nongovernmental staff to request from the Council assembly permission to work in the region. He also demanded that researchers present their findings to the assembly. These presentations often occasioned responses meant to align research and development aid with local interpretations of the environment. For example, one foreign researcher presented his proposal to study jaguars through the use of radio collars. A number

of farmers voiced an acceptance of this project on the basis of the need to eliminate jaguars living threateningly close to community water supplies. Both the investigator and Reserve director Acopa quickly explained that the research might have another use, specifically tracking jaguars for ecotourists who might photograph the animals.

Continued Resistance

Despite these [development] programs, farmers in southeast Campeche continued to resist conservation. Although their resistance had many sources, two points were particularly striking. One area of resistance was based in local ethnoecologies. If land is a place of work, then outsiders must have some kind of use in mind for the Calakmul Biosphere Reserve. Thinking along these lines, farmers viewed the goal of setting aside land that nobody would touch as a tactical maneuver on the part of government agents and urban environmentalists who aimed to control forests for their own ends.

The second source of resistance lay in local ideas of government-farmer relationships. Mexico's federal government has depended on a social contract with peasant farmers to create the perception of legitimate federal rule (Hart, 1987; Nugent, 1993). This contract includes providing farmers access to land and support in the form of technological inputs and development projects. When Salinas charged farmers with "caring for the Reserve," he invoked this contract by offering symbolic ownership over the Calakmul Biosphere Reserve. Still, farmers recognized the difference between symbolic and actual ownership. They opposed programs that took land out of the agricultural base on grounds that such actions constituted a breach in their social contract with government authorities.

Although the ideal government-farmer relationship enables farmer livelihoods, Calakmul's farmers have learned that many government practices undermine subsistence. Consequently, farmers link conservation to endemic corruption among Mexico's ruling authorities. In 1995, government agents monitoring older-growth forest were ambushed on leaving a community under surveillance for illegal felling. The farmers involved murdered one of the agents. Although this event was reported in the urban press as an act of poachers, locally people viewed the murder as retribution, because the agents were rumored to be extorting bribes from peasants.

Farmers, basing their conclusions on such rumors of corruption, surmise that environmental regulations contribute to more than competing interests in natural resource control. Such regulations also open a new field for illicit government activity. Therefore, when talking about the Reserve with one man, the author asked if he saw that animals were becoming extinct. The man replied, "No, the president invents these things, or he's taking advantage of something." Saying *somos tan desconfiados*, "we are so mistrustful," farmers repeatedly asserted a

lack of confidence in government actions. At the same time, because conservationism opened new economic and political avenues, farmers were willing to use environmental issues to engage government agents (see also Haenn, 1998).

Rather than change local ideas of the environment, conservation projects provided farmers with new rhetorical tools for appealing to people interested in environmental protection. Astute farmers soon learned to mimic conservationist rhetoric publicly while privately continuing to operate within their previously held constructs. For example, Jerónimo explained to me that his village had distributed land to its members in such a way as to promote forest conservation. When asked just how the village's land-distribution pattern (no different from any other in the region) encouraged conservation, Jerónimo could not answer. He had given the answer he thought I, who had arrived through the introduction of the Regional Council, wanted to hear.

Jerónimo participated in every sustainable development project offered in his community. He also sat on nearly every village committee overseeing these projects. Later I learned that although Jerónimo signed on for all projects, he followed through only on those he thought useful. For example, one year Jerónimo planted reforestation trees provided by the Council. The following year, on another Council project, he was able to plow his land with a tractor, a project that he was convinced would increase his harvest. With the Council tractor, Jerónimo plowed under the reforestation trees.

Jerónimo is one example of how farmers are wary of both environmental regulations and the benefits brought about by integration into conservation development programs. In this setting, farmers' notions of environment as a place of work take on political implications in the overall struggle to defend access to land. As farmers deal with the vagaries of an undependable government and marketplace, maintaining access to an environment in which they can work remains crucial to their livelihoods.

Conclusions

In calling for an ethnoecology that bridges knowledge and action, Nazarea (1999a) noted the importance of ethnoecologies as situated knowledge within overlapping power structures. The ethnoecology popularized and politicized by Reserve director Acopa self-consciously mediated a division in knowledge and power between Calakmul's *campesinos* and urban and international elites.

Through the Regional Council and their alliance with Reserve director Acopa, *campesinos* have promoted their notion of the environment as a place of work to counter preservationist ideas associated with the park model. Throughout my research, these two constructs had a symbiotic relationship such that one would hardly be mentioned without reference to the other. I came to question the interdependence of these two constructs. Could their pairing serve some purpose?

Since this research, much has changed in Calakmul. At the end of his tenure, Reserve director Acopa moved to another site in Mexico's tropics. When the Regional Council's federal funding ended, it received support from international donors for conservation development projects. These funds were not renewed, and the pervasive conservation development activities studied have ceased. Even at the height of conservation activities in 1995, policy makers had doubts about the programs' durability. They were unsure whether the programs, even if fully implemented, would actually result in continued forest cover and an increased standard of living for the region's families.

Given the tenuousness of conservation at Calakmul, I believe the connection between use and preservation served a variety of purposes. The opposing ideas provided latitude in which *campesinos*, government agents, and environmentalists could test both conservation programs and their respective strengths in shifting political fields. The opposition allowed farmers to take advantage of new subsidies while protecting their economic foundation in subsistence agriculture. In espousing both use and preservation, federal authorities appealed to conflicting interests among divergent constituencies. Finally, as scientific knowledge about Calakmul continued to accumulate, the opposition allowed policy makers to experiment with various conservation measures without forsaking any future path for protection.

Antienvironmentalism remains a powerful sentiment at Calakmul. In addition to their class critique of conservation, Calakmul's *campesinos* are aware that the tension surrounding resource management stems from the different ways in which people see the world. The material from Calakmul suggests that part of the political ecology of resource management lies in this intersection of power and knowledge. Calakmul's *campesinos* may have a more detailed awareness of divergent knowledge systems because environmental regulations and sustainable development projects force farmers to reckon with alien environmental categories. At the same time, the fact that a diverse body of local ethnoecologies has become distilled into the notion of environment as a place of work means that other possible areas for land use negotiation (such as aesthetic or cosmological considerations) are obscured. This distillation is not unusual. As Wolf has written, "ideas and idea-systems are often monopolized by power groups and rendered self-enclosed and self-referential" (1999, p. 7).

The Regional Council's program raises questions about possibilities for a more localized environmentalism. Does an environmental ethic exist in the political strategizing and anticonservation sentiment with which Calakmul's residents approach conservation development? Johnson (1999) cites the need to examine antienvironmentalism as part of the overall project of environmental protection. His research into the formation of a U.S.-protected area at the turn of the century questions the extent to which positions labeled as antienvironmentalist may contain wilderness ethics at odds with those favored by professional environmental

managers. Johnson describes a situation similar to Calakmul in which subsistence users came into conflict with local and urban elites who intended the park for tourism and sport hunting. According to Johnson's documentation, the latter environmental ideas won out over the former.

In my research, I met farmers opposed to conservation as described by government agents. They especially opposed government appropriation of land for parks but nevertheless maintained part of their farm parcels as forest for hunting or for collecting some other forest product. It is possible that with continued funding, small-scale sustainable development projects would have provided a format for greater elaboration of a localized environmentalism at Calakmul. Given the economic insecurity of subsistence agriculture and the wariness with which farmers approach government agents, it would not be surprising if this environmentalism built on notions of work to stress political autonomy and secure access to natural resources.

NOTES

1. In 1996, Mexican authorities created the *municipio* of Calakmul, composed of the Reserve and its buffer zone. A *municipio* is roughly equal to a U.S. county. In the following, the word "Calakmul" is used to refer to the area now within the *municipio*'s limits, whereas "Reserve" signifies the Biosphere Reserve.
2. See Whitmore, 1990, on distinctions between tropical and seasonal tropical forests.
3. No permanent streams or rivers exist in the Calakmul region. The area's limestone base, typical of the entire peninsula, quickly absorbs rainfall.
4. *Monte* is the general term applied to any growth that is not directly cultivated by humans. Here I draw on one of the word's meanings as it relates to forest growth.

REFERENCES

Acopa, D., and Boege, E. (1998). The Maya forest in Campeche, Mexico: Experiences in forest management at Calakmul. *In* Primack, R., Bray, D., Galletti, H., and Ponciano, I. (Eds.), *Timber, Tourists, and Temples: Conservation and Development in the Maya Forest of Belize, Guatemala, and Mexico*. Island, Washington, DC, pp. 81–97.

Beltrán, Enrique (Ed.). (1958). *Los Recursos Naturales del Sureste y su Aprovechamiento*. Instituto Mexicano de Recursos Naturales Renovables, A.C., México, D.F.

Blaikie, P., and Brookfield H. (1987). *Land Degradation and Society*. London: Methuen.

Boege, E. (1995). *The Calakmul Biosphere Reserve, Mexico*. South-South Cooperation Program, UNESCO, Paris.

Ericson, J. (1996). Conservation and Development on the Border of the Calakmul Biosphere Reserve. M.A. thesis, Humboldt State University.

Escobar, A. (1999). After nature: Steps to an antiessentialist political ecology. *Current Anthropology* 40 (1): 1–30.

Folan, W. (Ed.). (1991). *Programa de Manejo de la Biosfera Calakmul Campeche*. Secretaria de Desarollo Social, Campeche, Mexico.

Gates, M. (1993). *In Default: Peasants, the Debt Crisis, and the Agricultural Challenge in Mexico*. Westview, Boulder, CO.

Grossman, L. S. (1998). *The Political Ecology of Bananas: Contract Farming, Peasants, and Agrarian Change in the Eastern Caribbean*. University of North Carolina Press, Chapel Hill.

Haenn, N. (1998). "The Government Gave Us the Land": Political Ecology and Regional Culture in Campeche, Mexico. Ph.D. dissertation, Indiana University.

Haenn, N. (1999). Community formation in frontier Mexico: Accepting and rejecting new migrants. *Human Organization* 58 (1): 36–43.

Hart, J. M. (1987). *Revolutionary Mexico: The Coming and Process of the Mexican Revolution*. University of California Press, Berkeley.

Hunter, M., Jr. (1996). Benchmarks for managing ecosystems: Are human activities natural? *Conservation Biology* 10 (3): 695–697.

Johnson, B. H. (1999). Conservation, subsistence, and class at the birth of superior national forest. *Environmental History* 4 (1): 80–99.

Mansour, J. (Ed.). (1995). *Parks in Peril Source Book*. Nature Conservancy, Arlington, VA.

Milton, K. (1996). *Environmentalism and Cultural Theory: Exploring the Role of Anthropology in Environmental Discourse*. Routledge, New York.

Murphy, J. (1998). *Ways of Working in the Forest: Mediating Sustainable Development in Calakmul*. Paper presented at the 97th annual meeting of American Anthropological Association, Philadelphia, PA.

Nazarea, V. (1999a). Lenses and latitudes in landscapes and lifescapes. In Nazarea, V. (Ed.), *Ethnoecology: Situated Knowledge / Local Lives*. University of Arizona Press, Tucson, pp. 91–106.

Nazarea, V. (1999b). A view from a point: Ethnoecology as situated knowledge. In Nazarea, V. (Ed.), *Ethnoecology: Situated Knowledge / Local Lives*. University of Arizona Press, Tucson, pp. 3–20.

Nugent, D. (1993). *Spent Cartridges of the Revolution: An Anthropological History of Namiguipa*. University of Chicago Press, Chicago.

Peluso, N. (1991). *Rich Forests, Poor People: Resource Control and Resistance in Java*. University of California Press, Berkeley.

Rocheleau, D., Thomas-Slayter, B., and Wangari, E. (Eds.). (1996). *Feminist Political Ecology: Global Issues and Local Experiences*. Routledge, New York.

Schmink, M., and Wood, C. (1987). The "political ecology" of Amazonia. In Little, P. D., & Horowitz, M. M. (Eds.), *Lands at Risk in the Third World: Local Level Perspectives*. Westview, Boulder, CO.

Simonian, L. (1996). *Defending the Land of the Jaguar: A History of Conservation in Mexico*. University of Texas Press, Austin.

Stonich, S. (1993). *"I Am Destroying the Land!": The Political Ecology of Poverty and Environmental Destruction in Honduras*. Westview, Boulder, CO.

Stonich, S., and DeWalt, B. (1996). The political ecology of deforestation in Honduras. In Sponsel, L., Headland, T., and Bailey, R. (Eds.) *Tropical Deforestation: The Human Dimension*. Columbia University Press, New York, pp. 187–215.

Whitmore, T. C. (1990). *An Introduction to Tropical Rain Forests*. Clarendon, Oxford, UK.

Wolf, E. R. (1999). *Envisioning Power: Ideologies of Dominance and Crisis*. University of California Press, Berkeley.

32

Radical Ecology and Conservation Science*

An Australian Perspective

LIBBY ROBIN

The political difficulty of undertaking conservation is always greatest when the imperative for economic development is at its most jingoistic. In 1950s Australia, the postwar development boom was in full swing. The population was growing rapidly, both through postwar births and through immigration. Between 1945 and 1960, the population rose from 7.3 million to 10.4 million, and it was a young population, a population "with a future."[1] The demand for housing materials, for example, seriously exceeded supply. Governments were actively encouraging people to build their own homes because of the shortages of skilled builders to meet the demand and were requiring that such houses be limited in size to reduce demand on such basics as nails and timber.[2] The rhetoric encouraged individuals to make personal sacrifices in the interests of "nation building."

At the center of "national reconstruction" was a project to build a massive hydroelectricity scheme in Australia's highest mountains. The Snowy Mountains are in the southeastern corner of the continent, strategically located between Australia's largest cities, Sydney and Melbourne, and rather closer to Canberra, the seat of national government. The hydroelectricity scheme was devised and managed by the Snowy Mountains Authority, a massive government agency with a brief to build a system of hydroelectricity stations (through both private and public funding). The complexities of the scheme were considerable as it straddled two states (New South Wales and Victoria) and the Australian Capital Territory, and had implications for a third state, South Australia, downstream of the works. The states' cooperation was at least partly gained through the offer of "free irrigation to farmers downstream" as a by-product.[3] The hydroelectricity scheme was rhetorically linked to national pride. It was associated with building secondary industry, something very important to a nation with a predominantly agricultural economy at the time. The "Snowy Scheme" was the subject of jingoistic films, was promoted as a tourist attraction, and was an important "topic" in the curriculum of schoolchildren in the eastern states. Newly arrived immigrants from war-torn Europe provided the workforce for the scheme and

* From *Environment and History* 4, no. 2 (1998): 191–208. Used by permission of The White Horse Press.

were told by William (later Sir William) Hudson, the scheme's first commissioner, "You won't be Balts or Slavs. . . . You will be men of the Snowy."[4] Hudson's nationalistic rhetoric was typical of the time. The scheme was so "Australian," its imprimatur was capable of giving new immigrants quick status as "real Australians." The scheme's overwhelming contemporary popularity and the subsequent perception of its "success" is attributable, at least in part, to the capacity of the Authority to take advice at critical times. The young science of soil conservation, which offered significant (but not always popular) advice to the Authority, was important to the perceived success of the scheme both in engineering and in politics.

Australia, like the United States of America, had suffered massive soil erosion in the 1930s, resulting in enormous ecological damage and personal suffering. Country people, like the "Okies" in John Steinbeck's *Grapes of Wrath*, left the land for the cities. There was often deep shame felt by these people, especially those farming the small allotments issued to soldiers returned from the First World War, who felt they had failed personally. Some left their properties in the middle of the night without farewelling neighbors.[5] Government agencies for soil conservation were established in New South Wales in 1938 and Victoria in 1940, and while they were never big, in the 1950s they were taken seriously, as the nation's response to the massive agricultural disaster which had touched so many people.

The central story in this paper is about the role of science in mediating the nationalism inherent in both the grand engineering scheme and in the management of soil conservation. The science in the cross-fire was ecology.

"Ecology" first came to popular notice in Australia through nature study in the 1940s and was often associated with romantic views on the "web of life."[6] Most practicing ecologists of the time were quite comfortable with this type of popularization. In the 1950s, ecological scientists were glad of a public profile. But by the 1970s, when the word "ecology" came increasingly to mean politics rather than science, many scientific ecologists became disconcerted. They sought to distance themselves from the popular images of the subject, in particular the antiscience and antitechnology rhetoric of parts of the environment movement, and to reassert the scientific status of the discipline.[7] This paper explores the role of science in the management of the environment through conservation and ecology. It focuses on the 1950s, what (in an American context) Gregg Mitman has described as a "lost decade in environmental history."[8] It is a decade which has been lost perhaps because of a perception that it was a time of "political contentment and acquiescence in the system."[9] But while the 1950s were a time when scientific understandings themselves were less closely scrutinized, there is no doubt that scientists were far from acquiescent in the "system." It was a formative period for many senior ecologists and may, in subtle ways, still be shaping Australia's environmental debates.

The Institutional Structure of Scientific Ecology in Australia

Ecologists in Australia are generally sponsored by universities or government agencies but not by the corporate or private sectors. Australia's scientists traditionally have been forced by isolation to work as all-rounders rather than narrow specialists, and even academic scientists have rarely had the privilege of being funded for "pure research."[10] This pattern is particularly apparent in a discipline as small as ecology. Ecology is not prestigious in Australian universities. Ecology is generally regarded as a subset of botany, zoology, biology, environmental science, or even forestry. It seldom stands alone as a teaching or research discipline. Ecological scientists who work in universities therefore have to be actively concerned about their image within their wider scientific departments.[11] There are a number of chairs in environmental science and biological sciences that have been held by practicing ecologists, but the lack of named ecological chairs is a reflection of the fact that ecology is low in the hierarchical stakes in Australian universities.

Raymond L. Specht, himself a distinguished ecologist and former professor of botany at the University of Queensland, surveyed forty of his contemporaries who undertook postgraduate ecological studies in the period from 1930 to 1955.[12] He described a drift of ecologists away from ecology towards other fields as they get older. He noted that half of these opted out of field work, seventeen moving to taxonomy and three to plant physiology. Only seven of the early plant ecologists were still active in plant ecology in 1981. Four died relatively young, and the remaining nine took early retirement from university employment to pursue careers as environmental consultants. These figures are reminiscent of the trends in (or rather out of!) ecology in America thirty years earlier noted by the American historian of science Eugene Cittadino, who described ecology as "a young man's specialty."[13] In addition to the hard physical requirements of field work, there is the question of time. Most senior university-based positions carry a heavy administrative and teaching load, making it difficult to undertake field work in distant places at the ecologically appropriate time. Universities in Australia are mostly located in large cities well away from interesting ecosystems, so few field sites can be reached with less than several hours' traveling time. Only a full-time researcher can undertake year-round studies on remote ecosystems. The fact that time and physical fitness are less available to senior academics serves to reduce the prestige of ecology in universities further and to reinforce its status as a junior subdiscipline of something else.

The pragmatic construction of academic ecology as a subset of something else sits uneasily with the popular perception of ecology as an overarching worldview in environmental politics. At the turn of the century, the founders of scientific ecology saw the potential for the subject to have a broad scope. For example, the British physiologist J. S. Burdon-Sanderson in his presidential address to the

British Association for the Advancement of Science in 1893 told the audience "that 'oecology' was one of the three great divisions of biology, along with physiology and morphology."[14] But the way power is organized in universities and research institutions is by discipline, administered through chairs or directors, not by "great divisions in biology." At the pragmatic level, ecology is regarded in Australia as either too specialized or too general to be the central organizational focus of a department. University ecologists fight for their space and their research dollar in hostile departments. They have therefore sought and found allies outside university structures.

The most important allies for Australian ecologists historically have been government agencies, especially those charged with responsibility for natural resource management and land use. More ecologists have been employed by government conservation agencies than by universities.[15] The conservation agency sector has contributed significantly to ecological research in many fields. Such agencies have the structural arrangements that make it possible for long, intensive field trips in remote places at the "right" ecological time (for example, during the relevant flowering or breeding season). The majority of positions for ecologists still come up in the government sector—in land-use management, forestry, national parks, and soil conservation agencies. Universities provide a significant number of salaries; but frequently the research funding for these ecologists also comes from the government sector, and work so funded often has an applied or management dimension.

From the 1920s, South Australian university ecologists worked with the Waite Institute for Agricultural Research on the ecology of arid lands.[16] In the early 1940s, Victorian botanists were conscripted into alpine ecology by the Soil Conservation Board.[17] In the 1950s, the Snowy Mountains Authority became interested in alpine ecology through the mediation of the Soil Conservation Service of New South Wales. Ecology and conservation became synonymous and interchangeable terms.

A. B. Costin and Alpine Ecology in the 1950s

Alec Costin is arguably Australia's leading alpine ecologist, but he is not an "academic." Costin's distinction in his field has been recognized by the prestigious Australian Academy of Science, of which he is a fellow. But his career has been constructed almost entirely outside the university system: he worked for the Soil Conservation Service of New South Wales for eight years, the Soil Conservation Authority of Victoria for three years, and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for nineteen years.[18] His university affiliations were brief: two years as a scholar affiliated with Sydney University in the early 1950s and a visiting fellow at the Australian National University when in semiretirement. The support for his fine basic and strategic research came

almost exclusively from organizations with utilitarian management obligations. But it was only such organizations that could make ongoing structural allowances for the difficulty of traveling to and from the remote alpine regions where Costin often spent many weeks on field trips.

Costin's eminence in alpine science began with work in the 1940s and 1950s that provided much of the primary descriptions of vegetation communities and soil types of the Australian Alps, especially in the Mt. Kosciuszko[19] area. His later analyses built on his descriptive ecology and included catchment hydrology, glaciology, and carbon-14 dating. His most important environmental management papers dealt with the key issue of grazing in the alpine areas. In the mid-1950s, Costin was the leader in the move to end "snow leases," the leases that privilege certain families to graze sheep and cattle in the country above the snow line. Some bushwalking groups had expressed concerns about overgrazing in the fragile alpine country, but the political campaign to remove hard-hooved animals from its delicate soil structures was spearheaded by ecologists, especially those working for soil conservation agencies in Victoria and New South Wales. In Victoria, the pioneering ecologist Maisie Fawcett also succeeded in drawing political attention to the destruction of alpine ecosystems in the 1940s.[20] Fawcett's collaborator, John Turner, professor of botany and plant physiology at the University of Melbourne, who coauthored publications associated with the Victorian high-plains research, was also a great supporter of Costin and the environmental campaign for the Kosciuszko "Tops" in the 1950s.

Costin was able to tackle snow leases more directly in New South Wales than Fawcett was in Victoria because he received strong support from the Snowy Mountains Authority. An enterprising Soil Conservation Service chief convinced the Authority that it had an interest in ensuring that soil drift did not threaten hydroelectric works.[21] Initially, in Costin's words, the Authority "buggered up the country pretty well everywhere they went."[22] But once the Snowy Mountains Authority decided that good soil conservation practices were in its interests, it not only softened its own approach to the environment but funded the CSIRO to establish an Alpine Ecology Unit at Island Bend, in the middle of its works. Costin was appointed as senior research officer in CSIRO's Alpine Ecology Unit because of his experience in the analysis of alpine ecosystems, including those near the Authority's works, which he had studied for his postgraduate work, sponsored by the New South Wales Department of Agriculture. His credentials as an outspoken opponent of grazing in the high country may well have enhanced his attractiveness to the Authority.[23] The Authority wanted the snow leases ended ostensibly for the sake of water catchments critical to its hydroelectric works.[24]

It was probably one of the best public relations exercises ever undertaken by such an authority. Not only did it take attention away from its own mistakes; it also served to point the finger at the local farmers as the "poor land users"

who created environmental havoc by grazing hard-hooved animals on country that could not tolerate such treatment. "Snow leases" have been central to environmental protests in Australia on and off ever since, especially in Victoria, where the mountain cattlemen and cattlewomen (as they call themselves) still have limited use of the high country.[25] Yet, until recently, very few activists or scholars criticized the destruction of alpine environments caused by the Snowy Mountains Authority itself, which is on a much grander scale.[26]

The CSIRO "Kosciuszko School," as the Alpine Ecology Unit is often called, has earned its right to the title "School" because alongside its applied research brief, it has also provided leadership and support to many postgraduate students tackling ecological tasks in the high country.[27] Costin's first research focused on the Snowy Mountains Authority's needs, considering vegetation and soil management in relation to water yield in the alpine area.[28] The experimental plots he established in the 1950s are still monitored and are used for considering the effects of the latest problem land users, the tourists, who now flock to Mt. Kosciuszko and surrounding areas in thousands.[29] The soundly analyzed plots have also provided longitudinal information which has backgrounded a range of other recent scientific investigations, including the effects of "greenhouse" and cloud-seeding experiments.[30]

Ecology and Environmental Activism

The Snowy Mountains Authority's "public relations exercise"—the Alpine Ecology Unit—was not, however, without its problems. A crisis came in the late 1950s when it proposed a dam on Spencers Creek, near the summit of Mt. Kosciuszko. This was not an essential dam but a minor independent project which could bring hydroelectricity into the New South Wales grid relatively quickly, whilst other works were in progress. It was important to the Authority as a way of convincing New South Wales skeptics of the value of the main scheme but not essential to its success.[31] Spencers Creek did not have sufficient water in its own catchment for hydroelectric purposes, so the Authority proposed the building of aqueducts on both sides of the main range. Costin saw this proposal as a threat to continuing glaciological studies of the Mt. Kosciuszko area.[32]

The building of aqueducts was also a violation of national parks values set out in the Kosciusko State Park Act of 1944 and later amendments. This was in the days before a National Parks Authority existed, when each park was managed by a separate small committee. The Kosciusko State Park Trust, which had official control over the area, was simply a small band of nominees and never a strong organization. Its power had been further eroded by its changing membership during the 1930s and 1940s.[33] Costin and a number of other senior scientists put pressure on the Kosciusko State Park Trust to declare up to ten percent of the land in its care a "primitive area." Such a declaration would legislatively preclude

intrusions like aqueducts. Without the pressure from the scientists, the Trust would never have attempted to oppose the giant Snowy Mountains Authority, the "great development" leader in Australia at the time.

A formal submission to the Kosciusko State Park Trust was prepared early in 1958. It was entitled "Proposed Kosciusko Primitive Area" and was signed by fifty scientists, including thirty-six from CSIRO, eight from universities, and six from other government authorities including the Australian Museum. The majority of these scientists were biologists with at least some ecological interests. The submission was quite explicit. The declaration of a primitive area was a scientific matter: "the views of scientists should be presented on the location and management requirements."[34] The document also proclaimed that "successful management of the primitive area must be based upon sound ecological principles. To ensure this the scientists who have given their support to this submission are prepared to co-operate fully with park authorities in future management."[35] The ecologists here represented the "radical" view, taking on the biggest development scheme in Australia's history. Conservation in the 1950s *was* ecology, not just for the scientists but also for the wider community. Organizations such as the Wild Life Preservation Society of Australia in its popular magazine *Australian Wild Life* in 1958 and 1959 strongly endorsed the right of scientists to take a leading role in matters of environmental management.

Although Costin and other activists appreciated the aesthetic values of the high country, these values were not used in the appeal for the preservation of the Kosciuszko Tops. The campaign was for the preservation of sites suitable for scientific study because of their "naturalness." Geological and vegetational sites were foremost in the appeal, not the scenic beauty of the area. In 1950s Australia, an "objective argument" based on science was seen to be the way to apply radical political pressure.

The conservative Australian Academy of Science supported the campaign to preserve the "primitive" aspects of Australia's highest mountains, though it distanced itself from the strongly worded 1958 proposal, preferring to make separate statements on the subject. The Academy had already published a general report on the high mountain catchments of New South Wales and Victoria, edited by John Turner, who was one of its fellows.[36] This publication was followed by articles in the *Australian Journal of Science*.[37]

The scientists' campaign was successful: the Spencers Creek dam was never built. Their "victory" was also couched in scientific language: the "important glaciological sites" around David Moraine and Mt. Twynam were spared inundation. The fact that aqueducts are very unsightly was almost certainly the key to the hearts of the campaigners, but this was not mentioned. The parameters of the debate were scientific, ensuring scientific hegemony over the discussion. Perhaps, too, the scientists were aware of their political credibility within the Snowy Mountains Authority itself. The Authority's "conservation conscious"

image, bought at some expense through the funding of the Alpine Ecology Unit, would have been seriously tarnished by an open rift with the senior scientific community.

Although it was a grand victory for science and the mountains, the "primitive area" decision was not advantageous to Costin personally. He was a signatory of the 1958 report, and his Snowy Mountains Authority–sponsored work informed the Turner report. As he put it, "The SMA [had] plugged in quite a bit of money until that primitive area thing came out, and they promptly scrubbed the money [for the Alpine Ecology Unit]."[38] Costin thought he was going to lose his job, but at the last minute CSIRO found the money to continue his appointment. Costin was grateful to stay in Canberra, as a major move would have been very difficult for him at that time, with six children under five—including triplets and twins. The federal government, by underwriting the Alpine Ecology Unit through CSIRO, also indirectly "bailed out" the conservation-conscious image of the Snowy Mountains Authority. The rift between conservation scientists and the Authority never reached headlines.

Conservation as Applied Ecology

The campaigns of the 1950s established the right of scientists to speak on behalf of nature. The science of ecology emerged throughout the Western world in the late 1960s and early 1970s as the "voice of nature." But the "age of ecology" and the ecological movement were part of a wider counterculture, rather than something which emerged directly from the science. Nonetheless, some scientific ecologists welcomed the new popularity and sought to embrace it as a new phase of the 1950s conservation movement. In 1965, the Oxford ecologist H. N. Southern expressed concern about the "dangerous" increase in population and the corresponding diminution of resources and sought a "wise principle of coexistence between man and nature," mediated by scientific ecologists. Southern argued that this principle was "conservation," and conservation was "applied ecology." The definition of the population/resource problem as "ecology" translated directly for Southern into a justification of more funds for (scientific) ecological research.[39] The massively well-funded International Biological Program's (IBP) effort in ecology was justified by a similar logic.

The treating of conservation and ecology as synonymous was common throughout the Western world. It was particularly strong in Australia because it reflected the fact that scientific ecology had strong continuing links with agencies of natural resource management. The conflation of the terms was often politically convenient for practitioners of both. The CSIRO ecologist Francis Ratcliffe, for example, who was a prime mover in the establishment of the ACF in 1965, firmly believed that conservation was science and that the science of ecology was central to all conservation decisions. He was puzzled when he sought scientific

advice on the question of whether Lake Pedder in Tasmania should be flooded and discovered that none of the executive of the Tasmanian Conservation Trust were scientists. He was so convinced of the identity of conservation and science that he sought to keep the ACF at arm's length from the Lake Pedder debate until he could get advice from a reputable scientist on the subject.[40]

Radical ecology brought with it the need to consider cultural and aesthetic arguments, as well as democratic participation in conservation debates. The forestry professionals felt this change most acutely and struggled to justify their place in a debate where all the parameters seemed to change overnight. In Australia, Richard and Val Routley's book of 1974, *The Fight for the Forests*, was the catalyst for admitting values other than scientific and economic to debates about forestry practice. Foresters were appalled by the book, which criticized clearfelling on both scientific and aesthetic grounds and questioned the extensive planting of *Pinus radiata* sponsored by the Commonwealth government. The book was very unpopular with the forestry establishment. The Routleys claimed they were subjected to intellectual suppression (through limited library rights) by the Australian National University's School of Forestry.[41] This new "war" with foresters, seemingly on the "wrong side," was a source of particular tension for many ecologists. Foresters and ecologists often worked together. Some, like Peter Attiwill, belonged in a sense to both groups. Attiwill trained as a forester and paid back a bond to the Victorian Forests Commission in order to pursue a doctorate in ecology in the United States of America. The perceived oppression of foresters by radical environmentalists has angered and politicized some practicing ecologists to take backlash positions.

Other ecologists feel flat, depoliticized and disempowered. The networks of the new environmentalists do not privilege them as senior scientific ecologists in the way the utilitarian conservation networks did. It was not the fact that ecology was being directed towards "quality of life" concerns that disturbed them. Many of them had always understood it in those broad terms, even if they used scientific jargon to mount their political arguments.

In the late 1980s, the Australian Academy of Science sought to weigh into the debates about the environment through a series of conferences sponsored by the distinguished international virologist Professor Sir Frank Fenner and his wife, Mrs. Bobbie Fenner. Fenner is not an ecologist, but his interest in ecological matters dates back to the 1950s and earlier.[42] He has a direct lineage with the 1950s scientific activists, as he was secretary, biological sciences, in the Academy of Science in 1958 when the Kosciuszko Tops debate was at its peak. Fenner's recent involvement has tended to emphasize "science" as opposed to professional ecology and suggests another route by which scientists can assert hegemony in environmental discussions. Under the auspices of the Academy, the environment becomes a subject for the generalist scientist rather than the ecologist per se.[43]

Some ecologists, too, saw their environmental activism as part of their role as scientist in general, rather than ecologist in particular. They were comfortable with the notion of science as an important cultural activity, and their visions of its role in society were informed by this. Eminent Melbourne ecologist David Ashton, for example, commented,

> I think that the science of ecology is so fundamental that we have to, in our urban environments anyway, take in not only the economics but the sociology, all the interactions in the human level [which] have been mirrored in the animal and plant level. . . . We need things to support us. We need open spaces. We can't just have a concrete jungle, or you get people going nuts. . . . We've got to take cognizance of our human ecology—our relation to our environment. And this is a man-made environment, so we have to think about how we react to it.[44]

Ashton, however, has serious reservations about radical ecology and the green political movement. The shift in the definition of "experts" and the revised power relations have left him concerned that the decisions are now out of the hands of science, something he regards as undesirable. His views mirror those of his mentor, John Turner, whose own scientific activities were inextricably linked with concerns about the social fabric and education. But Turner was "too busy" to spend the time attending flat-hierarchy committees which shared power in a "democratic" way, and this led him to join the spate of resignations from the ACF in 1973.[45] Fundamentally, Turner and Ashton assumed that their scientific authority gave them a cultural status that should be trusted. Their difficulties were not with the political and cultural resonances of science but with a new environmental movement that demanded popular participation in framing the activist agenda.

The science of ecology in Australia has been nurtured in a strongly utilitarian context, and many practicing scientists have taken for granted its domination by conservation science professionals. The culture of bureaucracy contrasted sharply with the "public participation" demanded by the green political movement, and this contrast has contributed significantly to the discomfort of practitioners who saw the media identifying the term "ecology" with new environmental politics. Australian ecologists have seen profound structural changes in a short time. They were the radical reformers in the 1940s and 1950s and the central experts in control of the government's conservation agenda in the 1960s and 1970s. Many, however, feel only marginality and frustration in the 1980s and 1990s.

The deep suspicion of science and technology that is associated with "radical ecology" makes rapprochement between "utilitarian scientists" and "environmental activists" difficult in the 1990s context. The caricature of the "greenie"

as "antiscience" does harm to both parties. One retired forester put it heatedly, "[greenies] are just bloody ratbags, . . . but they're the ones the governments are listening to."[46] The polarized and oppositional relations between greenies and foresters that emerged in the 1980s mask their shared heritage, and this is regretted deeply by those with sympathy for both. Since the green revolution, many ecological scientists have felt reduced to mere "informants" or, worse, unconsulted, witnessing rather than shaping and participating in debates. Environmental historians can ensure that the historically deep links between scientific conservation and radical ecology are not forgotten. Identifying a common heritage may lead to a more thoughtful and precise analysis of what aspects of the "system" are problematic for the Earth.

NOTES

1. Statistics from the *Year Book of the Commonwealth of Australia*, 1944–1945 (no. 36), and 1961 (no. 47), pp. 455 and 290, respectively. Australian population growth has continued, though with significantly less jingoism since the 1970s. The 1997 population is about eighteen million.
2. Dingle and O'Hanlon (1996).
3. Collis (1990), pp. 35–38; also McHugh (1989). The "official" Snowy Mountains Authority history of the scheme is Wigmore (1968). The federal government drove the scheme through against the wishes of the New South Wales government, in particular, but by the late 1950s, it had the blessing of all the states affected by it.
4. Collis (1990), p. 40.
5. Borthwick (1990) related this memory as part of what motivated him to set up Victoria's first Ministry of Conservation in 1973. See also Lake (1987).
6. "Ped" (F. G. Elford) (1945), p. 351.
7. This phenomenon is well documented for both the United States (Nelkin 1971, 1975, 1977, 1987) and the United Kingdom (Sheail 1987, esp. pp. 224–262).
8. Mitman (1995).
9. Gottlieb (1993), p. 79.
10. For more on the structure of the discipline of ecology in an earlier period, see Robin (1997). There is an established literature about the effects of isolation on Australian science, especially physics. Examples include Home (1984); Jenkin (1985); Chambers (1991).
11. General source: *The Commonwealth Universities Yearbook, 1993*. Further details were ascertained (in August 1994) by a brief survey of relevant university departments. Only Monash University in Australia has a department of "ecology" (created by a merger of botany and zoology in 1990 and entitled "Ecology and Evolutionary Biology"). Professor J. Warren, chairman of Ecology and Evolutionary Biology, letter to L. Robin, 23 August 1994. Only two professorial chairs (at other universities) are earmarked "ecology." At the University of Sydney, there is a Chair of Experimental Ecology established in 1992 as a personal chair for A. J. Underwood and named by him. Professor R. G. Hewitt, dean, Faculty of Science, letter to L. Robin, 28 August 1994. In the same year, a Chair of Ecology was established at Griffith University in Queensland (occupied by Professor Roger Kitching). D. Smith, Faculty of Environmental Sciences, letter to L. Robin, 26 August 1994.
12. Specht (1981), esp. p. 410.
13. Cittadino (1980), p. 191.
14. Cited by Bowler (1992), p. 365. Another example was Moore (1920).

15. In the 1950s, state-funded soil conservation agencies and also CSIRO Wildlife Survey branch (later the Division of Wildlife and Ecology) and the Alpine Ecology Unit were all important supporters of ecological research. Departments of agriculture and forestry were also important. While conservation is not the "primary mission" of CSIRO, the rabbit research of Wildlife Survey and the soil conservation work of the Alpine Ecology Unit were central to those particular branches. In the period since the 1950s, the (state and federally funded) national parks services have also become important employers of ecologists.
16. Osborn (1925); Osborn et al. (1932); Robertson (1986), pp. 116–119.
17. Gillbank (1991, 1993); Robin (1993), pp. 229–240.
18. This information is based on A. B. Costin's curriculum vitae, supplied to Libby Robin at the time of interview (19 April 1994).
19. Formerly Mt. Kosciusko.
20. Gillbank (1993).
21. Breckwoldt (1988), pp. 100–105; Griffiths and Robin (1994), p. 7.
22. Costin (1994), tape 1, side B.
23. In 1955, he prepared a major report to Victoria's Land Utilization Advisory Council on the detrimental effects of cattle grazing in the Bogong High Plains. See Gillbank (1991), pp. 32, 38.
24. Costin (1954); Breckwoldt (1988).
25. Griffiths (1996).
26. One recent critic is Lawrence (1990, 1992, 1994).
27. The term "Kosciusko School" was used by Williams (1985) in the acknowledgments for his thesis. Many other students have received informal support from Costin and his associates. Roger Good, personal communication, April 1994.
28. This resulted in a series of papers on the catchment hydrology of the area: Costin, Wimbush, et al. (1959); Costin, Wimbush, and Kerr (1960); Costin, Gay, et al. (1961); Costin and Wimbush (1961); Costin, Wimbush, and Cromer (1964).
29. Griffiths and Robin (1994).
30. Harasymiw (1991); Costin (1994); Griffiths and Robin (1994).
31. Wigmore (1968), pp. 61–62.
32. Glaciological work had been undertaken in this area by Edgeworth David and others since the first decade of the twentieth century. (Browne 1914, 1943; Jennings and Costin 1977).
33. Breckwoldt (1988), pp. 95–99.
34. "Proposed Kosciusko Primitive Area," roneoed typescript, Australian Academy of Science Archives, Canberra (File No. 1002, National Parks Committee), p. 3.
35. Ibid., p. 2.
36. Turner (1957).
37. Australian Academy of Science (1961); Browne et al. (1965).
38. Costin (1994).
39. Southern (1965), pp. 6–7.
40. Robin (1994a).
41. Routley and Plumwood (1986).
42. Fenner (1989) comments that his interest in the environment began when he accompanied his father, Charles Fenner, on geomorphological trips in his childhood from 1928 onwards. In the same paper, however, he comments that his concern with the role of science in the management of the environment began in the Academy of Science and continued through his involvement in the establishment of the Centre for Resource and Environmental Studies (CRES) in Canberra (p. 3). Also discussion with Libby Robin, 21 April 1994.
43. The Fenner conferences have considered the Australian Alps national parks in 1988 (Good 1989), protection of marine and estuarine areas in 1991 (Ivanovici et al. 1991), the

conservation of biological diversity in Australia in 1992 (Australian Academy of Science 1993), and a conservation strategy for the Australian antarctic in 1993 (Handmer and Wilder 1993).

44. Ashton (1991), p. 23; Also discussion, 10 March 1994.
45. Robin (1994b).
46. Middleton (1990), p. 16.

REFERENCES

Ashton, D. 1991. Transcript of interview with Libby Robin, 30 October.

Australian Academy of Science 1961. "The Future of the Kosciusko Summit Area: A Report on a Proposed Primitive Area in the Kosciusko State Park." *Australian Journal of Science*, 23:12.

Australian Academy of Science 1993. *Biological Diversity: Its Future Conservation in Australia*. Canberra: AAS.

Borthwick, W. A. 1990. Transcript of interview with Libby Robin, 8 June.

Bowler, P. 1992. *The Fontana History of the Environmental Sciences*. London: Fontana.

Breckwoldt, R. 1988. *The Dirt Doctors: A Jubilee History of the Soil Conservation Service of New South Wales*. Sydney: SCSNSW.

Browne, W. R. 1914. "The Geology of the Cooma District: Part I." *Proceedings of the Royal Society of New South Wales*, 48:172–222.

———. 1943. "The Geology of the Cooma District, NSW: Part II." *Proceedings of the Royal Society of New South Wales*, 77:156–172.

Browne, W. R., A. B. Costin, M. F. Day, and J. S. Turner 1965. "The Kosciusko Primitive Area." *Australian Journal of Science*, 27:7.

Chambers, D. W. 1991. "Does Distance Tyrannise Science?," in R. W. Home and Sally Gregory Kohlstedt (eds.) *International Science and National Scientific Identity*. Dordrecht: Kluwer, pp. 19–38.

Cittadino, E. 1980. "Ecology and the Professionalization of Botany in America 1890–1905." *Studies in the History of Biology*, 4:171–198.

Collis, B. 1990. *Snowy: The Making of Modern Australia*. Rydalmere, NSW: Hodder and Stoughton.

Costin, A. B. 1954. *A Study of the Ecosystems of the Monaro Region of New South Wales: With Special Reference to Soil Erosion*. Sydney: Soil Conservation Service, NSW.

Costin, A. B. 1994. Taped interview with Libby Robin, 19 April.

Costin, A. B., L. W. Gay, D. J. Wimbush, and D. Kerr 1961. *Studies in Catchment Hydrology in the Australian Alps III*. CSIRO Division of Plant Industry. Technical Paper No. 15. Canberra.

Costin, A. B., and D. J. Wimbush 1961. *Studies in Catchment Hydrology in the Australian Alps IV*. CSIRO Division of Plant Industry. Technical Paper No. 16. Canberra.

Costin, A. B., D. J. Wimbush, and R. N. Cromer 1964. *Studies in Catchment Hydrology in the Australian Alps V*. CSIRO Division of Plant Industry. Technical Paper No. 20. Canberra.

Costin, A. B., D. J. Wimbush, and D. Kerr 1960. *Studies in Catchment Hydrology in the Australian Alps II*. CSIRO Division of Plant Industry. Technical Paper No. 14. Canberra.

Costin, A. B., D. J. Wimbush, D. Kerr, and L. W. Gay 1959. *Studies in Catchment Hydrology in the Australian Alps I*. CSIRO Division of Plant Industry. Technical Paper No. 13. Canberra.

Dingle, T., and S. O'Hanlon 1996. "Ten Per Cent Modern? Reshaping Melbourne's Suburban Homes, 1945–1960," in Tom Griffiths (ed.) *People and Place: Australian Heritage Perspectives*. London: Sir Robert Menzies Centre for Australian Studies, pp. 25–52.

Fenner, F. 1989. "Introduction," in Roger Good (ed.) *The Scientific Significance of the Australian Alps*. Canberra: Australian Alps Liaison Committee and Australian Academy of Science, pp. 3–5.

Gillbank, L. 1991. *The Biological Heritage of Victoria's Alps: An Historical Exploration*, mimeo report (72 pp.) prepared for the Historic Places Section, Department of Conservation and Environment, Melbourne.

Gillbank, L. 1993. "Into the Land of the Mountain Cattlemen: Maisie Fawcett's Ecological Investigations on the Bogong High Plains," in Farley Kelly (ed.) *On the Edge of Science: Australian Women in Science*. Melbourne: Text Publishing, pp. 133–154.

Good, R. (ed.) 1989. *The Scientific Significance of the Australian Alps*. Canberra: Australian Alps Liaison Committee and Australian Academy of Science.

Gottlieb, R. 1993. *Forcing the Spring: The Transformation of the American Environmental Movement*. Washington, DC: Island.

Griffiths, T. 1996. *Hunters and Collectors: The Antiquarian Imagination in Australia*. Melbourne: Cambridge University Press.

Griffiths, T., and L. Robin 1994. *Science in High Places: The Cultural Significance of Scientific Sites in the Australian Alps*. Canberra: Australian Alps Liaison Committee.

Handmer, J., and M. Wilder (eds.) 1993. *Towards a Conservation Strategy for the Australian Antarctic Territory*. Canberra: Australian Academy of Science.

Harasymiw, B. 1991. *Notice of Intention for a Cloud Seeding Experiment in the Snowy Mountains Region of South East New South Wales*. Melbourne: State Electricity Commission of Victoria, on behalf of Snowy Mountains Council.

Home, R. W. 1984. "The Problem of Intellectual Isolation in Scientific Life: W. H. Bragg and the Australian Scientific Community, 1886–1909." *Historical Records of Australian Science*, 6 (1): 19–30.

Ivanovici, A., D. Carter, and M. Olsen (eds.) 1991. *Protection of Marine and Estuarine Areas*. Canberra: Australian Academy of Science.

Jenkin, J. G. 1985. "Frederick Soddy's 1904 Visit to Australia and the Subsequent Soddy-Bragg Correspondence: Isolation from Without and Within." *Historical Records of Australian Science*, 6 (2): 153–169.

Jennings, J. N., and A. B. Costin 1977. "Stone Movement through Snow Creep, 1963–1975: Mt. Twynam, Snowy Mountains, Australia." *Earth Surface Processes*, 3:3–22.

Lake, M. 1987. *The Limits of Hope: Soldier Settlement in Victoria, 1915–1918*. Melbourne: Oxford University Press.

Lawrence, R. 1990. "The Interaction between the Environment, Land Use and Hydrology of the Bogong High Plains Area between 1850 and 1985." PhD diss., University of Melbourne.

Lawrence, R. 1992. "Use and Abuse of Water in the Victorian Alps," in Babette Scougall (ed.) *Cultural Heritage of the Australian Alps: Proceedings of the Symposium Held at Jindabyne NSW, 16–18 October 1991*. Canberra: Australian Alps Liaison Committee, 1992, pp. 295–308.

Lawrence, R. 1994. "Environmental Changes on the Bogong High Plains, 1850s to 1980s," in Stephen Dovers (ed.) *Australian Environmental History: Essays and Cases*. Melbourne: Oxford University Press, pp. 167–197.

McHugh, S. 1989. *The Snowy: The People behind the Power*. Port Melbourne: William Heinemann Australia.

Middleton, W. G. D. 1990. Transcript of interview with Libby Robin, 9 February.

Mitman, G. 1995. "High over the Borders: Visions of Conservation from Pan-Americanism to the Arusha Conference." Paper presented at the biennial conference of the International Society for the History, Philosophy and Social Studies of Biology, Leuven, Belgium, 21 July.

Moore, B. 1920. "The Scope of Ecology." Presidential address delivered before the St. Louis meeting of the Ecological Society of America, 31 December 1919. Reproduced in *Ecology*, 1 (1, January): 3–5.

Nelkin, D. 1971. "Scientists in an Environmental Controversy." *Science Studies*, 1:245–261.

Nelkin, D. 1975. "The Political Impact of Technical Expertise," *Social Studies of Science*, 5:35–54.
———. 1977. "Scientists and Professional Responsibility: The Experience of American Ecologists." *Social Studies of Science*, 7:75–95.
———. 1987. "Controversies and the Authority of Science," in H. Trislan Engelhardt, Jr., and Arthur L. Caplan (eds.) *Scientific Controversies*. Cambridge: Cambridge University Press, pp. 283–293.
Osborn, T. G. B. 1925. "On the Ecology of the Vegetation of Arid Australia. No. 1. Introduction and General Description of the Koonamore Reserve for the Study of Salt-Bush Flora." *Transactions of the Royal Society of South Australia*, 49:290–297.
Osborn, T. G. B., J. G. Wood, and T. B. Paltridge 1932. "On the Growth and Re-action to Grazing of the Perennial Salt-Bush, *Atriplex vesicarium*." *Proceedings of the Linnean Society of New South Wales*, 57:377–402.
"Ped" (F. G. Elford) 1945. "Ecology in General Science." *Wild Life*, 7 (November).
Robertson, E. L. 1986. "Botany," in C. R. Twidale, M. J. Tyler and M. Davies (eds.) *Ideas and Endeavours—The Natural Sciences in South Australia*. Adelaide: Royal Society of South Australia, pp. 116–119.
Robin, L. 1993. "The Rise of Ecological Consciousness in Victoria: The Little Desert Dispute, Its Context and Consequences." PhD diss., University of Melbourne.
———. 1994a. "Nature Conservation as a National Concern: The Role of the Australian Academy of Science." *Historical Records of Australian Science*, 10 (1): 1–24.
———. 1994b. "The Professor and the Journalist: Scientists in Popular Conservation Campaigns." *Victorian Historical Journal*, October, pp. 154–168.
———. 1997. "Ecology: A Science of Empire?," in Tom Griffiths and Libby Robin (eds.) *Ecology and Empire: Environmental History of Settler Societies*. Edinburgh: Keele University Press, pp. 63–75.
Routley, R., and V. Plumwood 1986. "The 'Fight for the Forests' Affair," in Brian Martin, C. M. Ann Baker, Clyde Manwell, and Cedric Pugh (eds.) *Intellectual Suppression: Australian Case Histories, Analysis and Responses*. North Ryde, Australia: Angus and Robertson, pp. 70–73.
Sheail, J. 1987. *Seventy-Five Years in Ecology: The British Ecological Society*. Oxford, UK: Blackwell Scientific.
Southern, H. N. 1965. "The Place of Ecology in Science and Affairs." *Proceedings of the New Zealand Ecological Society*, 12:5–9.
Specht, R. L. 1981. "Australia," in Edward J. Kormondy and J. Frank McCormick (eds.) *Handbook of Contemporary Developments in World Ecology*. Westport, CT: Greenwood, pp. 387–415.
Turner, J. S. (ed.) 1957. *A Report on the Condition of the High Mountain Catchments of New South Wales and Victoria*. Canberra: Australian Academy of Science.
Wigmore, L. 1968. *Struggle for the Snowy: The Background of the Snowy Mountains Scheme*. Melbourne: Oxford University Press.
Williams, R. J. 1985. "Aspects of Shrub-Grass Dynamics on the Bogong High Plains (Subalpine), Victoria." PhD diss., University of Melbourne.

33

Stolen Apes*

The Illicit Trade in Chimpanzees, Gorillas, Bonobos, and Orangutans

DANIEL STILES, IAN REDMOND, DOUG CRESS, CHRISTIAN NELLEMANN, AND RANNVEIG KNUTSDATTER FORMO

Great apes have become a commodity. In the past decade, a series of alarming reports from international experts, United Nations (UN) agencies, conservation organizations, and media outlets have revealed numerous cases of organized illegal trafficking and trade of gorillas, chimpanzees, bonobos, and orangutans. Environmental crime now ranks among the most significant illegal activities in the world, and the live trafficking of great apes is part of this global multibillion-dollar trade.

Given the wide range of illegal activity, relatively little is known about the scale and scope of the trade in great apes. This Rapid Response Assessment (RRA) was initiated to provide the first overview of the extent of the illicit global trade in great apes and to offer concrete recommendations for the mitigation of its potentially devastating impact on the remaining wild populations.

Great apes are trafficked in various ways. In many cases wild capture is opportunistic: farmers capture infant apes after having killed the mother during a crop raid, or bushmeat hunters shoot or trap adults for food and then collect the babies to sell. However, organized illicit dealers increasingly target great apes as part of a far more sophisticated and systematic trade. They use transnational criminal networks to supply a range of markets, including the tourist entertainment industry, disreputable zoos, and wealthy individuals who want exotic pets as status symbols. Great apes are used to attract tourists to entertainment facilities such as amusement parks and circuses. They are even used in tourist photo sessions on Mediterranean beaches and clumsy boxing matches in Asian safari parks.

Conservative data suggests that the illegal trade in great apes is widespread. Over the past seven years, a minimum of 643 chimpanzees, 48 bonobos, 98 gorillas, and 1,019 orangutans are documented to have been captured from the wild for illegal trade. These numbers are based on figures from 2005 to 2011 that comprise confiscation and arrival rates of orphans at sanctuaries in 12 African

* From D. Stiles, I. Redmond, D. Cress, C. Nellemann, R. K. Formo (eds.), *Stolen Apes—The Illicit Trade in Chimpanzees, Gorillas, Bonobos and Orangutans: A Rapid Response Assessment*, United Nations Environment Programme, GRID-Arendal, 2013, www.grida.no. Used by permission of United Nations Publications.

countries and rehabilitation centers in Indonesia, expert reports, and great ape bushmeat and body parts seized from traders. Many studies suggest that far more apes are either killed during the hunt or die in captivity than are ever confiscated, and law enforcement and customs officials admit that only a fraction of any contraband is ever seized.

Based on extrapolations, it is likely that as many as 22,218 wild great apes were lost between 2005 and 2011 related to the illegal trade, with chimpanzees comprising 64 percent of that number. The annual average loss of 2,972 great apes could have serious consequences for the biodiversity of key regions, given the important role great apes play in maintaining healthy ecosystems.

There is also evidence that the illegal trade has shifted from being a by-product of traditional conservation threats such as deforestation, mining, and bushmeat hunting to a more sophisticated business driven by demand from international markets. Since 2007, standing orders from zoos and private owners in Asia have spurred the export of over 130 chimpanzees and 10 gorillas under falsified permits from Guinea alone, an enterprise that requires a coordinated trading network through Central and West Africa.

Sadly, law enforcement efforts lag far behind the rates of illegal trade. Only 27 arrests were made in Africa and Asia in connection with great ape trade between 2005 and 2011, and one-fourth of the arrests were never prosecuted.

The loss of natural great ape range in Africa and Asia helps drive the illegal trade, as it promotes contact and conflict between apes and humans. Projections suggest that great ape habitat is being lost at the rate of 2–5 percent annually and that by 2030 less than 10 percent of their current range will remain unless challenged. In Southeast Asia, the conversion of rainforest for agro-industrial use happens so quickly that orangutans are flushed from the forest and end up being captured, killed, or trafficked. Only a small percentage of these apes are rescued and placed in rehabilitation centers.

In Africa, the proliferation of logging and mining camps in ape range areas has, in addition to rapidly growing towns and villages, fueled extensive bushmeat markets. These same markets drive the direct killing of adult and juvenile apes and lead to the capture of infants, which are then sold into the live trade.

Prices for great apes vary greatly. A poacher may sell a live chimpanzee for US$50–100, whereas the middleman will resell that same chimpanzee at a markup of as much as 400 percent. Orangutans can fetch US$1,000 at resale, and gorillas illegally sold to a zoo in Malaysia in 2002 reportedly went for US$400,000 each. Such prices are extremely rare, however, and the poacher who captures a live specimen may lose it to injuries, illness, or stress or have it confiscated if the poacher is arrested. At best, the actual poachers may earn only a fraction of the ultimate sale price of a great ape.

The primary offenders and profiteers of the live trade of apes are criminals who transport great apes by plane, boat, or over land by train and other types of

vehicles. The large number of air strips in the African bush, as well as smaller airports found primarily near infrastructure or resource exploration projects, allow smugglers to transport apes directly out on private cargo planes, usually bypassing customs officials. Other smuggling routes involve the ferrying of apes via boat or over land.

It is evident from this RRA as well as from previous reports from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and concerned nongovernmental organizations (NGOs) that the live trade in great apes and the continued violations of the Convention must be taken seriously. The fight against the trade must both tackle organized crime and combat demand, while reducing bushmeat hunting associated with logging, mining, or agricultural expansion. Conservation and law enforcement efforts in protected areas are also crucial for reducing the number of apes being caught.

This can only be done if CITES and national laws are enforced, if the transboundary criminal networks involved are investigated, if traffickers are arrested and prosecuted, if deterrent sentences and punishment are enforced, and if markets for this illegal trade are closed.

Recommendations

Organized trafficking	Law enforcement	Consumer demand
• Investigate international great ape traffickers and buyers for complicity in transboundary organized crime. • Prosecute those accused of participating in the organized transboundary crime of great ape trade to the fullest extent of the law. • Designate national customs units to specifically address environmental crime and carry out inspections targeting the live trade of great apes and other wildlife at airports (both regional and international), ports, and major roadways. • Emphasize inspections for illegal trade exports and imports. • Establish transnational criminal intelligence units targeting environmental crime to ensure that intelligence is compiled, analyzed, and shared with national police forces, customs, and INTERPOL. • Improve the training of police officers, customs officials, and the judiciary on the issues of illicit trade in great apes, environmental crime, and wildlife trafficking. • Increase enforcement of protected areas, both to reduce illegal trade in great apes and to protect their habitat.	• Establish an electronic database that includes the numbers, trends, and tendencies of the illegal great ape trade and monitor arrests, prosecutions, and convictions as a means of assessing national commitment. • Create law enforcement indicators that can accurately gauge national commitment. • Review national laws and penalties relating to the killing and trafficking of great apes and support efforts to forcefully implement and strengthen those laws. • Incorporate anticorruption measures into law enforcement efforts to protect great apes and urge governments to report annually on efforts to counter corruption. • Introduce both revised CITES permits and revised reporting systems that minimize forgery and falsification.	• DNA-test all confiscated great apes and return to country of origin—if discernible—within eight weeks of confiscation. • Utilize national and international multimedia campaigns to eliminate the trade/ownership/use of great apes and emphasize laws and deterrent punishment. • Require CITES authorities to control the exploitation of illegally trafficked great apes in entertainment facilities and zoos. • Support efforts to end the use of trained great apes in films, television shows, or advertising.

34

Difference and Conflict in the Struggle over Natural Resources*

A Political Ecology Framework

ARTURO ESCOBAR

The dominant models of development and the economy are making inroads into urban and rural landscapes, the body, and even the molecular fabric of life (for instance, as in the case of transgenic crops and nanotechnology). They introduce environmentally destructive practices that leave landscapes of ecological destruction, sometimes veritable devastation, along the way. It is no wonder that communities worldwide are increasingly steadfast, adamant, and articulate about the defense of their places, environments, and ecosystems. Long gone are the days when one could count, on one hand, the environmental movements in the Third World that achieved visibility in the West (the most famous of which being the valiant defense of Himalayan forests by women, known in the 1970s and 1980s as the Chipko movement). Today the number of environmental conflicts and mobilization that receive, or at least merit, worldwide attention has skyrocketed. Tropical forests, biodiversity, water, seeds, energy technologies, food, rivers, and seas, contamination caused by extractive industries such as oil and mining, transboundary pollution, fishing rights, urban redevelopment, the melting of glaciers and polar ice caps possibly caused by global warming, and many more are all the object of struggles in many parts of the world (Escobar, 1998).

These struggles have two important things in common. First, they often pit rich against poor, within regions, countries, and transnationally. In addition, the resulting struggles are often led by women, and they are particularly poignant when they involve indigenous or ethnic minority communities, given the tenacity with which they defend their places and the tremendous cultural contrast between the imposed models and local worldviews. Second, they invariably involve the questioning of capitalistic economic models, on the one hand, and some sort of mobilization around, or defense of, local cultures, on the other. This is why it is useful to think about environmental conflicts under three interrelated rubrics: economic, ecological, and cultural. Most conflicts over natural resources involve these three dimensions. . . .

* From *Development* 49, no. 3 (2006): 6–13. Used by permission of Palgrave.

Why Difference?

Globalization has not led to the flattening of differences that was once feared. While important forms of homogenization have occurred given the dominant European cultural forms (today largely driven by processes in the US), differences have by no means disappeared. Nevertheless, social groups worldwide see their long-standing cultural practices being transformed in the encounter with many other cultural forms, whether dominant and not. A key question with regards to these encounters is the relation between difference and equality. Especially, we need to consider how to achieve the goal of equality while respecting difference. . . .

We now recognize that diversity is here to stay. New forms of cultural difference are continuously being created, even in reaction to today's seemingly overpowering globalization. This realization, however, is usually accompanied by the widespread belief that diversity can more easily generate conflict and inequality than enable functioning pluralistic systems and a measure of justice and equality. Hence the importance of thinking again about the conditions for the coexistence of difference and equality under a set of historical factors which seems not only to pull them apart but to thrust them in opposite directions. It appears that the more diversity is affirmed, especially by those subalternized (culturally dominated and economically poor) groups which constitute the world's majority, the greater the tendency to exclude or dominate by the powerful few (rich) groups controlling the world's access to opportunities and resources for survival and development. Conversely, the greater the willingness by those in power to grant a measure of equality to subaltern groups, the more intense the pressure to deny their difference through processes of assimilation which are often conflictual.

The key questions we need to be asking are therefore, In what ways are economic, cultural, and ecological difference-in-equality either enabled or denied? How are culture, economy, and environment organized in order to deny difference or to produce difference but only according to a hierarchical order, and how are these denials and hierarchies related to issues of equality? What are the conflicts that ensue from this denial? For most critical analysts, it is the unequal distribution of income and material resources that is at the basis of conflict, instability, and the denial of difference and equality. The importance of economic factors cannot be emphasized enough. More recently, some have started to highlight the conflicts over access and control of natural resources as a key factor in today's global and local crises. In other words, today's cultural and economic crises have a fundamental ecological dimension. Few critics, however, seem to focus yet on what could be called "cultural distribution conflicts," namely, those that arise from the relative power, or powerlessness, accorded to various cultures and cultural practices in a historical context. There are of course the exceptions of critics who discuss culture conflict in homogenizing terms such as "the clash

of civilization" (Huntington 1993) or "the end of history" (Fukuyama 1992). But is it possible to imagine a different framework for thinking about the relation between difference and conflict?

A Political Ecology of Difference

Joan Martinez-Alier (2002) defines political ecology as the study of ecological distribution conflicts. By this he means conflicts over access to, and control over, natural resources, particularly as a source of livelihoods, including the costs of environmental destruction. "Ecological distribution conflicts," however, exist in the context of economies, cultures, and forms of knowledge, besides the obvious ecosystem context. Traditionally, political economy has been the study of economic distribution conflicts. This definition assumes that economic distribution is a political issue and related to social power. Yet economists have not dealt with the ecological and cultural dimensions of distribution and equality. Over the past two decades, the debate between environmental economics and ecological economics around the question of the "internalization of externalities" has led to a search for concepts to account adequately for the hidden ecological and social aspects of production. For neoclassical economists, the issue is resolved by internalizing previously unaccounted for ecological costs or "externalities" into the economic system (such as the contamination of water tables by pesticides, cleanup costs, the costs of reducing carbon dioxide emissions or the payment for carbon sinks, or the benefits to future generations foregone by destroying biodiversity). This is simply done by assigning property rights and market prices to all environmental services and resources. . . .

For the field of ecological economics, on the contrary, the value of nature cannot be assessed only in economic terms. There are ecological and political processes that contribute to define the value of natural resources that cannot be reflected in market prices. Indeed, in many cases there is incommensurability between economic and ecological processes to the extent that communities value the environment for reasons other than economic, for example, when they consider nature to be sacred and uncommodifiable. Conflicts over access and control of resources take on a complex ecological and political character if the widely held idea that everything can be tagged in monetary terms is suspended. This is why ecological economists have suggested the category of ecological distribution. Under conditions of unequal distribution of wealth, economic growth and production entail the negation of ecological integrity, since the time and requirements of capitalistic production and those of the natural processes are not the same. The result is conflicts of ecological distribution, such as those found in struggles around the protection of forests, rivers, mangroves, wetlands, or biodiversity. The fact that these conflicts oftentimes appear when poor communities mobilize for the defense of the environment as a source of livelihood has led

some ecologists to describe them as "environmentalism of the poor" (Martinez-Alier, 2002; Guha and Martinez-Alier, 1997).

But if production under unequal distribution negates ecological processes, it also negates the cultural processes that are at the basis of people's valuation and relationship to the natural world. Not only do ecosystems have different ecological conditions and requirements for their maintenance, communities worldwide have perceptions and practices of nature which differ greatly among themselves and which are also essential to the health or decline of natural environments. . . . In recent years, anthropologists have documented with increasing eloquence how social groups throughout the world "construct" nature—and hence utilize it—in quite specific ways. In many nonmodern or non-Western settings, the strict separation between the biophysical, the human, and the supernatural worlds that characterizes urban-based, modern societies does not exist. On the contrary, "nature" is an integral component of the human and supernatural domains. Nature exists in a dense universe of collective representations that at once grounds different ways of doing things with / around "nature." Succinctly put, many communities in the world signify their natural environment and then use it in ways that markedly contrast with the more commonly accepted way of seeing nature as a resource external to humans and which humans can appropriate in any way they see fit (Descola and Pálsson, 1996; Restrepo and del Valle, 1996).

Not only economic factors and ecological conditions, but cultural meanings, define the practices that determine how nature is appropriated and utilized. Until now, sustainability has referred chiefly to technological and economic variables. Ecological economists among others added the ecological dimension, yet the full inclusion of cultural conditions remains elusive (Leff, 1998). Recently, some work in political ecology as well as social movements' strategies have begun to emphasize cultural conditions. They shift the question of sustainability from its economic, technological, and managerial center to the ecological and cultural level. Struggles for cultural difference, ethnic identities, and local autonomy over territory and resources are contributing to redefine the agenda of environmental conflict beyond the economic and ecological fields. They take us fully into the terrain of the cultural as they elaborate a complex demand for seeing places in terms of economic, ecological, and cultural difference.

. . . Following this approach, we can now visualize the different levels of analysis that circumscribe environmental conflicts. In the first instance, environmental economics attempts to account for the so-called externalities associated with economic processes, but without altering in any significant way the current parameters of market, the capitalist economy, and, in the last instance, modernity. This is a worthy aim to some extent, but it contributes to consolidate neoliberal market-driven ideologies of environment and development. A further level of analysis and action is introduced by ecological economists, who

conclude that socio-environmental processes cannot be reduced to market values and that it is impossible to find a common standard of valuation for all cases and situations (including the possibility of incommensurability of values). . . .

In a third instance, yet to be more fully developed, cultural diversity is added to ecological diversity as a source of redefinition of production, sustainability, and conservation. By identifying culturally diverse models of nature as one of the three pillars of ecological distribution, this option moves outside the economic domain. This third proposal thus deepens the incommensurability of economy and ecology postulated by ecological economists. The approach sees such incommensurability as arising from the contrasting cultural meanings assigned to nature by various human groups and from the concomitant power strategies of social movements in defense of nature as both source of livelihood and cultural identity. In the last instance, what is at stake is a redefinition of production and the economy in line with both the ecological and cultural dimensions of the environment (Leff, 1998; Escobar, 1999). This in turn entails a plurality of development styles and deeply questions the economistic and technocratic approaches that have dominated the development experience. Instead, it encourages social groups and communities to engage in other types of development approaches and economies.

Conclusion

I started this article by emphasizing the need to reexamine the relationship between difference and equality of access from the simultaneous and interrelated perspective of economic, ecological, and cultural distribution conflicts (table 34.1). The fact that a growing number of people and groups demand the right to their own cultures, ecologies, and economies as part of our modern social world can no longer be denied. Nor can these demands be easily accommodated into standard liberal or neoliberal doctrine. It is the time for thinking more openly about the potential healing effects of a politically enriched difference and otherness.

It is necessary to strive for economic, ecological, and cultural distribution equally. Modernity and development have been built through unfair distribution and unequal exchange on all these three levels, and it is time to redress it. Movements for economic justice, environmental sustainability, and cultural difference are moving in this direction. The implications of such directions for policy and other forms of action are evident, for example, the need to limit cultural dominance in key institutions. This is particularly important in those institutions that regulate global policy concerning, for instance, property rights, conservation, and other forms of economic organization and development. Conversely, it is important to create spaces for the continued activation of nondominant cultural forms, such as less individualistic forms of economy and ecology. There should

TABLE 34.1. Economic, Ecological, and Cultural Distribution Conflicts

Context/ historical process	Concept/ problem	Theoretical/ academic response	Intellectual/ political project	Social/ political responses
Global capitalism Reductionist science and technology Dominant modernity (Modern Colonial World System)	Economic distribution (Negation of Economic Difference) Ecological distribution (Negation of Ecological Processes and Difference) Cultural distribution (Negation of Cultural Difference)	Internalization of externalities Environmental economics highlight incommensurability of (modern) economy and ecology Ecological economics and political ecology Highlight incommensurability of (modern) economy and culture Political ecology, politics of place, frameworks	"Sustainable" capitalist development Need to reembed economy in society and ecosystems Need to reembed economy in society, ecosystem, and culture	Environmental management Struggles over the environment as source of livelihood Environmentalism of the poor Place-based struggles for economic, ecological, and cultural difference Cultural politics of social movements; social movement networks

be educational strategies or an entire pedagogy of difference to support this aim; this applies to gender policies as well, to the extent that women are often at the forefront of challenging unfair distribution patterns at the levels of body, home, place, economy, and environment (Harcourt and Escobar, 2005). Finally, it is important to support the social movements that are creating alternative and plural visions of rights (such as the right to basic subsistence, autonomy, and difference), economy (in terms of alternative capitalistic and noncapitalist practices), and nature (in terms of ecological design principles that integrate human and ecological processes) (Gibson-Graham, 2005).

One final word about why so much emphasis on difference and "conflict." First, as the Brazilian liberation theologian Leonardo Boff (2002: 26) says, the valuation of difference entails acceptance of complementarities and convergences constructed out of the diversity of worldviews and practices. Second, while highlighting power, "conflict" should not be seen as reducing everything to power or to quantitative assessments of inequalities. The emphasis on conflict and difference is not about exclusion or segregation, as some might fear. In the best of cases, the language of distribution conflicts entails serious individual and collective confrontations with difference but without (having to) fear. It entails bridge building and technologies of crossing across difference (Anzaldúa and Keatin, 2002). As biologists Humberto Maturana and Francisco Varela put it, "A conflict can go away only if we move to another domain where coexistence takes

place. The knowledge of this knowledge constitutes the social imperative for a human-centered ethics. . . . As human beings we have only the world which we create with others—whether we like them or not" (1987: 246).

The answer to today's imperial globality enforced through violence by the ecology of difference is to ask that we understand distribution as the search for a shared sense of peace and justice. As a value, peace-with-justice does not belong completely to the domain of rationality but of ethics. It requires an attitude of transformation, caring, and solicitude in the face of difference and injustice. Peace-with-justice should be seen as always in process, something that can only be approached asymptotically but never really be reached. It is in the light of a planetary sense of ethics and spirituality such as found in the best ecology and pluralist religious thought and in the best humanist traditions of secular modernity that one may find elements for a workable strategy of peace out of the recognition of conflict (Boff, 2002, 2004). "Peace"—understood as a set of economic, cultural, and ecological processes that bring about a measure of justice and balance to natural and social orders—is the deepest meaning of the ecology of difference that aims towards a plurality of knowledges and worlds.

REFERENCES

Anzaldúa, Gloria, and Analouise Keatin (eds.) (2002) The Bridge We Call Home, New York: Routledge.

Boff, Leonardo (2002) El Cuidado Esencial, Madrid: Editorial Trotta.

Boff, Leonardo (2004) Ecologia: Grito da Terra, Grito dos Pobres, Rio de Janeiro: Editorial Sextante.

Descola, Philippe, and Gísli Pálsson (eds.) (1996) Nature and Society. Anthropological Perspectives, London: Routledge.

Escobar, Arturo (1998) "Whose Knowledge, Whose Nature? Biodiversity Conservation and the Political Ecology of Social Movements," Journal of Political Ecology 5:53–82.

Escobar, Arturo (1999) "After Nature: Steps to an Anti-essentialist Political Ecology," Current Anthropology 40 (1): 1–30.

Fukuyama, Francis. 1992. *The End of History and the Last Man*. New York: Free Press.

Gibson-Graham, J. K. (2005) "Building Community Economies: Women and the Politics of Place," in Harcourt, Wendy, and Escobar, Arturo (eds.) Women and the Politics of Place, Bloomfield, CT: Kumarian, pp. 130–57.

Guha, Ramachandra, and Joan Martinez-Alier (1997) Varieties of Environmentalism, Delhi: Oxford University Press.

Harcourt, Wendy, and Arturo Escobar (eds.) (2005) Women and the Politics of Place, Bloomfield, CT: Kumarian.

Huntington, Samuel P. 1993. *The Clash of Civilizations and the Remaking of World Order*. New York: Simon and Schuster.

Leff, Enrique (1998) SaberAmbiental, Mexico: Siglo XXI.

Martinez-Alier, Joan (2002) The Environmentalism of the Poor, London: Elgar.

Maturana, Humberto, and Francisco Varela (1987) The Tree of Knowledge, Boston: Shambhala.

Restrepo, Eduardo, and Jorge I. del Valle (eds.) (1996) Renacientes del Guandal, Bogotá: Proyecto Biopacífico / Universidad Nacional.

SECTION 7

Is Green Consumerism the Answer?

What does it mean to be "green"? How can we as anthropologists assess the merits and not-so-merits of green consumerism? Do wealth and consumption always go together? How do we differentiate between "standard of living," affluence, and overconsumption? Are there limits to human needs and wants? What aspirations are legitimate? What drives high levels of consumption, and what can (or should) be done to persuade people to limit their consumption? Is economic growth compatible with sustainability? Are terms like *sustainable development* and *green consumption* inherently oxymoronic?

Issues of consumption are central to understanding environmental change (Wilk 2006). Especially for a U.S. audience, this section brings home the personal dimension of environmental choices, because Americans live in a consumer society. Beyond basic food necessities, Americans are preoccupied with having the right car, clothes, home, and electronics. People replace these items with changing fashions, often before they are worn out. These consumption patterns connect Americans to a vast global network in which humans and natural resources are regularly exploited. This section, considered in tandem with the previous sections of this book, invites readers to consider not only the extent of American consumer culture but also the enormous difference between consumption patterns in different parts of the world and the ways through which these patterns could be changed.

In comparison to the average Indian, who consumes 2 kilograms of meat each year, U.S. residents eat 112 kilograms (Gupta 1998: 310). This imbalance of consumption is true for other items, as well. A typical North American consumes thirty to fifty times more energy and materials than someone living in a low-income country (Wilk 2006: 421). Per capita CO_2 emissions amount to 17.6 metric tons per capita in the United States, compared to 0.2 in Zambia, 1.1 in Honduras, and 1.7 in India (World Bank 2014). Even among high-income countries, Americans' carbon footprint looms large; the World Bank reports per capita CO_2 emissions of 6.9, 9.2, and 9.3 metric tons for Italy, Japan, and Israel, respectively (ibid.). As Paul Kennedy writes, "The average American baby represents twice the environmental damage of a Swedish child, three times that of an Italian, thirteen times that of a Brazilian, thirty-five times that of an Indian, and 280 (!) times that of a Chadian or Haitian because its level of consumption throughout its life will be so much greater. That is not a comfortable statistic for anyone with a conscience" (1993: 32–33).

But consumption includes more than individual per capita rates. Anthropological studies of consumer cultures must also take corporate behaviors and government policies into consideration. The first chapter in this section details the practices and priorities of one of the largest transnational corporations in the world—Cargill. This well-known agribusiness company was, when Brewster Kneen originally authored this contribution in 1995, and remains in 2014 the largest privately held company in the United States. Indeed, in the thirty years that *Forbes* has been publishing an annual list of America's largest private companies, Cargill has missed the number-one ranking only twice—it came in second to Koch Industries in 2006 and 2007 (Murphy 2014). As Kneen explains, this company has managed to expand its global reach while simultaneously maintaining a low profile and even appearing folksy. Today, Cargill employs over 143,000 people in sixty-seven countries. Its 2014 revenue exceeded $134 billion. Yet, in a contradictory series of events given the corporate veneration of the free market, much of this American company's success has depended on U.S. government subsidies and other publicly funded programs. Like the other chapters in this section, Kneen's contribution draws readers' attention to the sometimes secretive ways through which corporations affect peoples and environments around the world. This "invisible giant," Kneen explains, has shaped the agricultural policy and food security of dozens of counties while being accountable to no one outside the company. Interestingly, over Cargill's history, its size has actually limited its activity and agility—for example, its capacity for information sharing, decision making, and even separating the profits and losses associated with one raw material from those associated with others (Kneen 2002). Highlighting opposition movements in Japan and India, Kneen also acknowledges limits to Cargill's global reach and recognizes the emergence of socially just and environmentally sound alternatives to the type of transnational corporate production that Cargill exemplifies.

Martha Honey continues the theme of exploring "invisible" yet far-reaching business practices in her assessment of ecotourism. Tourism is a multibillion-dollar industry, structured to create an intimate experience of foreign cultures and environments. So-called green travel or ecotourism offers tourists the added sense that their travel experience is responsible—that is, that it helps conserve the natural environment and improve the well-being of local people. Examining the ecological and social foundations of ecotourism, Honey, like Kneen, sheds light on the sheer size of the industry—according to her, ecotourism "vies with oil as the world's largest legitimate business." She also describes some of the deceptive marketing tactics that allow big players in the tourism industry to present themselves as ecotourist enterprises even when they are not. For instance, in the same way that global giant Cargill intentionally puts forward a folksy image to improve its business, a travel and tourism agency can purchase for as little as

$200 the right to use the Green Globe logo in its literature, giving the impression that it is "going green" without any oversight to ensure it has actually instituted any environmentally sound practices. Honey concludes that if ecotourism is to mature into a socially responsible and environmentally respectful form of travel, then it must help the public become more informed and discerning.

The environmental solution offered in the next chapter is far more austere than either ecotourism or fair trade. Federico Demaria, François Schneider, Filka Sekulova, and Joan Martinez-Alier offer the radical idea that people could decline to consume altogether. Time spent shopping might be spent on other endeavors, as people build their lives around principles and activities that require far fewer financial and environmental expenditures. This activist-led movement and field of scholarship is called "degrowth," and in this chapter, Demaria et al. lay out its definition, origins, evolution, and practices.

This section's polemical piece by James G. Carrier couples nicely with the chapter on degrowth. Whereas Demaria et al. describe the convergence of critical ideas and political action that have given rise to the degrowth movement, Carrier describes the marketing tactics and processes of commodification that invisibly undermine consumers' values. Building on Karl Marx's concept of commodity fetishism, Carrier defines fetishism as ignoring or denying the background of objects—that is, the people and processes involved in creating an object and bringing it to market—and he examines three forms of fetishism that are involved in ethical consumption: fetishism of objects, fetishism of the purchase and consumption of objects, and fetishism of nature. As Carrier explains, the fetishism inherent in our consumption practices reduces the likelihood that ethical consumption can truly empower consumers either to lead more moral lives or to steer corporate behavior in more moral directions. Thus, Carrier questions the extent to which consumption, even "ethical consumption," can ever protect the natural environment.

REFERENCES

Gupta, Akhil. 1998. *Postcolonial Development: Agriculture in the Making of Modern India*. Durham, NC: Duke University Press.

Kennedy, Paul. 1993. *Preparing for the Twenty-First Century*. New York: HarperCollins.

Kneen, Brewster. 2002. *The Invisible Giant: Cargill and Its Transnational Strategies*. 2nd ed. London: Pluto.

Murphy, Andrea. 2014. America's Largest Private Companies 2014. *Forbes*, November 11. http://www.forbes.com/sites/andreamurphy/2014/11/05/americas-largest-private-companies-2014/.

Wilk, Richard R. 2006. The Ecology of Global Consumer Culture. In *The Environment in Anthropology: A Reader in Ecology, Culture, and Sustainable Living*. Nora Haenn and Richard R. Wilk, eds. Pp. 418–429. New York: NYU Press.

World Bank. 2014. World Development Indicators: Energy Dependency, Efficiency, and Carbon Dioxide Emissions. Washington, DC: World Bank Group. http://wdi.worldbank.org/table/3.8#.

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 35: "The Invisible Giant: Cargill and Its Transnational Strategies" by Brewster Kneen

1. What is PL 480? How did it benefit the Cargill company?
2. What other policies have benefited Cargill over the years?
3. What is "the revolving door of public service"? How does this affect companies like Cargill?
4. In addition to the revolving door, what other lobbying activities does Cargill use to its advantage?
5. How is it that the hybrid seed business is used as a "Trojan Horse" for farmers?
6. Why has Cargill not become a major player in the Japanese feed and meat markets?
7. What sort of resistance has Cargill encountered in India and elsewhere?

Questions to Accompany Chapter 36: "Treading Lightly? Ecotourism's Impact on the Environment" by Martha Honey

1. What is ecotourism? How does it differ from nature tourism, wildlife tourism, or adventure tourism?
2. Compare and contrast Maho Bay Camps in the U.S. Virgin Islands with Moka Ecolodge in Las Terrazas, Cuba. What are their strengths and shortcomings? Why does Honey suggest that Maho Bay is not real ecotourism?
3. What is "ecotourism lite"?
4. What pressing issues does Honey conclude that the ecotourism industry must address? What steps must be taken to ensure ecotourism's survival?

Questions to Accompany Chapter 37: "What Is Degrowth? From an Activist Slogan to a Social Movement" by Federico Demaria, François Schneider, Filka Sekulova, and Joan Martinez-Alier

1. What is degrowth? How is it related to the *res communis* approach?
2. What does the term *Homo economicus* mean? And how do advocates of degrowth view this concept?
3. What is the Easterlin Paradox?
4. What is ecological modernization, and how is it received among degrowth advocates?
5. Why do Demaria et al. argue that economic growth can never eradicate poverty?
6. What is the "nowtopia"?
7. How does this chapter on degrowth compare to Ferguson and Lohmann's chapter on "development" (chapter 18)?

Questions to Accompany Chapter 38: "Protecting the Environment the Natural Way: Ethical Consumption and Commodity Fetishism" by James G. Carrier

1. What are "fictitious commodities"? How do they relate to ethical consumption?
2. What is fetishization?
3. How do commodities get fetishized? How are the means by which consumers are able to purchase and consume an object fetishized? How are consumers themselves fetishized? How is the environment fetishized? And what does this mean for ethical consumption?
4. How is it that fetishizing images also define ethicality?
5. How does tourism affect the environment of Montego Bay and Negril?
6. Having read this chapter by James Carrier and the previous chapters by Honey and Demaria et al., what do you think is the most appropriate response, or answer, to our contemporary environmental problems? Is it ecotourism or ethical consumption? Is it degrowth? What other options are there?

35

The Invisible Giant*

Cargill and Its Transnational Strategies

BREWSTER KNEEN

Established in 1865, Cargill is the largest private company in the United States. It started out primarily as a regional grain merchandizer in Minnesota (where it is still headquartered); it now describes itself as the largest agricultural commodities trader in the world, with global sales of $51 billion in 1994–1995 and a daily profit of $2 million after taxes.[1]

Yet few people are aware of Cargill's global reach, not even many of its own employees. In Memphis, Tennessee, the casual visitor to the office of Hohenberg Bros. would be hard-pressed to know not only that it was the office of one of the top five cotton-trading companies in the world but also that it was a Cargill subsidiary.[2] In many towns and cities, the local Cargill office is housed in a nondescript building outside the main business district, with little indication of the company's presence except on the lobby plaque listing the building's tenants. This low profile is no accident. As Kerry Hawkins, president of Cargill Ltd. (Canada) once put it, "Our experience is if you're too big, people don't want to do business with you."[3]

And Cargill is big. It employs some 72,700 people worldwide in 800 locations in 60 countries in more than 50 leading lines of business, including corn, salt, peanuts, cotton, coffee, road transport, river-canal shipping, molasses, livestock feed, steel, hybrid seeds, rice milling, rubber, citrus, chicken, fresh fruits and vegetables, beef, pork, turkey, and flour milling. Cargill is the world's largest producer of malting barley, the largest oilseed processor, and the second-largest producer of phosphate fertilizer.[4]

Subsidies, Subsidies

Cargill's fortunes appear to have depended to a surprising extent, given the corporate ideology of free enterprise, on the major export-subsidy programs of the US government, particularly over the past 50 years.[5] Immediately after the Second World War, programs of the UN Relief and Rehabilitation Agency and the Marshall Plan moved mountains of grain as aid to Europe. US wheat and flour

* From the *Ecologist* 25, no. 5. See updates at ramshorn.ca. Used by permission of author.

exports jumped from 48 million bushels in 1944 to 504 million in 1948. Grain companies, including Cargill, stored and delivered grain—for a fee—on behalf of the US government.

By the early 1950s, however, domestic food production in Europe began to rise to replace imports. The dumping of US grain was no longer welcome foreign aid but unwelcome competition and an obstacle to the European goal of self-sufficiency in food. The response of the United States government, under heavy pressure from grain companies, was to subsidize the export of grain to countries outside of Europe under Public Law 480—the Agricultural Trade Development and Assistance Act, known as "Food for Peace"—which was passed in July 1954. As W. G. Broehl writes in his corporately sponsored history of Cargill, "PL 480 combined and extended the use of surplus agricultural products for the furtherance of foreign policy goals. . . . The funds could also be used to develop new markets for United States farm goods. . . . That it was a boon to the American grain traders goes without saying."[6]

Cargill has always been a major beneficiary of PL 480 finance. Between 1955 and 1965, Cargill's US grain exports increased 400 percent, with sales rising from $800 million to $2 billion. By 1963, Public Law 480 had generated revenue for Cargill of $1 billion. In addition, between 1958 and 1968, Cargill received some $76 million for storing grain, often in leased, publicly owned terminals or terminals built with public funds.

Cargill has been quick to capture other subsidies as well. In 1985, the US Congress passed the Export Enhancement Program (EEP) of the Food Security Act to bolster crop exports and help beleaguered US farmers. Under the EEP, eligible countries are designated each year by the US secretary of agriculture. Individual sales are then negotiated between the eligible country (or its designated agency) and a trading company on the basis of the subsidy available at the time for that particular country. The subsidy is then paid to the company making the deal.

From 1985 to early 1992, the US government doled out $4.26 billion to 95 corporate trading companies under the EEP, with Cargill receiving some $800 million of this. In 1987, wheat sales under the EEP to China alone reportedly netted Cargill subsidies of $2 million.[7] Commenting on the EEP, the *New York Times* concluded,

> The Agriculture Department's $40 billion campaign to bolster crop exports, begun a decade ago to help beleaguered farmers, has instead enriched a small group of multinational corporations while doing little to expand the US share of the world's agricultural markets. . . . An examination of the subsidy programs highlights the symbiotic relationship between one of the biggest and least scrutinized federal departments and some of the politically influential companies it regulates.[8]

Other publicly funded programs which have benefited Cargill and other grain processors and merchants in the name of US market share and global competitiveness are channeled through nonprofit industry foundations and associations so that they are relatively invisible to the public.

Molding Policy

Cargill has a full array of highly sophisticated lobbying styles to manipulate government policy and programs to its advantage. Its reputation in the grain trade for doing so is extensive: as an executive in a competitor company said, "The big ones don't get that way by waiting around for something to happen."[9]

A prime mechanism is the revolving door of public service: (usually) senior Cargill executives take leave of Cargill for a stint in government advisory and policy positions, returning to the company when their mission is accomplished. The career of William R. Pearce, who retired as Cargill's vice chair in 1993, is illustrative. In 1973, Pearce left Cargill to join the Nixon administration as deputy special representative for trade negotiations, steering a trade bill through Congress that, in Cargill's own words, "shaped international trade policy."[10] Pearce rejoined Cargill a year later in 1974.

Cargill employees or ex-employees have taken up key posts in the US Department of Agriculture (USDA) and in the US negotiating team for the recent GATT Uruguay Round. Such is the extent to which Cargill employees have rotated through positions at the USDA that one government investigator has called the practice "structural corruption."[11]

The next level of lobbying activity takes place through the myriad trade associations that represent a commodity or processing interest, such as turkey growers, flour millers, soybean processors, peanut growers, or the feed industry (there are 77 pages in one directory of US agricultural associations with several per page). While many of these associations present themselves as producer organizations and claim to speak on behalf of farmers, organizations like the "Western Canadian Wheat Growers" and the "Western Canadian Barley Growers" are actually financed by corporations and speak for their corporate backers. Cargill has organized similar groupings in countries where it is seeking to establish a presence: in India, for example, farmers to whom it has sold hybrid corn have been encouraged to speak on behalf of the company.

In recent years, Cargill has also developed effective grassroots lobbying techniques to enhance its higher-level activities and achieve favorable business climates at the local level. The Cargill Community Network (CCN), for example, is the name of a grassroots program "aimed at improving Cargill's reputation and success in communities where it is doing business." The CCN is "designed to help win Cargill's public-policy objectives at every level of government" by spreading the word that Cargill is "a solid corporate citizen" while "building a

reservoir of community goodwill that ensures we have friends when we need them." From a computer database, network members receive information on state and national issues as well as identification of their state and national legislators; in some cases, the network also negotiates group memberships "with leading business organizations."[12]

Establishing Beachheads

Nurturing such networks is key to Cargill's operations around the world. Indeed, its success as a global company—and, in particular, its ability to enter new product markets in many different localities—has depended on its capacity for identifying key political actors and politically appropriate business openings. James R. Wilson of Cargill Technical Services in the UK recently described Cargill's approach to starting a business in a new country:

> Cargill speaks of beachheads. Much of business strategy has its origins in military strategy. Historic product-line beachheads for the company have been hybrid seeds (primarily corn), commodity export marketing and animal feed milling. The strategy has been: create the beachhead with inputs of capital, technology and a management nucleus: get the cash flow positive; re-invest the cash flow and expand the beachhead. . . . The company generally insists on majority ownership in beachhead companies because it needs to be clear who is responsible for the management of an individual company.[13]

Hybrid seed has proved particularly attractive as a "beachhead product" because it requires virtually no capital investment. In Tanzania, for example, Cargill's seed business has 24 staff, most of whom are involved in seed production. Four or five of them, however, "bounce around the country on dirt bikes setting up a dealer network" and selling and delivering seed in small quantities of one to ten kilograms. Managers, meanwhile, work with "contract seed growers who run much bigger farms than most of their customers."[14] The hybrid seed business is then used as a "Trojan Horse" to create dependency among farmers upon Cargill's "crop inputs" of fertilizers and advice; as a result, they eventually become indebted suppliers of commodities, either for trade or processing. Besides Tanzania, Cargill has used hybrid seeds to establish itself in Argentina, India, Pakistan, Zambia, Zimbabwe, South Africa, and Malawi—all of which have the potential to become major grain- and oilseed-growing regions.

Elsewhere, other products have been used. In Indonesia, for example, Cargill scout Kees Nieuwenhuyzen recommended in 1970 that Cargill start a feed company and a small chicken-breeding hatchery. By 1982, Cargill's operations had grown to two feed mills, three chicken-breeding farms, and a hatchery with an annual production of 4.5 million broiler and layer chicks. Hybrid seed was

subsequently added to the company's products, with the Indonesian government subsidizing 30 percent of the costs of the seeds to farmers. James Spicola, a former president of Cargill, summarized the strategy: "We start out with a reasonably small capital investment in a field to which we think we can bring some expertise and technology and management, then grow the business from there. We reinvest the profits and move into other opportunities as the situation develops. . . . We've found that our welcome to the country is much more productive on a long-term basis if we've started small and grown."[15]

Stopped in Its Tracks

Despite its global reach and power, however, Cargill does not always get its own way. In Japan, it has consistently been hindered, if not blocked outright, by Japan's five large trading houses, known as the *Zaibatsu*. Cargill tried to get into feed milling in Japan, but the government would only permit it to buy an existing plant. When it tried to do so, all the mills in Japan agreed among themselves not to sell to Cargill. After US government intervention on Cargill's behalf, the Japanese government eventually gave Cargill permission to build a new plant—but, unlike other importers of feedstuffs, required Cargill to pay duty on its imports. Without duty-free imports, the plant could not compete in the Japanese market, and Cargill was forced to lobby again for the import duties to be lifted. This was eventually agreed, but the company has still been unable to expand its operations or become a major player in the Japanese feed market.

In addition, Cargill's failure to understand Japanese consumer tastes and work practices have also caused it major problems. In 1991, for instance, it announced that it was to build a beef "further-processing" plant to "enable Cargill to serve the expanding appetite of Japanese consumers for redmeat products as Japan liberalizes its meat-import laws." Barely two and a half years later, Cargill halted its operation and sold the processing plant to Nippon Meat Packers at a reported loss of $10 million. Industry insiders say that the venture failed because Cargill failed to understand the Japanese food distribution system, thinking instead that what worked in the US could be simply duplicated in Japan. However, Japan's food service industries and supermarkets require frequent, small-lot deliveries, demands which Cargill could not meet. Nippon Meat Packers, unlike Cargill, has developed a system that gets customized beef orders to restaurants and supermarkets across most of Japan within 24 hours of being imported.[16]

In India, Cargill's global reach has been curtailed through the opposition of "powerless" peasants. In July 1988, the Indian government approved a "New Policy on Seed Development," reducing the duty on imported seeds from 95 percent to 15 percent. Cargill began to implement its 1983 decision to enter the seed business in India by setting up a joint venture company—Cargill Seeds India—with Tedco, a subsidiary of Tata, one of India's largest corporations. An office

was established in Bangalore, and in early 1993 Cargill started to build a seed-processing factory on a 32-acre site at Bellary, 300 kilometers north of Bangalore. The facilities were to include an administration and seed-technology training center "to develop modern agriculture" and were scheduled to begin production in October 1993. The presence of Cargill in India, coupled with the push to conclude the Uruguay Round of the GATT negotiations, however, ignited a popular campaign against the company. On the morning of 13 July, local farmers gathered at the Cargill site, demolishing the partially completed facility with their bare hands.

Resisting the Giant

Powerful though Cargill appears from its balance sheet and its political contacts, there are clearly many things that it cannot do. Cargill and other transnational corporations have the wealth, skill, and political leverage to outflank or overpower virtually any organization that attacks them head-on in a game which is rigged in their favor. They cannot, however, force people—either farmers or the general public—to play their game.

The Japanese *Zaibatsu* have practiced one line of resistance to Cargill, banding together like warlords to defend "their" territory. The farmers of India, in their numbers, have manifested another. The growing refusal of consumers to eat highly processed food that has traveled from a centralized production facility and the rejection by increasing numbers of farmers of growing industrial monocultures are still others.

Around these old affirmations and new beginnings, social movements and their allies are making common cause worldwide to lay the grounds for socially just and environmentally sound alternatives to the global production systems which Cargill exemplifies. New forms of social organization are emerging which thrive on and generate diversity and inclusivity. It is hard to imagine a place for Cargill in such communities.

NOTES

1. *Minneapolis Star-Tribune*, 1 Sept. 1985; *Wall Street Journal*, 24 July 1995. See also Sewell, T., *The World Grain Trade*, Woodhead Faulkner, 1992.
2. Hohenberg Bros. operates in some parts of the world as Ralli Bros. & Coney.
3. *Ontario Farmer*, 4 Oct. 1989.
4. In the United States, Cargill is the third-largest beef packer and the fourth-largest pork slaughterer, the fourth-largest cattle feeder, the sixth-largest turkey producer, and the third-largest flour miller (19 mills). See Cargill handout, Sept. 1994.
5. I have to say "appear" because there are no consistent and reliable statistics to draw upon. Although aggregate figures for trade and aid are available from government sources, they do not give, and are not allowed to give, any indication of corporate shares. In addition, private corporations are under no obligation to reveal financial results; what numbers they give suit their own purposes. I am left having to observe correlations and draw inferences.

6. Broehl, W. G., *Cargill—Trading the World's Grain*, University Press of New England, Lebanon, NH, 1992, p. 778.
7. *Globe and Mail*, 13 Jan. 1987. In January 1994, the US granted a $65-per-tonne EEP subsidy to grain exporters to sell nearly one million tonnes of US wheat to China. The subsidy, larger than subsidies on grain sales to Africa or the ex-Soviet republics, enabled grain companies to sell grain at about half the US domestic price. See *Globe and Mail*, 6 Jan. 1994.
8. Baquet, D., with Henriques, D., "Abuses Plague Programs to Help Exports of Agricultural Products," *New York Times*, 10 Oct. 1993.
9. Ackerman, F. J., Louis Dreyfus Canada Ltd.
10. *Star Tribune*, 29 June 1993; *Cargill News*, June 1993.
11. Ahlberg, B., "Cargill: The Invisible Giant," *Multinational Monitor*, July–Aug. 1988, pp. 36–39.
12. *Cargill News*, Nov. 1993.
13. Wilson, J. R., "A Private Sector Approach to Agricultural Development," paper presented at Salzburg Seminar, Jan. 1994.
14. *Cargill News*, Nov. 1991.
15. *Corporate Report Minnesota*, Aug. 1987.
16. *Star Tribune*, 27 Nov. 1993.

36

Treading Lightly?*

Ecotourism's Impact on the Environment

MARTHA HONEY

Nestled in a national park on St. John in the U.S. Virgin Islands, Maho Bay Camps, 114 platformed tents hidden in deep foliage, overlook the turquoise-blue bay. Three miles of winding wooden walkways, designed to protect the growth and minimize soil erosion, connect the tents to the beach, communal toilets, cold water showers, and the large, gazebo-shaped dining-cum-meeting room. Maho Bay, the oldest, largest, and best-known property built and owned by New York developer Stanley Selengut, is one of the world's most famous and financially successful ecotourism resorts. Built in the 1970s, more than a decade before ecotourism gelled as a concept, this site-sensitive construction was both the cheapest and the least controversial technique, given the land's protected status. While the relatively rustic tents are billed as appealing to "vacationers of a Sierra Club bent," Harmony Resort, Selengut's "off the grid" condominium complex located just above the tents on the edge of the national park, has been ranked as the world's top "ecosensitive honeymoon resort."[1] These luxury villas are built almost entirely of recycled materials (although not from St. John): the roof shingles, for instance, are recycled cardboard and cement, the bathroom tiles are made from crushed lightbulbs, and the decks are recycled newspapers. Each condo relies on solar and wind power, captured rainwater, and has a computer to monitor how much electricity and water guests use.

Today, the Maho Bay tented camp and Harmony condos have become among the most popular destinations for ecotourists from the United States. They operate at nearly 90 percent occupancy, yet Selengut boasts that he spends no money on advertising. Bookings come from repeat customers and word-of-mouth referrals and from garnering more good media coverage and awards than any other ecotourism project. By 1993, the tented camp was taking in $3 million per year on an initial investment of $750,000. "It's almost like stealing," Selengut told *Forbes* magazine.[2]

Just a few islands away, in Cuba, a trickle of U.S. residents challenge the travel ban and stay at the state-of-the-art Moka Ecolodge, adjacent to Las Terrazas, one

* From *Environment: Science and Policy for Sustainable Development* 41, no. 5, pp. 4–9.

of Cuba's most successful postrevolutionary rural communities. Located in the lush tobacco and timber hills of Pinar del Rio province, Moka was the brainchild of Osmany Cienfuegos, tourism minister, architect, and close confidant of Fidel Castro. In 1990, as the island's economy plunged into its worst-ever economic crisis following the collapse of Cuba's economic and political patron, the Soviet Union, Minister Cienfuegos conceived of the project as a way of providing a steady income for Las Terrazas in keeping with the community's ecological and social goals. Las Terrazas, whose red-tile-roof apartments are built on terraces around an artificial lake, was founded in 1968 when approximately 70 scattered farm families, charcoal makers, and construction workers elected to move together to gain access to schools, health care, and other amenities. From its inception, Las Terrazas was an experiment in sound environmental and human management, and its progress has been carefully nurtured and monitored by government officials, sociologists, scientists, and environmentalists. Most of the adults in this 850-member village are involved in reforestation work in and around the Sierra del Rosario tropical mountain forest that the United Nations Educational, Scientific, and Cultural Organization declared a biosphere reserve in recognition of its unique ecosystem.

Like Maho Bay's tented camp, Moka Ecolodge is connected to a national park and has a number of innovative and environmentally sensitive architectural features: no forest was cut or hillside razed in building the 26-room lodge; a small brook runs through the lobby; solar panels provide some of the electricity; and some of the food served was grown in hydroponic, organic gardens. In contrast with the privately owned Maho Bay, Moka Ecolodge was financed and built by the government and is owned and run by the local community, which is scheduled to repay the $6 million investment over a 15- to 20-year period. Ecotourism now provides employment for approximately 150 Las Terrazas residents, either in the lodge itself, as guides in the reserve, or in the several new community tourism projects, including a bakery, craft workshops, a coffee shop, and a small restaurant. Forty percent of the profits from the hotel go into a community development fund overseen by the neighborhood committee, and another 10 percent go directly to the community's health clinic, which also grows and uses herbal medicines. In addition, 60 percent of the profits from the various community businesses go into the development fund. Ecotourism earnings also have helped finance Las Terrazas' schools, day-care center, and a community-based radio project.[3]

Defining Ecotourism

Ecotourism is defined most succinctly by The International Ecotourism Society (TIES) as "responsible travel to natural areas that conserves the environment and improves the well-being of local people." There are other variants of this popular

definition. Mexican environmentalist Héctor Ceballos-Lascuráin, one of several people who claim to have first coined the term, describes ecotourism as "a mode of ecodevelopment that represents a practical and effective means of attaining social and economic improvement for all countries." The definition used by the ecotourism program of the International Union for the Conservation of Nature (or World Conservation Union) (IUCN) is "environmentally responsible travel and visitation to relatively undisturbed natural areas, to enjoy and appreciate nature (and any accompanying cultural features—both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socioeconomic involvement of local populations." In a similar vein, the Canadian Environmental Advisory Council states, "Ecotourism is an enlightening nature travel experience that contributes to conservation of the ecosystem, while respecting the integrity of host communities."[4] . . . In all these definitions, ecotourism is distinct from "nature," "adventure," "wildlife," and virtually all other types of tourism because it focuses not simply on the type of leisure activity but on tourism's impact and the responsibilities of both the tourist and those in the tourism industry (such as tour operators or lodge owners). . . .

In sum, ecotourism is travel to fragile, pristine, and usually protected areas that strives to be low impact and (usually) small scale. It helps educate the traveler; provides funds for conservation; directly benefits the economic development and political empowerment of local communities; and fosters respect for different cultures and human rights.

Origins and Growth of Ecotourism

. . . Today, ecotourism, or at least a revamped version of nature and wildlife tourism, is the core of many developing countries' national economic development strategies and conservation efforts. At international conferences and in environmental and travel literature, the choice of countries seems endless: Bolivia, Belize, Dominica, Mongolia, Vietnam, Cambodia, Bhutan, Fiji, Indonesia, Senegal, Namibia, Madagascar, Uganda, and Zimbabwe are among the countries in Asia, Africa, and Latin America now on the ecotourism bandwagon. In several countries, nature-based tourism mushroomed into the largest foreign-exchange earner, surpassing bananas in Costa Rica, coffee in Tanzania and Kenya, and textiles and jewelry in India. . . .

Major international conservation organizations, including IUCN, the Nature Conservancy, Audubon Society, Conservation International, Africa Wildlife Foundation, Sierra Club, and World Wildlife Foundation, have initiated ecotourism-linked departments, programs, studies, and field projects, and many are conducting nature tours, adventure tours, or ecotours for their members. International lending and aid agencies pump millions of dollars into projects with ecotourism components. . . .

The International Ecotourism Society (TIES), a small, energetic nonprofit organization based in Vermont, includes among its 1,200 paid members travel-industry representatives, government officials, academics, and consultants in more than 75 countries. . . .

Today, virtually every country in the world is marketing some brand of ecotourism. Tourism has become a big business: As a $4 trillion-plus annual industry, it is the world's number-one employer, and it vies with oil as the world's largest legitimate business. If it were a country, it would have the second-largest economy, shadowed only by the United States. The world's biggest generator and beneficiary of tourism is the United States, accounting for about 15 percent of total spending. . . .

Sound Ecotourism vs. Ecotourism "Lite"

Throughout much of the 1990s, ecotourism has been trumpeted as a way to provide resources to help protect wildlife and fragile ecosystems, a development tool for rural communities living around parks and other protected areas, and a greener, cleaner alternative to the ills of conventional mass tourism. In reality, the picture is more complex. For instance, held up to this multilayered definition of real ecotourism, the two Caribbean resorts Maho and Moka show both strengths and shortcomings. While Maho Bay has helped to popularize the concept of ecotourism and is creatively pushing the perimeters of ecolodge design, it has paid little heed to other ecotourism principles involving the local community, conservation, and tourist education. Maho Bay employs few West Indians (most of the staff are young, single North Americans working for low wages in exchange for a stint in the tropics), does not promote local crafts in either its decor or gift shop, and has done little for the island in terms of financial contributions to environmental or social welfare projects. "These are green lodges, not real ecotourism," comments Joshua Reichert, director of the Pew Charitable Trusts' environmental program, who attended an ecotourism workshop at Maho Bay.[5]

Moka Ecolodge, in contrast, is clearly providing jobs and badly needed income to the local community of Las Terrazas and is generating additional resources to help protect the nearby biosphere. This state-financed lodge is too costly and cumbersome, however, to be easily replicated elsewhere on the island, and so far there has been scant foreign investment in Cuba's ecotourism sector. . . .

Most importantly, however, visiting Moka presents a tough political choice for U.S. residents. The most serious impediment to the success of Moka and Cuba's other ecotourism projects, contends tourism minister Osmany Cienfuegos, is the U.S. embargo that has been in place for nearly four decades and carries the penalty (never fully enforced) of large fines and up to 10 years in prison for unauthorized visits to the island. "If the blockade were lifted, ecotourism would jump dramatically with the influx of North American tourists," Cienfuegos

contends.[6] In prerevolutionary Cuba, 95 percent of the tourists came from the United States; today, as the rest of the world does business with Cuba and tourist arrivals have tripled this decade, only a few thousand U.S. travelers brave the embargo or succeed in getting special U.S. Treasury Department licenses allowing educational or humanitarian visits to the island.

While, like Maho and Moka, many projects around the world may be missing a few of the pillars of sound ecotourism, others amount to little more than green packaging or labeling of conventional or mass tourism. In Costa Rica, Papagayo, a $3 billion megaresort project that will include shopping centers, two golf courses, and a polo field—is officially called an "ecodevelopment." "Everyone calls themselves 'ecodevelopments,' but Papagayo is a city," retorts Costa Rican environmental activist Leon Gonzales.[7] Along Mozambique's southern coast next to South Africa, a U.S. developer is building "an $800 million ecotourism paradise" including a floating casino, a golf course with hippos in the water hazards, Club Med–style hotels, and imported wild game and San (popularly but derogatorily referred to as Bushmen) from the Kalahari Desert as additional "tourist attractions," while 10,000 local subsistence farmers and fishermen are to be moved out. Marketed as a "beast and beach" holiday package, the project's wildlife reintroduction plan "reads like a cargo manifest for Noah's Ark," according to the *New York Times*.[8] In Nepal, tourists can avoid climbing the mountainous terrain via what is marketed as "ecotourism of the future"—helicopter treks to the summits of various mountains.[9] Even Walt Disney is capitalizing on the traveling public's desire to "go green" with an ecotourism-type theme park, Animal Kingdom, which has transformed a central Florida cow pasture into an African savanna. Now the public can "go on safari" without leaving the shores of the United States.[10]

Much of what the big players in the tourism industry sell as green tourism is known as "ecotourism lite"—minor environmentally friendly, cost-saving measures (such as not washing sheets and towels each day) or "add-ons" (a half-day hike into a rainforest or bird watching, for instance) to conventional vacations. Mainstream ecotourism, or ecotourism lite, is often described with catchy phrases such as "treading lightly on the earth" and "taking only photos, leaving only footprints," and its advertisements and brochures contain buzzwords such as *quiet*, *pure*, *lush*, *unspoiled*, *bio-*, and, of course, *eco-* and *green*. In the mid-1990s, the World Travel and Tourism Council (WTTC), whose members include the directors of airlines, hotel chains, cruise lines, and major tour agencies, launched its "Green Globe" logo program designed to promote companies "committed to environmental improvement." As originally outlined by WTTC president Geoffrey Lipman, for as little as $200 a travel and tourism company could purchase the right to use the Green Globe logo in all its literature, giving the impression it was "going green." However, there was no oversight to ensure the company had instituted environmentally sound practices.[11]

While big players in the industry try to package themselves as green, on-the-ground ecotourism frequently involves conflicting control of natural resources and tourism dollars, struggles over local versus international ownership, and public policy versus private enterprise debates. However, the most contentious and overlooked part of the ecotourism equation is typically involving, benefiting, and respecting the rights and culture of the local communities.

Lessons from Kenya

East Africa is renowned as the home of both mankind's earliest ancestors and some of the world's finest wildlife game parks. It is also one of the places where the concept of ecotourism first evolved. Kenya, in particular, was the site of the continent's earliest government experiments with applying ecotourism principles to several national parks and reserves. Today, virtually every country in East and southern Africa is aggressively competing in nature tourism and ecotourism, and tourism has surpassed coffee as the number-one foreign-exchange earner in both Kenya and Tanzania. In many ways, East Africa serves as both a beacon light and a warning light for community-sensitive ecotourism policy and practices.

Under colonialism, Africa's national parks were originally created as exclusive domains for white hunters, scientists, and tourists. Hundreds of thousands of rural poor were forcibly moved (some chiefs were tricked with phony "treaties") and relocated to the parks' perimeters. The colonial philosophy, initially adopted by postcolonial governments, was that wildlife had to be protected from the local Africans with fences, fines, and firepower. In fact, pastoralists such as the Maasai in Kenya and Tanzania had evolved elaborate systems for living in harmony with wildlife; it was only with the arrival of European hunters and settlers that the rapid extermination of African game began. Despite this reality, colonial park policy typically barred Africans from hunting (or even having a gun), collecting grasses, firewood, or water, or visiting sacred and burial sites inside national parks. Those living on the parks' peripheries received little or no benefit from the parks, wildlife, or tourism.

Resentment grew, as did resistance born of necessity, including illegal hunting, fires, grazing, and collection of firewood inside the parks and reserves. Despite the escalating military tactics by park guards—endorsed and sometimes financed by international conservation organizations such as the World Wide Fund for Nature—poaching within parks of elephant, rhino, and other wildlife soared sharply in Kenya and Tanzania during the 1970s. Faced with this growing clash between people and parks, scientists, park officials, and environmental organizations began to rethink the protectionist conservationist model and to argue that threatened species and ecosystems would survive only if those people living nearest them benefited financially from both the parks and tourism. Thus,

the origins of ecotourism can be traced, in part, to East Africa, where in the late 1960s and 1970s conservationists began to posit a "stakeholders" theory of conservation: that those living on their perimeter should receive direct benefits from wildlife and tourism. As scientist David Western, the on-again, off-again director of Kenya Wildlife Service and the first president of the Ecotourism Society, writes, "Conscientious concerns for nature were soon extended to local (usually indigenous) peoples. Implicit in the term [ecotourism] is the assumption that local communities living with nature can and should benefit from tourism and will save nature in the process."[12]

It was in Kenya that Africa's first official experiments with this new approach began. The imperative to find a balance between people and parks had been great in Kenya because nearly all of its 50-plus national parks and reserves are small, incomplete ecosystems. Up to 75 percent of the wildlife either live in or migrate into the surrounding buffer zones, where they destroy crops, harm livestock, and on occasion, kill people. In 1961, at the time of independence, Kenya's new government agreed to put two of the most popular tourist destinations, Maasai Mara and Amboseli game reserves, under the control of local county councils, which subsequently began receiving revenue from both park entrance fees and hotel and other tourism facilities inside these reserves.

Over the decades, both reserves have gone through bureaucratic permutations and a variety of experiments with community-run tourism projects and revenue-sharing schemes. These pioneering ecotourism experiments meant that sizable numbers of Maasai pastoralists living around the Mara and Amboseli received employment as hotel staff, drivers, guides, and park guards and rangers and that entrance-fee revenues and a percentage of hotel profits supported local community projects. While poaching continued elsewhere—between 1975 and 1990, Kenya's elephant population dropped 85 percent and rhinoceroses by 97 percent—poaching was stabilized around Amboseli and Maasai Mara.

However, despite high income from tourism and low incidence of poaching, these two experimental parks are in trouble. The distribution of tourism profits has long been plagued with corruption and cronyism, enriching a handful of powerful politicians and businessmen. "The issues have always centered around money and how the money is spent," commented one Maasai dissident. Today, few community projects are visible: the roads are in terrible disrepair, and conditions in these most popular reserves are degraded by overcrowding and overdevelopment.[13] These problems have been compounded by an overall decline in tourist numbers to Kenya, due to political instability, massive rains, and the country's declining international reputation.

The deterioration of Kenya's premier national parks and reserves has led to the rapid increase of private wildlife ranches. Most ranches are owned by white settler families who market an elegant but colonialist "Out of Africa" experience under the banner of ecotourism, catering to a very upscale international clientele.

They have fenced off their estates to make wildlife parks: some are involved in breeding endangered species such as the black rhinoceros or Rothchild's giraffe, others care for orphaned or wounded animals, and still others offer specialties such as bird watching or fishing. Many of these ranch owners are active in the Ecotourism Society of Kenya (ESOK), the continent's first such organization intended to set standards and promote ecotourism principles and practices.

Much of this is ecotourism lite, however: these ranches have carefully cultivated relations with powerful politicians and international conservation organizations, the travel press, and filmmakers and are doing little revenue sharing with either local communities or Kenya's national treasury. According to environmental consultant Robert Hall, "These owners cry about their huge expenses to maintain their fences and protect their pet rhinos, but the truth is more complex. These guys have their own air strips, and no one, and I mean no one, knows how many people come and go during a year. Their charges are generally at least $250 to $600 per person per night. And what does the Treasury receive? Nada."[14]

Many of these settler farms have expanded into wildlife conservation and tourism in hopes of preserving and protecting their sizable tracks of land from government or squatter takeovers. Fundamentally, these private reserves are an attempt to maintain family wealth and a lifestyle from a bygone era "under the guise of conservation and ecotourism," says Maasai activist Meitamei Ole Dapash.[15] . . .

The Future of Ecotourism

Some experts have pronounced ecotourism dead, passé, or hopelessly diluted. However, amid the superficiality, hype, and marketing, there are excellent examples around the world of dedicated people, vibrant grassroots movements and struggles, and much creativity and experimentation. Although real ecotourism is indeed rare and usually imperfect, it is still in its infancy, not on its deathbed. Ecotourism has succeeded in fulfilling some of its stated goals: most ecotours are educational for the tourist, and many ecotourism projects are lower impact than conventional tours and are providing expanded benefits for conservation and environmental protection. The long-term challenge is to find ways to maintain the rigor and multidimensional qualities of genuine ecotourism while widening it beyond individual projects and making it integral to the concept of tourism in general.

The path toward a more planet-friendly tourism is paved with pitfalls. At present, ecotourism is a set of interconnected principles whose full implementation presents multilayered problems and challenges. Among the most pressing and only partially analyzed issues are how to make poor, rural communities equitable stakeholders in parks and ecotourism; how to ensure, in this era of free trade and economic globalization, that locally owned enterprises and national

capital can compete with strong foreign companies; how to balance a developing country's need to earn more foreign exchange by increasing tourism numbers with the need of fragile ecosystems for low-impact, small-scale tourism; how to allow, as ecotourism implies, exploration of pristine and uncharted areas of the Earth that are often home to isolated and fragile civilizations; and how to set up independent and competent mechanisms for monitoring, evaluating, and setting standards throughout the ecotourism chain.

As the millennium draws to a close, ecotourism has opened a bold new direction in how to explore the world. Whether ecotourism matures into adulthood, gains permanence, and becomes the predominant way we travel and interact with our physical and cultural environment in the 21st century depends on myriad factors. One step toward ensuring ecotourism's survival is helping to build a more discriminating and informed traveling public. The good news is that today's socially conscientious traveler can, with a bit of research and advance planning, find excellent ecotourism projects in nearly every corner of the world. Despite the constraints, there are growing numbers of travelers walking the path of socially responsible and environmentally respectful tourism.

NOTES

1. "Clipboard," *Travel Weekly*, 6 June 1994.
2. S. Oliver, "Eco-profitable," *Forbes* 153, no. 13 (1994).
3. Osmany Cienfuegos, tourism minister, as well as local villagers, interviews with the author, Moka Ecolodge, Cuba, 1994; and Karen Wald, Cuban-based American journalist, letter to the author.
4. Ecotourism Society, "Uniting Conservation & Travel Worldwide" (North Bennington, VT: TES, 1992); K. Brandon, "Ecotourism and Conservation: A Review of Key Issues," Environment Department Papers 033 (Washington, DC: World Bank, April 1996), 1; H. Ceballos-Lascuráin, *Tourism, Ecotourism, and Protected Areas* (Gland, Switzerland: International Union for the Conservation of Nature, 1996), 20; and P. A. Wight, "North American Ecotourists: Market Profile and Trip Characteristics," Ecotourism Society, 1996, http://www.ecotourism.org/data.html.
5. Joshua Reichert and Stanley Selengut, interviews with the author, Maho Bay, 1998.
6. Osmany Cienfuegos, tourism minister, interviews with the author, Moka Ecolodge, Cuba, 1994.
7. J. Brown, "Officials, Tourism Leaders Dispute Papagayo Project," *Tico Times*, 21 January 1994, 13.
8. D. McNeil, "Maputo Elephant Reserve Journal: Thinking Big ($800 Million) to Rescue Big Game," *New York Times*, 7 March 1996.
9. I. Muqbil, "German Tourism Activist Sounds Warning on Bogus 'Ecotourism,'" *Bangkok Post*, 7 April 1994, tourism supplement, 3.
10. M. Navarro, "New Disney Kingdom Comes with Real-Life Obstacles," *New York Times*, 16 April 1998; and J. Nordheimer, "Disney Goes Live with Its Newest Park," *New York Times*, 26 April 1998, 8–9, 25.
11. Geoffrey Lipman, president of World Travel and Tourism Council, interview with the author, Montreal, September 1994.

12. D. Western, "Ecotourism: The Kenya Challenge," in C. G. Gakahu and B. E. Goode, eds., *Ecotourism and Sustainable Development in Kenya*, Proceedings of the Kenya Ecotourism Workshop, Lake Nakuru National Park, Kenya, 13–17 September 1992 (Nairobi: Wildlife Conservation International, 1992), 15.
13. Among the numerous publications on Kenya's parks and tourism are R. Bonner, *At the Hand of Man: Peril and Hope for Africa's Wildlife* (New York: Vintage Books, 1994); Gakahu and Goode, *Ecotourism and Sustainable Development in Kenya*; C. G. Gakahu, ed., *Tourist Attitudes and Use Impacts in Maasai Mara National Reserve*, Proceedings of Wildlife Conservation International Workshop (Nairobi: English Press, 1992); and P. Olindo, "The Old Man of Nature Tourism: Kenya," in T. Whelan, ed., *Nature Tourism: Managing for the Environment* (Washington, DC: Island, 1991).
14. Robert Hall, interviews with the author, June 1998.
15. Meitamei Ole Dapash, activist, interviews with the author, Washington, DC, 1997, 1998. Publications include C. Alderman, "The Economics and the Role of Privately Owned Lands Used for Nature Tourism, Education, and Conservation" (paper presented at the Fourth World Congress of National Parks and Protected Areas, Caracas, Venezuela, February 1992).

37

What Is Degrowth?*

From an Activist Slogan to a Social Movement

FEDERICO DEMARIA, FRANÇOIS SCHNEIDER,
FILKA SEKULOVA, AND JOAN MARTINEZ-ALIER

A Short History of the Term . . .

Some of the ideas behind degrowth have been part of philosophical debates for centuries. The word *décroissance* (French for "degrowth") appeared possibly for the first time in 1972, . . . as a description of a societal path, and was mentioned several times (Amar 1973; Gorz 1977; Georgescu-Roegen 1979) in the follow-up of the Meadows report to the Club of Rome, "The Limits to Growth." In 1982, a conference was organized in Montreal with the title *Les enjeux de la décroissance* (the challenges of degrowth), but the word was used as a synonym of economic recession (ACSALF, 1983). *Décroissance* became an activist slogan in France in 2001, Italy in 2004 (as *Decrescita*), and Catalonia and Spain in 2006 (as *Decreixement* and *Decrecimiento*).

Décroissance, as a social movement, only started in Lyon (France) in the wake of protests for car-free cities, meals in the streets, food cooperatives, and anti-advertising. . . . This was followed, at the beginning of 2002, by a special issue of *Silence* magazine, edited by Vincent Cheynet and Bruno Clémentin. That same year the conference *Défaire le développement, refaire le monde* (Unmake development, remake the world) took place in Paris at UNESCO with 800 participants. In 2004, degrowth entered a larger public debate with the monthly degrowth magazine *La Décroissance, le journal de la joie de vivre*, selling today around 30,000 copies.

The English term "degrowth" was "officially" introduced at the first degrowth conference in Paris in 2008, which also marked the birth of degrowth as an international research area.

Following the Paris, Barcelona, Montreal, and Venice degrowth conferences between 2008 and 2012, the movement has further spread to groups and activities in Belgium, Switzerland, Finland, Poland, Greece, Germany, Portugal, Norway, Denmark, Czech Republic, Mexico, Brazil, Puerto Rico, Canada, and elsewhere.

* From *Environmental Values* 22, no. 2 (2013): 191–215. Used by permission of The White Horse Press.

Sources of Degrowth

Degrowth is rich in its meanings and does not embrace one single philosophical current. Its practitioners do not admire a single book or author. Its thematic backbone derives from some streams of ecological and social thought. . . . Degrowth is placed at the junction of several such sources or streams of thought which cross each other without being in competition (Bayon et al. 2010). . . . Below we identify six sources (adding "justice" to the five proposed by Fabrice Flipo). The attribution of authors to a specific source is somewhat artificial, as no author is related to only one. A more in-depth description of the first five degrowth sources can be found in Flipo (2007) and Bayon et al. (2010).

Ecology

[Degrowth] implies perceiving ecosystems as having value in themselves, and not only as providers of useful environmental resources or services. Secondly, it stresses the competition between ecosystems and the industrial production and consumption systems. An absolute decoupling between industrial expansion and ecological destruction has not been observed yet, and it is very unlikely to take place. Degrowth is therefore a possible path to preserve ecosystems by the reduction of human pressure over ecosystems and nature, and a challenge to the idea that decoupling of ecological impacts from economic growth is possible. Degrowth leads to the *res communis* approach (Bayon et al. 2010), suggesting that environmental goods are commonly cared for and shared so that appropriation by a single individual is avoided (as opposed to a *res nullius* approach, where resources belong to no one and can be freely destroyed and stolen). Strategy-wise, *res communis* implies an integration of humans in nature, while "rights of nature" could be a rearguard strategy to preserve what remains, creating areas for ecosystems regeneration.

Critiques of Development and Praise for Anti-Utilitarianism

This degrowth source derives from anthropology. Authors within this current perceive degrowth as a "missile word," which strikes down the hegemonic imaginary of both development and utilitarianism. Latouche has been an important author in this stream of thought. Critics of development from the 1970s and 1980s include Arturo Escobar, Gilbert Rist, Helena Norberg-Hodge, Majid Rahnema, Wolfgang Sachs, Ashish Nandy, Shiv Visvanathan, Gustavo Esteva (Sachs 1992), François Partant, Bernard Charbonneau, and Ivan Illich. The essence of this source is the critique of the uniformization of cultures due to the widespread adoption of particular technologies and consumption and production models experienced in the global North. As Latouche (2009) puts it, the

Western development model is a mental construct adopted by the rest of the world. Degrowth considers "sustainable development" an oxymoron and calls for disentangling from the social imaginary that it entails, and beyond this, it criticizes the notion of "development" itself.

The other face of this current in the degrowth movement is the critique of *homo economicus*, against utility maximization as the ultimate driving force of human behavior. . . .

The conception of human beings as economic agents driven by self-interest and utility maximization is one representation of the world, or one historic social construct which has been meticulously nested in the minds of many generations of economics students. Degrowth in that sense calls for more ample visions giving importance to economic relations based on sharing, gifts, and reciprocity, where social relations and conviviality are central. The focus here is on the change in the structure of values and the change in value-articulating institutions. Degrowth is thus a way to bring forward a new imaginary which implies a change of culture and a rediscovery of human identity which is disentangled from economic representations (Bayon et al. 2010).

Meaning of Life and Well-Being

The essence of this source is the emerging need for more meaning in life (and of life) in modern societies. It is a critique of lifestyles based on the mantras of working more, earning more, selling more, and buying more.

The "meaning of life" source of degrowth also draws on findings in the literature on the economics of happiness. The disconnect between income increase and life satisfaction over time, a phenomenon known as the Easterlin Paradox (Easterlin 1974), as well as the association between the importance of material gains and emotional disorders (Kasser 2002), are two important references. The movement for voluntary simplicity, reducing individual consumption while seeing simple life as liberating and profound rather than restraining and limiting, is an important vision within this source. Reference works here are *Walden or Life in the Woods* by Henry David Thoreau, *Happy Sobriety* by Pierre Rabhi, *Voluntary Simplicity* by Serge Mongeau, E. F. Schumacher's apology for *enoughness*, and J. C. Kumarappa's *Economy of Permanence* . . . .

Bioeconomics

Ecological economics and industrial ecology are also degrowth sources. Most ecological economists are followers of Georgescu-Roegen (1971), who introduced the term "bioeconomics" and wrote in favor of *décroissance* . . . .

For Georgescu-Roegen, human activity transforms energy and materials of low entropy or good quality into waste and pollution, which are unusable and

have high entropy. Even the inflow of low-entropy solar energy is limited in the sense that it falls in a dispersed fashion on the earth. Degrowth can thus slow down the process of material degradation. A steady-state economy (as proposed by Herman Daly) is not enough for rich countries.

The bioeconomic arguments for degrowth, including the decreasing energy return on investment and the imminent peak oil, . . . are often cited in academic and political debate. Ecological economists have long appealed to the 1920s economic writings of Frederick Soddy (Soddy 1926; Daly 1980, Martinez-Alier 1987). The financial crisis of 2008 and the idea of "debtocracy" have revived interest in this author, who stressed that the financial system confuses expansion of credit with the creation of real wealth, while the real economy of energy and materials cannot grow at the interest rate necessary to pay off debts. . . . The available natural resources are actually decreasing. The increase of private or public debts is thus a perfect recipe for economic and fiscal crises.

Degrowth is a criticism of the belief in ecological modernization, which claims that new technologies and efficiency improvements are key solutions to the ecological crisis. While technological innovation is a source of debate in degrowth, all degrowth actors question the capacity of technological innovation to overcome biophysical limits and sustain infinite economic growth. The Jevons paradox provides an explanation: eco-efficiency may lead to increased consumption or production because technologies suppress limits (to production and consumption) (Polimeni et al. 2008; Schneider 2008). For example, savings in energy and materials may be reinvested in new material and energy acquisitions, offsetting the gains in reduction of material and energy use associated with efficiency measures. Degrowth dwells on many "nontechnical" proposals for reducing material and energy flows outside the modernization approach, which tends to discard the option of setting some limits to technologies.

Democracy

The next source for the degrowth movement springs from the calls for deeper democracy (Deriu, 2008; Cattaneo et al. 2012; Asara et al., 2013). In particular, degrowth is a response to the lack of democratic debates on economic development, growth, technological innovation, and advancement. Within this source we find conflicting positions between those who defend present democratic institutions, considering the risks of losing what we have achieved (a more reformist strand), and those who demand completely new institutions based on direct and participatory democracy (more alternative, or postcapitalist, vision). Some of the key writers within this source for degrowth are Ivan Illich, Jacques Ellul, and Cornelius Castoriadis. As Illich (1973) stated, past a given threshold, technology can no longer be controlled by people. For Illich, only when keeping the technological system below a given multidimensional threshold can we make

democracy feasible. Ellul (1977), on the other hand, conducted profound studies on technology in which he described technology as a system that expands without democratic feedback and follows an independent path. In order to challenge techniques which Ellul perceived as autonomous and self-augmenting, we need democratic feedback that is external to the technical system. Castoriadis is another key author for degrowth. He defended the ideas of "self-institutionalising society" and of autonomy, meant as an entity that governs itself with its own laws. He defended that democracy can only exist by (and with) self-limitation (Castoriadis 1988; Asara et al. 2013).

Justice

The last source we wish to mention is justice. For Paul Ariès (2005), the first type of degrowth is the degrowth of inequality. In line with Dobson (2003) degrowth does not take "just sustainability" for granted. Instead it intentionally pursues and explores ways to make justice and sustainability compatible.

One common assumption among economists is that only economic growth can improve the living conditions of poor people on the planet. Given the perceived impossibility of voluntary income reduction and redistribution, the only strategy for dealing with poverty is having economic growth which will make sure that little drops of wealth eventually trickle down to the poor.

Facing the trickle down hypothesis (Snowdon 2006), degrowth opts for less competition, large-scale redistribution, sharing, and reduction of excessive incomes and wealth. If poverty is perceived in terms of relative consumption, it can never be "eradicated" by economic growth, as it only changes the scale but not the proportions of wealth which individuals possess. Needs, however, can be served by different satisfiers (Max-Neef and Kumar 1991). The degrowth popular literature, for example, has a large number of stories about "downshifters," or people who opt for frugality, fulfilling their needs with satisfiers which differ from those used by people with high incomes (Conill et al., 2012; Carlsson 2008).

As described by Ikeme (2003) we can identify two groups of philosophical trends here, one related to the consequentialist approach, which focuses on the ultimate results over the means, and the deontological one, which favors the means over the results. As an illustration, focusing only on well-being or inequality indicators is a consequence of applying only the first approach, while giving priority to a behavior such as nonviolence is related to the second one. Hereafter we go through different visions within the justice source of degrowth, while exploring the consequentialist-deontological duality.

The first vision is related to social comparison and envy. According to *Le Monde* journalist Herve Kempf, influenced by Veblen (1899), social comparison

based on the existence and promotion of rich-people lifestyles has been responsible for social and environmental crises (Kempf, 2007). From a consequentialist point of view degrowth can make social comparison less problematic by reducing the reasons for envy and competition "à la Darwin." Setting a maximum income, or maximum wealth, to weaken envy as a motor of consumerism, and opening borders ("no-border") to reduce means to keep inequality between rich and poor countries were some of the proposals discussed at the Second International Conference on degrowth. From a deontological perspective degrowth implies a change of culture making us insensitive to the attractions of high-consumption lifestyles, as suggested by the anti-utilitarian school. Justice requires a degrowth of the living standards of the rich classes of the North and South. This point is often misunderstood by those who see population growth as the central issue. They seem to ignore the difference between the lifestyle of an artisan fisher in India and a banker in New York or Mumbai.

The second vision implies repairing past injustice. A good illustration is the concept of ecological debt, or the demand that the Global North pays for past and present colonial exploitation in the Global South. The struggles for climate justice (such as the informal coalition of groups and organizations Climate Justice Now!) could easily become allies of degrowth, together with many other movements for environmental justice in the South (Martinez-Alier et al. 2010; Martinez-Alier 2012), including postextractivism and Buen Vivir in Latin America (Martinez-Alier et al. 2010; Martinez-Alier 2012; Acosta and Martínez 2009; Gudynas 2011).

Thirdly, the equality approach to justice in the context of degrowth implies resource and wealth redistribution both within and between North and South economies. Justice here is understood as a concern for a fair distribution of economic, social, and environmental goods and bads at all time lines (i.e., intragenerational and intergenerational). It is opposed to Garrett Hardin's (1974) "lifeboat ethics," in which environmental and population concerns lead easily to racism. Degrowth of resource exploitation to secure basic access to ecosystem services in the Global South and poorer fringes everywhere is consensual among authors. Having said this, we should mention that equality is often misunderstood as universalism or as a call for uniformization of Western lifestyles. . . .

Finally, some understand justice as preventing misery by establishing minimum standards and a basic income for all (in the form of natural resources, public services, and/or money). Others challenge the basic income approach and underline the importance of merit and contribution to society (Garcia Jané, 2012). Feminism, . . . caste and class division, . . . and nonviolence . . . are other key topics to discuss within the justice source of degrowth that would require extensive elaboration.

Degrowth Strategies and Actors

. . . Each source of degrowth can inspire a different range of action strategies at the local, global, and inter-levels, relating to everyday life, but also to the abstract work of intellectuals. Action strategies vary from opposition, building alternatives (creation of new institutions), and reformism (actions within existing institutions to create conditions for societal transformation)—from local to global levels (for a similar analysis, see Dobson 2007). Among the first promoters of degrowth we find grassroot activists engaged in opposition and practitioners developing alternatives. Some actors call for a complete overhaul of the existing institutions, while others call for their transformation or partial conservation at both local and higher levels (involving political engagement and academic research). The combination of different actors under the degrowth umbrella has not gone without conflicts, nor without complementarity. We analyze some of these below.

Oppositional Activism

Degrowth actors are often engaged in oppositional activism such as campaigners working to stop the expansion of highways, airports, high-speed trains, and other infrastructures. Opposition takes different forms: demonstrations, boycotts, civil disobedience, direct action, and protest songs. A good example of degrowth opposition in the financial sector is the action taken by Catalan degrowth activist Enric Duran; in September 2008, Duran publicly announced that he had "robbed" nearly a half million Euro by legally receiving relatively small loans from several banks, which he had no intention of returning (as he had spent them on worthy causes). This was a political action to denounce what he termed the "predatory capitalist system." One purpose of his act was to denounce the unsustainability of the banking system. Referring to the creation of money as debt, Duran declared that if the banks can create money from nothing, "I'll make them disappear into nothingness." From 2006 to 2008, he financed various anticapitalist movements, including magazines printed in a hundred thousand copies focusing on the energy crisis (i.e., peak oil), on critiques of the debt-based economy, and on presenting concrete alternatives for a sustainable economy of solidarity. . . .

Building Alternatives

Practitioners on the other hand promote local, decentralized, small-scale, and participatory alternatives such as cycling, reuse, vegetarianism or veganism, co-housing, agro-ecology, eco-villages, solidarity economy, consumer cooperatives, alternative (so-called ethical) banks or credit cooperatives, decentralized

renewable-energy cooperatives. This is an illustration of the "nowtopia" of Chris Carlsson (2008), or developing alternatives outside present institutions, now. The eco-villages and Transition Towns movement are important experiences within this strategy and often intersect with degrowth. . . . Some actors working on the development of alternatives argue that the change of individual values and behavior should be the main target of degrowth. This is manifest in the lifestyles of people who practice voluntary simplicity, living better with less, downshifting and slowing down life's pace. Much attention is given to how conscious critical consumption can promote transformation at both the individual and the social level—the major idea being if less time is spent on formal work and consumption, more time can be dedicated to other activities which are fundamental to one's well-being, such as social relations, political participation, physical exercise, spirituality, and contemplation. Such a shift will potentially be less environmentally harmful. . . .

Reformism: Preserving and Acting within Some Existing Institutions

In the words of Latouche (2009) we are living not only in a growth economy but in a growth society. Therefore degrowth implies a societal transformation. While many actors oppose or challenge some institutions, they often propose to act within existing ones. For example, while challenging capitalism via some actions, many radical organic farmers still organize their lives around cars and computers, which can be considered "reformist." In general, we can argue that some institutions need to be defended (like some form of social security and public health, public kindergarten and schools, or some other elements of the welfare state). The feminist literature, for example, highlights how "green notions of self-reliance, sustainable communities and 'doing one's bit' at home and in the public domain threaten to intensify women's already unsustainable burden of responsibility for care" (MacGregor 2004: 77–78). Reducing dependency on technology in households, for example, is another reason for having a more egalitarian division of labor between men and women.

Another recurring debate is on the type of democratic system. On the one hand we might have to defend the democratic institutions put at risk with the economic crisis, and at the same time support the development of more participative ones. Similarly, while some take a traditional anarchist perspective in favor of abandoning the state, others believe the state should be kept and improved.

In many cases, however, revolutionary positions could live together with reformist ones (or even reinforce each other). For example, proposals to set up new institutions in a context of direct democracy which replace the current ones are compatible with the defense and reform of some of the existing ones. Establishing a basic citizens' income, the elimination of debt-based money (money not 100 percent backed by deposits or real materials), and the protection and

strengthening of the commons can all be thought of as reform of the current institutions which go beyond the reforms that consolidate the current system. . . .

Acting on Different Scales: Local, National, Global

The degrowth movement is also concerned with the appropriate scale of action. There is awareness that action must be taken on all levels. Most activities take place at the local scale and are often articulated through informal and formal networks. Transition Towns (UK), Rete del Nuovo Municipio (Italy), and Comuni Virtuosi . . . (Italy) are good examples of urban-focused approaches.

Degrowth networks and actions, however, also exist nationally and regionally. . . . An informal network is also consolidating at the international level around events like the Degrowth Conferences. The most consolidated networks are issue specific (e.g., agro-ecology), but being a frame, degrowth offers the potential to create a network of networks including activists, practitioners, researchers, politicians, and scientists (e.g., Redes en Red . . .). There is an open debate over various possible ways of organizing such a network.

Even though networking is at the center of degrowth, the movement is still far from being able to coordinate actions to reduce absolute consumption of energy and materials at the national and global scale. What would happen to a nation that independently undertakes degrowth policies? Can degrowth alternatives be built in a social context of economic growth and "debt-fueled" capitalism? What should be done with the debts in a context of "debtocracy"? Here the open questions also have to do with the appropriate political conditions that might support the implementation of certain policies. It remains unclear how the socio-ecological transformation might actually take place at macro scales and which institutions should be involved. For example, those proposing direct democracy based on assemblies or the project of Inclusive Democracy (Fotopoulos, 1997) never convincingly articulate how to go beyond the municipal level of organization. Perhaps, following Murray Bookchin (1980), a confederation of municipal entities could take up the administrative roles of a state no longer focusing on economic growth. This is a view congenial to many in the degrowth movement.

REFERENCES

Acosta, A., and E. Martínez. 2009. *El buen vivir: Una vía para el desarrollo*. Quito, Ecuador: Abya-Yala.

ACSALF (Association canadienne des sociologues et des anthropologues de langue française), 1983. *Les enjeux sociaux de la décroissance: Actes du colloque*. Montreal: Editions coopératives Albert Saint-Martin; Saint-Laurent, Quebec: Diffusion Prologue.

Amar, A., 1973. "La croissance et le problème moral." *Cahiers de la Nef, "Les objecteurs de croissance,"* no. 52, p. 133.

Ariès, P. 2005. *Manifeste pour une décroissance équitable*. Villeurbanne, France: Éditions Golias.

Asara, V., E. Profumi, and G. Kallis. 2013. "Degrowth, democracy and autonomy." *Environmental Values* 22:217–239.

Bayon, D., F. Flipo, and F. Schneider. 2010. *La décroissance, 10 questions pour comprendre et en débattre*. Paris: La Découverte.

Bookchin, M. 1980. *Towards an Ecological Society*. Montreal: Black Rose.

Carlsson, C. 2008. *Nowtopia: How Pirate Programmers, Outlaw Bicyclists, and Vacant-Lot Gardeners Are Inventing the Future Today*. Oakland, CA: AK Press.

Castoriadis, C. 1998. *The Imaginary Institution of Society*. Cambridge, MA: MIT Press.

Cattaneo, C., G. D'Alisa, G. Kallis, and C. Zografos. 2012. "Introduction: Degrowth futures and democracy." *Futures* 44 (6): 515–523.

Conill, J., M. Castells, A. Cardenas, and L. Servon. 2012. "Beyond the crisis: The emergence of alternative economic practices." In M. Castells, J. Caraça, and G. Cardoso (eds.), *Aftermath: The Cultures of the Economic Crisis*, pp. 210–248. Oxford: Oxford University Press.

Daly, H. 1980. "The economic thought of Frederick Soddy." *History of Political Economy* 12 (4): 469–488.

Deriu, M. 2008. "Degrowth and democracy: Towards a post-developmentalist politics." In F. Flipo and F. Schneider (eds.), *Proceedings of the First Conference for Ecological Sustainability and Social Equity*. Paris: Research & Degrowth and Telecom Sud-Paris.

Dobson, A. 2003. "Social justice and environmental sustainability: Ne'er the twain shall meet?" In J. Agyeman, R. D. Bullard and B. Evans (eds.), *Just Sustainabilities: Development in an Unequal World*. London: Earthscan.

Dobson, A. 2007. *Green Political Thought*. 4th ed. London: Routledge.

Easterlin, R.A. 1974. "Does economic growth improve the human lot?" In P.A. David and W. Readers (eds.), *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz*. New York: Academic Press.

Ellul, J. 1977. *Le système technicien*. Paris: Calmann-Lévy.

Flipo, F. 2007. Voyage dans la galaxie décroissante. *Mouvements* 50 (2): 143–151.

Fotopoulos, T. 1997. *Towards an Inclusive Democracy: The Crisis of the Growth Economy and the Need for a New Liberatory Project*. London: Cassell.

Garcia Jané, J. 2012. *Adéu, capitalisme: 15M–2031*. Barcelona: XES/Icaria.

Georgescu-Roegen, N. 1971. *The Entropy Law and the Economic Process*. Cambridge, MA: Harvard University Press.

Georgescu-Roegen, N. 1979. *Demain la décroissance: Entropie-écologie-économie*. Preface and translation by Ivo Rens and Jacques Grinevald. Lausanne: Pierre-Marcel Favre.

Gorz, A., 1977. *Écologie et liberté*. Paris: Galilée.

Gudynas, E. 2011. "Desarrollo, postextractivismo y 'buen vivir.'" *Revista Pueblos* 49.

Hardin, G. 1974. "Lifeboat ethics: The case against helping the poor." *Psychology Today* 8:38–43.

Ikeme, J., 2003. "Equity, environmental justice and sustainability: Incomplete approaches in climate change politics." *Global Environmental Change* 13 (1): 195–206.

Illich, I., 1973. *Tools for Conviviality*. London: Calder and Boyars.

Kasser, T., 2002. *The High Price of Materialism*. Cambridge, MA: MIT Press.

Kempf, H., 2007. *Comment les riches détruisent la planète*. Paris: Seuil.

Latouche, S. 2009. *Farewell to Growth*. Cambridge, UK: Polity.

MacGregor, S. 2004. "From care to citizenship: Calling ecofeminism back to politics." *Ethics & the Environment* 9 (1): 56–84.

Martinez-Alier, J. 1987. *Ecological Economics*. Oxford, UK: Blackwell.

Martinez-Alier, J. 2012. "Environmental justice and economic degrowth: An alliance between two movements." *Capitalism, Nature, Socialism* 23 (1): 51–73.

Martinez-Alier, J., U. Pascual, F. Vivien, and E. Zaccai. 2010. "Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm." *Ecological Economics* 69 (9): 1741–1747.

Max-Neef, M., and S. Kumar. 1991. *How Much Is Enough?* London: Phil Shepherd Production.

Polimeni, J.M., K. Mayumi, M. Giampietro, and B. Alcott. 2008. *The Jevons Paradox and the Myth of Resource Efficiency Improvements*. London: Earthscan.

Sachs, W. (ed.). 1992. *The Development Dictionary: A Guide to Knowledge as Power*. London: Zed Books.

Schneider F. 2008. Macroscopic rebound effects as argument for economic degrowth. Proceedings of degrowth conference, Paris 18–19 April, Research & Degrowth.

Snowdon, B. 2006. "The enduring elixir of economic growth: Xavier Sala-i-Martin on the wealth and poverty of nations." *World Economics* 1 (7): 106.

Soddy, F. 1926. *Wealth, Virtual Wealth and Debt: The Solution of the Economic Paradox*. London: George Allen & Unwin.

Veblen, T.B. 1899. *The Theory of the Leisure Class*. Republished in 2008 by Forgotten Books, www.forgottenbooks.org.

38

Protecting the Environment the Natural Way*

Ethical Consumption and Commodity Fetishism

JAMES G. CARRIER

One of the ways that people are encouraged to protect the natural environment is by assessing the objects that they buy in terms of the degree to which they meet environmentalist criteria. People are urged to buy the objects that meet these criteria and reject the others. This goes under the name of "ethical consumption," which is concerned with social as well as environmental issues. . . .

Through ethical consumption, its advocates argue, people can do two things. Firstly, at a personal level, they can lead lives that are more moral. Secondly, at a public level, they can use their purchases to affect the larger world, by putting pressure on firms in a competitive market to change the ways that they do things. In both of these, . . . ethical consumption marks a conjunction of capitalism and conservation, for it identifies people's market transactions, and market mechanisms generally, as the effective way to bring about protection of the environment.

In this article I want to look at this conjunction in terms of something that has long been part of the analysis of capitalism, Marx's (1867) notion of commodity fetishism. In doing so, I mean to point to some aspects of ethical consumption that reduce the likelihood that it can serve as a means by which ethical consumers can either lead personal lives that are more moral or influence the behavior of firms in ways that they intend. What concerns me especially is the ways that the environment and conceptions of it are presented to would-be ethical consumers, presentations that are likely to be important in shaping the way people assess the conservationist merits of the various purchasing options available to them. . . .

I will draw here on "The fetishism of commodities and the secret thereof" (Marx 1867) in *Capital*. Recall that Marx was concerned with how commodities tend to be presented and perceived in a peculiar way under capitalism, one that ignores or denies the labor time entailed in the processes involved in their production and their presentation to the would-be purchaser.

Here, I extend "fetishism" somewhat more broadly than did Marx. I use it to refer to the ignoring or denial of the background of objects. . . . I take from his

* From *Antipode* 42, no. 3 (2010): 672–689.

argument a concern with the general tendency to obscure the people and processes, of which labor power is a component, that are part of creating an object and of bringing it to market. This tendency is an aspect of the abstraction of things from their practical contexts that is both widespread in modern capitalist societies and seen as natural and valuable (Carrier 2001). . . .

I extend fetishism beyond Marx's original argument in another way as well. He was concerned with the production of things with the intention of selling them in a market transaction, commodities. I include things, whether material or not, that are not produced in the conventional sense but that can be appropriated and used for commercial gain, in the manner of Polanyi's (1957 [1944]: ch. 6) fictitious commodities. For instance, a private nature reserve that charges admission fees does not produce the landscape or the living things within it in the way that a clothing company produces shirts or a law firm produces wills. However, if advertisements for the reserve urge people to come and see the landscape and animals for a fee, these things are commodities from my perspective. . . .

I have sketched the battery of basic concepts that I will deploy. I use them to consider what is in this paper's subtitle, ethical consumption and commodity fetishism. . . . I suggest that the nature of these markets in the current political economy encourages a fetishism of commodities that tends to subvert ethical consumption in ways that are likely to be invisible to ethical consumers. . . .

The Object

The first aspect of fetishization in ethical consumption that I want to consider is that of the object to be purchased. By this I mean the activities that remove it, to a greater or lesser degree, from the context in which it is produced, activities that range from the more symbolic to the more material. Because much ethical consumption is concerned with the social, political, and environmental context of objects, this removal is not absolute: it is hard to see how it could be in a situation where the context of the object is part of what is advertised, sold, and consumed. Rather, normally objects are presented in ways that manipulate that context, obscuring some aspects and featuring others. . . .

Ethical consumers want things that meet their moral criteria. An ecotourist wants a resort in a sound natural environment; an ethical consumer wants coffee produced in a way that does not exploit the growers. "Sound natural environment" and "production that does not exploit" are like "taxable income" and "traditional cultural practice" in that they are all conceptual categories, not things that exist independently of human thought and classification. Our ecotourist and ethical-coffee drinker need to be able to recognize a sound natural environment and nonexploitative coffee growing when they see them. These conceptual categories need to be legible, be visible and recognizable, if those ethical consumers are going to be able to assess the choices on offer.

Those who want to sell things to such people satisfy that need through images that encapsulate or manifest those conceptual categories, rendering them as instances of the categories. I think it likely that people who are not especially knowledgeable will come to take these images as defining a moral value, which is to say ethicality. So, for example, if photographs of people in exotic dress are used to represent indigenous people in general, then it is likely that people in exotic dress will come to define indigeneity, with the corollary that their absence will mark its absence. Similarly, to anticipate a point I develop later in this paper, if colorful fish are used to represent healthy coastal waters, then environmental health will tend to be defined by the presence of those fish. . . .

I will illustrate fetishization of the object purchased with Peter Luetchford's (2008) study of a growers' co-operative in Costa Rica that produces Fairtrade coffee. Often, such coffee is sold in packages that include the picture of a co-operative member, and the Fairtrade website regularly includes such pictures (Fairtrade Foundation 2008). . . . Typically, the picture is of a smiling man or woman of marked ethnic aspect presented as a small-holder working a few acres of land. However, because of the nature of coffee cultivation, presenting these growers in ways that suggest self-reliant peasantry fetishizes the coffee that they grow. Tending a coffee small-holding is not terribly difficult most of the time. However, harvesting is so intense that the co-operative members that Luetchford studied frequently had to hire additional labor from their village and from further afield, including migrant workers from Nicaragua. . . .

In focusing on peasant small-holders, then, the picture on the bag of coffee elides the wage labor and the migrant workers that are an important aspect of the production, and so fetishizes the product. Moreover, the pervasiveness of such images, coupled with the likely ignorance among ethical consumers of how coffee is grown, serves to shape ethicality. If I am correct, these images will come to define not just the form of coffee growing that meets those consumers' moral values but also those moral values themselves: "nonexploitative" will come to mean what ethical consumers imagine self-reliant, small-holding peasant production to be. Images of migrant workers living in barracks would be seen as indicating an unethical state of affairs, even though they are a part of Fairtrade coffee production.

This relationship of image and ethicality is clear in ecotourism, touristic consumption guided by environmentalist values. In the Caribbean, the area that I know best, the most visible form of ecotourism is tourist divers enjoying the coastal waters, often in national parks. Even though these parks are not straightforward commercial firms in a competitive market, they resemble companies that sell Fairtrade coffee because they advertise. They do so because, like roasters handling Fairtrade coffee, they need the business—in their case, visiting ecotourist divers who will pay user fees (Carrier 2003: 216–222). They need that business because the governments that made them parks do not give them

enough money to operate, whether because the government is too poor, because it is constrained by bodies like the World Bank and the International Monetary Fund, or because advocates assured the government that the proposed park would be self-supporting and were wrong. These parks advertise themselves and the waters that they protect, and these advertisements contain images intended to attract visitors. Like the picture on the bag of Fairtrade coffee, these images deserve attention.

The images that concern me come from two parks in Jamaica that I have studied, at Montego Bay and Negril. . . . For each, the predominant objects portrayed are fish and coral growths, sometimes by themselves and sometimes with a diver in the picture. Such images make commercial sense: fish and coral growths are relatively easy to photograph, and they are what a diver would want to see. And what a diver wants to see is important for those who run these parks. The director of the Montego Bay park repeatedly asked me for information about what made a "good dive," one that would attract tourist divers. . . .

While these attractive images make commercial sense, they fetishize the coastal waters that are being advertised to environmentally concerned divers. They do so when they focus on individual fish and coral growths as representing the state of those waters. For one thing, this focus ignores other aspects of those waters that may be more important ecologically but are not portrayed because they are not likely to attract ecotourists. Prime among these are sea-grass beds. These are important in local nutrient cycles but appear to repel tourists, and hotels often remove beds from the waters where their guests are supposed to swim. As well, and to anticipate a point I will address at greater length below, these images represent individual creatures rather than populations, which has important consequences. One is that, in the context of environmentalist concern, this stress on individuals implies certain sorts of threats rather than others. Those are the threats that individual ecotourists can ameliorate by taking steps to avoid harming those individual fish and coral growths: they can forego spearfishing, they can take care not to brush against a coral growth, they can make sure that the boats that take them on dives tie up at mooring buoys rather than using anchors.

I said that these sorts of representation do not only fetishize; they also serve to define ethicality. In saying this I am assuming two things. The first is that the vast majority of people who view these images are relatively ignorant of inshore, tropical ecosystems and of the political-economic context of marine parks in Jamaica and the Caribbean more generally. The second is that most people see these images as produced by groups of knowledgeable and conscientious park staff concerned to protect the coastal waters, which endows those images with authority. The sheer repetition of such images, like the sheer repetition of photographs of co-operative members on bags of Fairtrade coffee, will, then, embody the ethical consumer's values, and so will define ethicality. Just as a smiling

small-holder makes morally acceptable coffee growing legible, so pretty fish and colorful coral make a morally acceptable inshore environment legible. . . .

Jamaican marine parks and firms that sell Fairtrade coffee appeal to ethical consumers in different ways and in terms of different values. However, they operate in the same political-economic system, which constrains them to attract customers in the same way, by presenting appealing images that fetishize what they are selling. . . .

Purchase and Consumption

The second aspect of fetishization that concerns me is the fetishization of the means by which ethical consumers are able to purchase, and ultimately consume, an object. Those means are the commercial operations that bring the purchaser and object together, whether the result is the shopper confronting a bag of Fairtrade coffee on a supermarket shelf, a tourist settling in at an ecotourism resort, or . . . a boatload of tourists confronting a whale in the Canaries.

When these institutions and processes are ignored, ethical consumers are prone to see the object to be purchased or consumed in terms of what are taken to be its properties, rather than the activities that brought it and the consumer together. The result is something like the "tourist bubble" (e.g., Cohen 1979; Graburn 1989), the carefully managed and mediated experiences that certain sorts of guided tours provide for tourists, experiences that hide the management and the mediation from view. The result is also rather like the conception of consumers in much anthropology of consumption and neoclassical economics (see Carrier 2006). In these, the focus is on the moment of consumer choice, rather than the contextual factors that shape that choice. So relatively little attention is paid to the larger and longer-term processes by which consumers acquire their tastes or their utility functions and by which the object of consumption comes into being and is brought to the presence of the consumer.

This fetishism appears in Fairtrade coffee. Such coffee is seen as allowing a more direct link between purchaser and grower, "cutting out the middleman," enshrined in the picture of the co-operative member on the bag and in the name of a large British Fairtrade coffee company, Café Direct. This imagery of a direct link ignores the roasters, shippers, wholesalers, and retailers who stand between growers and drinkers of Fairtrade coffee, just as they do with ordinary coffee. In fact, with Fairtrade coffee they may be more numerous, as the Fairtrade organization itself intervenes in the process. . . .

This same sort of fetishization is readily apparent in ecotourism. Its existence among ecotourists became especially apparent to me when I was communicating with a woman who said that she was concerned for the environment. As evidence of this, she said that she was careful not to step on moss when she visited Antarctica, because it was so fragile. She could claim to be ethical environmentally

only if she viewed her consumption, her being in the Antarctic, fetishistically. Doing so meant that she could focus on her footsteps in the snow and ignore the operations that got her from Washington, DC, where she lived, to the continent and back again.

The most obvious of these operations is air travel, and Stefan Gössling (1999) calculated that, on average, getting a visitor from a First World country to a tropical ecotourism destination and back again uses 205 kg of aircraft fuel and generates about 650 kg of CO_2 emissions. . . .

However, a range of other practices and events remain obscured, among them those that frame the nature visible at the ecotourist destination. Rosaleen Duffy illustrates this in her description of ecotourism in Belize. The wreck where tourists dive to see nature, in the form of sharks and rays, was not the result of a ship accidentally foundering on the coast. It was bought and purposely sunk by a local dive shop (Duffy 2002: 29). . . .

This fetishization is not the accidental result of a mass of random, local decisions. Rather, it reflects the commercial pressures that influence all organizations that want tourist money, whether commercial ecotourism companies running resorts or underfunded national parks and reserves. And as a consequence it fetishizes ethical consumers themselves. They are portrayed, at least implicitly, as individuals motivated by their moral concerns. This hides the way that the expressions of that concern are shaped by commercial pressure, as well as the way that ethical consumers are a market that organizations seek to attract, even though many of the values of those consumers seem opposed to capitalist market rationality. . . .

The Environment

The last aspect of fetishization that I want to describe is that of the environment itself. By this I mean the ways that the natural environment tends to be presented, which remove salient features of it from the larger context in which they exist.

I have already mentioned something that is pertinent here, the need of bodies like national parks to raise money through user fees, analogous to the need of commercial operators to raise money through sales to customers. I have noted that this need can reflect a number of factors, especially the relative poverty of governments in the tropical countries where ecotourists often go. In addition, however, it is reinforced by international funding agencies. In Jamaica, for instance, the Montego Bay park regularly received money from the United States Agency for International Development. However, Agency rules required that the funding be used for special projects, not to fund the basic operation of the park. Much of it was spent, in fact, on producing management and business plans as

part of "capacity building." This was intended to put the park on a sound commercial basis by identifying possible sources of revenue, which turned out to be different aspects of tourism. This is indicated by the 1998 park management plan (Montego Bay Marine Park 1998), the bulk of which is devoted to revenue. . . .

Whatever the source of the pressure to treat parks as, in effect, tourism businesses, it is pervasive. Shortly after Jamaica began to undergo structural adjustment (see Bartilow 1997: chs. 2–3; Payne 1994: ch. 7), some long-term environmental activists in Montego Bay produced a report funded by the Organization of American States. That report evaluated a number of sites in Jamaica in terms of their suitability as the country's first marine national park. The crucial criterion was commercial, the ability to make money from tourists. . . . On these grounds, Montego Bay was the best site. It was the main point of entry for visitors to Jamaica and by far the largest tourist destination in the country. When the Jamaican government declared the first two national parks, Montego Bay was the marine park of the pair, which prompted a number of environmentalists in the country to complain that the tourism that made the site attractive financially had so damaged the bay that a park there would do no real good.

This is the commercial orientation and financial pressure that underlay the pictures of fish and coral on the park websites, which I mentioned previously. I want to return to those images. I already noted one aspect of the fetishization that they entail. I said that because they portrayed individual fish and coral growths, they implicitly identified threats to those things and so implicitly identified environmentally ethical behavior for ecotourists: do not take a fish or damage a coral. In the context of Jamaica's coastal waters, they implicitly point to another threat: the inshore artisanal fishers who are common around Jamaica's coast (see Garner 2009). Unlike ethical ecotourists, those fishers anchor their boats rather than using mooring buoys, and they spear and trap fish. Intentionally or otherwise, then, those images of individual fish and coral fetishize the nature that they portray in such a way that they reinforce the interests of one set of users of the coastal waters relative to another. Responsible tourists who spend money are welcome; irresponsible poor Jamaican fishers are not wanted. Here, then, is the political dimension of legibility that concerned Errington and Gewertz, and before them Scott; here too is the political dimension of ethicality.

There is a further aspect to this fetishization, also political. In portraying individuals, these images imply that an ethical concern to protect nature is satisfied by reducing threats to individuals. However, the environmental state of the coastal waters is indicated not so much by the fate of individuals as by the state of populations, influenced by the context in which they exist. It would be difficult to portray populations in ways that would attract the ecotourists that these parks and companies need. However, in portraying the coastal waters in terms of individuals abstracted from their context, these images fail to portray

populations, and so fail to imply that an ethical concern to protect these waters requires attending to threats to these populations. . . .

In Montego Bay and Negril, the most important of these are the activities that generate the runoff that feeds into the coastal waters that these parks and ethical tourists seek to protect. Much of this pollution, and many of these activities, are a direct or indirect consequence of tourism. Directly, three-fifths of the waste water produced by hotels in Jamaica is inadequately treated or not treated at all (Burke 2005: 11); the average tourist in Jamaica generates about four times the solid waste that the average Jamaican generates (Thomas-Hope and Jardine-Comrie 2005: 3); these feed into the surroundings and, in these coastal areas, end up washing into the sea.

Tourism also has had indirect effects in these two sites. The establishment and expansion of tourism in Montego Bay and Negril has led to the destruction of natural features that are important for the inshore ecology: the filling of swamps, destruction of mangrove stands, dredging of harbors, and realignment of beaches. As well, Jamaicans have moved to these towns in search of work in the tourism sector. In 40 years the city of Montego Bay has tripled in size, to about 100,000, with hotels having about 8,000 rooms servicing over 400,000 visitors in 2003; Negril has gone from a fishing camp in a cane-growing area to a town of about 20,000, with hotels having a total number of rooms of a little under 6,000 servicing about 275,000 visitors in the same year (Bakker and Phillip 2005). This growth in population has not been matched by an expansion of urban infrastructure: houses are not connected to what sewer system there is, and solid waste is not collected.

Conclusion

What I have presented here is a polemic. . . . I have described a set of images and representations without knowing how ethical consumers in fact respond to them. Equally, I have asserted that those images shape understandings of the world and ethicality in ways that make ethical consumption a dubious vehicle for challenging what many see as the ill effects of capitalism, and again, I have done so without knowing how ethical consumers respond to those images. These are empirical questions, and if there are studies of those responses, I do not know of them. The sorts of images that I have described are, however, quite common, which suggests that they are not there by accident. Rather, they appear to be there for a reason, to attract potential purchasers. Moreover, their persistent visibility, their dull repetition in everyday life, is likely to have an effect on ethicality, as they come to define morally acceptable coffee and coastal waters, and hence moral good itself. . . .

One could, of course, retort that the sort of images I have described are self-evidently condensations rather than thorough renderings, so that some ignoring

of context is inevitable. However, what I have described involves a particular sort of ignoring. The eliding of contextual events and processes serves repeatedly to present the object at issue in ways that conform to what appear to be ethical consumers' moral values. For Fairtrade coffee this means eliding the roasters, shippers, and merchants who stand between grower and purchaser. For ecotourists this means eliding the dubious processes that generate the bit of nature to be consumed, frame it, and make it available to the consumer. These elisions and the ethicality that they help define have two consequences that are worth mention. The first of these concerns the claim that ethical consumption is supposed to make visible the ways that things get into our lives. Doubtless in some ways it does so. At the same time, however, the fetishization that I have described continues to direct our attention in certain directions rather than others. In doing so, it continues and even strengthens the mystification of objects of consumption, though now it is the mystification of what is stressed in appeals to ethical consumers, the context that is an important part of what is being consumed.

The second, less visible consequence of fetishization in ethical consumption is that it strengthens the assumption that personal consumption decisions by autonomous market actors are an appropriate and effective vehicle for correcting what are seen to be the ill effects of a system of capitalist production and commerce. We need to buy the right coffee, relate more directly to the growers, not step on the moss or kill a coral or catch a fish. In a way, this assumption completes a logical circle, for it is not only coffee and coastal waters that fetishistically are stripped of the contexts that create them and in which they exist. Ethical consumers are too, in the focus on their moral choices rather than on the contexts that shape the ethicality people seek and the objects and mechanisms through which they are encouraged to seek it.

REFERENCES

Bakker M, and Phillip S (2005) *Travel and Tourism—Jamaica—February 2005*. London: Mintel

Bartilow H A (1997) *The Debt Dilemma: IMF Negotiations in Jamaica, Grenada and Guyana*. London: Macmillan

Burke R I (2005) *Environment and Tourism: Examining the Relationship between Tourism and the Environment in Barbados and St. Lucia*. (Sustainability impact assessment of the new Economic Partnership Agreements between the ACP & the GCC States and the EU). Neuilly-sur-Seine, France: PricewaterhouseCoopers

Carrier J G (2001) Social aspects of abstraction. *Social Anthropology* 9:243–256

Carrier J G (2003) Biography, ecology, political economy: Seascape and conflict in Jamaica. In A Strathern and P J Stewart (eds.) *Landscape, Memory and History* (pp. 210–228). London: Pluto

Carrier J G (2006) The limits of culture: Political economy and the anthropology of consumption. In F Trentmann (ed.) *The Making of the Consumer: Knowledge, Power and Identity in the Modern World* (pp. 271–289). Oxford, UK: Berg

Cohen E (1979) A phenomenology of tourist experiences. *Sociology* 13:179–201

Duffy R (2002) *Trip Too Far: Ecotourism, Politics and Exploitation*. London: Earthscan

Fairtrade Foundation (2008) Images, http://www.fairtrade.org.uk/resources/photo_library/images.aspx (last accessed 29 April 2008)

Garner A (2009) Uncivil society: Local stakeholders and environmental protection in Jamaica. In J G Carrier and P West (eds.) *Virtualism, Governance and Practice: Vision and Execution in Environmental Conservation* (pp. 134–154). Oxford, UK: Berghahn Books

Gössling S (1999) Ecotourism: A means to safeguard biodiversity and ecosystem function? *Ecological Economics* 29:303–320

Graburn N H H (1989) Tourism: The sacred journey. In V Smith (ed.) *Hosts and Guests: The Anthropology of Tourism* (pp. 21–36). Philadelphia: University of Pennsylvania Press

Luetchford P (2008) The hands that pick Fairtrade coffee: Beyond the charms of the family farm. In G De Neve, P Luetchford, J Pratt, and D Wood (eds.) *Hidden Hands in the Market: Ethnographies of Fair Trade, Ethical Consumption and Corporate Social Responsibility* (pp. 143–170). Research in Economic Anthropology 28. Bingley, UK: Emerald Group

Marx K (1867) The fetishism of commodities and the secret thereof. *Capital*, Vol. 1 (Part 1, Chap. 1, Sec. 4)

Montego Bay Marine Park (1998) Montego Bay Marine Park Management Plan. Computer file

Payne A (1994) *Politics in Jamaica* (rev. ed.) Kingston, Jamaica: Ian Randle

Polanyi K (1957 [1944]) *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon

Thomas-Hope E, and Jardine-Comrie A (2005) Valuation of environmental resources for tourism: The case of Jamaica. IRFD World Forum on Small Island Developing States, http://irfd.org/events/wfsids/virtual/papers/sids_ethomashope.pdf (last accessed 15 May 2006)

SECTION 8

Okay, Now What?

What ethical and political standpoints have scholars taken in response to their concerns about environmental degradation? How can anthropologists and environmental social scientists enter the political process? What does it mean to be an advocate? Can participatory and collaborative approaches to anthropology yield credible scientific outcomes? How far should social scientists go to address environmental issues? How far should anyone go? Now that you have arrived at the final section of this reader, you might be wondering, what comes next? Where should you go from here?

In a 2014 address to the Society for Applied Anthropology (SfAA), Paul Durrenberger spoke out against the profit-oriented university model, against the hesitation he witnessed in his own professional organization to support union workers, and he urged anthropology students to pursue applied work. "I won't make a case for applied anthropology," Durrenberger began.

> We have already done that with our work:
> - On city streets, battlefields and in hospitals, we have saved lives.
> - In the World Bank and U.S. Agency for International Development we have given voice to untold numbers of otherwise voiceless people.
> - We have put fishing peoples into fisheries management and the users into IT products from copy machines to computer programs.
> - Archaeologists have preserved the memory of labor struggles and documented the conditions of enslaved Africans that would otherwise escape the notice of history.
> - We are in the eco villages, farmer's markets and alternative agriculture movements.
> - In the Occupy Movement we have helped to organize the 99%.
>
> That's a wide swath through contemporary government, private, corporate, and resistance practice. Nobody needs to make a case for applied anthropology. We are here. (Durrenberger 2014: 299)

Durrenberger went on to list examples in which applied anthropology has provided a testing ground for theory:

- The tragedy of the commons has become a comedy of economists (McCay and Acheson 1987).

- Malinowski's (1922) critique of methodological individualism and economic man has been validated time and again (Durrenberger 2009).
- The ethnography has repeatedly shown that privatization is not a viable solution to resource management problems (Acheson 2000; Durrenberger and Palsson 2015; Carrier 2015).
- The ethnography shows that whenever you hear "all things being equal," you have a good reason to stop listening.
- Finally, we know that objective ethnography cannot be dismissed as simply "the objectivist narrative," one story among many, nor is it the exclusive domain of disengaged observers (Singer 1995). (Durrenberger 2014: 299)

These developments, Durrenberger announced, "reiterate the wisdom of Malinowski's classic ethnography: assume nothing, listen to the people you want to understand, don't substitute your understandings for theirs, and honor your observations. Where else but anthropology can we scrap all of the assumptions and examine living social orders for empirical answers to questions about human nature?" (ibid.: 300).

This section begins with Durrenberger's remarks, including his call for anthropologists to "get political." The Malinowski Award, which he was accepting on this occasion, has been presented every year since 1973 to an outstanding senior social scientist "in recognition of efforts to understand and serve the needs of the world's societies, who has actively pursued the goal of solving human problems using the tools of social science" (Weaver 2002: 2). It is applied social science's most prestigious award, and it ranks among the top awards in any field (ibid.). Durrenberger's recommendations to his audience reiterated themes given in the addresses of previous Malinowski Award winners:

1. Be critical.
2. Effect change.
3. Serve the people.

The next contributor, Barbara Rose Johnston, is an anthropologist whose work has most certainly followed those guiding themes. Johnston writes in this chapter about her participatory and collaborative work with the American Anthropological Association's (AAA) Human Rights and Environment (HRE) committee, with the United States Environmental Protection Agency (EPA), and with the Marshall Islands Nuclear Claims Tribunal. In all three cases, Johnston worked as a consultant for communities involved in environmental decision-making and problem-solving processes and as an advocate for cultural groups seeking remedy for human environmental rights abuses. She argues convincingly that participatory and collaborative research can yield credible scientific outcomes that help the engaged anthropological citizen to advocate for social

change. Reflecting on her work in the United States and abroad, Johnston states, "Anthropological praxis based on collaborative and participatory engagement produces credible research outcomes, allows informed consent, and fosters equity in the science-subject relationship. Because it is both problem and remedy focused, collaborative and participatory engagement allows the identification, and ideally the implementation, of meaningful remedy" (2010: S235).

In the chapter that follows, Garrett Graddy-Lovelace, Allison Harnish, and Julianne A. Hazlewood review the history of binary thinking and disciplinary partisanship leading up to the recent turn toward integrated and action-oriented socio-environmental scholarship. They offer profiles of practicing anthropologists whose work takes up Durrenberger's call and bridges the divide between academy and advocacy. In outlining two interdisciplinary frameworks and two engaged research methodologies that have risen to prominence in environmental social science, Graddy-Lovelace et al. offer a sampling of approaches to guide readers moving forward.

Building off the chapter by Graddy-Lovelace et al., the final chapter is a collection of references in engaged and action-oriented socio-environmental scholarship. This large, noncomprehensive bibliography provides suggestions for continued research.

REFERENCES

Acheson, James M. 2000. Clearcutting Maine: Implications for the Theory of Common Property Resources. *Human Ecology* 28 (2): 145–169.

Carrier, James G. 2015. Retrospect. In *Gambling Debt: The Meltdown of the Icelandic Economy*. Paul Durrenberger and Gisli Palsson, eds. Pp. 227–233. Boulder: University Press of Colorado.

Durrenberger, E. Paul. 2009. The Last Wall to Fall: The Anthropology of Collective Action in the Global System. *Journal of Anthropological Research* 65 (1): 9–26.

Durrenberger, E. Paul. 2014. Living Up to Our Words. *Human Organization* 73 (4): 299–304.

Durrenberger, E. Paul, and Gisli Palsson, eds. 2015. *Gambling Debt: The Meltdown of the Icelandic Economy*. Boulder: University Press of Colorado.

Johnston, Barbara Rose. 2010. Social Responsibility and the Anthropological Citizen. *Current Anthropology* 51 (S2): S235–S247.

Malinowski, Bronislaw. 1992. *Argonauts of the Western Pacific*. Prospect Heights, IL: Waveland.

McCay, Bonnie, and James M. Acheson. 1987. *The Question of the Commons: The Culture and Ecology of Communal Resources*. Tucson: University of Arizona Press.

Singer, Merrill. 1995. Beyond the Ivory Tower: Critical Praxis in Medical Anthropology. *Medical Anthropology Quarterly* 9 (1): 80–106.

Weaver, Thomas. 2002. *The Dynamics of Applied Anthropology in the Twentieth Century: The Malinowski Award Papers*. Oklahoma City: Society for Applied Anthropology

QUESTIONS FOR DISCUSSION

Questions to Accompany Chapter 39: "Living Up to Our Words" by Paul Durrenberger

1. Durrenberger makes reference to the famous quote "There but for the grace of God go I" throughout his address. What is the significance of this quote? How does it relate to the work that we do as anthropologists and as environmental social scientists?

2. How did Durrenberger actualize this quote in his work with the International Longshore and Warehouse Union in California? And how did he encourage the American Anthropological Association (AAA) and the Society for Applied Anthropology (SfAA) to adopt its outlook?
3. Why were Durrenberger and his colleague Kendall Thu unable to influence the process of industrial swine production in Iowa? What was their strategy?
4. Durrenberger concluded in his 2014 Malinowski Award lecture that anthropologists need to be willing to *get* political. What are your research interests, and how might you go about "getting political" with regard to your chosen topic? How might you "get political" in other ways—for example, on your campus, in your community, or within your professional organization(s)?

Questions to Accompany Chapter 40: "Social Responsibility and the Anthropological Citizen" by Barbara Rose Johnston

1. According to Johnston, what distinguishes participatory research from other forms of research?
2. In identifying herself as a "scholar-advocate," how does Johnston define the term? What was the advocacy goal in her proposal that the AAA and SfAA presidents "establish a joint committee with a mandate to develop and submit case studies to the UN-appointed special rapporteur"? What was the AAA president's decision on this matter?
3. What was included in the Human Rights and the Environment (HRE) booklet titled *Who Pays the Price?* To whom was this booklet distributed? What were some of the unintended consequences of this booklet and other project reports intended to draw attention to abuses resulting from processes of militarism and development?
4. What is the "culpability gap"? How has the HRE committee shifted its focus in regard to the culpability gap?
5. What is "backyard anthropology"? How is this embodied in the cooperative agreement between the SfAA and the U.S. Environmental Protection Agency (EPA)? How, according to Johnston, was this collaborative partnership different from relationships anthropologists have pursued with other agencies? What was included in the scope-of-work contracts for projects pursued under this partnership?
6. What was most difficult about the SfAA-EPA partnership, according to Johnston? What example does she provide to support her opinion? How was success redefined for the SfAA, the EPA, and the project sponsors in this example?
7. What was Johnston and her team's role in documenting the biocultural impacts of nuclear weapons testing in the Marshall Islands? What was the goal of this project? And what was included in this contract?
8. How did Johnston and her team overcome the methodological challenge of quantifying families' qualitative stories in this case?
9. What decision did the Nuclear Claims Tribunal issue in the Rongelap case?
10. What are the limits of informed consent as it is exercised in contemporary research? How are indigenous groups, governments, organizations, and universities addressing these limitations?

Questions to Accompany Chapter 41: "World Is Burning, Sky Is Falling, All Hands on Deck! Reflections on Engaged and Action-Oriented Socio-Environmental Scholarship" by Garrett Graddy-Lovelace, Allison Harnish, and Julianne A. Hazlewood

1. Do you have a disciplinary specialization? If so, what might your disciplinary perspective bring to the study of socio-environmental phenomena? What do the broad disciplinary perspectives—that is, those from the humanities, natural sciences, and social

sciences—bring? What do more specific disciplinary perspectives—for example, those from literature, art, philosophy, history, geography, anthropology, sociology, political science, communication studies, chemistry, biology, geology, physics, or astronomy—bring?

2. What separates the modern scientific understanding of nature (the view that was cultivated around the time of the European Enlightenment) from "Other" ways of knowing? What problems have come from the former? How are these two worldviews (which were once very distinct) merging today? And how does this synthesis affect our ability to identify and tackle contemporary socio-environmental issues?
3. What is historical ecology? How does it differ from the earlier theoretical approach of cultural ecology? What makes historical ecology an interdisciplinary approach?
4. What is political ecology? How does it differ from cultural ecology? And how does political ecology incorporate perspectives from multiple disciplines?
5. In what ways are historical ecology and political ecology similar? How are they different?
6. What are participatory and collaborative research methodologies? How do they differ from each other and from other, conventional, research approaches?
7. What are the pressing socio-environmental issues in your community? How might you incorporate the theoretical frameworks and research methodologies described by Graddy et al. into the study of such issues? How would this incorporation enhance your understanding and engagement with the issues in your community?
8. Which chapters in this reader embody the frameworks and methodologies described by Graddy-Lovelace et al.?

39

Living Up to Our Words*

PAUL DURRENBERGER

Thomas Weaver's compilation of Malinowski Award Addresses (2002) suggests common themes through four decades—concern for inequality, policy and influencing policy makers, empirical and accurate reportage, and public service.

I would rephrase these as

1. be empirical,
2. effect change,
3. serve the people.

And that's what I want to talk about tonight.

Unlike many of you, I've been institutionalized for most of my life. I've recently finished fifteen years at Penn State, Pennsylvania's land-grant college, another branch of Monsanto U, created to serve the people but hijacked to become the research-and-development arm of agribusiness. Before that, I was twenty-five years at the University of Iowa, that state's liberal arts university whose chief role is to serve the pharmaceutical industry.

Anthropology is rooted in the academy. So let's pause to understand the role of universities in our economic and ideological systems. . . .

There's a lot of fear in academia. Undergrads are afraid of exams; grad students are afraid of crossing professors, losing funding and sponsorship; junior faculty are afraid of not getting tenure, and by the time people are tenured, fear has become a habit. . . . A fearful faculty cannot teach boldness.

When [United Students Against Sweatshops] organized a sit-in at the president's office, I went with them. When they organized an action in front of Old Main, I led my class out to join them. And when they got a meeting with the president, Suzan Erem and I did role-play training to help ensure they wouldn't be drawing blanks when they faced a dismissive and arrogant administration.

That worked. An otherwise shy USAS representative refused to allow President Spanier to talk over him. When it became obvious that the administration lawyers were evading the issues, the USAS representatives caucused and then

* From *Human Organization* 73, no. 4 (2014): 299–304. Used by permission of the Society for Applied Anthropology.

walked out. That was a great victory and left the administration stunned. Students don't act that way!

What did that accomplish? I expect Penn State merchandise is still made in sweatshops, but those efforts produced a handful of dedicated, savvy, and smart organizers who are now working with unions and other activist organizations in Pennsylvania and other parts of the world. All without Ph.D.s.

Be empirical, effect change, serve the people. . . .

At the end of the semester I'd ask students to write a brief essay on what they'd learned. One of the most poignant was a young woman who wrote that she'd learned the most important lesson of her university education in one of my classes: "There but for the grace of God go I."

In other words, she's just like everyone else, vulnerable, weak, helpless, exposed. Anything that happens to anyone else could happen to me, to her, to you.

Taking that seriously motivates solidarity—people joining together to defend the weakest among them because they know that an injury to one is an injury to all. So for Nuer and Bedouin with their segmentary systems (Evans-Pritchard 1940, 1949); and so even for the longshoremen who load and unload ships at our ports every day.

Early in 2000 when the International Longshore and Warehouse Union in California heard about the troubles of their brother longshoremen in South Carolina, they immediately started to organize support. Even though they belonged to a different union. Even though their international told them not to. Even though the national labor confederation, the AFL-CIO refused to support them. When dockers in Europe, Latin America, and Asia ignored their national unions and joined the South Carolina local, there was a real prospect of shutting down global trade networks. They knew the loss of the longshoremen's local in Charleston would be a loss to all longshoremen.

Suzan and I spent three and a half years working on a book about that story, *On the Global Waterfront (2008)*. The union purchased a thousand copies to give to all its members and sparked what one observer called a cultural revolution on the waterfront. Longshoremen were sitting in their pickup trucks on their breaks reading the book. Thinking about solidarity and their role in it. The same thing happened in California and in Australia. Spanish dockers had it translated into Spanish.

Sometimes it helps to recognize and record people's actions. It lets them know they are not invisible. It prepares them for the next battle. The books we write *can* make a difference. Supporting those who are most threatened, those at the bottom, serves the interests of all workers. How does that pertain to us?

Are we not also workers? Like the hotel workers here? For one brief moment anthropologists showed sufficient courage to join the struggle and show solidarity with our fellow workers.

The 1999 meeting of the AAA was in a Chicago hotel close to the Congress Hotel and not far from a large homeless shelter. Suzan and I were taking a big plastic bag full of leftover food from the meeting to the homeless shelter and passed the picket line at the Congress Hotel. The workers there had been out on strike for a long time. The conjunction of the surplus high-end food on my shoulder, the homeless shelter, and the picket line caused me to wonder aloud what a bunch of anthropologists could do about anything. Aside from sit in a hotel and talk about it. We are, after all, a bunch of academics. Suzan, who learned about organizing in the labor movement, pointed out that our meetings themselves are a resource and that we could have some clout if we agreed to meet only in facilities whose workers were represented by unions.

As president of the Central States Anthropological Society, I drafted a letter to the Executive Board of the AAA, but that didn't go anywhere. Then I drafted a motion to that effect and took it to the Section Assembly for a vote. "But that would cost more," some protested. I provided data to refute that claim. After all, who ever thought that the wages of workers determined the prices of products? If *adjunct* wages determined tuition rates, there wouldn't be half as much student debt in this country as there is today.

The motion carried with a huge majority. The AAA Executive Board adopted the motion, and it became policy.

Then came 2004. The AAA contracted to meet in the San Francisco Hilton. But the hotel had locked out its workers and refused to negotiate with the representatives of their union. Perhaps it would be resolved before our meeting. Time wore on. Nothing happened.

Finally, AAA staff and leadership canceled the San Francisco venue. Other organizations joined us, and before long the San Francisco Hilton was negotiating with its workers; and soon they were back to work with a new contract.

That worked. That action accomplished something. That was solidarity. We anthropologists led the way for other scholarly organizations. But only because the policy was in place.

But we're professionals; why should we support unions? Look at the data from the Economic Policy Institute's yearly *State of Working America*. Having a union raises workers' wages, closes the gender and race gaps, and increases the chances workers will have health and pension benefits. A union contract provides a shield against arbitrary and capricious bosses. Effect change. Serve the people. It's something we can do.

But it raises costs to us, right? That's like the argument that a higher minimum wage decreases the number of jobs. Remember, be empirical. That has never happened. Ever. And it's the same for hotel costs. Union hotels don't cost more.

But there were costs. The AAA had to pay a stiff penalty for breaking a contract. The AAA meeting was disrupted. Some people couldn't give their papers; some could not get to their job interviews; some members lost the price of their

air tickets. But how can we weigh the cost of not getting a job interview, not giving a paper, not meeting friends against the benefit of helping hotel workers in their struggle for representation?

The logic of solidarity means that when you need that kind of help, you can hope that someone will be there to help you. There but for the grace of God go you.

The managerial part of the working class is supposed to have that logic of solidarity educated out of them. For years it's drummed into them: the market determines everything equitably. You get what you deserve. *You* don't need any help.

I don't know how it would have played out for the Charleston longshoremen if the California or Spanish dockers had questioned the cost of their actions. Or if they'd been afraid to act. But that would have made the shipping companies all very happy because it would have been their signal that they wouldn't need to put up with longshoremen's unions anymore, anywhere.

The ruling class likes that kind of message. It's just the message SfAA sent from Baltimore in 2012 when it violated a union boycott and refused to support hotel workers.

The workers of *this* hotel do not enjoy the benefits of union representation. Imagine what would happen if every organization told the conference bureau of Albuquerque that they could not meet in this town until its hotel workers were represented by unions.

For a brief moment, the AAA made a difference to working people. During the same period I was on the SfAA Board of Directors, and it would not even entertain the idea of such a policy of solidarity with unions. Thus, Baltimore.

Your board and offices have had more than two years to talk about it since Baltimore. Betsy Taylor, Mark Schuller, and others on SfAA's Human Rights and Social Justice Committee have provided the board all the information it needs. Now it is time to adopt a policy: Don't meet in hotels whose workers are not represented by unions.

If the town you want to meet in has no union hotels, be content to wait until the workers win that fight. Until then, meet in other cities. There are plenty of them. The board doesn't need more details. If the current board can't support such a change, then vote them out and run a slate that can.

But I was talking about universities. So let's get back to that. . . .

In one of her articles on the Baltimore debacle in the *SfAA News*, Betsy Taylor says, "The labor problems of the 'working poor' in hotels and hospitality industries are converging with the labor problems of the 'working poor' in academe and professions. It is inaccurate to argue that we should accept bad wages and work conditions for hotel workers to create cheap meetings for underpaid anthropologists. The same forces *push down all wages*" (2012: 28; emphasis in original).

There but for the grace of God go us all. . . .

And these days a Ph.D. is an impediment, not a benefit, for getting paid to use what you know about anthropology. What does it get you if the best you can look forward to is a low-paying, marginalized adjunct position? It simply supports the corporate-university Ph.D. mill that needs low-paid teaching and research assistants and adjuncts. Corporate universities have followed the rest of industry in substituting capital for labor, and no one is immune.

Machines can replace anyone. . . .

But let's get real. With no resident students, classes, or administrators, vast areas of dormitories, classrooms, and administrative offices will be vacant. Mostly climate controlled. A bottom-line-focused solution is to convert this space to concentrated animal feeding operations, CAFOs, to fatten hogs, chickens, and turkeys—perhaps in conjunction with the now Chinese-owned Smithfield Corporation—to finally achieve the dream of the university as a profit center.

Effect change?

I know something about CAFOs, because I've studied them.

Kendall Thu and I offered the first warnings to the people of Iowa in the mid-1990s. The Iowa swine industry kept saying, "We'll do for Iowa what we did for North Carolina," so we went to North Carolina and found that none of the consequences were good for the environment, local economies, rural residents, the wider economy, or most farmers. We returned to Iowa and said, "Hey, you don't *want* what the swine industry did for them."

In the mid-1990s, as an academic, I naively thought the best thing we could do was to get good scientific information into the hands of state decision makers. Kendall organized a series of workshops, convened scientists, and edited a two-volume series on the consequences of industrial swine production. He found funds to print the volumes and send them to every legislator in the state.

The process of industrial swine production continued apace. For the citizens' groups organizing against it, we put together a less technical book, *Pigs, Profits, and Rural Communities (1998)*. And the juggernaut rolled on.

Why? We wrote a paper about that too. . . . The biggest contributor to the Republican governor's campaign was the state's largest industrial swine producer. The governor had a line item in his budget for the dean of agriculture at Iowa State to use to scientifically prove how beneficial industrial swine production was. So the industry bought a governor, the governor bought Iowa State, and Iowa State proved it was all good. Just like we'd seen in North Carolina. No amount of information can influence that process. It's a political process, and Kendall was correct to see that the only meaningful way to engage it was via political action. An elegant analysis didn't mean squat. My academic naïveté prevented me from seeing political realities.

How can anthropologists, their heads in the clouds of academe, enter the political process? Well, we have to be willing to *get* political. Weaver's collection of 20th century Malinowski Award talks is full of calls from Malinowski

onward for anthropologists to organize to have some effect on public policy. It has never happened.

As chair of AAA's Public Policy Committee, Kendall tried to organize a Policy Institute, an organization that would be like the Brookings Institute, an authoritative voice that reporters could turn to for the scientific take on environmental issues, agricultural questions, immigration, the nature of marriage and family, and other policy matters. Imagine if anthropologists could speak with the authority of the Brookings Institute or Cato or the Heritage Foundation. Imagine anthropologists instead of economists as the go-to people for reporters. That was the idea.

AAA allocated money to start such an institute. With that backing, Kendall brought it to SfAA and suggested a joint venture. How would that look? The board wanted details. Kendall came back the next year with a plan. I was on the SfAA Board of Directors and heard my colleagues articulate reason after reason not to participate in such a venture. It might be "too political," as though every other speaker on this podium before me hadn't enjoined being political.

The politics of industrial agriculture might be a big objective for a couple of academic anthropologists to take on. But the politics of SfAA and the AAA? Surely, all of us together can manage that.

I tell you now, do what all of the Malinowski speakers before me have urged:

- Be political.
- Take a stand.
- Work for equality.
- Effect change.
- Organize a policy institute.
- Pass a union hotel policy.

Be *better*, be *stronger*, be *braver* than the anthropologists and leaders who came before you.

So I've said some things that we're not supposed to say. I've said that there is a class system in America:

- A ruling class
- A working class
- And lots of anthropology classes

I've suggested that our organizations don't live up to our ideals. All of this has probably made some folks uncomfortable. I hope so, because that might just be sufficient to motivate some change.

For this group of people dedicated to the uses of anthropology to make a better world, it seems to me the least we can do is to put our own organizations

on a path to doing that. For a meeting devoted to destinations, I think that's a worthy destination.

I'm truly honored to receive this award, and I've enjoyed speaking to you tonight. But now it's up to *you* to do the hard part—live up to the legacy all of the Malinowski speakers leave you.

Thank you.

REFERENCES

Evans-Pritchard, E. E. 1940 The Nuer: A Description of the Modes of Livelihood and Political Institutions of a Nilotic People. Oxford, UK: Clarendon

———1949 The Sanusi of Cyrenaica. Oxford: Oxford University Press

Ezram, Suzan, and E. Paul Durrenberger 2008 On the Global Waterfront: The Fight to Free the Charleston 5. New York: Monthly Review Press.

Taylor, Betsy 2012 Best Practices in Ethical Planning of Professional Meetings. SfAA News 23 (4): 26–28.

Thu, Kendall M., and E. Paul Durrenberger 1998 Pigs, Profits, and Rural Communities. Albany: State University of New York Press.

Weaver, Thomas 2002 The Dynamics of Applied Anthropology in the Twentieth Century: The Malinowski Award Papers. Oklahoma City: Society for Applied Anthropology.

40

Social Responsibility and the Anthropological Citizen*

BARBARA ROSE JOHNSTON

Introduction

Calls for developing a fieldwork ethic that emphasizes participatory action research have been met with complaints from many anthropologists who argue that participatory approaches—especially those that involve collaborative efforts to shape research goals, methods, and outcomes—overly emphasize the social welfare needs of the study population (Gross and Platner 2002). In catering to the needs of the study population, the argument goes, such research runs the risk of compromising the objectivity and integrity of anthropological research and transforms the role of anthropologist from scientist to social worker. . . .

At issue here is the question of the substantive "work" of anthropology: is it simply and solely an intellectual pursuit, with the primary purpose of fieldwork to collect data in a rigorous and objective manner? If so, then the social meaning of doing anthropology is, simply, to conduct work *in* communities, not *with* communities. In the social contract that structures such work, the power to define the terms of research is in the anthropologist's hands, and the nature of the researcher-subject relationship is necessarily hierarchical rather than equitable.

A contrary and increasingly dominant approach in anthropological praxis is problem-focused participatory research: working *with* communities to understand and address problems of mutual concern. The social contract that structures such work is a product of negotiation and collaboration, producing a research-subject partnership based on equity and respect.

My purpose in this article is to argue that participatory and collaborative research offers a means to implement the *meaningful* informed consent that is increasingly required by ethical codes of conduct and stipulated in national and international law. Such work (1) ensures that free and prior informed consent is achieved in meaningful ways; (2) allows for the possibility of more equitable relationships between scientists, problems, and subject; and (3) produces credible scientific outcomes. While all anthropological work is conducted with some form of social contract, whether implied or obvious, what distinguishes participatory research from other forms is the overt pursuit of a social contract not only

* From *Current Anthropology* 51, no. S2 (2010): S235–S247. Used by permission of the University of Chicago Press.

negotiating permission to do research (consent) but also negotiating the terms of work: the underlying questions, rules for conduct, hoped-for outcomes of such work, and the respective rights and obligations when work is done (meaningful informed consent).

Human Rights and the Environment: Asserting Disciplinary Voice

My life as an anthropologist reflects a professional path that many involved in human rights, environmental quality, health, and social justice struggles have taken (González 2004; Hale 2008; Sabloff 2001; Warren and Jackson 2002). This trajectory begins with a case-specific focus on incidents and examples of human rights abuse. Over time the research perspective broadens to include a more complex analysis of the contexts that precipitate gross violations and the controlling processes that link incidents to global patterns. And again, as research achieves cross-cultural and temporal depth, the focus of research further expands to consider the synergistic and cumulative consequences of perpetrating, hosting, or surviving these events. In this evolution of problem and focus, I have also seen my goals for engagement evolve. My initial goal was simply to document abuses and sound the alarm by asserting a generalized call for accountability. Goals have evolved to a current focus on locating evidence of culpability, assessing the consequential damages of abuse, discerning the many meanings of remedy, and encouraging the political will to implement or create mechanisms that might achieve reparation. Thus, I define myself as a scholar-advocate: a researcher, writer, adviser, expert witness, advocate, and, at times, a collaborative partner in consciously shaped political processes.

My initial point of entry to the scholar-advocate world began in the late 1980s with my first postgraduate job as a professor in an interdisciplinary environmental studies program. I had been hired to teach introductory courses that fulfilled a general education science requirement as well as upper-division and graduate courses in natural resource management, environmental impact analysis, field methods, and public policy. I began using previously required textbooks and found a frustrating lack of attention to the human dimensions of environmental problems. Like many new hires in an interdisciplinary program, I took to reworking the curriculum to strengthen the view through my disciplinary lens, in my case with a focus on intersects between ecocide and ethnocide. My revisionist effort involved adding human ecology texts to the curriculum, a disappointing addition in that it seemed too many of the typologies were built on cultural case examples of peoples whose ways of life—and in some cases, lives—no longer existed. Unable to find a text that reflected current conditions, contexts, and human environmental relationships, I decided to put off turning my political ecology dissertation into "the book" and instead focus on writing

an environmental studies textbook to tackle head-on this problem of static and apolitical representations of cultural diversity and human ecology.

In the fall of 1991, while reading *Earth Island Journal*, I came across a call for contributions to support a United Nations (UN) Commission on Human Rights Sub-Commission on Prevention of Discrimination and Protection of Minorities investigation into the relationship between human rights and the environment. A special rapporteur had been appointed to examine the linkages between human rights abuse and environmental crisis, and a call for case-study materials had been sent to the nations of the world and to concerned civil-society organizations. The call for contributions suggested an opportunity for generalized reciprocity, and I contacted the coordinating organization, the Sierra Club Legal Defense Fund (now known as Earth Justice), to offer my assistance with summations from my library of case studies on ecocide and ethnocide with the hopes that I could review the results from their call for contributions and incorporate relevant examples in my environmental anthropology text. At our first meeting, I learned that while their framing of the human rights and environment abuse issue was expansive, their supporting case documentation largely consisted of instances of individual rights abuse, especially journalists, scientists, and others imprisoned for publicizing environmental crimes. While they were aware of the indigenous rights movement and had contacted several key organizations, they had had no success in securing social science commitments to provide case-study materials on abuses experienced by cultural groups. I was surprised by this revelation, as so many anthropologists were reporting in conferences, newsletters, and scholarly publications case after case of development-induced ecocide leading to ethnocide. . . .

Realizing the need for a structured conduit to assert case studies and anthropological perspectives on the human rights–environment intersect, shortly before the November 1991 American Anthropological Association (AAA) meetings, I approached AAA president Jane Buikstra and Society for Applied Anthropology (SfAA) president Carole Hill with the proposal that they establish a joint committee with a mandate to develop and submit case studies to the UN-appointed special rapporteur. The advocacy goal here was to assert a disciplinary voice—not just the individual contributions of a concerned anthropologist, easily dismissed as an activist, thus biased, voice, but the powerful statement of the disciplinary voice that emerges through professional-organization-sponsored research and peer review. In response, Jane Buikstra agreed to the joint committee concept and placed me as a human rights and environment member of the new AAA Environmental Task Force. . . . Carole Hill invited me to present the idea to the SfAA executive board at their November 1991 meeting, resulting in their formal endorsement of a joint commission and its advocacy mandate. In subsequent months, as I attempted to get the human rights and environment

(HRE) committee structured and running, the AAA, with its new president on board, rejected the notion of a joint commission with the SfAA and thus declined to formally participate in a disciplinary contribution to the special rapporteur on human rights and environment.[1]

By spring 1992, following a 10-hour brainstorming meeting with David Maybury-Lewis, Ted MacDonald, and R. Brooke Thomas, we had an operational plan in place. By November 1992, the HRE committee had grown to include some 150 people—mostly anthropologists, a few sociologists, geographers, and ecologists—who responded to the call for case-study contributions. Our goal was to compile as many well-documented "representative" cases as possible—including indigenous rights issues, problems associated with large infrastructure development, abuses occurring in the name of national security, and the failure to recognize and attend to the human disasters that accompany environmental crises. We held HRE committee meetings at the SfAA, AAA, and other conferences, and we communicated year-round through letters and floppy disks. We passed a coffee can at meetings to offset copy fees and eventually secured a $5,000 grant from the Nathan Cummings Foundation to the SfAA to underwrite the costs of disseminating committee findings. I served as the HRE committee chair and worked with the committee to draft, compile, and review case submissions that formed the core for annual reports to the special rapporteur, supporting in small part the broader effort to shape a draft Declaration of Principles on Human Rights and the Environment.

Collectively we argued that cultural groups as well as individuals had rights; these rights were being abused by broad processes, such as militarism and development; in countless cases involving the consequences of development and militarism, people have no recourse because of the lack of a viable judiciary and the inability to bring some actors (state governments, transnational corporations, international financial institutions) to a regional or international court where claims can be filed and some measure of remedy provided. We called for national and international governance that recognized the relationship between human rights and the environment and that worked toward environmental justice. These calls were articulated in project reports, SfAA and AAA newsletter articles, and edited collections in books and journals (Johnston 1992, 1993a, 1994b, 1994c, 1995a). The Nathan Cummings Foundation grant allowed us to publish and send 450 free copies of a HRE booklet to a global network of environmental organizations, human rights groups, and the foundations that sponsor their work (Johnston 1993b). Gregory Button, the last AAA congressional fellow, was able to provide copies of this booklet, *Who Pays the Price?*, to all incoming members of the 103rd Congress (1993–1995) and thus generate interest in environmental justice issues and support for legislation introduced by the late senator Paul Wellstone in February 1994 (later addressed by President Clinton through Executive Order 12898 [Clinton 1994]).

The HRE committee goal was to support the review of the special rapporteur and with our documentation draw increased attention to abuses that result from processes, such as development and militarism, that are experienced by cultural groups. Evidence of success in achieving this goal, as measured by citations to our work in United Nations reports, is hard to find. Our reports were received but rarely cited in the special rapporteur's annual reports to the UN Human Rights Commission. However, our broad-spectrum approach to "make the case" in varied public forums produced a number of unanticipated results. Thus, our reports helped frame Worldwatch Institute research on indigenous peoples and environmental justice issues, summaries of which were included in its widely published *State of the World* series (Durning 1993; Sachs 1995, 1996). United States Senator Barbara Boxer sent *Who Pays the Price?* to energy secretary Hazel O'Leary with a letter drawing her attention to the Rongelap case study and urging her to include the Marshall Islanders as part of the Advisory Committee on Human Radiation Experimentation review. The booklet went to press in late 1993 as an SfAA report, and advance copies were sent to Vice President Al Gore and Kathleen McGinty at the White House Council on Environmental Quality. According to their letters of acknowledgment, the booklet helped support new initiatives within the U.S. Environmental Protection Agency (EPA) emphasizing the community role in environmental decision making and problem solving. The U.S. State Department later underwrote the costs to translate *Who Pays the Price?* into Arabic and facilitate distribution of 5,000 copies in Africa and the Middle East. . . .

Over the years, our social documentation of the "culpability gap"—where abuses occur as a result of state and transnational processes and in the absence of any formal viable judiciary—expanded to include a focus on response. By the mid-1990s, the HRE committee shifted its focus, addressing the questions of what people, communities, and their governments were doing in response to these life-and-death situations and to what effect. Were there examples of relative success in achieving meaningful remedy? Were there lessons that might be applicable elsewhere? And how could anthropologists facilitate the ability of affected peoples to tell their own stories, document their own problems, and more effectively make the case for meaningful remedy? This work resulted in a number of edited collections, including the *Endangered Peoples* book series (Brower and Johnston 2007; Donahue and Johnston 1998; Fitzpatrick 2000; Forward 2001; Freeman 2000; Greaves 2002; Hitchcock 2002; Johnston 1997; Sponsel 2000; and Stonich 2001). . . .

In this work, my role as an anthropologist was largely that of the social documentarian. Anthropological knowledge and expertise was used to examine on-the-ground experiences and draw linkages between micro and macro conditions, processes, and consequences, with the overarching goal of asserting an advocacy voice that draws attention to and seeks remedy for human environmental rights

abuse. I also worked as a union organizer of sorts—working with like-minded colleagues to help shape within our professional organizations the space for collective engagement on human rights and environment issues and the structural mechanisms for asserting a disciplinary voice in national and international political arenas (Johnston 1995b, 2001a, 2001b, 2001c, 2001d, 2001e).

Anthropology in My Backyard

Publication of this action-oriented research prompted requests from similarly affected communities and government agencies on behalf of communities for anthropological assistance in documenting conditions in ways that might encourage increased acknowledgment of culpability and, ideally, generate the political will to fashion some sort of remedy. One such example is the 1996 request to the SfAA from the EPA to develop a cooperative agreement providing anthropological expertise and assistance to communities involved in environmental decision-making and problem-solving processes. I worked with SfAA president Jay Schensul and others to draft a cooperative agreement and served as the project director for the first four years of the five-year project. My government counterpart was Theresa Trainor, a policy analyst in the Office of Sustainable Ecosystems and Communities, whose master's degree in anthropology made her one of the few "noneconomic" social scientists working for the EPA.

The SfAA-EPA cooperative agreement was consciously shaped as "backyard" anthropology: work that involves the application of anthropological skills and knowledge to problems and needs in the towns and communities we call home. This backyard approach was a reflection of the rapidly growing interest in a problem-focused, public-service-oriented anthropology, where the "field" is literally in your backyard and the close distance between engagement and outcome allows a stronger sense of responsibility and understanding of the social impact of doing anthropology. In essence, our advocacy goal was to both expand the social relevance of environmental anthropology and strengthen the presence and efficacy of anthropological work in the environmental labor market. Our mission and various project activities were developed in cooperation with EPA Project Officer Trainor and with the peer-review assistance of an advisory committee of cultural, medical, and ecological anthropologists working in academia, government, and communities and with tribal nations. . . .

Developing activities of equal interest to the EPA and the SfAA required fashioning a collaborative partnership that sharply contrasted with relationships with other disciplinary agencies. Our funded activities were not the product of client-consultant relationships—where ultimate power and authority in defining the problem, approaches, and reporting terms largely rests in the contracting agency's hands. Nor were funded activities the product of federal research awards—where questions, methods, and outcomes are defined and shaped by

the scholars who produce scientific knowledge for the benefit, first and foremost, of the scientific community. Rather, environmental anthropology projects were consciously framed as "technical assistance" shaped and implemented through partnership negotiation. This framing of anthropology as community-based technical assistance allowed us to prioritize problem-focused work using anthropological tools and techniques to address specific public-interest needs and to produce concrete outcomes. Projects funded under the cooperative agreement partnership were participatory and collaborative, reflecting the interests, actions, and code of ethics of the discipline; the mission and mandate of a federal regulatory agency; and the interests and concerns of civil society, communities, governmental agencies, and American Indian tribes. This framing meant that power relationships and project responsibilities were negotiated in equitable and respectful terms and codified in a scope-of-work contract signed by the anthropologist and representative from the host community or organization. Contracts included the SfAA code of ethics as well as the right for all parties to revisit and renegotiate the scope of work, partnership responsibilities, and project deliverables. In addition to the assistance in planning, public participation, and other environmental problem-solving processes, project outcomes included reports, conference papers, and, in a few instances, PhD dissertations and formal publications. The scientific integrity of this enterprise was strengthened by the requirement that fellows, interns, and technical consultants work with a mentor, and their work products underwent community and advisory-committee peer review. All told, I drafted the initial work plans and managed anthropological assistance in more than 30 different community-based environmental health, restoration, planning, and other problem-solving projects in California, North Carolina, Vermont, New York, Tennessee, Illinois, Indiana, Michigan, Montana, Colorado, New Mexico, Washington, Oregon, Oklahoma, Ohio, Georgia, Florida, Maryland, Washington, DC, and Pennsylvania.[2]

For me, the most difficult and time-consuming aspect of this work was not the research, data collection, community outreach, facilitation of meetings, or engagement in political processes, nor was it the analysis, reporting, and publication of findings. The most demanding aspect of this work was learning how to cooperate, how to listen, how to revise my notions of power and place in the intellectual enterprise to ensure an anthropology that facilitates, collaborates, and assists. The scope-of-work contract—with its overt expression of goals, objectives, partnership roles, and anticipated outcomes—became a key means by which this learning occurred.

Consider, for example, a project involving anthropological assistance to an American Indian community. The task was to develop a culturally appropriate restoration plan for a repatriated sacred site, a spring and saltwater marsh. After research was completed, the host community requested changes to the reporting requirements in the scope-of-work contract. Specifically, they requested new

language to ensure project materials (field notes, reports, interview recordings) were recognized by all parties as the intellectual property of the American Indian partner. This meant that the final project report would be the sole intellectual property of the American Indian government, that copies of this work would not be provided to the SfAA or EPA without prior permission from the council of elders, and that research findings would not be published by the consulting anthropologist without formal council review and approval. These changes in the terms of reference reflected the growing concern, by both the anthropologist and the American Indian partners, that the nature of anthropological assistance (documenting cultural values, uses, and stewardship traditions of a sacred site and incorporating this traditional knowledge into a restoration plan), if published or otherwise disseminated without the permission of elders, would violate customary law.

In negotiating the revised scope-of-work contract, the EPA partner expressed difficulty in agreeing to these new terms, as the formal product, a case-study report, is physical evidence that work occurred and funds were expended in legally defensible ways. Further, such reports not only justify the expenditure of funds but also are used by the EPA to educate its own staff and to inspire and assist other communities facing similar problems.

Resolution of this issue involved getting all parties to agree that the indicator of success in this project would not be a physical product (the publication and use of a report or the completion of a mutually agreed-on restoration plan) but a social outcome. The anthropologist conducted ethnographic and ethnobotanical research for the American Indian partner and authored a report that was reviewed, revised, and accepted by tribal authorities. For the EPA and the SfAA, the project sponsors, the "product" was a postproject debriefing, with indicators of success found in the culture-broker role of clarifying agendas and social relationships between tribal partners, the state, and federal government agencies. In short, "success" was redefined from a product to a process of engagement. . . .

Seeking Environmental Accountability in the Marshall Islands

The community-based environmental anthropology work described above involved working with governmental agencies to better assist communities in a common effort to understand and resolve environmental problems. This involved largely nonconfrontational ecopolitics in which all parties acknowledged that an environmental crisis existed, and somewhere some entity produced funding and the will to address the problem. In such contexts, the anthropologist's role was to provide the data and tools and to help facilitate informed and meaningful participation in decision-making and remediation processes. Other work resulting from the HRE disciplinary outreach campaign involved a much more political and personally engaged scientific research process aimed at teasing out the

nature of the human-environmental crisis, the varied failures to protect human rights, and the consequences of those failures. As one example, I briefly outline my work documenting the biocultural impacts of nuclear weapons testing in the Marshall Islands.[3]

After acute exposure to radioactive fallout after the March 1, 1954, detonation of a thermonuclear bomb, Bravo Test, the Rongelap community in the Marshall Islands was initially evacuated and enrolled in a classified research study documenting radiation burns and other acute effects. Three years later, with assurances that it was now safe, they were returned to their contaminated islands, and over the next four decades, they served, without informed consent, as subjects in research documenting the ways radiation moved through the environment, food chain, and human body. Biomedical examinations, sampling, and procedures focused on documenting the wide array of degenerative health effects of radiation exposure, while treatment was largely limited to specific radiogenic cancers. They were evacuated in 1985 after learning that their islands were still dangerously contaminated, and they continue to live in exile (Barker 1997; Johnston 1994a).[4]

In 1998, I received a call from Bill Graham, the public advocate for the Marshall Islands Nuclear Claims Tribunal, who, having seen my work on human rights and the environment (which included a case-study summation of the Rongelap experience), asked me to advise the tribunal on ways to assert Marshallese values and perspectives in the Rongelap community claim for property damages resulting from nuclear weapons testing. I agreed to assist with the caveat that I work as part of a team with Holly Barker, a linguistic anthropologist and adviser to the embassy of the Republic of the Marshall Islands (RMI), who had several years of experience living and working with the Marshallese. We also agreed that our role would be to advise the tribunal and to assist the Rongelap community in asserting their claim for damages, that this work would require additional research conducted with the involvement of the Marshallese community, and that our goal in applying a holistic lens to the question of how nuclear weapons testing damaged the community was to expand the categories of concern in property-damage proceedings to include the injuries associated with the loss of a healthy way of life and human radiation experimentation.

These terms were worked into a modified version of the Nuclear Claims Tribunal expert witness–consultant contract. Other modifications to the contract occurred at my request and included reference to an attached copy of the SfAA code of ethics, the formation of a Rongelap committee of elders and experts to advise and assist in shaping the research plan and to provide feedback on draft expert witness reports, the requirement of prepublication review by the public advocate of any derivative research product, and the agreement that we provide the opportunity to review and seek permission from the Nuclear Claims Tribunal and Rongelap community leadership before publishing the expert witness

reports and results from related research. This last requirement represented recognition of Marshallese intellectual rights and our mutual commitment to ensure meaningful informed consent before the publication of any derivative product.[5]

The Marshall Islands work involved the methodological challenge of how to quantify the qualitative: What is the value of the loss of land when such loss not only harms the individual, household, or community but also results in the loss of the means to support and sustain a cultural way of life? How do you identify the cumulative and synergistic effects on health, community, and culture when loss of use is the result of environmental contamination from nuclear weapons fallout? How do you value such damages to the marine, terrestrial, and arboreal ecosystems? How do you value these damages in ways that honor and respect Marshallese notions of meaningful remedy, remedy that largely involves acquiring new means to sustain a healthy way of life?

Many people in the Rongelap community had submitted complaints on their treatment and their injuries during the weapons testing period (1946–1958) and in later years when they served as human subjects in Atomic Energy Commission–funded research conducted by Brookhaven National Lab that documented the long-term effects of radiation exposure on a human population (1954–1992). Many had testified in the United States, the UN, and other international forums as well. Survivor accounts, however, had been easily dismissed as anecdotal—the unsubstantiated, biased, and imperfect understandings of victims. So, at a more fundamental level, our work involved the challenge of transforming how research was conducted (we introduced transparent, participatory, and collaborative research as the primary means of identifying and asserting the Marshallese voice) and the related challenge of transforming how this voice was perceived and valued as a formal element in tribunal proceedings. The then-existing role of the Marshallese voice in tribunal proceedings was that of survivors and witnesses whose anecdotal testimony suggests, amplifies, or illustrates complaints where the authenticity of complaints and value of damages is determined by an outside expert. We sought to introduce a new role, that of the cultural expert whose account constitutes a source of credible evidence concerning the value of critical resources that support customary ways of life and thereby allows a broader understanding of injury, consequential damages, and remedial needs.

Addressing these multiple challenges required archival research, evidentiary analysis of a recently declassified scientific record, ethnographic research, and most importantly, participatory and collaborative work that included repeated interdisciplinary and Marshallese review of research plans, methodologies, briefings, draft reports, and findings. For example, when we encountered evidence in the declassified biomedical record of an official policy to report, but not to study or to treat, any incidents of miscarriage and congenital birth defects, the Rongelap community helped to compile lists of affected women and children.

And, to help broaden tribunal procedures for valuing land (at the time the only recognized value of land was a market value for the lease rights to dry land), we created, with the help of Rongelap experts, a series of ethnographic maps for each atoll depicting sacred sites and critical resources such as springs providing drinking water, giant clam beds, and important reefs. We also located classified documents that illustrated United States awareness of customary law and property rights, especially the awareness that such rights extended into the marine realm. With the help of interdisciplinary reviewers from the scientific and legal communities, we identified case precedents and summarized the methods and rationale for valuing damages to natural and cultural resources. With input from anthropologists in Australia, Canada, and the United States, we developed a briefing citing the legal precedents granting expert witness status to indigenous community members as cultural experts. In short, we deployed a holistic approach to establish traditional ways of life, identified the critical resources that sustained those traditions, detailed the chain of events and injuries, and identified the diverse consequences that resulted when lands, lives, and livelihoods were damaged and destroyed by nuclear weapons fallout.

Our strategy for communicating this history and its consequences in an expert witness report and in the Nuclear Claims Tribunal proceedings involved a dual narrative consisting of Marshallese testimony and scientific "voice" from the declassified record that served to contextualize and support each element of the Rongelap complaint. In addition to narrative voice, the Rongelap community provided record books and maps depicting land claims and land-use history for exhibits. In addition, the Rongelap women prepared and submitted as evidence a list of names of those people who had died from radiation-related illnesses and those people who suffered from a preventable epidemic of polio. The participatory and collaborative approach to this research also involved substantial peer review of the initial research plan, draft findings, and expert witness reports. The result was an assessment of the consequential damages of nuclear weapons testing, human subject experimentation, and involuntary resettlement. The expert witness report demonstrated social, cultural, physical, economic, and environmental effects—with anecdotal accounts supported by the declassified scientific record—and presented valuation assessments for each category of injury using United States standards, international case precedents, and the community notion of a meaningful remedy. . . .

On April 17, 2007, some 16 years since the first claims were filed and five and a half years after presenting the expert witness findings to the tribunal, the Nuclear Claims Tribunal finally issued its decision in the Rongelap case, accepting the complaint and ordering some $1,031,231,200 in compensation for remediation and restoration of contaminated atolls as compensation for past and future lost property value and as compensation for the pain, suffering, and hardships that are consequences of those injuries. This award includes damages for the loss of

way of life, including the loss of the means to live in a healthy fashion on the land (people were on an island but were exposed to high levels of radiation). It includes compensation for serving, without informed consent, as a human subject in long-term biomedical studies, and it includes additional personal injury awards to subjects identified as receiving radioisotope injections as part of those studies (Nuclear Claims Tribunal 2007).

While this result demonstrates that a credible outcome can be achieved through a participatory and collaborative action-research process, meaningful remedy, while defined, has yet to be fully realized. The fact that Rongelap survivors were able to attend and testify at proceedings and see long contested and denied experiences accepted by tribunal judges, without question, as expert evidence in a formal court was significant. Elements of meaningful remedy were also achieved with the tribunal findings accompanying the award, findings that suggested a fundamental transformation in the principle of just compensation from a model of economic compensation for damage and a loss of individual property rights to a broader model of community damages and remedial needs associated with the loss of a healthy way of life. This transformation was achieved arguably as a result of our collaborative and participatory methods. We helped create the space for tribunal judges to listen and consider the Marshallese perspective and experience in new ways. However, while the monetary award is an essential core component of remedy in that it will help pay for medical care, environmental cleanup, and socioeconomic development to build a sustainable and healthy way of life, the tribunal has exhausted its funds and cannot pay this or other awards. The initial Nuclear Claims Tribunal trust fund created by the U.S. Congress under the Reagan administration never grew to the projected $150 million, an amount that was manifestly adequate to personal injury and property damages. At this writing, the only chance for the Marshallese to achieve the means to finance the meaningful remedy is through bilateral negotiation, or congressional action on the "changed circumstance" petition, and funding as provided by an act of the U.S. Congress.[6]

Since completing the expert witness work on the Rongelap claim, I have continued to serve the Nuclear Claims Tribunal as a pro bono adviser on human radiation experimentation. This work has included developing summations of the declassified record and assisting the public advocate in his effort to identify Marshallese subjects and secure on their behalf their right to a personal injury award for human radiation experimentation. With hopes of keeping the issue of U.S. obligation to the Marshallese in the public mind and on the political agenda, I have taken periodic action to advocate for remedy by sending letters and e-mail briefings with findings from the report to legislators and congressional staff and including summations of the case in other publications (Barker 2007; Johnston 2007). When the tribunal announced its award in the Rongelap Claim in 2007, as per the terms of my 1999 scope-of-work contract with the tribunal, I requested

permission to publish the expert witness report. In 2008, Holly Barker and I published a revised version of the report in the book *Consequential Damages of Nuclear War: The Rongelap Report*. Again, as per the terms of our scope-of-work contract, we sent a case of books to the Rongelap community, local government, the RMI embassy, and the Nuclear Claims Tribunal staff. I also sent prepublication copies of this book to nuclear security and other advisory staff in the Obama and Clinton 2008 presidential campaigns, wrote commentaries for the online political magazine *CounterPunch*, and posted excerpts on various Web sites. In addition, I have also used the data collected in my review of the Marshallese declassified record, especially the documentation of the biomedical consequences of long-term exposure to low-level radiation, in articles, op-eds, and other publications to question the wisdom of a new boom in uranium mining, a renewed push for nuclear energy, and a rapidly escalating reliance on depleted uranium in military and civilian police action (Johnston 2008; Johnston, Dawson, and Madsen 2007).

Obligations, Power, and Social Responsibility

This brief reflexive narrative of public-interest anthropology illustrates my understanding of what it means to use the tools of the trade as scholar and scribe to advocate for social change. My work has involved intensive engagement in case-specific environmental quality–social justice concerns. These efforts have helped inform my global studies of human environmental rights abuse and the evolving political architecture of rights-protective (or rights-abusive) space, an architecture of controlling processes, culpability gaps, and formative accountability mechanisms. Much of this work has been collaborative, participatory, and action oriented. It has also been, at times, immensely difficult.

In my praxis, I have found that the ethical terms of engagement are a constant source of tension in financing, in problem formation and the making and remaking of priorities, in collaborative partnerships, in research and the articulation of findings, and in advocacy initiatives. In an ideal world, professional codes of ethics guide and protect the researcher and the people we work with. In the real world, where research involves multiple sets of concerns and relationships—with subjects, partners, collaborators, sponsors, funders, clients, and more—defining the terms of engagement becomes all the more important.

The moral urgency that helped shape our code of ethics—the "do no harm" tenet—is derived from very real and horrid histories: anthropologists have done considerable harm with their tools and training, and anthropological theories have been used to shape and legitimize rights-abusive state and institutional polices and action (Schafft 2004). Ethical codes of conduct emerge and evolve as after-the-fact reactions to exploitation and abuse, as hopeful vows to ensure "never again."

Legal mandates governing human subject research and related efforts to strengthen local control over scientific research originated out of the need to ensure that biomedical research is conducted in ways that respect fundamental human rights. In recent years, the legal mandates and guidance governing scientific relationships with research subjects have been further expanded to protect intellectual property and cultural knowledge and to ensure free, prior, and meaningful informed consent (United Nations 1992, 2007; WHO 2003; Workgroup of the Indigenous Peoples Subcommittee 2000).

At its most fundamental level, meaningful informed consent implies self-determination, and as such, it has been an essential core element of indigenous rights struggles. Adoption of the UN Declaration on Indigenous Peoples by the UN General Assembly in September 2007 reconfirmed and strengthened the notion that indigenous peoples' right to self-determination and their status as subjects of international law includes the right to determine whether research is truly in their own best interest. Adoption of this declaration means that academic and research institutions that conduct work with indigenous peoples and the professional organizations that provide ethical guidance to their members (as organizations recognized by and subject to the laws of their nation) are now challenged to incorporate the declaration in their plans and activities.[7]

While informed consent is a both a matter of ethical codes and national and international law, it still suggests a hierarchal relationship between scientist and subject. The scientist controls the definition and shaping of the research problem, methods, and desired outcomes (and this shaping in turn is presumably influenced by the source of research funding). The subject or subject community gives their informed permission to proceed. . . . In reaction to what has been at times an exploitative science-subject relationship, American Indian tribes and nations in the United States and Canada have adopted research evaluation tools that strengthen internal community capacity to both evaluate and meaningfully participate in research (American Indian Law Center 1999; Council of Yukon First Nations 2000; Mohawk Council of Akwesasne 2006; National Environmental Justice Advisory Council 2000).

Universities and governments are also adopting guidance to ensure research is conducted with meaningful informed consent, especially when such work involves indigenous populations. A Canadian example is the recommendation for adoption of regulations for ethical conduct by the Royal Commission on Aboriginal Peoples (1993); the subsequent adoption of conduct codes involving research with aboriginal peoples by the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council of Canada (CIHR, NSERC, SSHRC 2005); and the resulting university regulations, for example, the University of Victoria's "Protocols and Principles for Conducting Research in an Indigenous Context" (Faculty of Human and Social Development 2003).

A similar U.S. example is the National Science Foundation's "Principles for the Conduct of Ethical Research in the Arctic" (National Science Foundation 2010). Prepared by the Interagency Social Science Task Force in response to a recommendation by the Polar Research Board of the National Academy of Sciences and at the direction of the Interagency Arctic Research Policy Committee, adoption of this code of conduct is one of the remedial actions resulting from the National Research Council (1996) investigation of human radiation experimentation in the Arctic involving the administration of radioiodine 131 without informed consent. Other remedial outcomes from the investigation of human subject abuse with federal funds have included a formal apology by President Clinton and individual and community compensation awards (Johnston 2007). . . . Such guidance reflects in part the growing federal recognition of the sovereign rights of American tribes and nations and federal obligations with regard to reparation and the right to remedy. These recognitions reflect both national experiences and resulting changes in law as well as the implementation of international treaties and conventions establishing fundamental rights for indigenous peoples. . . .

Conclusion

As citizens, anthropologists have the obligation to respect and abide by the laws and norms of the states in which we live, the states in which we work, and the nations and peoples with whom we work. Obviously there are times and circumstances when the obligation to abide by one set of laws comes into conflict with others. And there are times when our code of ethics, with its central "do no harm" tenet that is meant to shape and legitimize our conduct, is simply inadequate, especially when anthropologists are working in the service of a government, institutions, corporations, or other actors whose actions produce grave societal harm.

It is my argument that as global citizens who have historically and currently worked with the world's vulnerable peoples, anthropologists not only have a special obligation but a disciplinary obligation to consider international laws and norms in the shaping of their praxis. Recognition of international law, with its superseding rights, provides important guidance when, for example, the states in which we live or work are engaged in actions that result in gross violations of human rights. Such considerations are also a disciplinary norm, as evidenced by the AAA membership adoption of a human rights declaration that is situated in the broader body of human rights law.[8]

In short, we not only have the ethical obligation to do no harm but also the obligation to ensure that we consciously structure our public forays with careful consideration of the nature of proposed work and the social contracts that structure this work. The act of negotiation generates opportunities to proceed

with eyes wide open, to implement meaningful informed consent, and to articulate roles and responsibilities. Codifying these social contracts in negotiated and transparent instruments (such as the scope-of-work contract described in this article) allows an overt articulation of disciplinary ethics and responsibilities and serves as a core mechanism for restructuring social relationships in the production and application of anthropological knowledge, thus transforming the loci of power in the research enterprise.

I end this narrative with three concluding points. First, in my experience, the four-fields approach to studying the human condition allows an evidentiary-based analysis of history, conditions, and consequences that contextualizes and at times substantiates ethnographic voice. When coupled with participatory and collaborative research, the social impact of anthropological endeavor has the potential to move beyond documentation and toward the recognition of culpability, reparation, and ideally, the experience of meaningful remedy.

Second, such work involves complex histories, injuries, and social relationships. It is intensely political. Documenting social conditions with an aim toward exposing and addressing abuse is difficult work even in the most rights-protective of settings. This anthropology of trouble can generate an array of personal, professional, and societal risks that are addressed, and at times minimized, through the use of formal and informal social contracts—agreed-on terms of engagement—that structure the nature, approach, and intended outcomes of anthropological work (Johnston 2001a, 2001d).

Finally, while my own particular experiences are unique to my life, the broader narrative suggesting the promise, power, and social obligations of an engaged action-oriented anthropology could easily have been written by countless colleagues. Indeed, the call for a socially relevant action anthropology echoes across the generations. Consider, for example, the 1951 framing of the term "action anthropology" by Sol Tax (Bennett 1998); the Vietnam War–era call for reinventing anthropology by Dell Hymes, Laura Nader, Eric Wolf, and others (Hymes 1969); and the disciplinary advocacy architecture set into place with Roy Rappaport's 1986 vision of the AAA as a socially proactive force with social-problem-oriented task forces that, in later presidential terms, held commissions that led to the Committee for Human Rights (Rappaport 1986). And consider some of the many calls for an ethically responsible action anthropology within the broader context of the resurgent security state (González 2004; Hale 2008; Network of Concerned Anthropologists 2009).

Laura Nader argues in her essay "Public Interest Anthropology" that the 1960s vision of an anthropology that both is accessible to the public and is a fundamental part of public life will only be achieved if a "critical mass, a network, a will, and a passion to contribute to public education" emerges (1999: 9). While the political economy of academia in the 1980s and 1990s pushed more than half of our discipline into applied and public settings, I believe that it is only with the

events, actions, and subsequent degenerative human and environmental conditions created by the past decade of militarism and its profound consequences that we have finally achieved that critical mass with a passion and will to do public-interest anthropology. We are all keenly aware, now more than ever, of the obligations and responsibilities we have as anthropological citizens to assert individually and collectively our critical insights.

NOTES

1. While the American Anthropological Association (AAA) did not formally participate in this effort to inform a United Nations investigation, the majority of cases collected for the human rights and environment study were drafted by anthropologists with memberships in both organizations, including a contribution from AAA past president Roy Rappaport titled "Human Environment and the Notion of Impact" (1994).
2. See the Society for Applied Anthropology (SfAA) Environmental Anthropology project page (http://www.sfaa.net/eap/abouteap.html) to access links to the SfAA–Environmental Protection Agency cooperative agreement and to access project brochures, reports, conference papers, and other publications. The cooperative agreement is reproduced in its entirety at http://www.sfaa.net/eap/cooptext.html. An evaluation of the project and its outcomes was published as a special environmental anthropology issue of *Practicing Anthropology* 23 (3) (2002).
3. For a critical assessment of professional-organization-sponsored human rights advocacy, see discussion of the American Anthropological Association (AAA) Committee for Human Rights investigation of Chilean dam development and displacement of the Pehuenche in Johnston and Garcia-Downing (2004). For an example of how professional-organization sponsorship helped ensure that investigations were independent, communicated international interest, and helped create rights-protective space in a consequential damage assessment and plan for reparations in Guatemala, see Johnston (2009). In the Guatemala case, the American Association for the Advancement of Science (AAAS) and AAA sponsorship helped ensure that research was conducted as an independent scientific investigation with full professional peer review. In later years, the AAAS expanded on this approach, creating its Science and Human Rights coalition (2005) and an "on-call" program, Scientists with Human Rights Needs (2008).
4. As Glenn Alcalay (2010) notes, a U.S. congressional grant funded a limited remediation plan involving removal of contaminated soil, bioremediation, and construction of new buildings on the island of Rongelap. The Rongelap community is now being encouraged to resettle on this island. No remediation has occurred on the other islands of Rongelap Atoll, in the seriously contaminated lagoon, or on Ailinginae Atoll. Thus, the return to Rongelap would likely involve increased exposures to low-level radiation, very restricted living, and a dependence on imported foods. To offset radiation-exposure concerns, the U.S. Department of Energy proposes a return to the biomedical studies monitoring the radiation body burden of Rongelap island residents. For many reasons, the proposal to return has produced intense anxiety and controversy in the Marshall Islands.
5. While our research and expert witness reports were completed in 2001, we waited until after the Nuclear Claims Tribunal judgment was issued in 2007 before formally requesting permission from the tribunal and the Rongelap community to publish (Johnston and Barker 2008). The report details an explosive array of human rights abuses involving, for example, Atomic Energy Commission human experimentation with Marshallese subjects, including

the use, without informed consent, of radioisotopes in children and women of childbearing age. Some of our Marshallese advisers were concerned that publication of this report would generate political controversy that might adversely impact the bilateral negotiations for a new Compact of Free Association between the Republic of the Marshall Islands and the United States and impede efforts to take up a "changed circumstances" petition to the U.S. Congress for additional funding to address nuclear weapons testing program damages. A related concern was whether publication of the report before a tribunal decision might undermine the scientific integrity of the work, as the content would appeal to and be used by antinuclear activists and such use might foster a general public perception of the work as advocacy. Such a perception could, potentially, weaken the ability of a tribunal decision based on this report to stand up to future congressional scrutiny or U.S. court appeals. Holly Barker, with permission from the community, described elements of the Rongelap study methods in her 2003 monograph (Barker 2003).

6. The Nuclear Claims Tribunal was established in 1986 as result of the Compact of Free Association, a Reagan-era agreement between the United States and the Marshall Islands. In this agreement, the government of the United States accepted responsibility for compensation owed to citizens of the Marshall Islands for loss or damage to property and person of the citizens of the Marshall Islands resulting from the nuclear testing conducted in the Northern Marshall Islands (June 30, 1946–August 18, 1958). The Compact of Free Association changed the Marshall Islands' status from a U.S. territory to an independent, though associated, nation. In a separate agreement, the United States established the Nuclear Claims Tribunal as an administrative court to adjudicate claims and awards from a trust fund that was intended to achieve $150 million with investment and growth. Both parties agreed this action would represent a full settlement of all claims, past, present, and future, of the government, citizens, and nationals of the Marshall Islands. The agreements were made without Marshallese access to U.S. documents showing that the entire nation, not just the four northern atolls, had been exposed to dangerous levels of fallout, the nature of that contamination, and the full array of known biomedical effects. As a result, the agreed settlement for damages was manifestly inadequate. At the time of the judgment, there was less than $1 million in the Nuclear Claims Tribunal fund—with most personal injury awards and all property damage awards still outstanding. Because the initial Compact of Free Association included a "changed circumstances" clause, the Marshall Islands government believes it has the right to petition the U.S. Congress for additional funds. A "changed circumstances" petition submitted to Congress in 2000, 2001, and again in 2004 was rejected by the Bush administration, and while congressional hearings were held in 2005, as of this writing (March 2010), Congress has not adopted a formal response. A court case filed in U.S. courts by Bikini Atoll demanding full payment of its Nuclear Claims Tribunal Award in 2006 was dismissed by lower courts for lack of standing. This decision was reconfirmed in January 2009 by the U.S. Court of Appeals for the Federal Circuit, which ruled that the language of the initial agreement withdraws the jurisdiction of the U.S. courts. In October 2009, an appeal was filed with the U.S. Supreme Court arguing violation of the Marshallese right to just compensation. In April 2010, the Supreme Court declined to hear the case, dismissing the petition without comment.
7. Two articles of the United Nations Declaration on Indigenous Peoples (2007) are of particular relevance to this discussion of anthropological praxis and the obligations of citizenship, articles 11 and 31.

   A/Res/61/295, Article 11 (1,2): Indigenous peoples have the right to practice and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artifacts, designs, ceremonies, technologies and

visual and performing arts and literature. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with indigenous peoples, with respect to their cultural, intellectual, religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs.

A/Res/61/295, Article 31(1,2): Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions. In conjunction with indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.

8. These are the views of the American Anthropological Association (AAA) membership in their June 1999 vote and adoption of the AAA Human Rights Declaration. In adopting the declaration, AAA members acknowledge their responsibility to uphold and, through research and actions, help implement the tenets of international human rights law. As international human rights law evolves, so too do the obligations of the AAA and its members. Thus, AAA members are obligated to abide by and respect the terms of new international human rights treaties and covenants, such as the United Nations General Assembly's adoption of the Declaration on the Rights of Indigenous Peoples.

REFERENCES

Alcalay, Glenn. 2010. Atomic atolls. CommonDreams.org. March 12. http://www.commondreams.org/view/2010/03/12–5.

American Indian Law Center. 1999. *Model tribal research code: With materials for tribal regulation for research and checklist for Indian health boards*. 3rd ed. Albuquerque, NM: American Indian Law Center. http://www.ihs.gov/MedicalPrograms/Research/pdf_files/mdl-code.pdf (accessed August 7, 2006).

Barker, Holly M. 1997. Bravo for the Marshallese. In *Life and death matters: Human rights and the environment at the end of the millennium*. Barbara Rose Johnston, ed. Walnut Creek, CA: AltaMira.

———. 2003. *Bravo for the Marshallese: Regaining control in a postnuclear, post-colonial world*. Belmont, CA: Wadsworth.

———. 2007. From analysis to action: Efforts to address the nuclear legacy in the Marshall Islands. In *Half-lives and half-truths: Confronting the radioactive legacies of the Cold War*. Barbara Rose Johnston, ed. Santa Fe, NM: School for Advanced Research Press.

Bennett, John W. 1998. Applied and action anthropology: Problems of ideology and intervention; With a supplement: The career of Sol Tax and the genesis of action anthropology. In *Classic anthropology: Critical essays, 1944–1996*. John William Bennett, with contributions by Leo A. Despres and Michio Nagai. Pp. 315–358. New Brunswick, NJ: Transaction.

Brower, Barbara, and Barbara Rose Johnston, eds. 2007. *Disappearing peoples? Indigenous groups and ethnic minorities in South and Central Asia*. Walnut Creek, CA: Left Coast.

CIHR, NSERC, SSHRC (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, Social Sciences and Humanities Research Council of Canada). 2005. Section 6: Research involving aboriginal peoples. In *Tricouncil policy statement: Ethical conduct for research involving humans* (1998; with 2000, 2002, and 2005 amendments).

http://www.pre.ethics.gc.ca/english/policystatement/section6.cfm#6A (accessed May 12, 2006).

Clinton, William Jefferson. 1994. *Federal actions to address environmental justice in minority populations and low-income populations*. Executive Order 12898 of February 11, 1994. http://www.epa.gov/fedreg/eo/eo12898.htm (accessed March 13, 2010).

Council of Yukon Nations. 2000. *Traditional knowledge research guidelines: A guide for researchers in the Yukon*. Whitehorse, Yukon Territory: Council of Yukon First Nations.

Donahue, John, and Barbara Rose Johnston, eds. 1998. *Water, culture and power: Local struggles in a global context*. Covelo, CA: Island.

Durning, Alan Thein. 1993. Supporting indigenous peoples. In *State of the world 1993*. Pp. 80–100. Washington, DC: Worldwatch Institute.

Faculty of Human and Social Development. 2003. Protocols and principles for conducting research in an indigenous context. February. Faculty of Human and Social Development, University of Victoria.

Fitzpatrick, Judith, ed. 2000. *Endangered peoples of Oceania*. Westport, CT: Greenwood.

Forward, Jean, ed. 2001. *Endangered peoples of Europe*. Westport, CT: Greenwood.

Freeman, Milton, ed. 2000. *Endangered peoples of the Arctic*. Westport, CT: Greenwood.

González, Roberto J. 2004. *Anthropologists in the public sphere: Speaking out on war, peace, and American power*. Austin: University of Texas Press.

Greaves, Thomas, ed. 2002. *Endangered peoples of North America*. Westport, CT: Greenwood.

Gross, Daniel, and Stuart Platner. 2002. Commentary: Anthropology as social work: Collaborative models of anthropological research. *Anthropology News* 43 (8): 4.

Hale, Charles R., ed. 2008. *Engaging contradictions: Theory, politics, and methods of activist scholarship*. Berkeley: University of California Press.

Hitchcock, Robert, ed. 2002. *Endangered peoples of Africa and the Middle East*. Westport, CT: Greenwood.

Hymes, Dell, ed. 1969. *Reinventing anthropology*. New York: Pantheon.

Johnston, Barbara Rose, ed. 1992. *Human rights and the environment*. Preliminary report prepared by the Society for Applied Anthropology Committee on Human Rights and the Environment, submitted May 15 to the United Nations Commission on Human Rights, Sub-Commission on the Prevention of Discrimination and Protection of Minorities. Geneva: Office of the United Nations High Commissioner for Human Rights.

———, ed. 1993a. *Who pays the price? Examining the sociocultural context of environmental crisis*. Final report of the Society for Applied Anthropology Committee on Human Rights and the Environment. May. San Jose, CA: Society for Applied Anthropology and the Nathan Cummings Foundation.

———, ed. 1993b. *Who pays the price? Examining the sociocultural context of environmental crisis*. Booklet. July. San Jose, CA: Society for Applied Anthropology and the Nathan Cummings Foundation.

———. 1994a. Experimenting on human subjects: Nuclear weapons testing and human rights abuse. In *Who pays the price? The sociocultural context of environmental crisis*. Barbara Rose Johnston, ed. Pp. 131–141. Covelo, CA: Island.

———. 1994b. Human rights and the environment: Anthropological discourse, policy and praxis. *Practicing Anthropology* 16 (1): 8–12. Reprinted in *Classics of Practicing Anthropology: 1978–1998*. 2000. Patricia Higgins and J. Anthony Parades, eds. Pp. 223–230. Oklahoma City: Society for Applied Anthropology.

———, ed. 1994c. *Who pays the price? The sociocultural context of environmental crisis*. Findings from the Society for Applied Anthropology Committee on Human Rights and the Environment. Washington, DC: Island.

———. 1995a. Human rights and the environment. *Human Ecology* 23 (2): 111–123.

———. 1995b. The politics of advocacy in anthropology: Organizing the human rights and environment study. In *Gender and race through education and political activism: The legacy of Sylvia Helen Forman*. Dena Schenk, ed. Pp. 113–124. Washington, DC: American Anthropological Association / Association for Feminist Anthropology.

———, ed. 1997. *Life and death matters: Human rights and the environment at the end of the millennium*. Walnut Creek, CA: AltaMira.

———. 2001a. Anthropology and environmental justice: Analysts, advocates, activists and troublemakers. In *Anthropology and the environment*. Carole Crumley, ed. Pp. 132–149. Walnut Creek, CA: Alta Mira.

———. 2001b. Backyard anthropology and community struggles to reclaim the commons? Lessons from the SfAA environmental anthropology project. *Practicing Anthropology* 23:2.

———. 2001c. Building a public interest anthropology. In *Stewards of the human landscape*. *Common Ground*, Spring. Washington, DC: National Park Service.

———. 2001d. Function and dysfunction: Human environmental crisis and the response continuum. In *Thinking and engaging the whole: Essays on Roy Rappaport's anthropology*. Ellen Messer and Michael Lambeck, eds. Pp. 99–121. Ann Arbor: University of Michigan Press.

———. 2001e. Practicing anthropology in the human rights arena. *NAPA Bulletin* 20 (1): 39–44.

———. 2007. "More like us than mice": Radiation experiments with indigenous peoples. In *Half-lives and half-truths: Confronting the radioactive legacies of the Cold War*. Barbara Rose Johnston, ed. Santa Fe, NM: School for Advanced Research Press.

———. 2008. The clean, green nuclear machine? *CounterPunch*, October 27. http://www.counterpunch.org/2008/10/27/the-clean-green-nuclear-machine/.

———. 2009. Development disaster and the struggle to secure remedy: Reparations for dam-affected communities in Guatemala. In *Development and dispossession: The anthropology of displacement and resettlement*. Anthony Oliver-Smith, ed. Santa Fe, NM: School for Advanced Research Press.

Johnston, Barbara Rose, and Holly M. Barker. 2008. *Consequential damages of nuclear war: The Rongelap report*. Walnut Creek, CA: Left Coast.

Johnston, Barbara Rose, Susan Dawson, and Gary Madsen. 2007. Uranium mining and milling: Navajo experiences in the American Southwest. In *Half-lives and half-truths: Confronting the radioactive legacies of the Cold War*. Barbara Rose Johnston, ed. Pp. 97–116. Santa Fe, NM: School for Advanced Research Press.

Johnston, Barbara Rose, and Carmen Garcia-Downing. 2004. The Pehuenche: Human rights, the environment, and hydrodevelopment on the Biobio River, Chile. In *In the way of development: Indigenous peoples, life projects, and globalization*. Mario Blaser, Harvey Feit, and Glenn McRae, eds. Pp. 211–231. London: Zed.

Mohawk Council of Akwesasne. 2006. *Protocol for review of environmental and scientific research proposals*. Saint Regis, Quebec: Research Advisory Committee of the Akwesasne Task Force on the Environment, Mohawk Council of Akwesasne, Mohawk Nation. http://www.northnet.org/atfe/Prot.htm (accessed June 25, 2010).

Nader, Laura. 1999. Public interest anthropology. *Bulletin of the General Anthropology Division* 5 (2): 1, 7–9.

National Environmental Justice Advisory Council. 2000. Guide on consultation and collaboration with Indian governments and the public participation of indigenous groups. May 25. Workgroup of the indigenous peoples subcommittee of the National Environmental Justice Advisory Council. Washington, DC: United States Environmental Protection Agency. http://www.epa.gov/environmentaljustice/nejac/recommendations.html (accessed July 15, 2006).

National Research Council. 1996. The Arctic Aeromedical Laboratory's thyroid function study: A radiological risk and ethical analysis. National Research Council Committee on Evaluation of 1950s Air Force Human Health Testing in Alaska Using Radioactive Iodine 131. Washington, DC: National Academy.

National Science Foundation. 2010. Principles for the conduct of research in the Arctic. http://www.nsf.gov/od/opp/arctic/conduct.jsp (accessed February 10, 2010).

Network of Concerned Anthropologists. 2009. *The counter-counterinsurgency manual*. Chicago: Prickly Paradigm.

Nuclear Claims Tribunal, Republic of the Marshall Islands. 2007. Memorandum of Decision and Order, In the Matter of the People of Rongelap, NCT No. 23-02440, NCT No. 23-05443-B, NCT No. 23-05445-B, consolidated claims, April 17. http://www.nuclearclaimstribunal.com/ (accessed April 20, 2009).

Rappaport, Roy. 1986. President-elect calls for advice on association initiative. *Anthropology News* 27 (7): 1, 15.

———. 1994. Human environment and the notion of impact. In *Who pays the price? The sociocultural context of environmental crisis*. Barbara Rose Johnston, ed. Pp. 157–169. Washington, DC: Island.

Royal Commission on Aboriginal Peoples. 1993. Appendix E: Ethical guidelines for research. In *Renewal: A twenty-year commitment*, vol. 5 of *Report of the Royal Commission on Aboriginal Peoples*. Ottawa: Canada Communications Group.

Sabloff, Paula, ed. 2001. Careers in anthropology: Profiles of practitioner anthropologists. *NAPA Bulletin* 20 (1).

Sachs, Aaron. 1995. *Eco-justice: Linking human rights and the environment*. Worldwatch paper 127. Washington, DC: Worldwatch Institute.

———. 1996. Upholding human rights and environmental justice. In *State of the world 1996*. Pp. 133–151. Washington, DC: Worldwatch Institute.

Schafft, Gretchen. 2004. *From racism to genocide: Anthropology in the Third Reich*. Urbana: University of Illinois Press.

Sponsel, Leslie, ed. 2000. *Endangered peoples of Southeast and East Asia*. Westport, CT: Greenwood.

Stonich, Susan, ed. 2001. *Endangered peoples of Latin America*. Westport, CT: Greenwood.

United Nations. 1992. Convention on biological diversity. Article 8(j): Traditional knowledge, innovations and practices. Instruments, guidelines, codes and statements. http://www.cbd.int/convention/convention.shtml.

———. 2007. Declaration on the rights of indigenous peoples. Adopted by the General Assembly September 13; A/RES/61/295. http://www.un.org/esa/socdev/unpfii/en/declaration.html (accessed March 10, 2010).

Warren, Kay B., and Jean E. Jackson, eds. 2002. *Indigenous movements, self-representation, and the state in Latin America*. Austin: University of Texas Press.

WHO (World Health Organization). 2003. Indigenous peoples and participatory health research. http://www.who.int/ethics/indigenous_peoples/en/.

Workgroup of the Indigenous Peoples Subcommittee. 2000. Guide on consultation and collaboration with Indian governments and the public participation of indigenous groups. May 25. Washington, DC: Workgroup of the Indigenous Peoples Subcommittee of the National Environmental Justice Advisory Council, U.S. Environmental Protection Agency.

41

World Is Burning, Sky Is Falling, All Hands on Deck!

Reflections on Engaged and Action-Oriented Socio-Environmental Scholarship

GARRETT GRADDY-LOVELACE, ALLISON HARNISH, AND JULIANNE A. HAZLEWOOD

The forest is alive. It can only die if the white people persist in destroying it. If they succeed, the rivers will disappear underground, the soil will crumble, the trees will shrivel up, and the stones will crack in the heat. The dried up earth will become empty and silent. The *xapiri* spirits who come down from the mountains to play on their mirrors in the forest will escape far away. Their shaman fathers will no longer be able to call them and make them dance to protect us. They will be powerless to repel the epidemic fumes which devour us. They will no longer be able to hold back the evil beings who will turn the forest to chaos. We will die one after the other, the white people as well as us. All the shamans will finally perish. Then, if none of them survive to hold it up, the sky will fall.

—Davi Kopenawa, author of *The Falling Sky: Words of a Yanomami Shaman*, 2013

I. World Is Burning, Sky Is Falling: All Hands on Deck!

The sheer scope and depth of the world's environmental crises are admittedly daunting. As we author this final chapter in *The Environment in Anthropology*, cities in California are finally responding to five years of acute drought with strict water quotas, as is the large agricultural industry (Carlton 2014). Spurred by drought conditions, the largest wildfires in California's and New Mexico's histories occurred in 2013 and 2012, respectively (National Interagency Fire Center 2015). According to the National Oceanic and Atmospheric Administration (NOAA 2015), the latest 12-month period (from May 2014 to April 2015) tied with the previous 12-month period (from April 2014 to March 2015) as the warmest year on record since recordkeeping began 136 years ago.

There have most definitely been advancements for socio-environmental justice. Both Ecuador's adoption of a "green constitution" that guarantees the rights of nature and proposes alternatives to "business as usual" by outlining the rights to "living well" (*Sumak Kawsay* in the Indigenous Kichwa language; Republic of Ecuador 2008) and Bolivia's recent passage of "The Law of Mother Earth"

offer hopeful ways forward—on paper (Buxton 2011; Chávez 2014). But, in practice, and in spite of the dire warnings of climate scientists, a new Amazonian oil boom is under way. This new extractive matrix is threatening both biological diversity and the lives and livelihoods of Indigenous communities.

Around the world, at least 116 environmental activists were killed in 2014 amid disputes over hydropower, mining, logging, and agribusiness ventures (Stout 2015; Global Witness 2015). That is nearly twice the number of journalists killed in the same period, according to a report by the UK-based NGO Global Witness (2015).[1] Forty percent of the victims were Indigenous, and the majority of the deaths occurred in Central and South America. One such activist, the Indigenous Ecuadorian leader José Isidro Tendetza Antún, was murdered just days before he was expected to file a complaint against a controversial copper-mining project at the International Tribunal Court for the Rights of Nature. The Tribunal—which was being held concurrently with the December 2014 United Nations Framework Convention on Climate Change Conference (UN FCCC COP 20) in Lima, Peru—was dedicated to his honor (Watts and Collyns 2014; Puig 2014; Global Alliance for the Rights of Nature 2014).

A hemisphere away, foreign investors are leasing vast swaths of farmland in some of Africa's poorest countries, and entire communities are being uprooted to make way for monoculture food crop and biofuel plantations (McMichael 2013; White et al. 2013). Four years after the disastrous triple meltdown at the Fukushima Daiichi nuclear power plant in Japan, radioactive water regularly escapes from the plant, and rainwater continues to flush toxic effluent into the Pacific Ocean. As the earth warms, sea-level rise threatens to completely inundate small island nations like the Maldives and Tuvalu. In addition to sea-level rise, the United Nations High Commission on Refugees (UNHCR) estimates that the extreme weather, shifts in precipitation, dwindling water reserves, increased soil salinity, and degradation of agricultural lands brought about by climate change will displace hundreds of millions of people in the decades ahead (Sunjic 2008). With the destruction of the Amazon rain forest and the pillaging and pollution of environments and communities from Bangladesh to Zambia, humankind "may be approaching an ecological collapse—what Yanomami-Brazilian shaman Davi Kopenawa calls the time of the 'falling sky'" (Malaurie 2013: viii).

The environmental science of global climate change alone seems inescapably dire. Furthermore, the social science of weak treaties and weaker leadership can seem baffling, if not maddening. But that is not the intended conclusion of this book. Our goal in authoring this chapter is not to mire our readers in disheartening statistics but to steer them *away* from feelings of apathy, fatalism, or helplessness.

As the previous chapters and the following bibliography demonstrate, crisis is not the whole story. While the oceans acidify, some coastal communities organize to effect change. While biodiversity dwindles, scientists, activists, and policy

makers cooperate to protect endangered species. While topsoil and agrochemicals wash downstream, some farmers work to regenerate agroecological vitality. After generations of deregulating highly polluting industries, governments are increasingly being called on to safeguard air and water quality. For example, in December 2014, New York became the second state in the US (Vermont was the first) to implement a moratorium on fracking.[2] On May 19, 2015, the Obama administration announced the first "National Strategy to Promote the Health of Honey Bees and Other Pollinators"—a plan to reduce honeybee colony losses, increase the eastern population of the monarch butterfly, and increase and improve habitat for pollinators (Pollinator Health Task Force 2015).[3] The human dimensions of environmental change have become an important priority at the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), and other agencies supporting science research and education. Around the world, cities, businesses, foundations, individuals, religious organizations, and institutions of higher education are joining the fossil fuel divestment movement and purging oil, natural gas, and coal investments from their portfolios. And all the while, a critical resource is unfolding: a growing body of interdisciplinary scholarship that not only documents and analyzes the complex causes and consequences of ecological degradation but also works with communities to mobilize for viable solutions.

Over the past decade or so, research institutions have borne witness to a "breakdown" of conventional disciplinary boundaries. Researchers studying issues ranging from climate change to biodiversity loss and from tropical deforestation to crises in the availability of potable water "have come to a nearly unanimous conclusion that we cannot begin to understand global environmental change without a concerted and unified effort that integrates both biophysical and social sciences" (Moran 2010: 1). More integrative scholarship is needed to explore not only how the "environment" works but also how ideas of the environment—articulated in art, music, literature, oral history, religious doctrine, and spiritual ethos—capture, reflect, and influence social attitudes and institutions that govern human and beyond-human realms. Meaningful engagement with what have been called environmental issues will therefore need to incorporate lessons from the natural sciences, the social sciences, and the humanities. In short, all hands on deck!

We have opted to couple the terms *environment* and *socio-* in this chapter in order to dismantle classic demarcations between nature and culture, society and ecology, science and humanity, humans and their environs. Our use of the term *socio-environmental* builds on engaged scholarship and helpful policy that are already deploying this discourse. Recognizing that standard disciplinary confines sometimes falter, we wish to expand the integrative potential of a socio-environmental lens.

In the pages that follow, we briefly visit the history of disciplinary partisanship and cooperation leading up to the emergence of the new environmental social science (a.k.a. second environmental science, integrative human-environment research, sustainability science, and coupled human natural systems research). We offer summaries of two interdisciplinary frameworks and two research methodologies that we feel are particularly beneficial for engaged research and environmental justice advocacy. Finally, we present profiles of three practicing anthropologists whose work exemplifies the bourgeoning trend toward action-oriented socio-environmental scholarship and whose efforts should give readers reasons to hope, to study, and to act.

II. (We All Care about Something) and Everything Is Ecological

Action-oriented socio-environmental scholarship studies the interplay of human and other ecological life, how our current crises came to be, and how we can make positive changes toward socio-environmental justice. Excessive greenhouse gas emissions are responsible, in part, for warming and shifting climate—but what caused those excessive emissions in the first place, and what can we do about it?

Some historians understand modernity, in large part, as the institutionalization of an ethos of ecological domination. This non-eco-logic predates 20th-century Fordist industrialization and can be traced back to the Enlightenment and then further to the age of discovery and the beginning of European colonialism (Mignolo 2005; Cronon 1996; Graddy-Lovelace 2013). Even before this, groups of people have overfished, overgrazed, or overhunted and thereby undermined the means of their own existence and forced migration or decentralization. But during the European Enlightenment itself, a distinct ecological ontology came to power that imagined "nature" as distinct and separate from humanity, as an object of inquiry and control rather than as a mutually constituted extension of human physical and social life. Nature was to be conquered and tamed, made docile for calculation, consumption, and accumulation. The scientific revolution ushered in a worldview that, in the words of Carolyn Merchant, "saw nature not as an organism but as a machine—dead, inert, and insensitive to human action" (2005: 45). For example, the 17th-century English philosopher and father of empiricism Francis Bacon wrote, "The new man of science must not think that the 'inquisition of nature is in any part interdicted or forbidden.' Nature must be 'bound into service' and made a 'slave,' put 'in constraint' and 'molded' by the mechanical arts" (Bacon 1870: 20, 287, 294, qtd. in Merchant 2005: 45). Moreover, the object of "nature" was often feminized and racialized in its subjugation (Merchant 1990, 2005).[4]

This decidedly unecological way of thinking gained enormous power during the centuries of colonialism, early capitalism, and industrialization, which were

arguably justified through this worldview (Foster 2000; Mignolo 2005). Today, the nature-society dichotomy persists in industrialized consumption habits, in the daily practices of resource extraction and disposal, and in the policies that regulate both public health and environmental quality. Throughout the 20th century, it has even permeated public discourse and journalism as well as religious preaching and introductory textbooks—across capitalist and communist public school systems alike. Under the banner of modernity, learning about the science of the natural world has entailed learning how to most efficiently extract and accumulate its value: forestry has been a field of learning how to log; agriculture, a field of how to increase commodity crop yields at all costs; and geology, a field of mineral extraction. As Barry Commoner, American ecologist and leader of the environmental movement, notes, "In the eager search for the benefits of modern science and technology we have become enticed into a nearly fatal illusion: that through our machines we have at last escaped from dependence on the natural environment" (1971: 15).

From this unecological way of understanding and interacting with the world came entrenched ecological problems, from biodiversity loss (as chronicled in Rachel Carson's 1962 *Silent Spring*) to water pollution (as seen in the 1969 Cuyahoga River fire) to deadly agro-chemical leaks (as proven in the 1984 Bhopal disaster). That which was deemed "nature" and peripheralized as the "environment" reasserted itself as the very stuff of our lungs, bloodstreams, and food source. It returned as crop infestations, as toxic algal blooms, and as antibiotic-resistant bacteria. Meanwhile, human bodies began succumbing to so-called occupational diseases (like black lung and asbestosis) and diseases of civilization (including Alzheimer's, asthma, obesity, stroke, Type 2 diabetes, and certain cancers), revealing the alarming and fascinating epigenetic processes by which environments actually affect gene expression (Francis 2012; Guthman 2014).

It is important to note that, while colonizing and globalizing forces have helped spread this worldview to cultures around the planet, the bifurcation of humans and nature has deep roots in the "Western" cultural tradition. The vast majority of the world's diverse ecological ontologies have historically understood humans to be part of nature (Moran 2010)—and vice versa. Indeed, "most indigenous and non-Western cultures do not even have a word for lands untouched by humans and do not distinguish between 'wild' and 'non-wild' landscapes" (Robbins et al. 2013: 129).

Jack Forbes (1934–2011), Powhatan-Delaware activist-scholar, UC Davis emeritus professor, and founder of Degoniwida-Quetzalcoatl University in Davis, California, demonstrates that there is no "nature" out there. Instead of a separate "nature," Forbes highlights the concept of relationality, of interbeing with all living creatures: "Native American traditions point out to us that all forms of life, including humans, animals, birds, plants, and insects, are children of the same parents. The earth is our mother and the Great Mystery, or Great

Creative Power, is seen as our grandfather or grandmother-grandfather" (2008: 9). He then describes Native American conceptualizations of the rights of nature: "Native American philosophy recognizes the right of every living creature to life and to live its own life without interference" (13). "The life of Native American peoples revolves around the concept of the sacredness, beauty, power and relatedness of *all forms* of existence" (15).

The Nuu-chah-nulth chief, scholar, and associate adjunct professor at the University of Victoria, British Columbia E. Richard Atleo (known as Umeek in Nuu-cha-nulth) describes the profound simplicity of the Nuu-chah-nulth worldview: "*Relationships are*" (2011: ix). He explains, "A constellation of teachings was developed to maintain and to enhance life's major purpose, namely, the development of harmonious relationships between and among *all* life forms" (54; emphasis added).

In the 1971 best-selling book *The Closing Circle: Nature, Man, and Technology*, Commoner presented four informal laws of ecology: (1) everything is connected to everything else, (2) everything must go somewhere, (3) nature knows best, and (4) there is no such thing as a free lunch. The first informal law reminds us that ecosystems are complex, variable, and interconnected. Changes in one community of organisms can affect the fecundity of others, and small disruptions in one place may have "large, distant, long-delayed effects" elsewhere (Commoner 1971: 39). Commoner's second informal law (everything must go somewhere) restates a basic law of thermodynamics, that matter is indestructible. There is no waste in nature; nothing "goes away." We all know, for example, that humans and other animals release carbon dioxide as respiratory waste. This waste is then taken up by photosynthetic plants and excreted as oxygen, which is used in turn by animals. But rarely do we stop to consider the fate of a household item:

> A dry-cell battery containing mercury is purchased, used to the point of exhaustion, and then thrown out. But where does it really go? First it is placed in a container of rubbish; this is collected and taken to an incinerator. Here the mercury is heated; this produces mercury vapor which is emitted by the incinerator stack, and mercury *vapor* is toxic. Mercury vapor is carried by the wind, eventually brought to earth in rain or snow. Entering a mountain lake, let us say, the mercury condenses and sinks to the bottom. Here it is acted on by bacteria which convert it to methyl mercury. This is soluble and taken up by fish; since it is not metabolized, the mercury accumulates in the organs and flesh of the fish. The fish is caught and eaten by a man and the mercury becomes deposited in his organs, where it might be harmful. And so on. (Commoner 1971: 40)

Commoner's third informal law asserts—rather boldly, considering the time it was published—that the artificial introduction of manmade compounds (such as DDT) "is very likely to be harmful" (1971: 43). Over the course of four to

five billion years of evolution, organisms on earth have developed an array of complex parts, substances, mechanisms, and reactions that together constitute our biosphere (Foster 2005). During the past several decades, however, advances in human technology (most notably in the petrochemical industry) have created thousands of new substances that are not naturally occurring (e.g., solvents, detergents, insecticides, herbicides) and, thus, may be incompatible with the chemistry of living systems. Such substances, Commoner writes, "are usually toxic and frequently carcinogenic" (1971: 44).

In Commoner's last informal law (there is no free lunch), he draws from the field of economics to warn that every (economic) gain is won at some (environmental) cost. And, because of the processes outlined in the previous three laws, all debts are eventually paid. Commoner goes on to note that, while his effort to distill these four informal laws of ecology was scientific in nature—that is to say, the laws were developed from available facts, through logical relations, into a set of comprehensive generalizations" (1971: 46)—his conclusions merely echo the ideas that have been widely held and circulated by people who, without the aid of "modern," "scientific" instruments, for millennia, have astutely described humans' place in the web of life through art, song, story, prose, and poetry. Indeed, Robin Kimmerer (2002) and others (Posey and Plenderlieth 2004; Berkes 1999) have noted the urgency of expanding scientific inquiry on environmental issues to include and even foreground "traditional" and Indigenous ecological knowledge and ways of knowing (Weaver 1996; Wildcat 2009; Heckler 2009).

Amid the useful and not-so-useful theoretical debates, more and more people are asserting their need and love for what "nature" provides. This common ground (pun intended) need not be overlooked or undervalued. It is worth reclaiming the sheer potential of the starting-point fact that we all care for something and that this "something" came from, depends on, *is* the beyond-human realms of water, air, soil, flora, fauna, bacteria, fungus, and animals. This allegiance, affiliation, identity, and interdependence illuminates mutual constitution and foregrounds subsequent responsibilities.

III. History of Disciplinary Partisanship and the Social Construction of Nature

The specific academic disciplines of 21st-century US universities emerged in the late 19th and early 20th centuries. While fields like philosophy, geography, medicine, theology, and mathematics date back thousands of years to universities in Athens, Baghdad, Cordoba, Hamburg, and beyond, the trend toward specialization—both by field and within fields—accelerated dramatically in the past 150 years (Folmer and Johansson-Stenman 2011). In 1850, the University of Cambridge had final exams in only two subjects: mathematics and classics. Today, it is divided into more than 100 faculties and departments (Burke

2012). After the invention of the microscope, the study of the relationships and processes that link organisms to each other and to their physical and chemical environments—what we call *ecology*—split into two general fields: *micro*ecology is incorporated through cell and molecular biology into the curriculum at schools of medicine and public health, while *macro*ecology (which garners far fewer research dollars than its "better-connected twin") is the basis of wildlife ecology and global ecology research (Crumley 1998: xi). Today, in addition to these two scalar foci, the field of ecology is further specialized into over 200 unique approaches and perspectives, many of which have their own professional associations, academic journals, and research institutions (Esbjörn-Hargens 2006). In the 20 years after World War II, the number of new specialties in American science grew more rapidly than did the number of scientists available to fill them (Hollingsworth 1984).

Though the specialization of knowledge has certainly brought about important insights (advances in medical technology are key among them), it has also led to a fragmentation of theory, methodology, and terminology and imposed barriers to communication (both among researchers and between researchers and the public), which invites incomplete and sometimes distorted understandings of reality (Folmer and Johansson-Stenman 2011). In the late 19th and early 20th centuries, geography was promoted as an "integrating discipline" capable of bridging the physical and social sciences by bringing together scientific understandings of a region's natural environment with studies of the use of that region's resources, as illustrated by patterns of land use and settlement (R. Johnston 2005: 10). But, by the middle of the 20th century, geography had split into two subfields: *physical* geography has strong links with environmental science, while *human* geography shares many of its theories and methodological approaches with the social sciences and humanities (R. Johnston 2005). This schism, some people fear, ultimately "undermines the ability of geographers to meaningfully contribute to . . . understandings of nature-society relations" (Gaile and Wilmott 1989: xxxi; see also R. Johnston 2005). Anthropology in the United States is composed of four subfields (sociocultural, biological, linguistic, and archaeology). But, historically, the subfields most closely aligned with the sciences (biological anthropology and archaeology) have been marginalized and even stigmatized within the mainstream of anthropology (Crumley 1998; Goodman and Leatherman 1998).

Herein lies the problem, eloquently articulated by the historian Rogers Hollingsworth: "If the prime purpose of science is to learn as much as possible about the physical, biological, and social worlds, the specialization and fragmentation of knowledge and the resulting breakdown in communication among scientists should become matters of concern" (1984: 34). The polarization of "nature" and "nurture" both within and between academic disciplines has the unfortunate

consequence of reifying a false dichotomy between humans and their environments. This binary thinking, which gained a foothold in Western thought during the early modern period (ca. 1500–1815), flies in the face of integrative worldviews (and even science, frankly) and effectively distances researchers from the real socio-environmental issues of their time.

IV. Toward an Integrated Environmental Social Science

Anthropology is at its core a social science. Though employing slightly different methodologies and analytical lenses, the many social sciences—among them anthropology, demography, economics, education, human geography, political science, psychology, and sociology—all have in common a guiding focus on human society, human behaviors, and the influence of each on the surrounding world. Anthropology is also uniquely recognized as one of the more humanistic of the social sciences. Its critical emphasis on culture and the ways in which people process and document their experiences allies it with disciplines in the humanities—like art, history, language, literature, music, philosophy, and religion. Generally speaking, the natural sciences—including astronomy, biology, chemistry, geoscience, and physics—are centered on theory-driven, empirical research. Meanwhile, the humanities "excel at putting a human face on environmental issues" (Environmental Humanities Initiative 2015). Positioned between these two disciplinary groups, the social sciences harbor aspects of each. Social sciences like anthropology, sociology, and human geography employ qualitative (more humanistic) as well as quantitative (more scientific) research methods (Crumley 1998), and both are certainly needed in order to observe and make sense of environmental phenomena.

Commenting in the 1980s on the explosion of disciplinary specialization and professionalization in the United States, Hollingsworth lamented that scientists today "rarely pursue the real goal of science: the comprehension of the unity of things" (1984: 37). He went on to warn that, unless universities "can better unify the rapidly fragmenting knowledge, [they] risk being charged by an increasing number of citizens as irrelevant to the needs of society" (ibid.). It seems research institutions and researchers alike are heeding this warning. Though specialization continues within the academy, a reverse trend toward integrated social and natural sciences is evident in the growth of interdisciplinary majors (e.g., environmental studies, international studies) and in the development and application of interdisciplinary theories and methods.

Until the late 1980s, research on environmental change had been conducted primarily by earth scientists (geologists, meteorologists, atmospheric chemists). It was not until the late 1980s that social scientists started to play a major role in assessing the human dimensions of global environmental change by

systematically exploring, for example, the effect of markets and property-rights regimes on land-use and land-cover changes. By the mid-1990s, major institutions like the National Science Foundation, the National Research Council, NOAA, NASA, the Social Science Research Council (SSRC), and the Social Science and Population Program at the National Institute for Child Health and Human Development (NICHD) had begun to prioritize research on the "human dimensions" of global environmental change (Moran 2010). Such research is inherently multiscalar, multinational, and multidisciplinary. It often involves temporally and spatially explicit methods and large teams of researchers (this vein of socio-environmental research is perhaps best demonstrated in chapter 10 in this volume, by de Sherbinin et al.). Such work advances theory, Emilio Moran writes, by posing "new questions that reach beyond traditional disciplinary concerns and thus extend the value of social and natural science research to all of society" (2010: 21). It is policy relevant and thus engaged and action oriented. Yet in the face of budget cuts, economic constraints become epistemic and political: predictive modeling is favored over participatory, collaborative inquiry, and national security reigns as the goal of science. Nevertheless, such institutional embrace of integrative socio-environmental scholarship is to be celebrated—while challenged to go further.

You have already read about ethnoecology, which incorporates biology (specifically agronomy and soil science) with ethnographic and linguistic research (see chapters 5, 25, and 31). Here, we briefly present two other interdisciplinary research programs that have risen to prominence in the arena of action-oriented socio-environmental scholarship: historical ecology and political ecology.

As defined by leaders in the field, historical ecology studies interactions between societies and environments and the effects of these interactions on landscapes and cultures through time (Balée 2006). Approaches in historical ecology emphasize the landscape as a unit of analysis and take a long view of history, spanning from decades to millennia (Swetnam et al. 1999). This long view of history is necessary in order to establish a range of ecological variability that provides a frame of reference for assessing modern patterns and processes. Historical ecologists integrate "all of the data, techniques, and perspectives derived from paleoecology" (the study of fossil organisms) and instrument-based observations of the environment (such as weather records, stream gauges, soil studies, and data from satellites) with land-use histories (ascertained from archival, archaeological, and ethnographic research) and long-term ecological research involving experiments and monitoring over decades (Swetnam et al. 1999: 1190). In studying landscapes according to three broadly defined temporal scales—*événement* (event), *conjuncture* (cultural and historical context), *and longue durée* (long-term history)—historical ecologists can assess the present condition of a landscape and establish a basis for effective and equitable land-management decisions (Crumley 1998).

The type of historically informed environmental analysis made possible through the framework of historical ecology is necessary, according to Moran, "if for no other reason than to correct the misperception that past environments were 'pristine' and that only recently have humans begun to have an impact on the earth" (2010: 36). Historical ecologists also broaden our understanding of human-environment interactions to account for the ways in which human impacts on ecosystems may be benign or even beneficial (see chapters 3 and 13 in this volume).

Like cultural ecology (discussed in section 1), historical ecology can overturn the colonial assumptions of policy makers to demonstrate that Indigenous and popular land-management strategies are "empirically derived and potentially useful" (Crumley 2006). But, unlike cultural ecology, historical ecology focuses on how human societies, "rather than adapting their subsistence activities, seasonal schedules, population size, settlements and so on to preexisting constraints in the environment, . . . begin at once to transform most of these constraints" through drainage, cropping practices, modification of soils, and so on (Balée and Erickson 2006: 4; see also Moran 2010). In other words, historical ecologists see environments as mutually adapted to humans' needs and desires. They are cautious, William Balée and Clark Erickson explain, about uncritically applying terms like *beneficial*, *destructive*, *enhancing*, *degrading*, and *sustainable* to past and present human activities, as these terms "imply an extant benchmark for a pristine, natural environment to which anthropogenic landscapes can be compared" (2006: 9). Pristine environments, they write, "must be first proved, rather than assumed" (ibid.). But the most important feature of historical ecology, according to Carole Crumley, is that "it celebrates both the open-mindedness of scientific inquiry and the phenomenological intensity of human experience" (1998: xiii–xiv). In this way, the field of historical ecology fosters collaboration among the social sciences and bridges natural sciences, social sciences, and humanities (Crumley 2006).

Similar to historical ecology, the field of political ecology also considers the role of shifting social power in contributing to environmental changes. A dynamic and diverse body of scholarship (Zimmerer and Bassett 2003), political ecology emerged from cultural ecology, as perhaps best known by Julian Steward (see chapter 1 in this volume). Cultural ecologists pay careful attention to how a particular group of people interacts with, influences, and adapts to a particular place. Descriptive data are used to explain how these pastoralists grazed their semiarid hills or how those hunters tracked their game—and how such practices influenced the landscape itself. But what if this particular group of people carries a historical legacy of racialized identity? What if that community of growers endured displaced land tenure and then exploitative labor conditions as tenant farmers? What if assessments of fishing practices reveal that the heavy metals coursing through this particular river shed have disproportionally

bioaccumulated in these particular communities' bloodstreams? Or that these toxins result from upstream, deregulated strip-mining operations? Then, the descriptive data would need to entail information about this extractive industry, about the unenforced regulatory policies, about local governance structures and allegations of corruption, about the consolidated power of the mining company itself. Suddenly the nuance of micro-observation needs the breadth of macro-analysis, so as to round out the observation itself. As Paul Robbins writes in his popular introduction to political ecology, "The crisis of explanation confronted by cultural ecology would become the fulcrum on which political ecology would be levered into prominence" (2004: 36).

In the foundational 1987 text, Piers Blaikie and Harold Brookfield define the nascent field of political ecology as the intersection of investigations on ecology with those on political economy. This interdisciplinary framework explores the ways in which social and economic inequalities underlie many of the world's environmental problems (Berkhout et al. 2003). In other words, political ecologists understand environmental problems to be *social* in origin, more related to disparities in access and control over resources than they are to poor management, inappropriate technology, or overpopulation on the part of the land managers. Throughout various iterations of research, this assertion remains valid. The force driving policy, political ecologists show repeatedly, is the drive for capital accumulation—amid the systemic crises thereof (Polanyi 1944; O'Connor 1998; Harvey 2014). Political ecologists cannot ignore the role of global market forces in shaping local ecological conditions. For example, rather than chalking up deforestation in eastern Amazonia to the apolitically destructive practices of irresponsible land users, political ecologists will consider how the actions of ranchers, peasants, and workers are shaped by "external structures"—such as transnational companies, federal subsidies, consumer demand, or commodity prices—operating within the broader "historical, political and economic context" (Blaikie and Brookfield 1987a: 17, 1987c: 239; see also Watts and Peet 2004).

But political ecology does not stop at the levels of policy, political structures, or political economy. It delves even deeper to disclose the discourses that animate and justify these political economies—chief among them productivity, modernity, development. Here, the field has contributed mightily to countering academia's blind spots with regard to these enormously powerful paradigms. In an overview of the field a decade ago, Susan Paulson, Lisa Gezon, and Michael Watts laid out its three basic challenges: "to define politics and the environment in ways that facilitate a more thorough examination of the relationships between them; to identify methods for carrying out and analyzing research that encompasses relations between politics and environment; and to develop ways to apply the methods and findings in addressing social-environmental concerns" (2003:

208). They call for explicit analysis of power, politics, and relations therein—while not diluting environmental understandings by overgeneralizing ecological phenomena (Rocheleau et al. 1996; Rocheleau 2008).

In short, political ecology acknowledges—and interrogates—the role of power in environmental crises. It begins with the understanding that ecological degradation necessarily entails social degradation and that such degradation reflects and perpetuates political inequity. Political ecology takes as its point of departure injustice and as its (nebulous, ambitious) goal a righting of blatant wrongs (see chapters 4, 16, and 34 in this volume).

The difference between historical ecology and political ecology is arguably one of spatial and temporal scale. While historical ecology concentrates on a single landscape over a long time span (sometimes as long as millennia), political ecology tends to focus on the ways in which a contemporary environmental issue occurring in one locality is linked to broader political and economic processes unfolding in other parts of the world. However, the two fields are not mutually exclusive, and scholars regularly draw inspiration from both while incorporating concepts and methods from still more disciplinary and interdisciplinary theoretical frameworks.

V. Participatory and Collaborative Research Methodologies

The purpose of environmental social science is to gather and contextualize information on the invariably human dimensions of ecological problems; to translate, communicate, connect, and debate the data; and to identify solutions. How does such metaresearch happen? Well, it happens in many ways: regression models informed by critical race theory; focus groups informed by toxicology reports; discourse analysis of archival investigations of government-sponsored wetland restoration; econometrics of international food aid. Mixed methods merge the different logistical capacities of quantitative and qualitative methods, helping to bridge their unhelpful dichotomization (both historical ecology and political ecology owe their efficacy in part to the methodological relief of this merging). This research happens through standard academic modes of diligent nerdiness and investigative sleuthing, as well as engaged fieldwork and learning by doing: learning about an issue from multiple perspectives (historical, financial, decolonial, biochemcal, legislative); learning *about* people by learning *from* them. Often, this research is participatory and/or collaborative, meaning research is conducted with / for / on behalf of environmentally impacted communities—not *on* them. This engagement begs questions of objectivity, but it also answers them. Rigor still reigns. But scholars who embark on an investigative line of inquiry because of injustice engage in this study so as to help right the wrong of that exploitation.

A broad range of scholarship involving participatory action research exists in the development-oriented socio-environmental sciences (Chambers 1983; Pretty et al. 1995; Thomas-Slayter 2001; Wilmsen 2006; Cahill 2007b; Cahill et al. 2007; Fals Borda 1978; Jupp 2007; Kesby 2007; Kindon 2005; Kindon et al. 2007). Such work questions power, positionality, and the politics that influence knowledge-production processes and define "legitimate" ways of knowing (Cahill 2007a; Dove 1999; Nast 1998). It involves those who are impacted by the environmental issue at hand—those who have a stake in the problem, and sometimes that stake has life-or-death consequences. Participatory action research at its best begins and remains collaborative throughout the research design, implementation, analysis, and use of data. The goal for the researcher and the community with whom the researcher is working is to effect change, deepen knowledge, circulate findings, inform policy, and improve the situation—together.

Increasingly, scholars working in or with Indigenous and other communities of color are advocating another methodological framework, called "collaborative research" (Lassiter 2000; Watson and Huntington 2008). This methodology is based on the decolonizing principles proposed by Linda Tuhiwai Smith (1999) and expanded on in a comprehensive collection titled *Handbook of Critical and Indigenous Methodologies* (Denzin et al. 2008). These scholars decry the colonial legacy of conventional social science research methodologies and challenge academia to decolonize itself by acknowledging Indigenous ways of knowing as valid (rather than depicting them as "primitive" or "folk" knowledges). Smith clarifies the colonial foundations of research, both from her own perspective (as she is a Maori scholar-activist) and from the perspective of Maori communities.

According to Smith and others, collaborative approaches go a step further in combatting the colonial relations that linger even in participatory social science research. For instance, Indigenous groups and decolonial scholars suggest that some of the terms employed in participatory research—terms like *participatory*, *empowering*, and *emancipatory*—imply that researchers are merely "allowing" the participation of their host communities (Gibbs 2001). The Indigenous Peoples Specialty Group (IPSG) of the Association of American Geographers (AAG) advocates this vein of decolonial collaborative research in geography:

> The new paradigm of "collaborative" research goes beyond "participatory" research, by making the community and its own ideas and self-determination processes central to the project. Constructing power relations in which the academic researcher acknowledges that Indigenous communities and people also produce knowledge is key. Moreover, as collaborators, Indigenous peoples are no longer treated as simply "informants," but knowledge-holders and experts on particular topics in relation to their own identities, histories, environment, and definitions of

> self-determination. Knowledge *about* Indigenous peoples is not the same as Indigenous knowledge, which is held by the people themselves. (2010: 2)

The differences being articulated between participatory and collaborative research approaches are a testament to the dynamic nature of the research process; the questions we ask and the ways we go about answering them are always changing in response to a shifting socio-environmental climate, where new issues and new critiques emerge daily. For as long as these changes are under way, much of the terminology remains nebulous. On some occasions, terms like *participatory* and *collaborative* are used synonymously. On others, scholars are careful to partition the discourse along a continuum of engaged and action-oriented scholarship (for more on the complementary but distinct traditions of action research, see Fox 2006).

To offer some real-world examples, the most important lesson that one of this chapter's authors, Julianne A. Hazlewood (2006), learned while working with the Tlingit Nation's Sitka Tribe in the Pacific archipelago of Southeast Alaska is that conducting both participatory and collaborative research is complex but well worth the challenge. She maintains that if research is not participatory and/or collaborative from its beginning stages, it is difficult to see how the research results benefit the community or why the community would be interested in taking part in the research in the first place. After all, if a community is not an active part of the research process and is not interested in the outcome, then it seems the research is little more than self-serving for the researcher and his or her institution and thus a reinforcement of its colonial origins.

Decolonizing socio-environmental research is an enormous undertaking requiring honest reflexivity, brave self-awareness, and respectful, ongoing dialogue. Why is it assumed that it is the researcher who should do the empowering and the research subjects who are in need of the empowerment? Until the differing positionalities—and power differentials—of researchers and those who are often thought of as the research subjects are negotiated, and until the discrepancies between the legitimacy of scientific knowledges versus "Other" knowledges are confronted, the academy will continue to project a colonial agenda. Thus, collaborative research does not seek to translate its results back into scientific paradigms. Rather than trying to prove that it is "scientifically rigorous," collaborative research places a higher priority on contextualizing its findings within the language of "Other" epistemologies (Hazlewood 2010).

One of the first theorists of participatory action research (in Spanish called *investigación-acción participativa*), the Colombian scholar-activist Orlando Fals Borda (1978, 1987) discusses the *sentipensante* approach in which one combines reason and love, the body and the heart, to undo the processes that disrupt human-nature harmony and the power to speak the truth (Moncayo 2013).

Employing a praxis of the heart/mind—wherein the researcher reflexively checks in with him- or herself, no matter how unpleasant, disheartening, and "unproductive" it may seem—is an essential part of decolonizing research, maintaining rapport, and working *with* communities to assemble peace-with-justice processes so that more people on the planet may live a life of dignity.

Ethics and methods are interdependent and enmeshed when working with marginalized peoples who share colonial histories and whose territories are still under extractivist siege by the Global North and their own country's political and economic centers (Hazlewood 2010). It is, therefore, important—from an ethical standpoint, for methodological rigor, and for effecting change—that researchers engage themselves with the communities in which they work. Doing so takes time and patience. Research proposals must include blocks of time to build reciprocal relationships (see chapters 27 and 40 in this volume). It is vital to ask *both* regional *and* local organizations/communities to be partners and to collaborate on the research proposal from its inception, as opposed to showing up to research communities with a fixed and funded proposal; doing the latter is tenably a violation of communal rights to free, prior, and informed consent.

Whether one prefers to do participatory, collaborative, or any vein of engaged and action-oriented scholarship, approaching socio-environmental problems with *both* the mind *and* heart and taking what people say about their everyday environs as *real knowledge* helps foster socially just and environmentally sustainable "ways of organizing human-human and human-environment relations" (Burke and Shear 2014: 127; see also Hazlewood 2010).

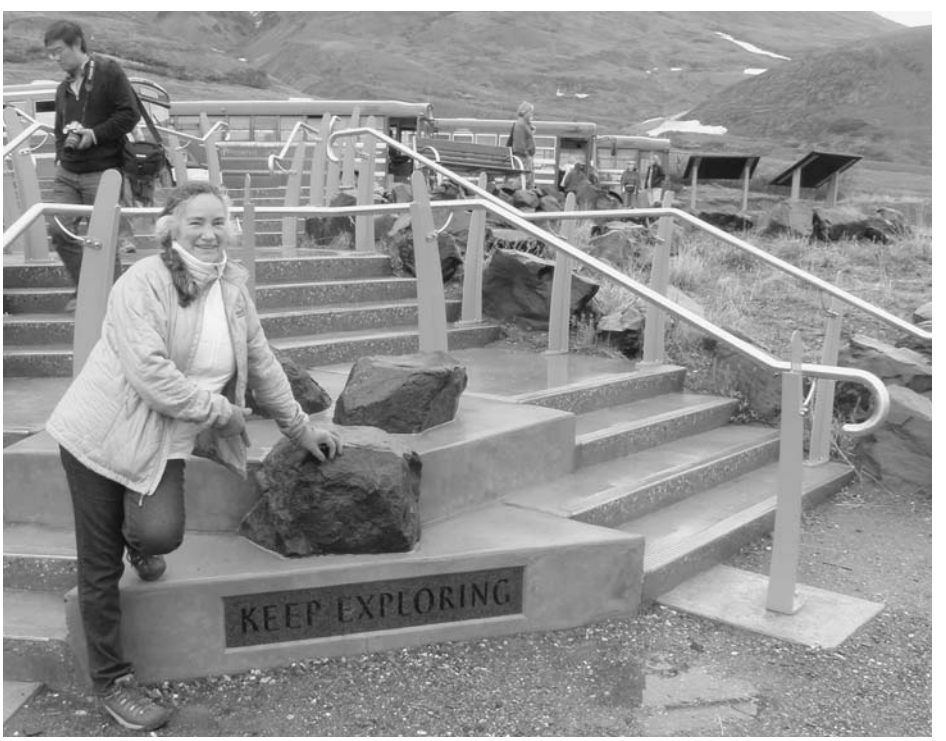
VI. Anthropological Examples of Engaged and Action-Oriented Socio-Environmental Scholarship

Anthropologists are not alone in the pursuit of sustainability and social justice. Practically every discipline has an artery with a focus on environmental issues. And, beyond such disciplinary specializations as environmental/ecological anthropology, environmental geography, environmental sociology, environmental history, environmental law, environmental and ecological economics, environmental psychology, environmental literature, and environmental art, there are transdisciplinary frameworks (e.g., historical ecology and political ecology) and scholar-activist methodologies that expose political-economic and environmental exploitation and help articulate alternative, eco-logical, and socially just ways of being (Burke and Shear 2014). Here, we have offered a cursory summary of historical ecology and political ecology as well as participatory and collaborative methodologies. Next, we offer three practitioner profiles that illustrate what anthropology can look like when it is guided by a focus on pressing socio-environmental issues, practiced under the rubric of interdisciplinary frameworks, and exercised in partnership with affected communities.

VI (i): Articulating an Anthropology of Trouble: Barbara Rose Johnston

Barbara Rose Johnston is an environmental anthropologist and senior research fellow at the Center for Political Ecology (Santa Cruz, California), a lecturer at the University California–Santa Cruz, and adjunct professor of anthropology at Michigan State University. Her action-oriented research has been shaped and informed by collaborative and participatory work with communities, civil society, and professional associations. An active member and leader in disciplinary and transdisciplinary organizations, Johnston has served on the founding board of the American Anthropological Association's (AAA's) Feminist Anthropology section (1989–1992), Environmental Task Force (1991–1995), interim and founding boards of the Anthropology and Environment section (1994–1998), Committee for Human Rights (1997–2001), Task Force on the Status of Indigenous Peoples in South America (2001), and Ethics Committee (2009–2012). In 2008, she began a five-year stint as the public anthropology associate editor for the AAA's flagship publication, *American Anthropologist*. At the Society for Applied Anthropology (SfAA), Johnston organized and chaired the Human Rights and Environment (HRE) Committee (1990–1997).

In numerous reports, newsletters journal articles, and edited book collections, the HRE Committee has articulated a collective argument that individuals and



Johnston in Denali, Alaska, in 2013. (Barbara Rose Johnston)

cultural groups have rights, that these rights are being abused in the name of economic development and national security, and that oftentimes individuals whose rights are violated have "no recourse because of a lack of a viable judiciary and the inability to bring some actors (state governments, transnational corporations, international financial institutions) to a regional or international court where claims can be filed and some measure of remedy provided" (B. Johnston, chapter 40 in this volume). Accordingly, the HRE Committee has called on national and international systems of governance to recognize the relationship between human rights and the environment and to take steps to work toward environmental justice.

As the years went by, many far-reaching impacts of this work became evident, impacts fueled in part by aggressive efforts to disseminate the HRE Committee report and findings in multiple arenas. For example, with support from the Nathan Cummings Foundation, Johnston sent an HRE Committee report—what was later published by Island Press as *Who Pays the Price?* (B. Johnston 1994b)—to 450 national and international environment and human rights nonprofit organizations and foundations. With AAA congressional fellow Gregory Button's help, the booklet was distributed to all members of the 1993 US Congress. *Who Pays the Price?* was also sent to other US and UN officials; in 1996, it was translated by the US Department of State into Arabic and distributed throughout the Middle East. This outreach helped launch a new holistic approach in civil society and support the push for national environmental justice legislation and policy. US vice president Al Gore sent his copy of the book to the EPA, where the environmental social science approach and its social justice goals helped shape the Office of Sustainable Ecosystems and Communities (OSEC) mandate and environmental justice policy, especially emphasizing the responsibility of government to enhance and empower community-based environmental problem solving.

Recognizing that *Who Pays the Price?* was the result of professional-organization commission work, the EPA approached the SfAA with a proposal to help implement OSEC's mandate, and Johnston helped draft and direct a resulting cooperative agreement that emphasized "backyard anthropology"—action-oriented research that helped launch the field of environmental anthropology (B. Johnston 2012). Most importantly, for the communities that served as case-specific examples of human environmental rights abuse, the work made the culpability gap broadly visible, launching international support and engagement in what had largely been place-based struggles. The key question asked in *Who Pays the Price?* and its call to consider the sociocultural context of environmental crisis prompted demands for accountability and meaningful remedy, questions and concerns that still resonate decades later.

As Johnston's anthropology evolved from the role of social documentarian to action-researcher, her understanding and application of evidentiary analysis as a

key element in environmental justice work expanded to incorporate an increasing focus "on locating evidence of culpability, assessing the consequential damages of abuse, discerning the many meanings of remedy, and encouraging the political will to implement or create mechanisms that might achieve reparation" (chapter 40 in this volume).

For example, one of the cases chronicled in the HRE Committee study documented the human rights abuses associated with nuclear weapons testing and related human radiation experimentation in the Marshall Islands (B. Johnston 1994a). This publication resulted in an invitation for Johnston to serve as an adviser to the Marshall Islands Nuclear Claims Tribunal Office of the Public Advocate, which is charged with assessing damages and claims related to the United States' nuclear weapons testing program. Johnston and her team worked collaboratively with Marshall Islanders to assess the biomedical, social, cultural, economic, and environmental impacts of the program and the history and consequences of a classified human radiation experimentation program. Johnston and fellow anthropologist Holly Barker served as expert witnesses in the Nuclear Claims Tribunal 2001 Proceedings, joining the Marshallese in three days of formal testimony. Summarizing the case online, the AAA explains,

> Dr. Johnston and others meticulously documented the consequences of the 1954 thermonuclear testing including the loss of a way of life and of a healthy habitat, through a collaborative and participatory approach which gave broad ownership to the process and the results. . . .
>
> As a result, the property claim was developed on a much broader basis than simply the contamination of the atoll's land. The tribunal framed the discussion and the assessment of damages in terms of "loss of a way of life" and "loss of the means to live in a healthy fashion," and awarded the people of Rongelap $1 billion in damages. The judicial findings of the Rongelap claims are extremely significant in amending the legal concept of "property" and create precedent that other cases can build upon. (2007)

This work was chronicled in a publication that Johnston coauthored with Holly Barker, titled *Consequential Damages of Nuclear War: The Rongelap Report* (2008), a book that received the Society for Medical Anthropology's New Millennium Book Award in 2011.

Johnston's efforts to assess the consequential damages of human environmental rights abuse in ways that encourage reparation and the right to remedy prompted other advisory consultations. In 1999, she was asked to prepare a briefing for the World Commission on Dams (WCD) that explores internationally financed development-induced human rights abuses accompanying large dams, examines the presence and performance of accountability mechanisms, identifies culpability gaps, and proposes corrective actions. This analysis was informed

by case-specific investigation, reviewing development and resettlement records as well as the evidence demonstrating the consequential damages of flawed, corrupt, and inept development. This work resulted in WCD recommendations for an independent reparation mechanism (WCD 2000).

In 2003, Johnston was contacted by representatives from one of the cases profiled in the "Reparations and Right to Remedy" brief prepared for the WCD, and she agreed to their request to further develop a consequential damage assessment and reparation plan. The resulting *Chixoy Dam Legacy Issues Study*—an independent scientific assessment commissioned by the Asociación Campesina Río Negro 13 de Marzo Maya Achi (ASCRA), International Rivers Network, Reform the World Bank–Italy, and Rights Action–Guatemala—was released in 2005. This five-volume assessment reveals the grave human rights abuses and social injustices resulting from the construction of the Chixoy Dam in Guatemala and recommends a five-tiered approach to reparation:

> Tier I. Immediate actions to address the dire needs of resettled, disenfranchised, and stigmatized communities including: emergency relief to households and communities who suffer from the lack of water, electricity, and deteriorating housing; and, an assessment and remedy for the gaps in their delivery of social, economic, education, and public health services in the Alta and Baja Verapaz Districts. Other immediate needs include a thorough survey and census of the entire dam-affected population.
>
> Tier II. Economic, sociocultural, education, health, and infrastructure development of dam affected communities and the broader region.
>
> Tier III. Implementation of community and family specific remedies to restore, repair, and improve the conditions of life of those communities and families most seriously affected by the Chixoy Dam Project.
>
> Tier IV. Reparation and reconciliation with respect to violence accompanying the construction of the Chixoy Dam including violence associated with resettlement negotiations, the assassination of community leaders and the theft of community records, and the massacres of the Rio Negro community and the communities that sheltered Rio Negro survivors.
>
> Tier V. Political actions and initiatives that acknowledge and address the historical wrongs of this case of hydroelectric dam development subsidized by the lands, livelihood and lives of societies' most vulnerable people, and political action that insures "never again." (Johnston 2005: 8)

In 2002, the AAA awarded Johnston the Solon T. Kimball Award for Public and Applied Anthropology in recognition of leadership strengthening the ways anthropology perceives and responds to environmental injustice and human rights abuse. Her work was further recognized in 2007 by the AAA's

Anthropology and Environment section with the Lourdes Arizpe Award for groundbreaking participatory research and success in influencing culturally inflected reparation decisions. In 2015, the AAA announced Johnston as the recipient of their second biennial Public Policy Award. This award recognizes the positive influence her work has had on the course of government decision making and action concerning a range of issues including biocultural health and diversity (especially with regard to water), institutionally financed development safeguards and accountability, hydro development, and nuclear disaster.

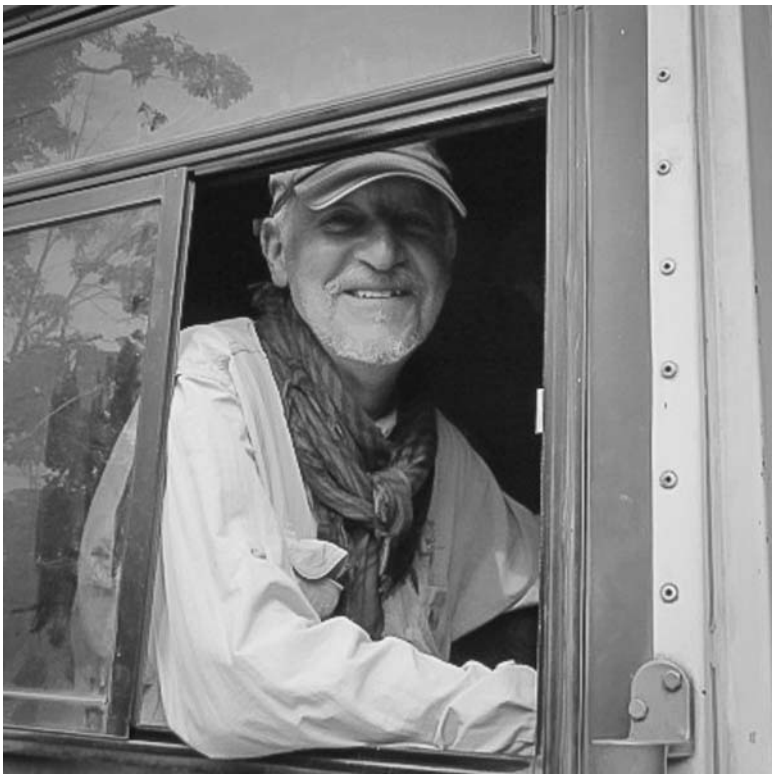
Citing Roy Rappaport (1993), Johnston acknowledges that "substantive transformations can occur when anthropologists act as citizens, when they apply their analytical skills to troubles at home as well as abroad, and when they consciously use these engagements to encourage broader awareness and acceptance of responsibility" (2001b: 102). This type of "'cause oriented' anthropology," she writes, "suggests people who make trouble" (2001a: 132).

Johnston's efforts to explore case-specific human environmental rights abuse in ways that encourage and help shape meaningful remedy have been central to the struggle to secure justice in the Marshall Islands and Guatemala, yet in both instances, the struggle to secure and fully implement reparation agreements continues. Signed agreements and administrative court rulings are meaningless without the political will that ensures that economic means are allocated to fully fund agreements and that transparent oversight and accountability mechanisms are in place and used to guarantee full implementation. Thus, long after the action-oriented research is conducted, advocacy work continues, with Johnston "making the case" for continuing human environmental abuse associated with unmet obligations in the Marshall Islands and Guatemala in multiple arenas.

Johnston's work as an adviser to the UN Special Rapporteur on Human Rights and the Environment, the US EPA, UNESCO, the Marshall Islands Nuclear Claims Tribunal, and Indigenous survivors of massacre and genocide in Guatemala is chronicled in some 150 publications (O'Gorman and Meyers 2014), including *Who Pays the Price? The Sociocultural Context of Environmental Crisis* (1994), *Water, Culture and Power: Local Struggles in a Global Context* (with John Donahue, 1998), *Half-Lives and Half-Truths: Confronting the Radioactive Legacies of the Cold War* (2007), *Consequential Damages of Nuclear War: The Rongelap Report* (with Holly Barker, 2008), and *Life and Death Matters: Human Rights, Environment, and Social Justice* (2011).

VI (ii): Still on the Scholar-Activist Bus: Stefano Varese

Stefano Varese is professor emeritus in the Department of Native American Studies at the University of California–Davis. On June 1, 2013, he became the 14th recipient of the LASA / Oxfam America Martin Diskin Memorial Lectureship at



Almost fifty years since Varese first started working with Indigenous forest peoples, and he is still on the Amazonica University scholar-activist bus. This photo was taken in the Ecuadorian Amazon during Varese's UC Davis Summer Abroad course, July 19, 2013. (Julianne A. Hazlewood)

the International Congress of the Latin American Studies Association (LASA). This prestigious award is intended to honor outstanding senior scholars who demonstrate a combined commitment to activism and scholarship.

As a scholar, Varese is simultaneously an advocate for Indigenous peoples of the Amazon and for the Amazon itself. Over the past five decades, Varese has rigorously crafted his own variety of political economy (Hale 2013) that emboldens Indigenous cosmologies (origin stories) based on the interdependence of people and "nature." Varese readily recognizes that socialist and Marxist political theory is a Western and mostly Eurocentric construction, and thus, he underscores the contributions of Indigenous ways of knowing and everyday life practices to the world. Demonstrating that Amazonian Indigenous peoples have lived in endemic relation to their environment for millennia and still continue to shape the forests and rivers over time, Varese holds that the innumerable species of the Amazonian forests and rivers also inform Indigenous people's "moral" and more environmentally harmonious economies. As a witness of Indigenous peoples' place-based sustainability, based on their everyday relations with the forest/river

species and the forests and rivers themselves, he promotes pluralist approaches to economic and social development. In other words, he is an advocate for the rights of diverse peoples in their respective places/ecologies to choose *diverse* and *distinct* pathways to living well relative to "all their relations." His dedication to and teaching of *praxis* has encouraged many students and Indigenous people to push forward on these same routes of activist scholarship in hopes of "changing and shaping ethical, social, political, and economic life in the direction of a more just, egalitarian and humanistic world community" (Varese 2013: 9).

Varese recalled in in his LASA / Oxfam America Martin Diskin Memorial Lecture that the idea of praxis began to make sense to him and to scholars of his generation precisely when they stepped into the field. He describes how, at this time, when research "was supposed to be objective, neutral, empirically disinfected and focused on discrete sociographical spaces," the work of praxis actually freed him and his colleagues from "the restraining conceptual devices of [their] conformist and conventional discipline" (Varese 2013: 9).

In January 1971, Varese joined a politically imaginative group of international anthropologists in the Caribbean country of Barbados at a symposium sponsored by the World Council of Churches (WCC) Commission on International Affairs, the WCC Programme to Combat Racism, and the Ethnology Department of the University of Berne (Switzerland). The outcome of the Barbados I meeting, as it came to be known, was a declaration decrying the human rights abuses carried out by governments, companies, missionaries, and even social scientists against Indigenous peoples and calling for the their rights to autonomously design their own culturally relevant pathways of development. This Declaration of Barbados "soon became the banner for some of the emerging Indigenous organizations of Mexico and Central and South America" (Varese 2013: 12).

Varese was born in Genoa, Italy, and moved with his family to Lima, Peru, when he was a young boy. He completed his doctorate at the Pontificía Universidad Católica del Perú in 1967. His dissertation, which was based on his work with the Campa Asháninka people of the Peruvian Amazon, represented a "prescient break with the dominant tradition of community studies," which tended at the time to depict Indigenous peoples as "frozen in their own premodern space-time" (Hale 2013: 6). Rather than portraying the Asháninka as static and unchanging, Varese "analyzed [their] engagements with broader political and economic forces" (ibid.). Published in Spanish as *La sal de los cerros* (1973) and in English as *The Salt of the Mountain* (2004), Varese's dissertation is now a classic.

After Varese completed his PhD when he was 28 years old, he took a teaching position at the renowned San Marcos University in Lima—Peru's capital and center for legislative decision making. In 1968, the Revolutionary Government of Juan Velasco Alvarado declared an Agrarian Reform, the expropriation of the International Petroleum Company, and the nationalization of the strategic industries, among other transformations. In recognition of the PhD fieldwork

that Varese had done with the Campa Asháninka communities, the Revolutionary Government appointed him to the position of director of División de Comunidades Nativas de la Selva (Division of Native Forest Communities).

Given the primary duty to direct the expansion of the "land reform" process into the Amazon, Varese implemented a program recognizing Indigenous peoples' ancestral territories and associated ethnic rights. In so doing, he was able to transform Amazonian anthropological theory into activism and political mobilization of Amazonian peoples in the defense of their territorial and ethnic autonomy (Varese 2013; see also Hale 2013).

The Peruvian Amazon was at that time (and, to a large extent, continues to be) of marginal interest to most people except those who live and work there. Thus, Varese rooted into a novel position by carving out routes in "no-man's-land." On one hand, the extreme leftist social scientists were more interested in national politics, as well as urban (Lima) and Andean plantation labor issues. On the other hand, because the majority of the population of the Amazon was Indigenous peoples, social scientists of the Right were pessimistic—and racist—about the potential for "development" in the Amazon. Despite the lack of involvement of both the Right and Left Limeño social scientists and policy makers, Varese dedicated himself to becoming an activist anthropologist of the Amazonian geographical area.

He had learned from the Amazonian people about human beings living in relation with all the other-than-human beings around them and challenging the traditional, dichotomous separation between anthropocentric (people-centered) and geocentric (earth-centered) worldviews. At that time, there was no branch of anthropology or geography that stood as a middle ground between the two disciplines, so Varese took initiative to be both a pioneer and a bridge: he was one of the first applied, Indigenous-based political ecologists. He brought questions of place, identity, and their interconnections to the table of political discussions in Lima. He pushed for policies that respect Indigenous peoples' territories and rights of self-determination and that recognize Indigenous epistemologies (ways of knowing), ontologies (ways of being), economies (ways of exchange), and environments (understood as *inseparable* from humans).

Like all things in life, politics has its high moments and its turning points. When General Velasco was removed from power, Varese was forced to leave Peru to begin his life again in Mexico, where he was offered political asylum. Almost immediately, he was called to the refugee camps in the Mexican states of Campeche and Quintana Roo, where he witnessed and recorded the horrific testimonies of Maya and Ladino people escaping the ethnocidal and ecocidal war in neighboring Guatemala. Here, he commenced a career-long practice of serving as a witness on human rights assignments for and with Indigenous peoples. During Nicaragua's Sandinista Revolution in the 1980s, Varese participated

in a verification mission of the LASA task force responsible for investigating human rights abuses in Creole, Miskito, and Garifuna communities. During the 10 years that he lived in Mexico, Varese headed the Ministry of Education development entity for Indigenous people, where he founded and advanced a number of projects, including ones focused on ancestral craft making and bilingual-bicultural education.

In the 1990s, Varese joined the Native American Studies Department at UC Davis, where he became involved in "La Ruta Mixteca" (the Mixtec Route) and the experience of "distant belonging" of thousands of Oaxacan Indigenous peoples, who in Mexico and as undocumented migrants and farm workers in the western US suffer discrimination and human rights abuses. He was instrumental in transforming UC Davis's Native American Studies *Program*, which was founded in 1970, into the first Native American Studies *Department* in the United States. Established in 1993, it is the only Native American Studies Department in the country with a hemispheric focus on Indigenous peoples of *the Americas*.

As emeritus professor, Varese continues to be a much-appreciated teacher, disseminating to his students his spirit of scholar-activism, his perseverance in struggling for cultural and environmental justice, and his love for the Amazon and its peoples. Since 2012, he has taken groups of students to Ecuador in his UC Davis Summer Abroad program, called "Sustainable Ecuador: From the Andes to the Amazon." Since the Ecuadorian government made the decision to proceed with oil extraction in Yasuni-ITT blocks of Yasuni National Park, he has joined a task force to defend the rights of the Waorani and the uncontacted Taromenani, Tagaeri, and Dubakaeri peoples.

When Charles Hale (the director of the Lozano Long Institute of Latin American Studies at the University of Texas and an internationally renowned activist anthropologist) introduced Varese at the LASA / Oxfam America Martin Diskin Memorial Lectureship, he described him as having mastered "the sage ability to maintain both an intense reverence for the weight of history, and an abundant appreciation for the dance of life" (2013: 1). Committed to Indigenous peoples' rights since 1960s, in Peru, Mexico, Guatemala, Nicaragua, the United States, and worldwide, Varese has made an assortment of moves, but each has been critical in working toward Indigenous peoples' rights to resist development and demand respect for their cultural, educational, economic, and territorial self-determination.

Varese takes the position that respecting Amazonian peoples' rights to live in dignified ways in their ancestral lands, which consist largely of primary and secondary forest, also means protecting the rain forest. His books and articles have argued for what he learned five decades ago by living with the Asháninka people of the Amazon: that humans and the other-than-human are inseparable in both Indigenous cosmologies and their lived "environments." Moreover,

respecting Indigenous rights to their territories is vital to *everybody's* survival. Why? We might learn a thing or two from Indigenous communities about living sustainably—that is, if we learn how to listen, as Varese has.

Varese's publications include *Witness to Sovereignty: Essays on the Indian Movement in Latin America* (2006) and *Salt of the Mountain: Campa Asháninka History and Resistance in the Peruvian Jungle* (2004). Most recently, he and Fréderique Apfel-Marglin coedited a quintessential volume in Amazonian studies, *Selva vida: De la destrucción de la Amazonía al paradigma de la regeneración* (Jungle Life: From the Destruction of the Amazon to the Paradigm of Regeneration, 2013).

VI (iii): Building Sustainable Solutions to Climate Change: Tsechu Dolma[5]

Tsechu Dolma is a graduate student pursuing a master's in public administration (MPA) degree at Columbia University's School of International and Public Affairs. She received a Brower Youth Award on October 21, 2014. These awards have been given since 2010 to young environmental leaders from across North America in recognition of "sustainable projects, innovative ideas, and informed analyses" that benefit the environment (Brower Youth Awards 2015). In 2013, she

Tsechu Dolma (*at far left*) in Upper Mustang, Nepal. (Tsechu Dolma)

received one of the 50 prestigious Morris K. Udall Scholarships that are awarded annually to undergraduate students in the United States who demonstrate a commitment to careers in the environment, American Indian health care, or tribal public policy

Dolma was born in Nepal to Tibetan refugee parents. During the 1950s, her father fought against Chinese occupation, and her family was forced into exile. She and her family were granted political asylum in the United States, and they moved to New York City when she was 10 years old.

"For us, the mountains represent home." As Tibetan refugees, Dolma explains, "we don't have a political home that you can point at on a map. But, when you see the mountains, you know . . . that's where home is." Dolma's first chance to go back to Nepal came when she when she was 17. She returned as an ethnographic research assistant studying at Barnard College. Fluent in Nepali and Tibetan, she established strong ties with villagers in the Upper Mustang region in the Nepalese Himalayas.

She learned from them that climate change had brought changes in seasonal weather patterns and that stream flow was reduced because of glacier retreat. "When I spoke to community members," Dolma recalls, "they brought up problems of erratic precipitation, depleting water resources, and, due to the effects of climate change, food security was becoming an increasing problem."

Working with members of the Himalayan diaspora communities in New York and with academic researchers, she wrote a successful grant proposal for a community greenhouse to address these challenges by improving agricultural yields and conserving water. The villagers welcomed the idea of the greenhouse and worked with Dolma to turn the idea into a concrete reality.

Together, Dolma and the community members found ways to involve village youth, who felt keenly the lack of employment opportunities in the region. The greenhouse, made of locally available materials to avoid dependence on external markets, is now complete and operational. "Communities like Mustang have existed for centuries," says Dolma. "It has a very rich history. These communities are vulnerable and endangered by the effects of climate change. The only way these communities can move forward is if we build sustainable models of local ownership and expansion of community rights over resources."

Commenting on Dolma's work in Mustang, the renowned anthropologist Ben Orlove noted, "There are many projects where there is an initial investment and then the thing collapses. What's fantastic about Tsechu's project is that it draws on ongoing community resources to assure that it is sustainable."

Dolma remains active in community-oriented development. She is cofounder and strategic director of the Yulha Fund, which seeks to address climate change in the Himalayan region by promoting food security, energy security, and what it terms "talent security"—finding meaningful work for youth in high mountain regions. She also works with ACHA Himalayan Sisterhood, a group

that addresses the needs of immigrant and refugee girls and women. Dolma has worked as a development consultant at the United Nations Development Programme (UNDP), where she designed its strategy on extractive industry and natural resource management in Columbia. She contributes regularly to merabsarpa.com, an online platform for scholarly engagement among Tibetan students, and writes about issues of gender inequality, tourism, and water in Nepal on glacierhub.org.

VII. World Is Burning, Sky Is Falling: Welcome!

Piers Blaikie begins his landmark *The Political Economy of Soil Erosion in Developing Countries* by declaring that it "is not a neutral book. It takes sides and argues a position because soil erosion *is* a political-economic issue, and even a position of so-called neutrality rests upon partisan assumptions" (1985: 1; qtd. in Forsyth 2008: 756). The idea that scholarly discourse must—in order to be reputable or scholarly in the first place—refrain from making value judgments has been discredited for some time. As William Schulz explains,

> Any individual or institution with power (and, as Plato taught us, the defining characteristic of Being is power so every individual and institution qualifies) cannot avoid making a decision as to how to use that power. That decision in turn constitutes an ethical choice. The power capital which the scholar has to expend . . . is intellectual. In some cases the intellectual power a scholar has to wield may have relatively little impact on the contemporary world. In most academic disciplines, however, the relationship between ideas and consequences is quite direct. (2004: vi)

In other words, ideas matter, scholars have power, "and the morally reputable choice is to extend that power on behalf of those who suffer" (ibid.). Socio-environmental research and advocacy needs students who are not afraid to take a position on an issue for fear of seeming un-"objective" or being "biased." It needs rigorous critical scholarship, scholarship that is born both of urgency and of critique (LaDuke 1999).

Paolo Freire's *Pedagogy of the Oppressed* (1970) explains the social urgency and educational opportunity of active, engaged inquiry—a pedagogy that has helped inform the praxis-oriented research methodologies animating activist scholarship and scholar-advocacy. The very urgency of environmental change and environmental injustice demands rigorous research—and rigorous self-reflexivity on the part of the researcher and of society in general. According to many social science approaches to environmental problems, thorough scholarship also needs to debate and, if need be, problematize the very terms used to pose the ecological problem in the first place. Academia, at its best, is an

extraordinarily powerful—and potentially empowering—space in the contemporary world, providing a rare and invaluable opportunity for critical analysis, collective reflection, and open-minded debate. Here, even Freire is questioned: the dichotomous categories of "oppressor" and "oppressed" reflected stark political and social inequities in 1960s Brazil. Do those inequalities pertain in other societies today? Who are the oppressors and the oppressed today—particularly in terms of agricultural and environmental crises? Can one be both?

Global climate change alone serves as a sort of ongoing wake-up call—a global warning, if you will—to pay attention to weather patterns, to regional water levels, to the shifting geography of insects and the rise of infestations—in short, farmer talk, what growers and fishers and hunters and ranchers have been talking about for millennia. The deagrarianization of modern life ironically has culminated in a begrudging—but irrevocable—reagrarianization of our news. After years of acute drought, the Salinas Valley crisis finally makes mainstream news: a parched fruit basket for the nation that, as it turns out, does not have its own water source. Here a nation begins the process of facing its unecological collective decision to grow its fresh produce in the desert. For generations, Californian (as in US) agriculture has banked on dams to solve its aridity and in the process forestalled the ecological inevitable—as well as flaunted Mexican fishing communities downstream of the Colorado River, where fishing boats perch drily on what use to be riverbanks.

Thanks in part to anti- and alter-globalization movements, Indigenous activism, and rising interests in local, organic, DIY, degrowth, slow food, and back-to-the-land lifestyles, mainstream thinking is recognizing that humans cannot exist apart from nature—that we in fact are nature—and that our knowledge of the environment, even knowledge gained through scientific methods, is socially constructed and historically contingent (Berkhout et al. 2003). This realization is also supported by the recent growth in critical theory and science and technology studies.

As pockets of skepticism give way to shared consensus—that anthropogenic climate change is under way, that clean water is important, that fish are a good food source—a host of questions promptly emerge: Does everyone deserve fresh water and affordable seafood or just "me" and people like me? (How) would effective watershed protections ever actually happen? Who is to blame for this mess? Ethically speaking, how important is the environment as an arena for action? Are there other issues that demand attention and a higher priority than the environment? Environmental management demands both personal lifestyle changes and community organizing, both political activism and economic reform. How does one prioritize these concurrent needs, these lines of action? If environmental management demands collective action, how do groups form and operate effectively—from families to neighborhoods, campuses to online social networks, political parties to private businesses? What frameworks are

best suited to capture the sociopolitical complexities of environmental issues? What scales of reference are most capable of enacting wise, lasting change?

In a recent special section of the *Journal of Political Ecology*, Brian Burke and Boone Shear argue that engaged researchers can help build sustainable futures by "(1) examining the tremendously diverse, already-existing experiments with other ways of being in the world, (2) helping to develop alternative visions, analyses, narratives, and desires that can move people to desire and adopt those ways of being, and (3) actively supporting and constructing economies and ecologies with alternative ethical orientations" (2014: 127). Of course, diverse worldviews debate and clash regarding how to mitigate, adapt to, and even survive rising ocean temperatures, impending urban water shortages, and coastal anaerobic "dead" zones. And as specialized researchers pursue the logic of their own disciplines, they risk removing themselves from these and other needs of society (Hollingsworth 1984: 34). Engaged and integrative research prevents this sort of isolating specialization and disciplinary navel-gazing while remaining beholden to the community where it is being carried out.

Here, we have briefly presented two interdisciplinary theoretical frameworks (historical ecology and political ecology) and two methodological approaches (participatory and collaborative) within environmental social science. But none of these is a panacea. To be sure, today's diverse socio-environmental crises demand diverse solutions. "No single notion, model, or approach," according to Barbara Rose Johnston, "is sufficiently capable to handle problems that are synergistic and cumulative. . . . [All] sorts of paths are necessary and all sorts of risks must be taken. We need the continuum of actors, . . . and that continuum includes those who *do* as well as those who distance themselves from action" (2001c: 42).

Never before has the world needed so many hydrologists, agroecologists, ecologically minded engineers, or geoscientists. But climate science or toxicology alone will not save the day. As the diversity of case studies in this reader attests, an eroded hillside cannot be extricated from the broader political, economic, and sociohistorical processes that drove local farmers to such marginal lands in the first place. Bee colony collapse disorder is not apolitical. Never before has the world needed so many artists, authors, poets, playwrights, performers, and filmmakers to document our environmental crises, to give these crises a human face, and to stir audiences to action. The world has never needed so many environmental social scientists to bridge the humanities' and natural sciences' perspectives. But without communities to guide the research, challenge its assumptions, and contextualize its findings, the social sciences may not be sufficient to address today's socio-environmental crises.

Profiles of three anthropologists whose work is engaged and action oriented have also been offered in this chapter. This book is peppered with the works of

many more. And still more research is being carried out that we have not the space to acknowledge here. While Johnston, Varese, and Dolma differ in their backgrounds, in their research foci, in their institutional affiliations, and in the stages of their careers, they are united in their commitment to participatory, collaborative, and cause-oriented socio-environmental research.

While the case studies in this book and the events referenced in this chapter are undoubtedly alarming, our message is optimistic, especially in light of the burgeoning interdisciplinary and collaborative scholar-advocacy shown here. Where there is crisis, there is opportunity. After all, the larger and more complicated the problem, the more prospects exist for us to advance social and environmental justice. Each toxic coal-slurry spill serves as an invitation. Each oil-train explosion is a summons. The world is burning, the sky is falling: welcome aboard! You, as a student of ecological anthropology and/or environmental social science, are now part of this exciting and timely work.

NOTES

1. Each of these 116 cases is a confirmed extrajudicial killing, murder without state involvement, or enforced disappearance documented in publicly available information. The Global Witness report acknowledges that the actual figures are undoubtedly higher, but media suppression in some countries as well as limited civil society monitoring in others leads to scant data on the killing of environmental activists.
2. On May 18, 2015—just months after New York governor Andrew Cuomo passed a statewide fracking ban—Texas governor Greg Abbott signed into law a bill that restricts cities and towns from attempting to ban fracking operations and from imposing ordinances that would regulate oil and gas drilling. Oklahoma is currently poised to pass a similar law, despite a recent dramatic increase in seismic activity linked to the great quantities of wastewater that are injected into the ground as part of the hydraulic fracturing process.
3. While this action of the Pollinator Health Task Force is most certainly an important first step, it has come under fire from farmers, beekeepers, scientists, and environmentalists for not going far enough to acknowledge the role of neonicotinoid pesticides in contributing to bee colony collapse.
4. For example, scholars like Jake Kosek (2004) and Carolyn Finney (2014) remind us that prevailing social constructions of nature often maintain many of the gendered and racialized demarcations governing historical dichotomies of nature and culture, that dominant conceptions of "wilderness" are valued and preserved through racialized language and spatializations, thereby reinforcing racialized exclusions. Julian Agyeman (2013) builds off 20th-century scholarship and activism investigating environmental injustice to propose an urban planning that holds antiracism, cultural diversity, and social justice as central to its definition of environmental sustainability.
5. This feature was adapted and is being reproduced with generous permission from Benjamin Orlove and Tsechu Dolma. The original feature may be viewed online at http://glacierhub.org/2015/01/08/two-glacierhub-writers-win-prizes-in-2014/. The Profile Film "Tsechu Dolma, 2014 Brower Youth Award Winner" may be viewed at http://www.broweryouthawards.org/winner/tsechu-dolma/ and https://www.youtube.com/watch?v=t_Z9i_FYGTg.

REFERENCES

Agyeman, Julian. 2013. *Just Sustainabilities: Policy, Planning and Practice*. New York: Zed Books.

American Anthropological Association. 2007. Lourdes Arizpe Award: Engaging Environmental Issues and Policy. http://www.aaanet.org/cmtes/copapia/Arizpe.cfm.

Atleo, E. Richard. 2011. *Principles of Tsawalk: An Indigenous Approach to Global Crisis*. Vancouver and Toronto, Canada: UBC Press.

Bacon, Francis. 1870. *The Works of Francis Bacon*. Vol. 4. James Spedding, Robert L. Ellis, Douglas D. Health, eds. London: Longmans Green.

Balée, William. 2006. The Research Program of Historical Ecology. *Annual Review of Anthropology* 35:75–98.

Balée, William, and Clark L. Erickson. 2006. Time, Complexity, and Historical Ecology. In *Time and Complexity in Historical Ecology: Studies in the Neotropical Lowlands*, edited by William Balée and Clark L. Erickson, 1–17. New York: Columbia University Press.

Berkes, Fikret. 1999. *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Philadelphia: Taylor and Francis.

Berkhout, Frans, Melissa Leach, and Ian Scoones. 2003. Shifting Perspectives in Environmental Social Science. In *Negotiating Environmental Change: New Perspectives from Social Science,* edited by Frans Berkhout, Melissa Leach, and Ian Scoones, 1–32. Northampton, MA: Edward Elgar.

Blaikie, Piers. 1985. *The Political Economy of Soil Erosion in Developing Countries*. London: Longman Development Series.

Blaikie, Piers, and Harold Brookfield. 1987a. Defining and Debating the Problem. In *Land Degradation and Society*, edited by Piers Blaikie and Harold Brookfield, 1–26. London: Methuen.

Blaikie, Piers, and Harold Brookfield, eds. 1987b. *Land Degradation and Society*. London: Methuen.

Blaikie, Piers, and Harold Brookfield. 1987c. Retrospect and prospect. In *Land Degradation and Society, edited by Piers Blaikie and Harold Brookfield*, 239–250. London: Methuen.

Brower Youth Awards. 2015. Our Work. http://www.broweryouthawards.org/about/.

Burke, Brian, and Boone Shear. 2014. Engaged Scholarship for Non-capitalist Political Ecologies. *Journal of Political Ecology* 21: 127–154.

Burke, Peter. 2012. *A Social History of Knowledge*, vol. 2, *From the Encyclopaedia to Wikipedia*. Malden, MA: Polity.

Buxton, Nick. 2011. The Law of Mother Earth: Behind Bolivia's Historic Bill. *Yes Magazine!*. April 21. http://www.yesmagazine.org/planet/the-law-of-mother-earth-behind-bolivias-historic-bill.

Cahill, Caitlin. 2007a. Afterword: Well Positioned? Locating Participation in Theory and Practice. *Environment and Planning A* 39 (12): 2861–2865.

Cahill, Caitlin. 2007b. Repositioning Ethical Commitments: Participatory Action Research as a Relational Praxis of Social Change. *ACME: An International E-Journal for Critical Geographies* 6 (3): 360–373.

Cahill, Caitlin, Farhana Sultana, and Rachel Pain. 2007. Participatory Ethics: Politics, Practices and Institutions. *ACME: An International E-Journal for Critical Geographies* 6 (3): 304–318.

Carlton, Jim. 2014. California Cities Crack Down on Water Use. *Wall Street Journal*. June 30, 2014. http://www.wsj.com/articles/california-cities-crack-down-on-water-use-amid-drought-1404170293.

Carson, Rachel. 1962. *Silent Spring*. Boston: Houghton Mifflin; Cambridge, MA: Riverside.

Chambers, Robert. 1983. *Rural Development: Putting the First Last*. Harlow, UK: Longman.

Chávez, Franz. 2014. Bolivia's Mother Earth Law Hard to Implement. Inter Press Service (IPS) News Agency. May 19, 2014. http://www.ipsnews.net/2014/05/bolivias-mother-earth-law-hard-implement/.

Commoner, Barry. 1971. *The Closing Circle: Nature, Man, and Technology*. New York: Bantam Books.

Cronon, William, ed. 1996. *Uncommon Ground: Rethinking the Human Place in Nature*. New York: Norton.

Crumley, Carole L. 1998. Foreword to *Advances in Historical Ecology*, edited by William Balée, ix–xiv. New York: Columbia University Press.

Crumley, Carole L. 2006. Historical Ecology: Integrated Thinking at Multiple Temporal and Spatial Scales. In *The World System and the Earth System: Global Socioenvironmental Change and Sustainability since the Neolithic*, edited by Alf Hornborg and Carole Crumley, 15–28. Walnut Creek, CA: Left Coast.

Denzin, Norman K., Yvonna S. Lincoln, and Linda T. Smith. 2008. *Handbook of Critical and Indigenous Methodologies*. Los Angeles: Sage.

Donahue, John, and Barbara Rose Johnston, eds. 1998. *Water, Culture and Power: Local Struggles in a Global Context*. Covelo, CA: Island.

Dove, Michael. 1999. Writing For, versus About, the Ethnographic Other: Issues of Engagement and Reflexivity in Working with a Tribal NGO in Indonesia. *Identity* 6 (2–3): 225–253.

Environmental Humanities Initiative. 2015. Home page. University of California, Santa Barbara. http://ehc.english.ucsb.edu/?page_id=1266.

Esbjörn-Hargens, Sean. 2006. Integral Ecology: An Ecology of Perspectives. *AQAL: Journal of Integral Theory and Practice* 1 (1): 267–304.

Fals Borda, Orlando. 1978. Por la praxis: El problema de cómo investigar la realidad para transformarla. Bogota, Colombia: Federación para el análisis de la realidad Colombiana (FUNDABCO).

Fals Borda, Orlando. 1987. The Application of Participatory Action-Research in Latin America. *International Sociology* 2 (4): 329–347.

Finney, Carolyn. 2014. *Black Faces, White Spaces: Reimagining the Relationship of African Americans to the Great Outdoors*. Chapel Hill: University of North Carolina Press.

Folmer, Henk, and Olof Johansson-Stenman. 2011. Does Environmental Economics Produce Aeroplanes without Engines? On the Need for an Environmental Social Science. *Environmental Resource Economics* 48:337–361.

Forbes, Jack D. 2008. *Columbus and Other Cannibals: The Wétiko Disease of Exploitation, Imperialism, and Terrorism*. New York: Seven Stories.

Forsyth, Tim. 2008. Political Ecology and the Epistemology of Social Justice. *Geoforum* 39:756–764.

Foster, John Bellamy. 2000. *Marx's Ecology: Materialism and Nature*. New York: Monthly Review Press.

Foster, John Bellamy. 2005. The Vulnerable Planet. In *Environmental Sociology: From Analysis to Action*, edited by Leslie King and Deborah McCarthy, 3–15. Lanham, MD: Rowman and Littlefield.

Fox, Jonathan A. 2006. Lessons from Action-Research Partnerships: LASA / Oxfam America 2004 Martin Diskin Memorial Lecture. *Development in Practice* 16 (1): 27–38.

Francis, Richard C. 2012. *Epigenetics: How Environment Shapes Our Genes*. New York: Norton.

Freire, Paolo. 1970. *Pedagogy of the Oppressed*. New York: Continuum.

Gaile, Gary L., and Cort J. Wilmott. 1989. Introduction to *Geography in America*, edited by Gary L. Gaile and Cort J. Wilmott, xxiv–xliv. Columbus, OH: Merrill.

Gibbs, Meredith. 2001. Toward a Strategy for Undertaking Cross-Cultural Collaborative Research. *Society & Natural Resources* 14 (8): 673–687.

Global Alliance for the Rights of Nature. 2014. 2014 Rights of Nature Tribunal. http://therightsofnature.org/lima-2014-tribunal/.

Global Witness. 2015. How Many More? 2014's Deadly Environment: The Killing and Intimidation of Environmental and Land Activists, with a Spotlight on Honduras. https://www.globalwitness.org/campaigns/environmental-activists/how-many-more/.

Goodman, Allan H., and Thomas L. Leatherman. 1998. *Building a New Biocultural Synthesis: Political-Economic Perspectives on Human Biology*. Ann Arbor: University of Michigan Press.

Graddy-Lovelace, T. Garrett. 2013. Regarding Biocultural Heritage: In Situ Political Ecology of Agricultural Biodiversity in the Peruvian Andes. *Agriculture and Human Values* 30:587–604.

Guthman, Julie. 2014. Doing Justice to Bodies? Reflections on Food Justice, Race, and Biology. *Antipode* 46 (5): 1153–1171.

Hale, Charles R. 2013. Introduction of the Recipient, Stefano Varese. 2013 LASA / Oxfam America Martin Diskin Lecture. *LASA Forum* 44 (3): 6–7.

Harvey, David. 2014. *Seventeen Contradictions and the End of Capitalism*. Oxford: Oxford University Press.

Hazlewood, Julianne A. 2006. *Community Forestry Research Fellowship Final Report: The Alaska Native Claims Settlement Act, Sitka Tribal Collaboration with the Forest Service, and Cultural Resilience*. Ford Foundation's 2006 Community Forestry Research Fellowship. https://nature.berkeley.edu/community_forestry/People/Final%20Reports/hazelwood%20final.pdf.

Hazlewood, Julianne A. 2010. Geographies of CO_2lonialism and Hope in the Northwest Pacific Frontier Territory-Region of Ecuador. Ph.D. dissertation, University of Kentucky.

Heckler, Serena, ed. 2009. *Landscape, Process and Power: Re-evaluating Traditional Environmental Knowledge*. New York: Berghahn Books.

Hollingsworth, Rogers. 1984. The Snare of Specialization. *Bulletin of the Atomic Scientists* 40 (6): 34–37.

Indigenous Peoples Specialty Group of the Association of American Geographers. 2010. AAG Indigenous Peoples Specialty Group's Declaration of Key Questions about Research Ethics with Indigenous Communities. http://www.indigenousgeography.net/IPSG/pdf/IPSG ResearchEthicsFinal.pdf.

Johnston, Barbara Rose. 1994a. Experimenting on Human Subjects: Nuclear Weapons Testing and Human Rights Abuse. In *Who Pays the Price? The Sociocultural Context of Environmental Crisis*, edited by Barbara Rose Johnston, 131–141. Washington, DC: Island.

Johnston, Barbara Rose, ed. 1994b. *Who Pays the Price? The Sociocultural Context of Environmental Crisis*. Washington, DC: Island.

Johnston, Barbara Rose. 2001a. Anthropology and Environmental Justice: Analysts, Advocates, Mediators, and Troublemakers. In *New Directions in Anthropology and Environment: Intersections,* edited by Carole Crumley, 132–149. Lanham, MD: AltaMira.

Johnston, Barbara Rose. 2001b. Considering the Power and Potential of the Anthropology of Trouble. In *Ecology and the Sacred: Engaging the Anthropology of Roy A. Rappaport,* edited by Ellen Messer and Michael Lambek, 99–121. Ann Arbor: University of Michigan Press.

Johnston, Barbara Rose. 2001c. Practicing Anthropology in the Human Rights Arena. *NAPA Bulletin* 20 (1): 39–44.

Johnston, Barbara Rose. 2005. *Chixoy Dam Legacy Issues Study*, vol. 1, *Executive Summary: Consequential Damages and Reparation: Recommendations for Remedy*. Santa Cruz: Center for Political Ecology.

Johnston, Barbara Rose, ed. 2007. *Half-Lives and Half-Truths: Confronting the Radioactive Legacies of the Cold War*. Santa Fe, NM: School for Advanced Research Press.

Johnston, Barbara Rose, ed. 2011. *Life and Death Matters: Human Rights, Environment, and Social Justice*. Walnut Creek, CA: Left Coast.

Johnston, Barbara Rose. 2012. An Anthropological Ecology? Struggles to Secure Environmental Quality and Social Justice. *Kroeber Anthropological Society Papers* 101 (1): 3–21.

Johnston, Barbara Rose, and Holly M. Barker. 2008. *Consequential Damages of Nuclear War: The Rongelap Report*. Walnut Creek, CA: Left Coast.

Johnston, Ron. 2005. Geography—Coming Apart at the Seams? In *Questioning Geography: Fundamental Debates*, edited by Noel Castree, Alisdair Rogers, and Douglas Sherman, 9–25. Malden, MA: Blackwell.

Jupp, Eleanor. 2007. Participation, Local Knowledge, and Empowerment: Researching Public Space with Young People. *Environment and Planning A* 39 (12): 2832–2844.

Kesby, Mike. 2007. Spatializing Participatory Approaches: The Contribution of Geography to a Mature Debate. *Environment and Planning A* 39 (12): 2813–2831.

Kimmerer, Robin Wall. 2002. Weaving Traditional Ecological Knowledge into Biological Education: A Call to Action. *BioScience* 52:432–438.

Kindon, Sara. 2005. Participatory Action Research. In *Qualitative Research Methods in Human Geography* (2nd ed.), edited by Iain Hay, 207–220. Oxford: Oxford University Press.

Kindon, Sara, Rachel Pain, and Mike Kesby, eds. 2007. *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place*. New York: Routledge.

Kopenawa, Davi, and Bruce Albert. *The Falling Sky: Words of A Yanomami Shaman*. Translated by Nicholas Elliott and Alison Dundy. Cambridge, MA: Harvard University Press.

Kosek, Jake. 2004. Purity and Pollution: Racial Degradation and Environmental Anxieties. In *Liberation Ecologies: Environment, Development, Social Movements* (2nd ed.), edited by Richard Peet and Michael Watts, 115–152. London: Routledge.

LaDuke, Winona. 1999. *All Our Relations: Native Struggles for Land and Life*. Boston: South End.

Lassiter, Luke E. 2000. Commentary: Authoritative Texts, Collaborative Ethnography, and Native American Studies. *American Indian Quarterly* 24 (4): 601–614.

Malaurie, Jean. 2013. Foreword to *The Falling Sky: Words of A Yanomami Shaman*, by Davi Kopenawa and Bruce Albert, vii–viii. Translated by Nicholas Elliott and Alison Dundy. Cambridge, MA: Harvard University Press.

McMichael, Philip. 2013. Agrofuels in the Food Regime. In *The Politics of Biofuels, Land and Agrarian Change*, edited by Saturnino M. Borras Jr., Philip McMichael, and Ian Scoones, 35–56. London: Routledge.

Merchant, Carolyn. 1980. *The Death of Nature: Women, Ecology, and the Scientific Revolution*. New York: HarperCollins.

Merchant, Carolyn. 2005. *Radical Ecology: The Search for a Livable World* (2nd ed.). New York: Routledge.

Mignolo, Walter. 2005. *The Idea of Latin America*. Malden, MA: Blackwell.

Moncayo, Victor Manuel. 2013. Una sociología sentipensante para América Latina. In *Una sociología sentipensante para América Latina: Antología de Fals Borda*, edited by Emir Sader, 9–19. Bogota, Colombia: Siglo de Hombre Editores y CLASCO.

Moran, Emilio. 2010. *Environmental Social Science: Human-Environment Interactions and Sustainability*. Malden, MA: Wiley-Blackwell.

Nast, Heidi J. 1998. The Body as "Place": Reflexivity and Fieldwork in Kano, Nigeria. In *Places through the Body,* edited by Heidi J. Nast and Steve Pile, 93–116. New York: Routledge.

National Interagency Fire Center. 2015. Historically Significant Wildland Fires. https://www.nifc.gov/fireInfo/fireInfo_stats_histSigFires.html.

National Oceanic and Atmospheric Administration (NOAA). 2015. Global Analysis—April 2015. http://www.ncdc.noaa.gov/sotc/global/201504.

O'Connor, James. 1998. Capitalism, Nature, Socialism: A Theoretical Introduction. *Capitalism, Nature, Socialism* 1 (1): 11–38.

O'Gorman, Jodie, and Katie Meyers. 2014. Dr. Barbara Rose Johnston: Examining Society and Environment. *Department of Anthropology Newsletter*, Winter, Michigan State University. http://anthropology.msu.edu/wp-content/uploads/2014/02/ANPNewsWinter2014.pdf.

Paulson, Susan, Lisa Gezon, and Michael Watts. 2003. Locating the Political in Political Ecology: An Introduction. *Human Organization* 62 (3): 205–217.

Polanyi, Karl. 1944. *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon.

Pollinator Health Task Force. 2015. National Strategy to Promote the Health of Honey Bees and Other Pollinators. Washington, DC: White House.

Posey, Darrell Addison, and Kristina Plenderlieth, eds. 2004. *Indigenous Knowledge and Ethics: A Darrell Posey Reader*. New York: Routledge.

Pretty, Jules. N., Irene Guijt, John Thompson, and Ian Scoones. 1995. *Participatory Learning and Action: A Trainer's Guide*. London: IIED.

Puig, Juan Falconi. 2014. Ecuador Has Set Up Independent Inquiry into the Death of the Indigenous Leader José Tendetza. *Guardian*. December 18, 2014. http://www.theguardian.com/world/2014/dec/18/ecuador-independent-inquiry-death-indigenous-leader-jose-tendetza.

Rappaport, Roy. 1993. Distinguished Lecture in General Anthropology: The Anthropology of Trouble. *American Anthropologist* 95 (2): 295–303.

Republic of Ecuador. 2008. Constitution of the Republic of Ecuador. Quito: Ecuadorian National Assembly, Legislative and Oversight Committee. English version available at http://pdba.georgetown.edu/Constitutions/Ecuador/english08.html.

Robbins, Paul. 2004. *Political Ecology: A Critical Introduction*. Malden, MA: Blackwell.

Robbins, Paul, John Hintz, and Sarah A. Moore. 2013. *Environment and Society: A Critical Introduction* (2nd ed.). Malden, MA: Wiley Blackwell.

Rocheleau, Dianne. 2008. Political Ecology in the Key of Policy: From Chains of Explanation to Webs of Relation. *Geoforum* 39:716–727.

Rocheleau, Dianne, Barbara Thomas-Slayter, and Esther Wangari, eds. 1996. *Feminist Political Ecology: Global Issues and Local Experiences*. London: Routledge.

Schulz, William. 2004. Foreword to *Human Rights: The Scholar as Activist,* edited by Carole Nagengast and Carlos Velez-Ibanez, v–ix. Oklahoma City: Society for Applied Anthropology.

Smith, Linda Tuhiwai. 1999. *Decolonizing Methodology: Research and Indigenous Peoples*. New York: Zed Books.

Stout, David. 2015. More than Two Environmental Activists Were Killed Each Week in 2014. *Time*. April 20, 2015. http://time.com/3827939/environmental-activists-killed-2014-global-witness/.

Sunjic, Melita. 2008. Top UNHCR Official Warns about Displacement from Climate Change. *United Nations High Commission on Refugees (UNHCR) News*. December 9. http://www.unhcr.org/493e9bd94.html.

Swetnam, Thomas W., Craig D. Allen, and Julio L. Betancourt. 1999. Applied Historical Ecology: Using the Past to Manage for the Future. *Ecological Applications* 9 (4): 1189–1206.

Thomas-Slayter, Barbara. 2001. A Brief History of Participatory Methodologies. In *Power, Process, and Participation: Tools for Change*, edited by Rachel Slocum, Lori Wichhart, Dianne Rocheleau, and Barbara Thomas-Slayter, 17–30. London: ITDG.

Varese, Stefano. 2004. *Salt of the Mountain: Campa Asháninka History and Resistance in the Peruvian Jungle*. Norman: University of Oklahoma Press.

Varese, Stefano. 2006. *Witness to Sovereignty: Essays on the Indian Movement in Latin America*. Copenhagen, Denmark: IWGIA.

Varese, Stefano. 2013. Eulogy of Utopian Praxis: From Dystopian Reality to the Research of Hope. 2013 LASA / Oxfam America Martin Diskin Lecture. *LASA Forum* 44 (3): 8–13.

Varese, Stefano, and Fréderique Apfel-Marglin, eds. 2013. *Selva vida: De la destrucción de la Amazonía al paradigma de la regeneración*. Copenhagen, Denmark: IWGIA.

Watson, Annette, and Orville H. Huntington. 2008. They're *Here*—I Can *Feel* Them: The Epistemic Spaces of Indigenous and Western Knowledges. *Social and Cultural Geography* 9 (3): 257–281.

Watts, Jonathan, and Dan Collyns. 2014. Ecuador Indigenous Leader Found Days before Planned Lima Protest. *Guardian*. December 6, 2014. http://www.theguardian.com/world/2014/dec/06/ecuador-indigenous-leader-found-dead-lima-climate-talks.

Watts, Michael, and Richard Peet. 2004. Liberating Political Ecology. In *Liberation Ecologies: Environment, Development, and Social Movements* (2nd ed.), edited by Richard Peet and Michael Watts, 3–42. New York: Routledge.

Weaver, Jace, ed., 1996. *Defending Mother Earth: Native American Perspectives on Environmental Justice*. Maryknoll, NY: Orbis Books.

White, Ben, Saturnino M. Borras, Jr., Ruth Hall, Ian Scoones, and Wendy Wolford, eds. 2013. *The New Enclosures: Critical Perspectives on Corporate Land Deals*. New York City: Routledge.

Wildcat, Daniel. 2009. *Red Alert! Saving the Planet with Indigenous Knowledge*. Golden, CO: Fulcrum.

Wilmsen, Carl. 2006. Participation, Reciprocity, and Empowerment in the Practice of Participatory Research. College of Natural Resources, University of California, Berkeley. http://nature.berkeley.edu/communityforestry/Workshops/2006/WCAR%202006%20final%20draft%20Wilmsen.pdf.

World Commission on Dams (WCD). 2000. *Dams and Development: A New Framework for Decision-Making*. London: Earthscan.

Zimmerer, Karl, and Thomas Bassett, eds. 2003. *Political Ecology: An Integrative Approach to Geography and Environment Development Studies*. New York: Guilford.

42

A Wonderfully Incomplete Bibliography of Action-Oriented Anthropology and Applied Environmental Social Science

ALLISON HARNISH, JULIANNE A. HAZLEWOOD, AMANDA BEDKER, AND SYDNEY ROEDER

We call this a wonderfully incomplete bibliography. It is very much incomplete in that there is such a great deal of relevant scholarship that we—for space limitations alone—have been unable to include it all. And it is indeed wonderful that there is so much applied, activist, advocate, engaged, collaborative, praxis, problem-focused, and participatory research related to anthropology and the environment that it simply cannot be contained within a single book chapter. The large and growing canon of action-oriented anthropology and applied environmental social science is wonderfully inspiring. And so the following suggested reading for continued scholarly engagement in today's socio-environmental issues is, we feel, an apt way to conclude this reader. This bibliography begins with a noncomprehensive list of relevant websites. The bibliography is then sectioned into journal special issues and dedicated sections, journal articles, books, book chapters, and web publications. The vast majority of these references were recommended by members of the Anthropology and Environment Society, a section of the American Anthropological Association with its own listserv boasting over two thousand members.

Organization Websites

What follows is a noncomprehensive list of organizations and agencies related to environmental social science, environmental activism, and sustainability. The description for each organization comes from that organization's website.

350.org

http://www.350.org

350.org is a global climate movement founded in 2008 by the author Bill McKibben and a group of American university students. Today, they work in over 180 countries on campaigns ranging from fighting coal power plants in India to stopping the Keystone XL pipeline in the U.S. and divesting public institutions everywhere from fossil fuels.

Anthropology and Environment Society

http://www.aaanet.org/sections/ae/

The Anthropology and Environment Society is a section of the American Anthropological Association. The society hosts an *Engagement Blog* featuring firsthand accounts by anthropologists and other social scientists who have been directly engaged in work on environmental problems.

Beautiful Solutions

https://solutions.thischangeseverything.org/#

The Beautiful Solutions Gallery and Lab is an online "solutions lab" launched by Beautiful Trouble (a book, web toolbox, and international network of artist-activist trainers whose mission is to make grassroots movements more creative and more effective) in partnership with This Changes Everything (a multi-platform project that includes a nonfiction book by Naomi Klein and a feature documentary by Avi Lewis). Beautiful Solutions provides valuable resources and inspiration for activists and organizers on the front lines of building an intersectional global movement for system change. It is housed alongside the website for Naomi Klein's book, *This Changes Everything: Capitalism vs. the Climate*.

Center for Political Ecology

http://www.centerforpoliticalecology.org/

The Center for Political Ecology (CPE) is an independent 501(c)3 nonprofit based in Santa Cruz, California. It supports political ecology scholarship, education, advocacy, and transformative change by serving as the fiscal sponsor for environmental action, agroecology, and sustainability groups in the Monterey and San Francisco Bay Area as well as the CPE action-research collective: a transdisciplinary, international group of researchers whose science and human rights action research focuses on environment, health, and human rights. Working in alliance with diverse partners and communities, the Center for Political Ecology's action research documents the conditions that structure human environmental crises and their consequential damages in ways that define and, ideally, secure meaningful remedy.

Center for Popular Economics

http://www.populareconomics.org/

The Center for Popular Economics (CPE) is a nonprofit collective of political economists who put useful economic tools in the hands of people fighting for social and economic justice. CPE provides a forum for activists, organizers,

educators, and progressive economists to come together, learn from one another, and work to build a movement for social and economic justice. CPE hosts a weeklong residential Summer Institute to provide intensive training in economics for activists, educators, media makers, and anyone who wants a better understanding of how the economy works.

The Corner House

http://www.thecornerhouse.org.uk/

The Corner House aims to support democratic and community movements for environmental and social justice. It aims to pay constant attention to issues of social, economic, and political power and practical strategy. As part of its solidarity work, The Corner House carries out analyses, research, and advocacy with the aim of linking issues, of stimulating informed discussion and strategic thought on critical environmental and social concerns, and of encouraging broad alliances to tackle them.

Cultural Survival

http://www.culturalsurvival.org/

Cultural Survival advocates for Indigenous Peoples' rights and supports Indigenous communities' self-determination, cultures, and political resilience. Predicated on the United Nations Declaration on the Rights of Indigenous Peoples, Cultural Survival works on the ground in Indigenous communities, always at their invitation. In addition to publicizing Indigenous Peoples' issues through its award-winning publications, Cultural Survival also mounts letter-writing campaigns and other advocacy efforts to stop environmental destruction and abuses of Native Peoples' rights.

The Earth Institute

http://www.earthinstitute.columbia.edu/sections/view/9

The Earth Institute at Columbia University comprises more than thirty research centers and some 850 scientists, postdoctoral fellows, staff, and students. Earth Institute experts work across many disciplines to study and create solutions for problems in public health, poverty, energy, ecosystems, climate, natural hazards, and urbanization. They work hand in hand with academia, corporations, government agencies, nonprofits, and individuals. They advise national governments and the United Nations on issues related to sustainable development and the Millennium Development Goals. The Earth Institute is educating the next generation of leaders in basic sciences and sustainable development.

Economics for Peace Institute

http://www.econ4peace.org/

Economics for Peace Institute is a start-up global nonprofit that advances neutral, science-based, participatory research strategies to reveal community well-being and ecosystem stewardship.

The EcoTipping Points Project: Models for Success in a Time of Crisis

http://www.ecotippingpoints.org/index.html

Day by day, we face torrents of environmental bad news. Experts warn that our natural systems, from rainforests to ocean currents, may be nearing "tipping points," catastrophic changes that can't be undone for lifetimes to come. But quietly, around the globe, a different kind of tipping point is emerging. Environmental pioneers in community organizations, businesses, and governments are making changes that turn ecosystems away from ruin and back toward health and sustainability. The EcoTipping Points Project features a compilation of environmental success stories with lessons intended to inspire and guide efforts to achieve sustainability.

ENTITLE

http://entitleblog.org/

ENTITLE is a European network of research and training on political ecology that brings together scholars and fellows from a variety of institutions and disciplinary and geographical backgrounds. ENTITLE works in solidarity with social-ecological movements, people, and communities facing various forms of exploitation and dispossession from open-cast mining to land-grabbing, from toxic contamination to murder. As researchers and activist-scholars, they seek to reveal how power relations structure access to environmental goods and bads and to envisage democratic systems that ensure a more equal distribution of power in society, as well as more just and ecologically sustainable economic systems.

Environmental Justice Organizations, Liabilities, and Trade

http://www.ejolt.org/

Environmental Justice Organizations, Liabilities, and Trade (EJOLT) is a global research project bringing science and society together to catalogue and analyze ecological distribution conflicts and confront environmental injustice.

Fossil Free

http://gofossilfree.org/

Fossil Free is an international network of campaigns and campaigners working toward fossil fuel divestment in their respective communities. While each campaign is independently run and may bring different emphases and tasks depending on its local context, the majority of campaigns are asking institutions to immediately freeze any new investment in fossil fuel companies and divest from direct ownership and any commingled funds that include fossil fuel public equities and corporate bonds within five years. Fossil Free is a project of 350.org.

GlacierHub

http://www.glacierhub.org

GlacierHub provides information about current scientific research, it tells stories of people who live near glaciers or who visit them, and it offers accounts of the efforts of communities and organizations to address the challenges brought by glacier retreat. It serves as well as a nexus to link people who are concerned about glaciers, so that they can communicate with each other and develop responses to the changes in glaciers. GlacierHub is managed by Ben Orlove, an anthropologist at the Earth Institute and Center for Research on Environmental Decisions (CRED) at Columbia University.

Idle No More

http://www.idlenomore.ca/

Idle No More is a peaceful revolution to honor indigenous sovereignty and to protect the land and water.

Intercontinental Cry

https://intercontinentalcry.org/

Intercontinental Cry is a free online magazine of the Center for World Indigenous Studies. As a volunteer-run grassroots publication, *IC Magazine* has over the last ten years published more than three thousand articles detailing the challenges, struggles, and successes of approximately 520 Indigenous Nations and Peoples around the world.

International Network on Displacement and Resettlement

http://indr.org/

The World Bank estimates that over fifteen million people are displaced by development projects each year, resulting in substantial, multifaceted risks of

impoverishment. Outnumbering political refugees, development-induced displacees have become a concealed, global human rights and development problem. The International Network on Displacement and Resettlement (INDR) is composed of professionals working to assure that people who are forcefully displaced become beneficiaries rather than victims of development.

International Rivers

http://www.internationalrivers.org/

Since 1985, International Rivers has been at the heart of the global struggle to protect rivers and the rights of communities that depend on them. It works with an international network of dam-affected people, grassroots organizations, environmentalists, human rights advocates, and others who are committed to stopping destructive river projects and promoting better options.

Public Political Ecology Lab

http://ppel.arizona.edu/?cat=27

The Public Political Ecology Lab (PPEL) aims to communicate political ecology research to a broader public as a vehicle for social and environmental change. It does this by providing students and scholars of political ecology with training in a diverse set of research methods (including community-based and participatory action research methods) and media skills, as well as a forum to present their work. The PPEL also serves as a portal that connects organizations and community groups seeking political ecological research with graduate students interested in conducting research as part of their theses or dissertations that will have a more direct social and environmental impact.

Research & Degrowth

http://www.degrowth.org/

Research & Degrowth (R&D) is an academic association dedicated to research, awareness raising, and events organization around the topic of degrowth. R&D defines degrowth as a multilevel voluntary path toward reduction of production and consumption aiming at ecological sustainability, good life, liberty, and social justice. For R&D, degrowth is grounded in ecology, ecological economics, anthropology, psychology, and social sciences in general. In the degrowth process, R&D is concerned with democracy, international cooperation, and understanding as opposed to societal closure, fragmentation, and authoritarianism. R&D cosponsors a Summer School on Degrowth and Environmental Justice.

Rights and Resources

http://www.rightsandresources.org

The Rights and Resources Initiative (RRI) supports the developing world's indigenous peoples and local communities in forests and other rural areas, helping them to secure and realize the rights to own, control, and benefit from the natural resources they have depended on for generations. It works together with community organizations, civil society, governments, international institutions, and the private sector to promote and accelerate global efforts to improve local livelihoods, reform forest tenure and governance, combat poverty, mitigate the effects of climate change, and deliver sustainable development.

The Story of Stuff

http://storyofstuff.org/

The Story of Stuff is a community of over a million change makers worldwide, working to build a more healthy and just planet. The movement began with a twenty-minute Internet movie about the way we make, use, and throw away stuff. From there, it grew and responded to public demand by releasing a best-selling book, cocreating a high-school-level educational curriculum called "Buy, Use, Toss," developing a study program for faith communities, launching a hope-filled podcast series called *The Good Stuff* that chronicles the efforts of everyday change makers, and creating a series of additional online movies. Season 1—"The Story of Bottled Water," "The Story of Cosmetics," and "The Story of Electronics"—used everyday consumer products to take a deeper look at where our stuff comes from and where it goes when we throw it away. When the community asked to go deeper, The Story of Stuff created season 2—"The Story of Citizens United v. FEC," "The Story of Broke," and "The Story of Change"—which examines the underlying roots of our unsustainable production and consumption patterns: what makes the system tick, who pays, who benefits, and how can we turn it around.

Survival International

http://www.survivalinternational.org/

Survival International is a global movement for tribal peoples' rights. Tribal peoples have developed ways of life that are largely self-sufficient and extraordinarily diverse. Many of the world's staple crops and drugs used in Western medicine originate with them and have saved millions of lives. Even so, tribal peoples are portrayed as backward and primitive simply because their communal ways are different. Industrialized societies subject them to genocidal violence, slavery, and racism so they can steal their lands, resources, and labor in the name

of "progress" and "civilization." Survival International's work is preventing the annihilation of tribal peoples. It gives them a platform to speak to the world. It investigates atrocities and presents evidence to the United Nations and other international forums. It supports legal representation and funds medical and self-help projects. It educates, researches, campaigns, lobbies, and protests to protect the rights of tribal peoples.

The Transitions Research Network

http://www.transitionresearchnetwork.org/

The Transition Research Network (TRN) is a self-organizing peer group of academics and community activists that aims to help advance understanding and practice in transition—grassroots initiatives to create more sustainable and locally resilient communities. The TRN website hosts an online bibliography of transitions research and contains advice on how to design and develop research that is mutually beneficial for both transition initiatives (part of the Transition Towns movement) and academic researchers.

We Are Power Shift

http://www.wearepowershift.org/

We Are Power Shift is a grassroots-driven online community that seeks to empower and serve as a hub for the youth climate movement. The site offers activists a forum for discussion and a platform to share resources, swap stories, strengthen relationships, and showcase the diverse movement to the media and the world.

Some Examples of Projects

The following are examples of projects developed by anthropology professors and/or their students.

Climate, Energy, and Society

http://www.cla.auburn.edu/ces

This site was composed by students in Kelly Alley's anthropology class for the purpose of providing accurate information about modern climate and energy concerns.

Food Ways and Food Scapes Co/LAB

http://foodwaysandfoodscapes.org/

Food Ways and Food Scapes collects stories about the past, present, and future of real, wholesome, local food in San Diego and connects these stories to data and policy information through maps. The Co/LAB is coordinated by Annie Lorrie Anderson-Lazo, a cultural anthropologist, community organizer, and political storyteller.

SfAA-EPA Collaboration in Environmental Anthropology

http://www.sfaa.net/publications/other/sfaa-epa/

In the late 1990s, the Society for Applied Anthropology and the United States Environmental Protection Agency partnered to author a number of reports in order to

- enhance understanding of the role of culture in social problem solving and community development;
- recognize the interdisciplinary nature of human problems in publications and practice;
- promote social science research with implications for programmatic, policy, and community development;
- provide support and guidance to applied anthropology training programs;
- support communication and exchange of knowledge within anthropology and between anthropology and related disciplines; and
- promote the responsible application of anthropological research methods, data, and results to community, cultural, and social problems in the United States and elsewhere.

This site includes papers and publications resulting from this partnership. The project was developed and directed by Barbara Rose Johnston.

The Tidewater Communities Project

http://hdygert.wix.com/tidewater#!community-action/c9t1

The Tidewater Communities Project was developed by Holly Dygert, a professor of anthropology at Rhode Island College. This website provides information from the Tidewater Communities Project, an anthropological project focusing on the management of a former industrial property located in Pawtucket, Rhode Island. The property—the Tidewater Site—is contaminated with waste from over a century of industrial use. Some of this waste is hazardous to human health.

Literature

What follows is a large, noncomprehensive bibliography of action-oriented scholarship and engaged environmental social science. These works are organized into six sections: journal special issues and dedicated sections, journal articles, books, book chapters, and web publications.

Journal Special Issues and Dedicated Sections

Aiello, Leslie C., ed. "Engaged Anthropology: Diversity and Dilemmas." Special issue, *Current Anthropology* 51, no. S2 (2010).

Burke, Brian, and Boone Shear, eds. "Non-capitalist Political Ecologies." Special section, *Journal of Political Ecology* 21 (2014).

Carr, Edward R., and David Simon, eds. "Development Geography: Can Critical Perspectives Exist in Policy and Implementation?" Edited symposium, *Third World Quarterly* 35, no. 3 (2014): 505–527.

Guerron-Montero, ed. "Careers in 21st Century Applied Anthropology: Perspectives from Academics and Practitioners." Special issue, *NAPA Bulletin* 29, no. 1 (2008).

Guldbrandsen, Thaddeus Countway, and Dorothy C. Holland. "Encounters with the Supercitizen: Neoliberalism, Environmental Activism, and the American Heritage Rivers Initiative." Special issue, edited by Krista Harper, *Anthropological Quarterly* 74, no. 3 (2001): 124–134.

Hill, Carole E., and Marietta L. Baba, eds. "The Unity of Theory and Practice in Anthropology: Rebuilding a Fractured Synthesis." Special issue, *NAPA Bulletin* 18, no. 1 (2000).

Johnston, Barbara Rose, ed. "Human Rights and the Environment." Special issue, *Human Ecology* 23, no. 2 (1995).

Johnston, Barbara Rose, and Thomas Arcury, eds. "Anthropology and Environmental Education." Special issue, *Practicing Anthropology* 16, no. 4 (1995).

Johnston, Barbara Rose, and John Young, eds. "Environmental Anthropology." Special issue, *Practicing Anthropology* 23, no. 3 (2001).

Menzies, Charles R., and Anna L. Anderson-Lazo, eds. "Practice What You Teach." Special issue, *New Proposals: Journal of Marxism and Interdisciplinary Inquiry* 2, no. 2 (2009).

Paladino, Stephanie, and Jeanne Simonelli, eds. "Global Ecosystems: Creating Options through Anthropological Perspectives." Special issue, *NAPA Bulletin* 15, no. 1 (1995).

Paladino, Stephanie, and Jeanne Simonelli, eds. "Hazards So Grave: Anthropology and Energy." Special issue, *Culture, Agriculture, Food and Environment: The Journal of Culture and Agriculture* 35, no. 1 (2013).

Sabloff, Paula L. W., ed. "Careers in Anthropology: Profiles of Practitioner Anthropologists." Special issue, *NAPA Bulletin* 20, no. 1 (2001).

Journal Articles and Policy Papers

Acosta, Alberto. "Toward the Universal Declaration of the Rights of Nature: Thoughts for Action." *AFESE Journal*, August 2010, 1–16. http://therightsofnature.org/wp-content/uploads/pdfs/Toward-the-Universal-Declaration-of-Rights-of-Nature-Alberto-Acosta.pdf.

Acosta, Alberto, Eduardo Gudynas, Esperanza Martínez, and Joseph H. Vogel. "Leaving the Oil in the Ground: A Political, Economic and Ecological Initiative in the Ecuadorian Amazon." Washington, DC: Center for International Policy (August 13, 2009).

Ashwill, Maximillian, Cornelia Flora, and Jan Flora. *Building Community Resilience to Climate Change: Testing the Adaptation Coalition Framework in Latin America.* Washington, DC: World Bank, 2011. http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/

Resources/244362–1232059926563/5747581–1239131985528/Adaptation-Coalition-Framework-Latin-America_web.pdf.

Batterman, Stuart, Joseph Eisenberg, Rebecca Hardin, Margaret E. Kruk, Maria Carmen Lemos, Anna M. Michalak, Bhramar Mukherjee, et al. "Sustainable Control of Water-Related Infectious Diseases: A Review and Proposal for Interdisciplinary Health-Based Systems Research." *Environmental Health Perspectives* 117, no. 7 (2009): 1023–1032.

Becker, Marc. "Correa, Indigenous Movements, and the Writing of a New Constitution in Ecuador." *Latin American Perspectives* 38, no. 1 (2011): 47–62.

Bell, Shannon. "Photovoice as a Strategy for Community Organizing in the Appalachian Coalfields." *Journal of Appalachian Studies* 14, no. 1–2 (2008): 34–48.

Bell, Shannon, and Richard York. "Community Economic Identity: The Coal Industry and Ideology Construction in West Virginia." *Rural Sociology* 75, no. 1 (2010): 111–143.

Brockington, Dan, Jim Igoe, and Kai Schmidt-Soltau. "Conservation, Human Rights, and Poverty Reduction." *Conservation Biology* 20, no. 1 (2006): 250–252.

Bromley, Daniel W., and Michael M. Cernea. "The Management of Common Property Natural Resources: Some Conceptual and Operational Fallacies." *World Bank Discussion Papers* 57 (1989): 1–66. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1999/12/03/000178830_98101903572526/Rendered/PDF/multi_page.pdf.

Brondo, Keri Vacanti. "When Mestizo Becomes (Like) Indio . . . or Is It Garífuna? Multicultural Rights and 'Making Place' on Honduras' North Coast." *Journal of Latin American and Caribbean Anthropology* 15, no. 1 (2010): 170–194.

Casas-Cortés, Maria Isabel, Michal Osterweil, and Dana E. Powell. "Blurring Boundaries: Recognizing Knowledge-Practices in the Study of Social Movements." *Anthropological Quarterly* 81, no. 1 (2008): 17–58.

Cernea, Michael. "The Risks and Reconstruction Model for Resettling Displaced Populations." *World Development* 25, no. 10 (1997): 1569–1587.

Cernea, Michael, and Kai Schmidt-Soltau. "Poverty Risks and National Parks: Policy Issues in Conservation and Resettlement." *World Development* 34, no. 10 (2006): 1808–1830.

Chapin, Mac. "A Challenge to Conservationists." *World Watch: Vision for a Sustainable World*, November–December 2004, 17–31.

Checker, Melissa. "From Friend to Foe and Back Again: Industry and Environmental Action in the Urban South." *Urban Anthropology and Studies of Cultural Systems and World Economic Development* 34, no. 1 (2005): 1–38.

Checker, Melissa. "'It's in the Air': Redefining the Environment as a New Metaphor for Old Social Justice Struggles." *Human Organization* 61, no. 1 (2002): 94–105.

Checker, Melissa. "'We All Have Identity at the Table': Negotiating Difference in a Southern African American Environmental Justice Network." *Identities: Global Studies in Culture and Power* 11, no. 2 (2004): 171–194.

Checker, Melissa. "Wiped Out by the 'Greenwave': Environmental Gentrification and the Paradoxical Politics of Urban Sustainability." *City & Society* 23, no. 2 (2011): 210–229.

Chernela, Janet. "The Art of Listening: Collaboration between International Environmental NGOs and Indigenous Peoples in the Amazon Basin of Brazil." *Worldwatch Institute Magazine* 18, no. 2 (2005).

Chernela, Janet. "Barriers Natural and Unnatural: Islamiento as a Central Metaphor in Kuna Ecotourism." *Bulletin of Latin American Research* 30, no. 1 (2011): 35–49.

Chernela, Janet. "Fire and Ice: Talking about Carbon in the Brazilian Amazon." *Practicing Anthropology* 36, no. 3 (2014): 17–21.

Chernela, Janet. "An Indigenous System of Forest and Fisheries Management in the Uaupés Basin of Brazil." *Cultural Survival Quarterly* 6, no. 2 (1982): 17–18.

Chernela, Janet. "Opposition in the Time of Avatar: Belo Monte Dam in the Brazilian Amazon." *Anthropology News* 51, no. 8 (2010): 26–27.

Chernela, Janet. "The Politics of Mediation: Local-Global Interactions in the Central Amazon of Brazil." *American Anthropologist* 107, no. 4 (2005): 620–631.

Chernela, Janet. "Potential Impacts of a Proposed Amazon Hydroelectric Project." *Cultural Survival Quarterly* 12, no. 2 (1988): 20–24.

Chernela, Janet. "Potential Impacts of the Proposed Altamira-Xingú Hydroelectric Complex in Brazil." *Latin American Studies Association Forum* 19, no. 2 (1988): 1–6.

Chernela, Janet. "The Wealth of Nations: Green Accounting and Latin America." *Hemisphere: A Magazine of the Americas* 8, no. 1 (1997): 43–49.

Chernela, Janet, Susan Crate, Brandon Derman, Noor Johnson, Ted Maclin, and Bob Pokrant. "Documenting COP-15: Modes of Participation and Knowledge Flows." *Anthropology News* 51, no. 4 (2010): 21–22.

Chernela, Janet, and Laura Zanotti. "Conflicting Cultures of Nature: Ecotourism, Education, and the Kayapó of the Brazilian Amazon." *Journal of Tourism Geographies* 10, no. 4 (2008): 495–521.

Chollett, Donna. "The Native American Organic Garden: Using Service Learning as a Site of Resistance." *Culture, Agriculture, Food and Environment* 36, no. 2 (2014): 93–104.

Cook, Samuel R. "'You Can't Put a Price on It': Activist Anthropology in the Mountaintop Removal Debate." *Collaborative Anthropologies* 1 (2008): 138–162.

Dahlberg, Britt. "Finding & Forming 'The Community' of a Contaminated Site: Reflections for the EPA Community Involvement Process." NNEMS report for the U.S. Environmental Protection Agency (EPA), August 2013.

Dahlberg, Britt. "Mapping Disaster: Contesting Boundaries of a Hazardous Space, and of 'The Problem' Itself." Special issue, *Anthropology News* 53 no. 2 (2012).

De la Cadena, Marisol. "Indigenous Cosmopolitics in the Andes: Conceptual Reflections beyond 'Politics.'" *Cultural Anthropology* 25, no. 2 (2010): 334–370.

Dilly, Barbara J. "Tax Policy and Swine Production in Iowa, United States." *Journal of Ecological Anthropology* 10 (2006): 45–60.

Dosemagen, Shannon, Jeffrey Warren, and Sara Wylie. "Grassroots Mapping: Creating a Participatory Map-Making Process Centered on Discourse." In "Grassroots Modernism," *Journal of Aesthetics and Protest* 8 (2011).

Enns, Charis, Brock Bersaglio, and Thembela Kepe. "Indigenous Voices and the Making of the Post-2015 Development Agenda: The Recurring Tyranny of Participation." *Third World Development* 35, no. 3 (2014): 358–375.

Escobar, Arturo. "After Nature: Steps to an Anti-essentialist Political Ecology." *Current Anthropology* 40, no. 1 (1999): 1–30.

Escobar, Arturo. "Constructing Nature: Elements for a Poststructuralist Political Ecology." *Futures* 28 no. 4 (1996): 325–344.

Escobar, Arturo. "Culture Sits in Places: Reflections on Globalism and Subaltern Strategies of Localization." *Political Geography* 20 (2001): 139–174.

Escobar, Arturo. "Difference and Conflict in the Struggle over Natural Resources: A Political Ecological Framework." *Development* 49, no. 3 (2006): 6–13.

Escobar, Arturo. "Latin America at a Crossroads." *Cultural Studies* 21, no. 1 (2010): 1–65.

Escobar, Arturo. "Whose Knowledge, Whose Nature? Biodiversity Conservation and the Political Ecology of Social Movements." *Journal of Political Ecology* 5 (1998): 53–82.

Fals Borda, Orlando. "The Application of Participatory Action-Research in Latin America." *International Sociology* 2, no. 4 (1987): 329–347.

Gibbs, Meredith. "Toward a Strategy for Undertaking Cross-Cultural Collaborative Research." *Society and Natural Resources* 14, no. 8 (2001): 673–687.

Gibson-Graham, J. K. "Diverse Economies: Performative Practices for 'Other Worlds.'" *Progress in Human Geology* 35, no. 5 (2008): 613–632.

Gibson-Graham, J. K. "A Feminist Project of Belonging for the Anthropocene." *Gender, Place, and Culture: A Journal of Feminist Geography* 18, no. 1 (2011): 1–21.

Gibson-Graham, J. K., and Gerda Rowlvink. "An Economic Ethics for the Anthropocene." *Antipode* 41, no. 1 (2010): 320–346.

Graeber, David. "The New Anarchists." *New Left Review* 13, no. 6 (2002): 61–73.

Grossman, Zoltan. "Unlikely Alliances: Treaty Conflicts and Environmental Cooperation between Native American and Rural White Communities." *American Indian Culture and Research Journal* 29, no. 4 (2005): 21–43.

Griffin, Joshua. "Towards an Environmental History of Kivalina, Alaska: A Collaborative Ethnography of Place, in Support of Climate-Induced Relocation." *Anthropology News* 54, no. 2 (2013): 86–121.

Hale, Charles R. "Activist Research v. Cultural Critique: Indigenous Land Rights and the Contradictions of Politically Engaged Anthropology" *Cultural Anthropology* 21, no. 1 (2006): 96–120.

Hale, Charles R. "What Is Activist Research?" *Social Science Research Council* 2, nos. 1–2 (2001): 13–15.

Harper, Krista. "Environment as Master Narrative: Discourse and Identity in Environmental Conflicts." Special issue, *Anthropological Quarterly* 74, no. 3 (2001): 101–103.

Hastrup, Frida, and Bradley Walters. "Theory and Methodology in Casual Research: A Commentary." *Geografisk tidskrift* 122, no. 2 (2012): 206–207.

Hazlewood, Julianne A. "CO_2lonialism and the 'Unintended Consequences' of Commoditizing Climate Change: Geographies of Hope amid a Sea of Oil Palms in the Northwest Ecuadorian Pacific Region." *Journal of Sustainable Forestry* 31, nos. 1–2 (2012): 125–153.

Hazlewood, Julianne A. "Más allá de la crisis económica: CO_2lonialismo y geografías de esperanza" [Beyond the economic crisis: CO_2lonialism and geographies of hope]. *ICONOS—Revista de ciencias sociales, naturaleza y los efectos de crisis de capitalismo global* [ICONOS—Social sciences journal: Nature and the effects of the global crisis of capitalism] 36 (January 2010): 81–95.

Holland, Dorothy. "Multiple Identities in Practice: On the Dilemmas of Being a Hunter and an Environmentalist in the USA." *Focaal: European Journal of Anthropology* 42 (2003): 23–41.

Holland, Dorothy, Dana E. Powell, Eugenia Eng, and Georgina Drew. "Models of Engaged Scholarship: An Interdisciplinary Discussion." *Collaborative Anthropologies* 3 (2010): 1–36.

Igoe, Jim. "The Spectacle of Nature in the Global Economy of Appearances: Anthropological Engagements with the Spectacular Mediations of Transnational Conservation." *Critique of Anthropology* 30, no. 4 (2010): 375–397.

Jarosz, Lucy. "Political Ecology as Ethical Practice." *Political Geography* 23, no. 7 (2004): 917–927.

Johnson, Jay T., Renee Pualani Louis, and Albertus Hadi Pramono. "Facing the Future: Encouraging Critical Cartographic Literacies in Indigenous Communities." *ACME: An International E-Journal for Critical Geographies* 4, no. 1 (2006): 80–98.

Johnston, Barbara R. "Anthropological Ecology? Struggles to Secure Environmental Quality and Social Justice." *Kroeber Anthropological Society Papers* 101, no. 1 (2010): 3–21.

Johnston, Barbara R. "Chixoy Dam Legacies: The Struggle to Secure Reparation, and the Right to Remedy in Guatemala." *Water Alternatives* 3 no. 2 (2010): 341–361.

Johnston, Barbara R. "Human Needs and Environmental Rights to Water: A Biocultural Systems Approach to Hydrodevelopment and Management." *Ecosphere* 4, no. 3 (2013): 39.

Johnston, Barbara R., and Shirley J Fiske. "The Precarious State of the Hydrosphere: Why Biocultural Health Matters." *Wiley Interdisciplinary Reviews: Water* 1 no. 1 (2013): 1–9.

Kempton, Willett, Dorothy C. Holland, Katherine Bunting-Howarth, Erin Hannan, and Christopher Payne. "Local Environmental Groups: A Systematic Enumeration in Two Geographical Areas." *Rural Sociology* 66, no. 4 (2001): 557–578.

Kingsolver, Ann E. "Farmers and Farmworkers: Two Centuries of Strategic Alterity in Kentucky's Tobacco Fields." *Critique of Anthropology* 27, no. 1 (2007): 87–102.

Kitchell, Anne, Willett Kempton, Dorothy Holland, and Danielle Tesch. "Identities and Actions within Environmental Groups." *Human Ecology Review* 7, no. 2 (2000): 1–20.

Leung, Margaret, Irene Yen, and Meredith Menkler. "Community Based Participatory Research: A Promising Approach for Increasing Epidemiology's Relevance in the 21st Century." *International Journal of Epidemiology* 33, no. 3 (2004): 499–506.

Little, Paul E. "Environments and Environmentalisms in Anthropological Research: Facing a New Millennium." *Annual Review of Anthropology* 28 (1999): 253–284.

Lohmann, Larry. "Marketing and Making Carbon Dumps: Commodification, Calculation and Counterfactuals in Climate Change Mitigation." *Science as Culture* 14, no. 3 (2005): 203–235.

Lohmann, Larry. "Toward a Different Debate in Environmental Accounting: The Cases of Carbon and Cost-Benefit." *Accounting, Organizations and Society* 34, no. 3 (2009): 499–534.

Louis, Renee Pualani. "Can You Hear Us Now? Voices from the Margin: Using Indigenous Methodologies in Geographic Research." *Geographical Research* 45, no. 2 (2007): 130–139.

Lyons, Kristina Marie. "Soil Science, Development and the 'Elusive Nature' of Colombia's Amazonian Plains." *Journal of Latin American and Caribbean Anthropology* 19, no. 2 (2014): 212–236.

Martinez-Alier, Joan, Isabelle Anguelovski, Patrick Bond, Daniela Del Bene, Federico Demaria, Julien-Francois Gerber, Lucie Greyl, Willi Haas, Hali Healy, Victoria Marín-Burgos, Godwin Ojo, Marcelo Firpo Porto, Leida Rijnhout, Beatriz Rodríguez-Labajos, Joachim Spangenberg, Leah Temper, Rikard Warlenius, and Ivonne Yánez. "Between Activism and Science: Grassroots Concepts for Sustainability Coined by Environmental Justice Organizations." *Journal of Political Ecology* 21 (2014): 19–60.

McIlvaine-Newsad, Heather, and Rob Porter. "How Does Your Garden Grow? Environmental Justice Aspects of Community Gardens." *Journal of Ecological Anthropology* 16, no. 1 (2013): 69–75.

McKee, Emily. "Of Camels and 'Ca-mail': Engaging Complex Representations of Bedouins in Activism." *Collaborative Anthropologies* 3 (2010): 81–92.

McKee, Emily. "Socio-Environmental Sustainability: Lessons from Environmental Justice Activism." *Anthropology News* 52, no. 4 (2011): 18.

McKenna, Brian. "Dow Chemical's Knowledge Factories: Action Anthropology against Michigan's Company Town Culture." *Anthropology in Action* 16, no. 2 (2009): 39–50.

McKenna, Brian. "Exposing Environmental Health Deception as a Government Whistleblower: Turning Critical Ethnography into Public Pedagogy." *Policy Futures in Education* 8, no. 1 (2010): 22–36.

Newman, Andrew. "Contested Ecologies: Environmental Activism and Urban Space in Immigrant Paris." *City & Society* 23, no. 2 (2011): 192–209.

Newman, Andrew. "Gatekeepers of the Urban Commons? Vigilant Citizenship and Neoliberal Space in Multiethnic Paris." *Antipode* 45, no. 4 (2013): 947–964.

Ogden, Laura, Nik Heynen, Ulrich Oslender, Paige West, Karim-Aly Kassam, and Paul Robbins. "Place, Equity and Earth Stewardship in the Anthropocene." *Frontiers in Ecology and the Environment* 11, no. 7 (2013): 341–347.

Orlove, Ben. "Human Adaptation to Climate Change: A Review of Three Historical Cases and Some General Perspectives." *Environmental Science & Policy* 8, no. 6 (2005): 589–600.

Oslender, Ulrich. "Another History of Violence: The Production of 'Geographies of Terror' in Colombia's Pacific Coast Region." *Latin American Perspectives* 35, no. 5 (2008): 77–102.

Oslender, Ulrich. "Violence in Development: The Logic of Forced Displacement on Colombia's Pacific Coast." *Development in Practice* 17, no. 6 (2007): 752–764.

Parkes, Margot, and Ruth Panelli. "Integrating Catchment Ecosystems and Community Health: The Value of Participatory Action Research." *Ecosystem Health* 7, no. 2 (2001): 85–106.

Participants of Symposium on Ethics and Sustainability. "A Manifesto for Life: In Favor of an Ethic of Sustainability." *Capitalism, Nature, Socialism* 13, no. 4 (2002): 121–136.

Perkins, Tracy. "Women's Pathways into Activism: Rethinking the Women's Environmental Justice Narrative in California's San Joaquin Valley." *Organization Environment* 25, no. 1 (2012): 76–94.

Perreault, Tom. "Dispossession by Accumulation? Mining, Water and the Nature of Enclosure on the Bolivian Altiplano." *Antipode* 45, no. 5 (2013): 1050–1069.

Peterson, Richard, Paige West, Diane Russell, and Peter Brosius. "Seeing (and Doing) Conservation through a Cultural Lenses." *Environmental Management* 45 (2010): 5–18.

Powell, Dana. "Technologies of Existence: The Indigenous Environmental Justice Movement." *Development* 49 (2006): 119–124.

Powell, Dana, and Andrew Curley. "K'e, Hozhó, and Non-governmental Politics on the Navajo Nation: Ontologies of Difference Manifest in Environmental Activism." *World Anthropologies Network (WAN) E-Journal* 4 (2009). http://www.ram-wan.net/documents/05_e_Journal/journal-4/5-powell.pdf.

Pulido, Laura. "Ecological Legitimacy and Cultural Essentialism: Hispano Grazing in the Southwest." *Capitalism Nature Socialism* 7, no. 4 (1996): 37–58.

Pulido, Laura. "Rethinking Environmental Racism: White Privilege and Urban Development in Southern California." *Annals of the Association of American Geographers* 90, no. 1 (2000): 12–40.

Radcliffe, Sarah A. "Development for a Postneoliberal Era? Sumak Kawsay, Living Well and the Limits to Decolonisation in Ecuador." *Geoforum* 43, no. 2 (2012): 240–249.

Radcliffe, Sarah A. "Latin American Indigenous Geographies of Fear: Living in the Shadow of Racism, Lack of Development, and Antiterror Measures." *Annals of the Association of American Geographers* 97, no. 2 (2007): 385–397.

Robson, James P., Andrew M. Miller, Carlos Julián Idrobo, Catie Burlando, Nathan Deutsch, John-Erik Kocho-Schellenberg, Ryan D. Pengelly, and Katherine L. Turner. "Building Communities of Learning: Indigenous Ways of Knowing in Contemporary Natural Resources and Environmental Management." *Journal of the Royal Society of New Zealand* 39, no. 4 (2009): 173–177.

Rosset, Peter. "Food Sovereignty in Latin America: Confronting the 'New' Crisis." *NACLA Report on the Americas*, May–June 2009, 16–21.

Schensul, Jean J. "Organizing Community Research Partnerships in the Struggle against AIDS." *Health Education and Behavior* 26, no. 2 (1999): 266–283.

Scoones, Ian. "Mobilizing against GM Crops in India, South Africa and Brazil." *Journal of Agrarian Change* 8, nos. 2–3 (2008): 315–344.

Simon, David, James Sidaway, Ian Yeboah, Kathleen O'Reilly, and Edward Carr. "Geographers and/in Development." *Environment and Planning A* 43, no. 12 (2011): 2788–2800.

Simonelli, Jeanne M. "Defective Modernization and Health in Mexico." *Social Science & Medicine* 24, no. 1 (1987): 23–36.

Sletto, Bjørn. "'Indigenous People Don't Have Boundaries': Reborderings, Fire Management, and Productions of Authenticities in Indigenous Landscapes." *Cultural Geographies* 16, no. 2 (2009): 253–277.

Solway, Jacqueline S., Richard B. Lee, Alan Barnard, M. G. Bicchieri, Alec C. Campbell, James Denbow, Robert Gordon, et al. "Foragers, Genuine or Spurious? Situating the Kalahari San in History [and Comments and Reply]." *Current Anthropology* 31, no. 2 (1990): 109–146.

Spicer, Cara, and Gustavo Rivera. "Building on the Past: A New Foundation for Community in North Kenwood-Oakland." *Perspectives on Civic Activism and City Life* 3 (2004): 50–61.

Stavenhagen, Rodolfo. "Classes, Colonialism, and Acculturation." *Studies in Comparative International Development* 6, no. 1 (1965): 53–77.

Sundberg, Juanita. "Conservation Encounters and Transculturation in the 'Contact Zones' of Empire." *Cultural Geographies* 13, no. 2 (2006): 239–265.

Sundberg, Juanita. "Decolonizing Posthumanist Geographies." *Cultural Geographies* 21, no. 1 (2013): 33–47.

Sundberg, Juanita. "Placing Race in Environmental Justice Research in Latin America." *Society and Natural Resources: An International Journal* 21, no. 7 (2008): 569–582.

Swanson, Kate. "Revanchist Urbanism Heads South: The Regulation of Indigenous Beggars and Street Vendors in Ecuador." *Antipode* 39, no. 4 (2007): 708–728.

Varese, Stefano. "The Forest Indians in the Present Political Situation of Peru." IWGIA Document 8. Copenhagen (Denmark): IWGIA, 1972. http://www.iwgia.org/iwgia_files_publications_files/0205_08Peru.pdf.

Velica, Irina. "The Aesthetic Post-communist Subject and the *Differend* of Rosia Montana." *Studies in Social Justice* 6, no. 1 (2012): 125–141.

Velica, Irina. "To Sell or Not to Sell: Landscapes of Resistance to Neo-liberal Globalization in Transylvania." *Globalizations* 9, no. 2 (2012): 307–321.

Veteto, James R. "The History and Survival of Traditional Heirloom Vegetable Varieties in the Southern Appalachian Mountains of Western North Carolina." *Agriculture and Human Values* 25, no. 1 (2008): 121–134.

Veteto, James R., and Joshua Lockyer. "Environmental Anthropology Engaging Permaculture: Moving Theory and Practice toward Sustainability." *Culture and Agriculture* 30, nos. 1–2 (2008): 47–58.

Veteto, James R., and Kristine Skarbø. "Sowing the Seeds: Anthropological Contributions to Agrobiodiversity Studies." *Culture and Agriculture* 31, no. 2 (2009): 73–87.

Walker, David, John Paul Jones III, Susan M. Roberts, and Oliver R. Fröhling. "When Participation Meets Empowerment: The WWF and the Politics of Invitation in the Chimalapas, Mexico," *Annals of the Association of American Geographers* 97, no. 2 (2007): 423–444.

Walker, Margath, Susan M. Roberts, John Paul Jones III, and Oliver R. Fröhling. "Neoliberal Development through Technical Assistance: Constructing Communities of Entrepreneurial Subjects in Oaxaca, Mexico." *Geoforum* 39, no. 1 (2008): 527–542.

Walsh, Catherine. "Afro and Indigenous Life-Visions in/and Politics: (De)Colonial Perspectives in Bolivia and Ecuador." *Bolivian Studies Journal* 18 (2011): 49–69.

Walsh, Catherine. "Development as Buen Vivir: Institutional Arrangements and (De)colonial Entanglements." *Development* 53, no. 1 (2010): 15–21.

Walsh, Catherine. "Shifting the Geopolitics of Critical Knowledge." *Cultural Studies* 21, nos. 2–3 (2007): 224–239.

Walters, Bradley. "Do Property Rights Matter for Conservation? Family Land, Forests, and Trees in St. Lucia, West Indies." *Human Ecology* 40 (2012): 863–878.

Walters, Bradley. "An Event-Based Methodology for Climate Change and Human-Environment Research." *Geografisk tidskrift* 122, no. 2 (2012): 135–143.

Walters, Bradley, and Lisa Hansen. "Farmed Landscapes, Trees and Forest Conservation in Saint Lucia (West Indies)." *Environmental Conservation* 40, no. 3 (2013): 211–221.

Watkins, Cristy A. "Natural Resource Use Strategies in a Forest-Adjacent Ugandan Village." *Human Ecology* 37, no. 6 (2009): 723–731.

Watson-Grego, Karen Ann, and David W. Grego. "Keeping Culture Out of the Classroom in Rural Solomon Islands Schools: A Critical Analysis." *Educational Foundations* 8, no. 2 (1994): 27–55.

Weeks, Margaret R., Jean J. Schensul, Sunyna S. Williams, Merrill Singer, and Maryland Grier. "AIDS Prevention for African-American and Latina Women: Building Culturally and Gender-Appropriate Interventions." *AIDS Education and Prevention* 7, no. 3 (1995): 251–264.

Welch, John R., Karl A. Hoerig, and Raymond Endfield, Jr. "Enhancing Cultural Heritage Management and Research through Tourism on White Mountain Apache Tribe Trust Lands." *SAA Archaeological Record* 5, no. 3 (2005): 15–19.

Welker, Marina. "'Corporate Security Begins in the Community': Mining, the Corporate Social Responsibility Industry, and Environmental Advocacy in Indonesia." *Cultural Anthropology* 24, no. 1 (2009): 142–179.

Welker, Marina. "Shareholder Activism and Alienation." *Current Anthropology* 52, no. S3 (2011): S57–S69.

Wilhusen, Peter R. "The Receiving End of Reform: Everyday Responses to Neoliberalization in Southeastern Mexico." *Antipode* 42, no. 3 (2010): 767–799.

Willow, Anna. "Clear-Cutting and Colonialism: The Ethnopolitical Dynamics of Indigenous Environmental Activism in Northwestern Ontario." *Ethnohistory* 56, no. 1 (2009): 35–67.

Willow, Anna. "Conceiving Kakipitatapitmok: The Political Landscape of Anishinaabe Anti-clearcutting Activism." *American Anthropologist* 113, no. 2 (2011): 262–276.

Wylie, Sara Ann, Kirk Jalbert, Shannon Dosemagen, and Matt Ratto. "Institutions for Civic Technoscience: How Critical Making Is Transforming Environmental Research." *Information Society* 30, no. 2 (2014): 116–126.

Wyndham, Felice S. "Environments of Learning: Rarámuri Children's Plant Knowledge and Experience of Schooling, Family, and Landscapes in the Sierra Tarahumara, Mexico." *Human Ecology* 38, no. 1 (2010): 87–99.

Wyndham, Felice S. "Spheres of Relations, Lines of Interaction: Subtle Ecologies of the Rarámuri Landscape in Northern Mexico." *Journal of Ethnobiology* 34, no. 3 (2007): 271–295.

Zimmerman, Barbara, Carlos A. Peres, Jay R. Malcolm, and Terence Turner. "Conservation and Development Alliances with the Kayapó of South-Eastern Amazonia, a Tropical Forest Indigenous People." *Environmental Conservation* 28, no. 1 (2001): 10–22.

Books

Abramsky, Kolya. *Sparking a Worldwide Energy Revolution: Social Struggles in a Transition to a Post-Petrol World*. Edinburgh, UK: AK Press, 2010.

Agyeman, Julian, Peter Cole, Randolph Haluza-DeLay, and Patricia O'Riley, eds. *Speaking for Ourselves: Environmental Justice in Canada*. Vancouver: University of British Columbia Press, 2009.

Alvarez, Sonia E., Evelina Dagnino, and Arturo Escobar, eds. *Cultures of Politics / Politics of Cultures: Re-Visioning Latin American Social Movements*. Boulder, CO: Westview, 1998.

Anderson, Kat. *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources*. Berkeley: University of California Press, 2006.

Andolina, Robert, Nina Laurie, and Sarah A. Radcliffe. *Indigenous Development in the Andes: Culture, Power and Transnationalism*. Durham, NC: Duke University Press, 2009.

Apffel-Marglin, Frédérique. *Subversive Spiritualities: How Rituals Enact the World.* New York: Oxford University Press, 2011.

Asher, Kiran. *Black and Green: Afro-Colombians, Development and Nature in the Pacific Lowlands*. Durham, NC: Duke University Press, 2009.

Atleo, E. Richard. *Principles of Tsawalk: An Indigenous Approach to Global Crisis*. Vancouver: University of British Columbia Press, 2011.

Atleo, E. Richard. *Tsawalk: A Nuu-chach-nulth Worldview*. Vancouver: University of British Columbia Press, 2004.

Batterbury, Simon, and Leah Horowitz, eds. *Engaged Political Ecologies*. Forthcoming. Cambridge, UK: Open Book.

Bell, Shannon. *Our Roots Run Deep as Ironweed: Appalachian Women and the Fight for Environmental Justice*. Urbana: University of Illinois Press, 2013.

Black, Toban, Stephen D'Arcy, Tony Weis, and Kahn Russel Joshua, eds. *A Line in the Tar Sands: Struggles for Environmental Justice*. Toronto: Between the Lines, 2014.

Bondi, Liz, and Nina Laurie. *Working the Spaces of Neoliberalism: Activism, Professionalisation and Incorporation*. Malden, MA: Wiley-Blackwell, 2011.

Bookchin, Natalie, Pamela Brown, Suzahn Ebrahimian, colectivo Enmedio, Alexandra Juhasz, Leónidas Martin, MTL, Nicholas Mirzoeff, Andrew Ross, A. Joan Saab, and Marina Sitrin. *The Militant Research Handbook*. New York: New York University, 2013. http://www.visualculturenow.org/wp-content/uploads/2013/09/MRH_Web.pdf.

Braun, Bruce. *The Intemperate Rain Forest: Nature, Culture and Power on Canada's West Coast*. Minneapolis: University of Minnesota Press, 2002.

Brockington, Dan, Rosaleen Duffy, and Jim Igoe. *Nature Unbound: Conservation, Capitalism and the Future of Protected Areas*. New York: Earthscan, 2008.

Brodkin, Karen. *Caring by the Hour: Women, Work, and Organizing at Duke Medical Center*. Urbana: University of Illinois Press, 1988.

Brodkin, Karen. *How Jews Became White Folks and What That Says about Race in America*. New Brunswick, NJ: Rutgers University Press, 1998.

Brodkin, Karen. *My Troubles Are Going to Have Trouble with Me: Everyday Trials and Triumphs of Women Workers*. New Brunswick, NJ: Rutgers University Press, 1989.

Carere, Ricardo, and Larry Lohmann. *Pulping the South: Industrial Tree Plantations and the World Paper Economy*. London: Zed Books, 1996.

Carrier, James G., and Paige West, eds. *Virtualism, Governance, and Practice: Vision and Execution in Environmental Conservation*. London: Berghahn Books, 2009.

Cernea, Michael. *Putting People First: Sociological Variables in Rural Development*. Oxford: Oxford University Press, 1985.

Checker, Melissa. *Polluted Promises: Environmental Racism and the Search for Justice in a Southern Town*. New York: NYU Press, 2005.

Checker, Melissa, and Maggie Fishman, eds. *Local Actions: Cultural Activism, Power, and Public Life in America*. New York: Columbia University Press, 2004.

Cleveland, David A., and Daniela Soleri. *Food from Dryland Gardens: An Ecological, Nutritional and Social Approach to Small-Scale Household Food Production*. Tucson, AZ: Center for People, Food and Environment, 1991.

Daubenmier, Judith M. *The Meskwaki and Anthropologists: Action Anthropology Reconsidered*. Lincoln: University of Nebraska Press, 2008.

Davidson, Debra J., and Michael Gismondi. *Challenging Legitimacy at the Precipice of Energy Calamity*. New York: Springer Science & Business Media, 2011.

Du Bois, William Edward Burghardt, ed. *The Negro Church: Report of a Social Study Made under the Direction of Atlanta University; Together with the Proceedings of the Eighth Conference for the Study of the Negro Problems, Held at Atlanta University, May 26, 1903*. Atlanta: Atlanta University Press, 1903.

Du Bois, William Edward Burghardt. *The Souls of Black Folk*. Chicago: A. C. McClurg, 1903.

Earle, Duncan, and Jeanne M. Simonelli. *Uprising of Hope: Sharing the Zapatista Journey to Alternative Development*. Lanham, MD: AltaMira, 2005.

Escobar, Arturo. *Encountering Development: The Making and Unmaking of the Third World*. 1995. Repr., Princeton, NJ: Princeton University Press, 2008.

Escobar, Arturo. *Territories of Difference: Place, Movements, Life, Redes*. Durham, NC: Duke University Press, 2008.

Finney, Ben R., and Karen Ann Watson, eds. *A New Kind of Sugar: Tourism in the Pacific*. Santa Cruz, CA: Center for South Pacific Studies, 1977.

George, Earl Maquinna. *Living on the Edge: Nuu-Chah-Nulth History from an Ahousaht Chief's Perspective*. Winlaw, BC: Sono Nis, 2003.

González, Roberto J. *Anthropologists in the Public Sphere: Speaking Out on War, Peace, and American Power*. Austin: University of Texas Press, 2004.

Graeber, David. *Possibilities: Essays on Hierarchy, Rebellion and Desire*. Oakland, CA: AK Press, 2007.

Gunewardena, Nandini, and Mark Schuller, eds. *Capitalizing on Catastrophe: Neoliberal Strategies in Disaster Reconstruction*. Lanham, MD: AltaMira, 2008.

Hale, Charles R., ed. *Engaging Contradictions: Theory, Politics, and Methods of Activist Scholarship*. Berkeley: University of California Press, 2008.

Hayden, Cori. *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*. Princeton, NJ: Princeton University Press, 2003.

Hoerig, Karl A. *Under the Palace Portal: Native American Artists in Santa Fe*. Albuquerque: University of New Mexico Press, 2003.

Holland, Dorothy, Catherine Lutz, Donald M. Nonini, Lesley Bartlett, Marla Frederick-McGlathery, Thaddeus C. Guldbrandsen, and Enrique G. Murillo, Jr. *Local Democracy under Siege: Activism, Public Interests, and Private Politics*. New York: NYU Press, 2007.

Hyland, Stanley E., ed. *Community Building in the Twenty-First Century.* Santa Fe, NM: School of American Research Press, 2005.

Johnston, Barbara R. *Chixoy Dam Legacies: Social Commitments and Resettlement Obligations: Promises, Actions, Consequential Damages, and Community Needs*. Santa Cruz, CA: Center for Political Ecology, 2005.

Johnston, Barbara R., ed. *Half-Lives and Half-Truths: Confronting the Radioactive Legacies of the Cold War*. Santa Fe, NM: School of American Research Press, 2007.

Johnston, Barbara R., ed. *Life and Death Matters: Human Rights and the Environment at the End of the Millennium*. Lanham, MD: AltaMira, 1997.

Johnston, Barbara R., ed. *Life and Death Matters: Human Rights, Environment and Social Justice*. 2nd ed. Walnut Creek, CA: Left Coast, 2011.

Johnston, Barbara R. *Who Pays the Price? The Sociocultural Context of Environmental Crisis*. Washington, DC: Island, 1994.

Johnston, Barbara R., and Holly M. Barker. *Consequential Damages of Nuclear War: The Rongelap Report*. Walnut Creek, CA: Left Coast, 2008.

Johnston, Barbara R., and John Donahue, eds. *Water, Culture, and Power: Local Struggles in a Global Context*. Washington, DC: Island, 1998.

Johnston, Barbara R., Lisa Hiwasaki, Irene J. Klaver, Ameyali Ramos-Castillo, and Veronica Strang, eds. *Water, Cultural Diversity, and Global Environmental Change: Emerging Trends, Sustainable Futures?* Dordrecht, Netherlands: Springer; Jakarta, Indonesia: UNESCO, 2012. http://unesdoc.unesco.org/images/0021/002151/215119E.pdf.

Johnston, Barbara R., and Susan Slyomovics, eds. *Waging War, Making Peace: Reparations and Human Rights*. Walnut Creek, CA: Left Coast, 2009.

Juris, Jeffrey S., and Alex Khasnabish, eds. *Insurgent Encounters: Transnational Activism, Ethnography, and the Political*. Durham, NC: Duke University Press, 2013.

Kingsolver, Ann E. *NAFTA Stories: Fears and Hopes in Mexico and the United States*. Boulder, CO: Lynne Rienner, 2001.

Kun, Josh, and Laura Pulido. *Black and Brown in Los Angeles: Beyond Conflict and Coalition.* Berkeley: University of California Press, 2014.

LeCompte, Margaret D., and Jean J. Schensul. *Designing and Conducting Ethnographic Research*. Lanham, MD: AltaMira, 2010.

Lipietz, Alain. *Towards a New Economic Order: Postfordism, Ecology, and Democracy*. New York: Oxford University Press, 1992.

Lockyer, Joshua, and James R. Veteto, eds. *Environmental Anthropology Engaging Ecotopia: Bioregionalism, Permaculture, and Ecovillages*. New York: Berghahn Books, 2013.

Loker, William. *Changing Places: Environment, Development and Social Change in Rural Honduras*. Durham, NC: Carolina Academic Press, 2004.

Martinez-Iglesias, Mercedes, ed. *Experts and Campaigners: Scientific Information and Collective Action in Socio-Ecological Conflicts*. Valencia, Spain: University of Valencia Press, 2014.

Menzies, Charles R., ed. *Traditional Ecological Knowledge and Natural Resource Management*. Lincoln: University of Nebraska Press, 2006.

Middleton, Beth Rose. *Trust in the Land: New Directions in Tribal Conservation*. Tucson: University of Arizona Press, 2011.

Mignolo, Walter. *The Idea of Latin America*. Malden, MA: Blackwell, 2005.

Milton, Kay. *Environmentalism: The View from Anthropology*. New York: Routledge, 1993.

Nabhan, Gary Paul. *Cross Pollinations: The Marriage of Science and Poetry*. Minneapolis, MN: Milkweed Editions, 2004.

Nabhan, Gary Paul. *Growing Food in a Hotter, Drier Land: Lessons from Desert Farmers on Adapting to Climate Uncertainty*. White River Junction, VT: Chelsea Green, 2013.

Nabhan, Gary Paul, ed. *Renewing America's Food Traditions: Saving and Savoring the Continent's Most Endangered Foods*. White River Junction, VT: Chelsea Green, 2008.

Nabhan, Gary Paul. *Where Our Food Comes From: Retracing Nikolay Vavilov's Quest to End Famine*. Washington, DC: Island, 2008.

Nagengast, Carole, and Carlos G. Vélez-Ibáñez, eds. *Human Rights: The Scholar as Activist*. Oklahoma City: Society for Applied Anthropology, 2004.

Ng'weno, Bettina. *Turf Wars: Territory and Citizenship in the Contemporary State*. Stanford, CA: Stanford University Press, 2007.

Oliver-Smith, Anthony, and Susanna M. Hoffman, eds. *The Angry Earth: Disaster in Anthropological Perspective*. New York: Routledge, 1999.

Orlove, Ben. *Lines in the Water: Nature and Culture at Lake Titicaca*. Berkeley: University of California Press, 2002.

Powell, Robert G., and Dana Powell. *Classroom Communication and Diversity: Enhancing Instructional Practice*. New York: Routledge, 2010.

Pulido, Laura. *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest*. Tucson: University of Arizona Press, 1996.

Radcliffe, Sarah, and Sally Westwood. *Remaking the Nation: Place, Identity and Politics in Latin America*. New York: Routledge, 1996.

Reiter, Bernd, and Ulrich Oslender, eds. *Bridging Scholarship and Activism: Reflections from the Frontlines of Collaborative Research*. East Lansing: Michigan State University Press, 2014.

Sadler, Thomas R., Heather McIlvaine-Newsad, and Bill Knox, eds. *Local Food Networks and Activism in the Heartland*. Champaign, IL: Common Ground, 2013.

Serageldin, Ismail, and Andrew Steer, eds. With Michael M. Cernea, John A. Dixon, Ernst Lutz, Sergio Margulis, Mohan Munasinghe, and Colin Rees. *Making Development Sustainable: From Concepts to Action*. Environmentally Sustainable Development Occasional Paper Series No. 2. Washington, D.C.: The World Bank, 1994.

Smith, Neil. *Uneven Development: Nature, Capital and the Production of Space*. Athens: University of Georgia Press, 1984.

Stavenhagen, Rodolfo. *The Ethnic Question: Conflicts, Development, and Human Rights*. Tokyo: United Nations University Press, 1990.

Swanson, Kate. *Begging as a Path to Progress: Indigenous Women and Children and the Struggle for Urban Spaces*. Athens: University of Georgia Press, 2010.

Townsend-Gault, Charlotte, Jennifer Kramer, and Ki-Ke-In, eds. *Native Art of the Northwest Coast: A History of Changing Ideas*. Seattle: University of Washington Press, 2014.

Turner, Nancy. *The Earth's Blanket: Traditional Teachings for Sustainable Living*. Seattle: University of Washington Press, 2005.

Varese, Stefano. *Salt of the Mountain: Campa Asháninka History and Resistance in the Peruvian Jungle*. Norman: University of Oklahoma Press, 2002.

Vayda, Andrew P., Bradley B. Walters, eds. *Casual Explanation for Social Scientists: A Reader*. Lanham, MD: AltaMira, 2011

Veltmeyer, Henry, and James Petras, eds. *The New Extractivism: A Post-neoliberal Development Model or Imperialism of the Twenty-First Century?* London: Zed Books, 2014.

Veteto, James R., and Edward M. Maclin, eds. *The Slaw and the Slow Cooked: Culture and Barbecue in the Mid-South*. Nashville, TN: Vanderbilt University Press, 2011.

Veteto, James R., Gary Paul Nabhan, Regina Fitzsimmons, Kanin Routson, and Deja Walker, eds. *Place-Based Foods of Appalachia: From Rarity to Community Restoration and Market Recovery*. College Park, MD: Sustainable Agriculture Research and Education (SARE), 2011.

Walters, Bradley B., Bonnie J. McCay, Paige West, and Susan Lees, eds. *Against the Grain: The Vayda Tradition in Human Ecology and Ecological Anthropology*. Lanham, MD: AltaMira, 2008.

West, Paige. *Conservation Is Our Government Now: The Politics of Ecology in Papua New Guinea*. Durham, NC: Duke University Press, 2006.

West, Paige. *From Modern Production to Imagined Primitive: The Social Life of Coffee from Papua New Guinea*. Durham, NC: Duke University Press, 2012.

Willow, Anna J. *Strong Hearts, Native Lands: The Cultural and Political Landscape of Anishinaabe Anti-Clearcutting Activism*. Albany: State University of New York Press, 2012.

Wolford, Wendy. 2010. *This Land Is Ours Now: Social Mobilization and the Meanings of Land in Brazil*. Durham, NC: Duke University Press.

Zibechi, Raúl. 2012. *Territories in Resistance: A Cartography of Latin American Social Movements*. Oakland, CA: AK Press.

Book Chapters

Allen, Kim, Vinci Daro, and Dorothy C. Holland. "Becoming an Environmental Justice Activist." In *Environmental Justice and Environmentalism: The Social Justice Challenge to the Environmental Movement*, edited by Ronald Sandler and Phaedra C. Pezzullo, 105–134. Cambridge, MA: MIT Press, 2007.

Bennett, John W. "Applied and Action Anthropology: Problems of Ideology and Intervention. With a Supplement: The Career of Sol Tax and the Genesis of Action Anthropology." In *Classic Anthropology: Critical Essays, 1944–1996*, edited by John William Bennett, with contributions by Leo A. Despres and Michio Nagai, 315–358. New Brunswick, NJ: Transaction, 1998.

Casas-Cortés, Maribel, Michal Osterweil, and Dana E. Powell. "Transformations in Engaged Ethnography: Knowledge, Networks, and Social Movements." In *Insurgent Encounters: Ethnography, Activism, and the Transnational*, edited by Jeffrey S. Juris and Alex Khasnabish, 199–228. Durham: Duke University Press, 2013.

Checker, Melissa. "Treading Murky Waters: Day-to-Day Dilemmas in the Construction of a Pluralistic U.S. Environmental Movement." In *Local Actions: Cultural Activism, Power, and Public Life,* edited by Melissa Checker and Maggie Fishman, 27–50. New York: Columbia University Press, 2004.

Chernela, Janet. "The Awa of Ecuador: An Experiment in Community-Based Conservation and Resource Use." In *Endangered Peoples of Latin America: Struggles to Survive and Thrive*, edited by Susan Stonich, 173–187. Westport, CT: Greenwood, 2001.

Chernela, Janet. "Innovative Local Protected Area Governance: Silves in the Central Brazilian Amazon." In *Innovative Governance: Indigenous Peoples, Local Communities, and Protected Areas*, edited by Hanna Jaireth and Dermot Smyth, 165–182. New Delhi: Ane Books India, 2003.

Chernela, Janet. "Local Communities and Protected Areas: The Indigenous Awa of Ecuador." In *Innovative Governance: Indigenous Peoples, Local Communities, and Protected Areas*, edited by Hanna Jaireth and Dermot Smyth, 197–210. New Delhi: Ane Books India, 2003.

Chernela, Janet. "Managing Rivers of Hunger: The Importance of the Blackwater River Margin." In *Resource Management in Amazonia: Indigenous and Folk Strategies*, edited by Darrell Posey and William Balee, 238–248. Advances in Economic Botany 7. New York: New York Botanical Garden Press, 1989.

Chernela, Janet. "A Species Apart: Ideology, Science, and the End of Life." In *The Anthropology of Extinctions: Essays on Culture and Species Death*, edited by Genese Marie Sodikoff, 18–38. Bloomington: Indiana University Press, 2012.

Desai, Manisha. "The Possibilities and Perils for Scholar-Activists and Activist-Scholars." In *Insurgent Encounters: Ethnography, Activism, and the Transnational*, edited by Jeffrey S. Juris and Alex Khasnabish, 199–228. Durham, NC: Duke University Press, 2013.

de Sousa Santos, Boaventura, João Arriscado Nunes, and Maria Paula Meneses. "Introduction: Opening Up the Canon of Knowledge and Recognition of Difference." In *Another Knowledge Is Possible: Beyond Northern Epistemologies*, edited by Boaventura de Sousa Santos, xix–lxii. London: Verso, 2007.

Dilly, Barbara J. "Gender, Culture, and Ecotourism: Development Policies and Practices in the Guyanese Rain Forest." In *Women and Development: Rethinking Policy and Reconceptualizing Practice*, edited by Fran Vavrus and Lisa A. Richey, 58–75. Special issue of *Women's Studies Quarterly* 31, nos. 3–4. New York: Feminist Press, 2003.

Escobar, Arturo. "The Emergence of Collective Ethnic Identities and Alternative Political Ecologies in the Colombian Pacific Rainforest." In *Political Ecology across Spaces, Scales, and Social Groups*, edited by Susan Paulson and Lisa L. Gezon, 257–278. New Brunswick, NJ: Rutgers University Press, 2005.

Escobar, Arturo. "The Making and Unmaking of the Third World through Development." In *The Post-development Reader*, edited by Majid Rahnema and Victoria Bawtree, 85–93. London: Zed Books, 1997.

Escobar, Arturo. "Place, Nature and Culture in Discourses of Globalization." In *Localizing Knowledge in a Globalizing World*, edited by Ali Mirsepassi, Amrita Basu, and Frederick Weaver, 37–59. Syracuse, NY: Syracuse University Press, 2003.

Esteva, Gustavo. "Development." In *The Development Dictionary: A Guide to Knowledge as Power*, edited by Wolfgang Sachs, 6–25. London: Zed Books, 1992.

Galeano, Eduardo. "To Be Like Them." In *The Post-development Reader*, edited by Majid Rahnema and Victoria Bawtree, 214–222. London: Zed Books, 1997.

Gibson-Graham, J. K. 2002. "Beyond Global vs. Local: Economic Politics outside the Binary Frame." In *Geographies of Power: Placing Scale*, edited by Andrew Herod and Melissa W. Wright, 25–60. Oxford, UK: Blackwell, 2002.

Gibson-Graham, J. K., and Gerda Rowlvink. "Social Innovation for Community Economies." In *Social Innovation and Territorial Development*, edited by Diana MacCallum, Frank Moulaert, Jean Hillier, and Serena Vicari Haddock, 25–37. Farnham, UK: Ashgate, 2009.

Grossman, Zoltan. "Let's Not Create Evilness for this River: Interethnic Environmental Alliances of Native Americans and Rural Whites in Northern Wisconsin." In *Forging Radical Alliances across Difference: Coalition Politics for the New Millennium*, edited by Jill M. Bystydzienski and Steven P. Schacht, 146–159. Lanham, MD: Rowman and Littlefield, 2001.

Hale, Charles R. "In Praise of 'Reckless Minds': Making a Case for Activist Anthropology." In *Anthropology Put to Work*, edited by Les W. Field and Richard G. Fox, 103–128. Oxford, UK: Berg, 2007.

Heller, Chaia, and Arturo Escobar. "From Pure Genes to GMOs: Transnational Gene Landscapes in the Biodiversity and Transgenic 10 Food Networks." In *Genetic Nature/Culture: Anthropology and Science beyond the Two-Culture Divide*, edited by Alan Goodman, Deborah Heath, and M. Susan Lindee, 155–175. Berkeley: University of California Press, 2003.

Howe, Cymene, Dominic Boyer, and Edith Barrera. "Wind at the Margins of the State: Autonomy and Renewable Energy Development in Southern Mexico." In *Contested Powers: The Politics of Energy and Development in Latin America*, edited by Owen Logan, John-Andrew McNeish, and Axel Borchgrevink. London: Zed Books, 2015.

Hvalkof, Søren, and Arturo Escobar. "Nature, Political Ecology, and Social Practice: Toward an Academic and Political Agenda." In *Building a New Biocultural Synthesis: Political-Economic Perspectives in Biological Anthropology*, edited by Alan Goodman and Thomas Leatherman, 425–450. Ann Arbor: University of Michigan Press, 1998.

Johnston, Barbara R. "Nuclear Weapons Tests, Fallout, and the Devastating Impact on Marshall Islands Environment, Health and Human Rights." In *Unspeakable Suffering: The Humanitarian Impact of Nuclear Weapons*, edited by Beatrice Fihn, 88–93. Geneva, Switzerland: Reaching Critical Will, 2013.

Kempton, Willett, and Dorothy Holland. "Identity and Sustained Environmental Practice." In *Identity and the Natural Environment: The Psychological Significance of Nature*, edited by Susan Clayton and Susan Opotow, 317–341. Cambridge, MA: MIT Press, 2003.

Lockyer, Joshua, and James R. Veteto. "Ecovillages." In *Berkshire Encyclopedia of Sustainability*, vol. 8, *The Americas and Oceania: Assessing Sustainability*, edited by Sara G. Beavis, Michael L. Dougherty, and Tirso Gonzales, 92–95. Great Barrington, MA: Berkshire, 2012.

Loker, William M. "From Indigenous Movement to Indigenous Management: Conflict and Accommodation in Chortí Maya Ethnopolitics." In *The Ch'orti' Maya Area: Past and Present,* edited by Brent E. Metz, Cameron L. McNeil, and Kerry M. Hull, 230–245. Gainesville: University Press of Florida, 2009.

McIlvaine-Newsad, Heather, and Rob Porter. "The Birth of the Macomb Community Gardens." In *Local Food Networks and Activism in the Heartland*, edited by Thomas R. Sadler, Heather McIlvaine-Newsad, and Bill Knox, 131–140. Champaign, IL: Common Ground, 2013.

Merrett, Christopher, Frederick Iutzi, Erin Orwig, Sarah Shike, and Heather McIlvaine-Newsad. "Trends in Local Food Production: The Growing Importance and Impacts of Community Supported Agriculture in the United States." In *Local Food Networks and Activism in the Heartland*, edited by Thomas R. Sadler, Heather McIlvaine-Newsad, and Bill Knox, 94–111. Champaign, IL: Common Ground, 2013.

Middleton, Beth Rose. "Advocating for Traditional Native American Gathering Rights on US Forest Service Lands." In *Forests and People: Property, Governance, and Human Rights*, edited by Thomas Sikor and Johannes Stahl, 143–157. Oxon, UK: Earthscan, 2011.

Oslender, Ulrich. "Spaces of Terror and Fear on Colombia's Pacific Coast: The Armed Conflict and Forced Displacement among Black Communities." In *Violent Geographies: Fear, Terror, and Political Violence*, edited by Derek Gregory and Allan Pred, 111–132. New York: Routledge, 2007.

Pochettino, María Lelia, María Rosa Martínez, and Marta Crivos. "Landscape Domestication among Two Mbyá-Guaraní Communities in Misiones, Argentina." In *Ethnobiology and Biocultural Diversity: Proceedings of the Seventh International Congress of Ethnobiology*, edited by John R. Stepp, Felice S. Wyndham, and Rebecca K. Zarger, 696–704. Athens: University of Georgia Press, 2002.

Powell, Dana E., and Dailan J. Long. "Landscapes of Power: Renewable Energy Activism in Diné Bikéyah." In *Indians & Energy: Exploitation and Opportunity in the American Southwest*, edited by Sherry L. Smith and Brian Frehner, 231–262. Santa Fe, NM: School of Advanced Research Press, 2010

Pulido, Laura. "Restructuring and the Contraction and Expansion of Environmental Rights in the United States." In *Geographic Thought: A Praxis Perspective*, edited by George Henderson and Marvin Waterstone, 274–292. Oxon, UK: Routledge, 2008.

Quijano, Aníbal. 2008. "Coloniality of Power, Eurocentrism, and Latin America." In *Coloniality at Large: Latin America and the Postcolonial Debate*, edited by Mabel Moraña, Enrique Dussel, and Carlos A. Jáuregui, 181–225. Durham, NC: Duke University Press, 2008.

Robbins, Paul. "Political versus Apolitical Ecologies?" In *Political Ecology: A Critical Introduction*, 2nd ed., edited by Paul Robbins, 11–24. Malden, MA: Wiley-Blackwell, 2012.

Roncoli, Carla, Todd Crane, and Ben Orlove. "Fielding Climate Change in Cultural Anthropology." In *Anthropology and Climate Change: From Encounters to Actions*, edited by Susan A. Crate and Mark Nuttall, 87–115. Walnut Creek, CA: Left Coast, 2009.

Sponsel, Leslie E. "Advocacy in Anthropology." In *International Encyclopedia of the Social and Behavioral Sciences*, 2nd ed., edited by Neil J. Smelser and Paul B. Baltes, Oxford, UK: Elsevier, 2015.

Turner, Nancy J., and Helen Clifton. "Gitga'at Seaweed, Traditional Ecological Knowledge, and Community Survival." In *Traditional Ecological Knowledge and Natural Resource Management*, edited by Charles R. Menzies, 65–86. Lincoln: University of Nebraska Press, 2006.

Varese, Stefano. "The New Environmentalist Movement of Latin American Indigenous People." In *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights*, edited by Stephen B. Brush and Doreen Stabinsky, 122–142. Washington, DC: Island, 1996.

Veteto, James R. "Appalachian Agricultural Biodiversity: Threats and Resilience." In *Seed Freedom: A Global Citizen's Report*, edited by Vandana Shiva, Ruchi Shroff, and Caroline Lockhart, 228–229. New Delhi, India: Navdanya, 2012.

Veteto, James R. "Apple-achia: The Most Diverse Foodshed in the US, Canada, and Northern Mexico." In *Place-Based Foods of Appalachia: From Rarity to Community Restoration and Market Recovery*, edited by James R. Veteto, Gary Paul Nabhan, Regina Fitzsimmons, Kanin Routson, and DeJa Walker, 3–5. College Park, MD: Sustainable Agriculture Research and Education (SARE), 2011.

Veteto, James R. "From Mountain Anthropology to Montology? An Overview of the Anthropological Approach to Mountain Studies." In *Horizons in Earth Science Research*, vol. 1, edited by Benjamin Veress and Jozsi Szigethey, 281–298. Hauppauge, NY: Nova Science, 2010.

Zarger, Rebecca K. "Acquisition and Transmission of Subsistence Knowledge by Q'eqchi'Maya in Belize." In *Ethnobiology and Biocultural Diversity: Proceedings of the Seventh International*

Congress of Ethnobiology, edited by John R. Stepp, Felice S. Wyndham, and Rebecca K. Zarger, 593–603. Athens: University of Georgia Press, 2002.

Web Publications and Dissertations

Burlando, Catie. "Land Use Planning Policy in the Far North Region of Ontario: Conservation Targets, Politics of Scale, and the Role of Civil Society Organizations in Aboriginal-State Relations." PhD diss., University of Manitoba, 2012.

D'Amico, Linda. "Grassroots Environmentalism in Intag, Ecuador." Paper prepared for the second UNITAR'-Yale Conference on Environmental Governance and Democracy, September 17–19, 2010, New Haven, CT. http://conference.unitar.org/yale/sites/conference.unitar.org.yale/files/Paper_Damico_Revised%20Version_0.pdf.

Johnston, Barbara R. "Anthropological Voice on the Fukushima Nuclear Disaster." *Society for Applied Anthropology Newsletter*, May 2011. http://sfaanews.sfaa.net/2011/05/01/anthropological-voice-on-the-fukushimanuclear-disaster/.

Johnston, Barbara R. "The Chixoy Dam Is Development at Its Worst." *CounterPunch*, March 22, 2011. http://www.counterpunch.org/2011/03/22/the-chixoy-dam-is-development-at-its-worst/.

Johnston, Barbara R. "The Clean, Green Nuclear Machine?" *CounterPunch*, October 27, 2008. http://www.counterpunch.org/2008/10/27/the-clean-green-nuclear-machine/.

Johnston, Barbara R. "Dam Legacies, Damned Futures." *CounterPunch*, May 24, 2008. http://www.counterpunch.org/2008/05/24/dam-legacies-damned-futures/.

Johnston, Barbara R. "Guatemalan Genocide and US Security." *CounterPunch*, August 19, 2006. http://www.counterpunch.org/2006/08/19/guatemalan-genocide-and-us-security/.

Johnston, Barbara R. "Inside the Chixoy Dam Reparations Deal." *CounterPunch*, November 14, 2014, http://www.counterpunch.org/2014/11/14/inside-the-chixoy-dam-reparations-deal/.

Johnston, Barbara R. "In This Nuclear World, What Is the Meaning of 'Safe'?" *Bulletin of the Atomic Scientists*, March 18, 2011. http://thebulletin.org/nuclear-world-what-meaning-safe.

Johnston, Barbara R. "The Marshall Islands versus the Nuclear Nations." *CounterPunch*, April 25, 2014, http://www.counterpunch.org/2014/04/25/the-marshall-islands-versus-the-nuclear-nations/.

Johnston, Barbara R. "Nuclear Betrayal in the Marshall Islands." *CounterPunch*, September 17, 2012. http://www.counterpunch.org/2012/09/17/nuclear-betrayal-in-the-marshall-islands/.

Johnston, Barbara R. "Nuclear News, Nuclear Fears and the Role of Science." *CounterPunch*, August 11, 2010. http://www.counterpunch.org/2010/08/11/nuclear-news-nuclear-fears-and-the-role-of-science/.

Johnston, Barbara R. "Nuclear Savages." *CounterPunch*, June 1, 2012. http://www.counterpunch.org/2012/06/01/nuclear-savages/.

Johnston, Barbara R. "Nuclear War and Its Consequences." *CounterPunch*, April 21, 2007. http://www.counterpunch.org/2007/04/21/nuclear-war-and-its-consequences/.

Johnston, Barbara R. "Secrets of the Tribe." *CounterPunch*, March 19, 2010. http://www.counterpunch.org/2010/03/19/secrets-of-the-tribe/.

Johnston, Barbara R. "SpeakOut: Marshall Islanders Stand before UN Council." *Truthout*, September 21, 2012. http://truth-out.org/speakout/item/11695-marshall-islanders-stand-before-uncouncil.

Johnston, Barbara R. "Waking Up to a Nuclear Nightmare." *Truthout*, April 4, 2011. http://www.truthout.org/waking-nuclear-nightmare.

Johnston, Barbara R. "War, Peace and the Obamajority." *CounterPunch*, October 19, 2009. http://www.counterpunch.org/2009/10/19/war-peace-and-the-obamajority/.

Johnston, Barbara R. "Water Culture Wars." *CounterPunch*, March 27, 2009. http://www.counterpunch.org/2009/03/27/water-culture-wars/.

Johnston, Barbara R., and Holly Barker. "Cautionary Tales from a Nuclear War Zone." *CounterPunch*, November 21, 2008. http://www.counterpunch.org/2008/11/21/cautionary-tales-from-a-nuclear-war-zone/.

Garoville, Rebecca. "Andrew Matthews on Forestry, Bureaucracy, and Engaged Scholarship." *ENGAGEMENT Blog*, Anthropology and Environment Society, January 14, 2013. http://www.aaanet.org/sections/ae/index.php/mathews-interview/.

Garoville, Rebecca. "Genese Marie Sodikoff on Forest Conservation, Malagasy Worker-Peasants and Biodiversity." *ENGAGEMENT Blog*, Anthropology and Environment Society, April 1, 2013. http://www.aaanet.org/sections/ae/index.php/sodikoff-interview/.

McKenna, Brian. "Dow Chemical Buys Silence in Michigan." *CounterPunch*, April 18, 2005. http://www.counterpunch.org/2005/04/18/dow-chemical-buys-silence-in-michigan/.

McKenna, Brian. "How Dow Chemical Defies Homeland Security and Risks Another 9/11." *CounterPunch*, November 20, 2008. http://www.counterpunch.org/2008/11/20/how-dow-chemical-defies-homeland-security-and-risks-another-9–11/.

McKenna, Brian. "Muckrake Your Town." *CounterPunch*, September 28, 2010. http://www.counterpunch.org/2010/09/28/muckrake-your-town/.

McKenna, Brian. "Profitting from Pandemics." *CounterPunch*, August 31, 2009. http://www.counterpunch.org/2009/08/31/profitting-from-pandemics/.

McKenna, Brian. "Student Loan Fury in the Occupy Movement." *CounterPunch*, November 25, 2011. http://www.counterpunch.org/2011/11/25/student-loan-fury-in-the-occupy-movement/.

McKenna, Brian. "Ted Downing and Troublemaker Anthropology." *CounterPunch*, December 30, 2008. http://www.counterpunch.org/2008/12/30/ted-downing-and-troublemaker-anthropology/.

Montoya-Greenheck, Felipe. "Engagement in the Alexander Skutch Biological Corridor." *ENGAGEMENT Blog*, Anthropology and Environment Society, February 10, 2014. http://www.aaanet.org/sections/ae/index.php/engagement-in-the-alexander-skutch-biological-corridor/.

Murphy, Cailin. "Sustainability and Food Production in the Hoosier Heartland: Learning through Local Engagement." *ENGAGEMENT Blog*, Anthropology and Environment Society, February 4, 2013. http://www.aaanet.org/sections/ae/index.php/sustainability-and-food-production-in-the-hoosier-heartland/.

Perkins, Tracy, and Julie Sze. "Images from the Central Valley." *Boom: A Journal of California* 1, no. 1 (2011). http://www.boomcalifornia.com/2011/03/images-from-the-central-valley/.

Public Employees for Environmental Responsibility (PEER). "Ingham County, MI. A Story of Suppression Part 1: The Story of Water Resources at Work." August 10, 2001. http://www.peer.org/assets/docs/mi/Ingham_co_water.pdf.

Schuller, Mark. "Fault Lines: Haiti's Earthquake and Reconstruction, through the Eyes of Many." *Huffington Post*, May 2, 2010. http://www.huffingtonpost.com/mark-schuller/fault-lines-haitis-earthq_b_483455.html.

Wasserstrom, Jeffrey. "The Pollution Crisis and Environmental Activism in China: A Q&A with Ralph Litzinger." *Dissent*, May 15, 2013. http://www.dissentmagazine.org/online_articles/the-pollution-crisis-and-environmental-activism-in-china-a-qa-with-anthropologist-ralph-litzinger.

This page intentionally left blank

CONTRIBUTORS

James M. Acheson is Research Professor of Anthropology at the University of Maine. His numerous publications include the books *Capturing the Commons: Devising Institutions to Manage the Maine Lobster Industry* and *The Lobster Gangs of Maine*.

Rimjhim Aggarwal is Senior Sustainability Scientist with the Julie Ann Wrigley Global Institute of Sustainability and Associate Professor in the School of Sustainability at Arizona State University.

Abdon Awono is Senior Research Officer with the Forests and Livelihoods Programme of the Center for International Forestry Research, Indonesia.

Andrea Babon is a Ph.D. candidate at the Research Institute for the Environment and Livelihoods at Charles Darwin University and a researcher with the Global Comparative Study on Reducing Emissions from Deforestation and Forest Degradation at the Centre for International Forestry Research.

Alisson Barbieri is Professor in the Department of Demography and Center for Regional Development and Planning (CEDEPLAR) at the Federal University of Minas Gerais in Brazil. He has published widely on population, migration, and environment.

Amanda Bedker is an undergraduate student at Albion College working toward a combined major in anthropology and sociology and a minor in theater.

Fikret Berkes is Distinguished Professor and Canada Research Chair in the Natural Resources Institute at the University of Manitoba. His many publications include *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*.

David Bloom is the Clarence James Gamble Professor of Economics and Demography in the Department of Global Health and Population at Harvard University.

Maria Brockhaus researches forest governance, REDD+, adaptation, policy analysis, and social network analysis with the Center for International Forestry Research, Indonesia.

Dan Brockington is trained as an anthropologist and is Professor of Conservation and Development at the School of Environment, Education and Development at the University of Manchester.

J. Peter Brosius is Professor of Anthropology at the University of Georgia, where he directs the Center for Integrative Conservation Research.

Frederick H. Buttel was Professor of Rural Sociology at the University of Wisconsin, Madison, where he specialized in the sociology of agriculture, environmental sociology, technological change in agriculture, and environmental activism.

James G. Carrier is Professor at the Max Planck Institute for Social Anthropology. His publications include the coedited volumes *Ethical Consumption: Social Value and Economic Practice*; *Tourism, Power and Culture: Anthropological Insights*; *and Virtualism, Governance and Practice: Vision and Execution in Environmental Conservation.*

Melissa Checker is the Hagedorn Professor of Urban Studies at Queens College and Associate Professor of Anthropology and Environmental Psychology at the CUNY Graduate Center. Her research focuses on environmental justice, urban sustainability in the United States, the social justice implications of the green economy, and social movements.

Lisa Cliggett is Associate Professor of Anthropology at the University of Kentucky. She is the coauthor of *Economies and Cultures: Foundations of Economic Anthropology* (2nd ed.), and the author of *Grains from Grass: Aging, Gender, and Famine in Rural Africa*.

Doug Cress is the program coordinator for the Great Apes Survival Partnership (GRASP), a United Nations initiative that aims to protect apes and their habitat in Africa and Asia.

Simon Dalby is CIGI Chair in the Political Economy of Climate Change and Professor of Geography and Environmental Studies at Wilfrid Laurier University. His publications include the book *Security and Environmental Change*. He is currently the editor of the journal *Geopolitics*.

Federico Demaria is a member of the collective Research & Degrowth and a researcher at the Autonomous University of Barcelona and the Jawaharlal Nehru University, India. He is the coeditor (with Giacomo D'Alisa and Giorgios Kallis) of *Degrowth: A Vocabulary for a New Era* (2014).

Alex de Sherbinin is Senior Staff Associate for Research at the Center for International Earth Science Information Network (CIESIN), Columbia University. He is a geographer whose research interests focus on the human aspects of environmental change at local, national, and global scales.

Therese Dokken is a researcher with the School of Economics and Business at the Norwegian University of Life Sciences.

Amy Duchelle coordinates research on the effectiveness, efficiency, equity, and co-benefits of REDD+ initiatives in Latin America through the Center for International Forestry Research, Brazil.

Paul Durrenberger is Professor Emeritus of Anthropology at the Pennsylvania State University and the University of Iowa. He is the author of *Anthropology Unbound: A Field Guide to the 21st Century* with Suzan Erem and the editor of *The Anthropology of Labor Unions* with Karaleah S. Reichart. He is currently working with his wife, Suzan Erem, on the Sustainable Iowa Land Trust, a slow money chapter in Iowa City, and growing food on their farm at Draco Hill.

Marc Edelman is Professor in the Department of Anthropology at Hunter College and the CUNY Graduate Center. His current Peasants Rights Project includes research on a UN Declaration on the Rights of Peasants and Other People Working in Rural Areas.

Arturo Escobar is the Kenan Distinguished Teaching Professor of Anthropology at the University of North Carolina at Chapel Hill. He is the author of *Territories of Difference: Place, Movements, Life, Redes.*

James Fairhead is Chair in Social Anthropology at the University of Sussex. His work examines indigenous agroecological knowledge, as well as the history of early anthropology in the United States.

David Feeny is Professor in the Department of Economics at McMaster University and a founding member of the Centre for Health Economics and Policy Analysis. His current research examines the evaluation and assessment of health care technologies and services.

James Ferguson is the Susan S. and William H. Hindle Professor in the School of Humanities and Sciences and Professor in the Department of Anthropology. His books include *Global Shadows: Africa in the Neoliberal World Order*.

Rannveig Knutsdatter Formo works with the Norwegian Ministry of Climate and Environment, where she coordinates that country's collaboration on forest conservation and REDD+ with Vietnam and Myanmar.

Garrett Graddy-Lovelace is Assistant Professor of Agricultural and Environmental Policy at American University's School of International Service in Washington, DC. Drawing on participatory action research methodologies and community-based learning pedagogies, she teaches and researches agrarian politics in the Americas.

David Grigg was Professor of Human Geography at the University of Sheffield, where he taught from 1959 to 2004.

Nora Haenn is Associate Professor of Anthropology at North Carolina State University. She has published a series of articles related to tropical conservation and a book, *Fields of Power, Forests of Discontent: Culture, Conservation, and the State in Mexico*.

Allison Harnish is Assistant Professor of Anthropology at Albion College in Albion, Michigan. Her research and teaching interests include political ecology, international development, wildlife conservation, forced relocation, and environmental change.

Julianne A. Hazlewood is Coordinator of the Te Ha Indigenous Alliance for Intercultural Solidarity at the Cultural Conservancy. She is also Co-Instructor and Community Engagement Facilitator for UC Davis Study Abroad in Ecuador.

Sabine Henry is Professor in the Department of Geography at the University of Namur in Belgium. Her research interests include migration, environment, and remote sensing.

Martha Honey is a cofounder and codirector of CREST, the Center for Responsible Travel. Her books include *Ecotourism and Sustainable Development: Who Owns Paradise?*

Lori M. Hunter is Professor of Sociology at the University of Colorado at Boulder, affiliated with the Environmental Studies Program. Since 2007, she has served as editor in chief of the journal *Population and Environment*.

Thu-Ba Huynh is an analyst with the Primary Industries Climate Challenges Centre at the University of Melbourne, Australia, and is an associate with Apidae, a communications consultancy.

Jim Igoe is Associate Professor of Anthropology at the University of Virginia. He is the author of numerous articles on the connections between capitalism and conservation.

Alex Carr Johnson is a freelance journalist, essayist, and author who lives in western Colorado. He is a Wyss Scholar for Conservation in the Intermountain West and can be found online at www.alexcarrjohnson.com.

Barbara Rose Johnston is Senior Research Fellow at the Center for Political Ecology in Santa Cruz, California. Her action-research explores environmental crisis and human rights abuse, seeking acknowledgment and implementation of the right to a healthy environment, environmental equity, and the right to reparation and remedy.

Brewster Kneen is the author of *Farmageddon: Food and the Culture of Biotechnology* and *Invisible Giant: Cargill and Its Transnational Strategies*. He also publishes *The Ram's Horn*, a monthly journal of food systems analysis: www.ramshorn.ca.

Anne M. Larson is Principal Scientist with the Center for International Forestry Research in Indonesia, where she examines decentralization, devolution, and forest tenure rights.

Melissa Leach is Professorial Fellow at the University of Sussex, where she directs the Institute of Development Studies.

Larry Lohmann is a member of The Corner House, a research organization that supports democratic movements. He is also a cofounder of the Durban Group for Climate Justice.

Joan Martinez-Alier is Professor of Economics and Economic History and Researcher Deputy Director of the Institute of Science and Technology (ICTA) at the Autonomous University of Barcelona. He is the author of *Ecological Economics: Energy, Environment and Society* (1990) and *The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation* (2002)

Bonnie J. McCay is Board of Governors Distinguished Service Professor at Rutgers University in the Department of Human Ecology of the School of Environmental and Biological Sciences.

Richard J. McNeil is Professor Emeritus of Natural Resources Policy at Cornell University, where he won numerous teaching awards.

Kendra McSweeney is Associate Professor of Geography at Ohio State University. Her research examines conservation and development, resilience, demography, and land use/cover change.

Kay Milton is Director of the Anthropology Research Network in the School of History and Anthropology at Queens University, Belfast. Her current research examines emotional attachments to land and landscape.

Virginia D. Nazarea is Professor of Anthropology at the University of Georgia, where she is Director of the Ethnoecology and Biodiversity Lab.

Christian Nellemann leads the United Nations Environmental Programme's Rapid Response Assessments at the UNEP's GRID Arendal Centre in Norway.

Robert McC. Netting was Professor at the University of Arizona and a leader in the field of cultural ecology. His books include *Cultural Ecology* and *Smallholders, Householders*.

Andrea Nightingale is Senior Lecturer (docent) in Human Ecology, School of Global Studies, University of Gothenburg, Sweden. She is also an Honorary Fellow at the Centre for South Asian Studies, University of Edinburgh.

Theodore Panayotou has been Director of the Cyprus International Institute of Management since 2000. He directs the Environment and Sustainable Development Program at the Center for International Development at Harvard University.

Gregory Pavela is a postdoctoral trainee in the Obesity Training Program at the School of Public Health, University of Alabama at Birmingham.

Robert Todd Perdue researches the social and ecological impacts of resource extraction at Virginia Tech.

Thu Thuy Pham is an investigator with the Center for International Forestry Research in Hanoi, Vietnam.

S. Ravi Rajan is Associate Professor of Environmental Studies at the University of California, Santa Cruz. His research interests include environmentally inclusive governance, the governance of environmental risks, and green design and entrepreneurship.

Charles Redman is the Distinguished Sustainability Scientist with the Julie Ann Wrigley Global Institute of Sustainability at Arizona State University.

Ian Redmond is a field biologist and conservationist who established and chairs the Ape Alliance (www.4apes.com), the African Ele-Fund, and the UK Rhino Group (www.rhinogroup.org.uk).

I. A. P. Resosudarmo is an investigator with the Center for International Forestry Research, Indonesia.

Paul Robbins is Director of the Nelson Institute for Environmental Studies at the University of Wisconsin–Madison.

Libby Robin is Professor and Senior Research Fellow at the Fenner School of Environment and Society, the Australian National University.

Dianne Rocheleau is Professor in Clark University's Graduate School of Geography and programs in International Development, Community and Environment, Women's Studies, and Environmental Sciences.

Sydney Roeder is an undergraduate student at Albion College majoring in anthropology and international studies.

Suzana Sawyer is Associate Professor in the Department of Anthropology at the University of California, Davis, and a coeditor of *The Politics of Resource Extraction*.

François Schneider is an industrial ecologist and degrowth researcher. Since 2001, he is active in the development of the degrowth concept and debate in France and Europe. Founding the research group Research & Degrowth in 2006, he initiated and organized the first scientific conference on degrowth for Sustainability and Equity in Paris in 2008.

Filka Sekulova is based at the Autonomous University of Barcelona. She holds a master's degree in environmental economics and a doctoral degree in ecological economics with a specialization in happiness and climate change. Her postdoctoral research explores the success factors of community-based initiatives as part of the European research project TESS (http://www.tess-project.eu/).

Galia Selaya is a postdoctoral research scientist with the Field Museum in Chicago, Illinois.

Julie Sharp holds an M.A. in geography from the Ohio State University.

Julian Steward founded and was the first director of the Institute of Social Anthropology. He taught at Columbia University and the University of Illinois at Urbana-Champaign.

Daniel Stiles received his Ph.D. in anthropology from the University of California, Berkeley, in 1981. Since then, he has worked for the UN Environment Programme, the UN Development Programme, the wildlife trade monitoring network TRAFFIC, and the International Union for the Conservation of Nature (IUCN). He is currently the Project Manager of the Sweetwaters Chimpanzee Sanctuary Advocacy on Chimpanzee Conservation and Law Enforcement project.

William D. Sunderlin is a sociologist and principal scientist at the Center for International Forestry Research and heads the Global Comparative Study research component on REDD projects.

Peter J. Taylor is Professor at the University of Massachusetts, Boston, where he directs the Critical & Creative Thinking graduate program, as well as the Program in Science, Technology and Values.

Barbara Thomas-Slayter teaches at Clark University and is the coeditor of *Feminist Political Ecology: Global Issues and Local Experiences* and author of *Southern Exposure: International Development and the Global South in the Twenty-First Century*.

Anna Lowenhaupt Tsing is Professor of Anthropology at the University of California, Santa Cruz. She is the author of *Friction: An Ethnography of Global Connection* and *In the Realm of the Diamond Queen: Marginality in an Out-of-the-Way Place* and an editor of *Nature in the Global South: Environmental Projects in South and Southeast Asia*.

Wayne Twine is Associate Professor at the University of the Witwatersrand. Based at the Wits Rural Facility in the central lowveld of Limpopo Province, South Africa, he manages a research program for the School of Animal, Plant, and Environmental Sciences.

Leah VanWey is Associate Professor of Sociology at Indiana University. Her work encompasses micro-level studies of migration and household livelihoods and meso-level studies of agricultural intensification and its social and environmental correlates.

Robert Walker is Professor of Geography at the University of Florida. His research explores land-cover change processes, especially tropical deforestation.

Esther Wangari is Associate Professor of Women's Studies at Towson University. She is the author of *The Heritage Library of African Peoples: Ameru* and coeditor of *Feminist Political Ecology: Global Issues and Local Experiences*.

Richard R. Wilk is Distinguished Professor and Provost's Professor of Anthropology at Indiana University, where he directs the Food Studies Program. His Ph.D. from the University of Arizona was supervised by Robert McC. Netting. He has since published widely on topics including cultural ecology, agricultural development, globalization, economic anthropology, and consumer culture.

This page intentionally left blank

INDEX