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The politics of environmental science

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Critical Political Ecology

Critical Political Ecology brings political debate to the science of ecology. As political controversies multiply over the science underlying environmental debates, there is an increasing need to understand the relationship between environmental science and politics. In this timely and wide-ranging volume, Tim Forsyth provides innovative approaches to applying political analysis to ecology, and shows how more politicized approaches to science can be used in environmental decision-making.

Critical Political Ecology examines:

- how social and political factors frame environmental science, and how science in turn shapes politics;
- how new thinking in philosophy and the sociology of science can provide fresh insights into the biophysical causes and impacts of environmental problems;
- how policy and decision makers can acknowledge the political influences on science and achieve more effective public participation and governance.

The book discusses a variety of global environmental problems at local and global scales, including climate change, deforestation, GMOs, desertification and pollution. It also probes the activities of environmental social movements and international organizations such as the World Bank.

Critical Political Ecology advances existing approaches to political ecology, science and politics by offering the means to integrate environmental politics with environmental science. It offers insights into blending social and natural science approaches to environmental problems, and for merging "political ecology" with "science studies."

Tim Forsyth is a lecturer in Environment and Development at the London School of Economics.

"A truth is the kind of error without which a certain species of life could not live."

Frederick Nietzsche, *The Will to Power* (1901: 493)

"Call it a lie, if you like, but a lie is a sort of myth and a myth is a sort of truth."

Cyrano de Bergerac, in Edmond Rostand, *Cyrano de Bergerac* (Act 2)

Preface and acknowledgments

These are controversial times for writing about politics and environmental science. An increasing number of authors are acknowledging the political influences on scientific knowledge and organizations that undertake scientific research. Yet, discussing the link between science and politics commonly leads to accusations of being anti-environmentalist, or epistemologically relativist. There is a need for an approach to environmental politics that acknowledges the social and political framings of environmental science, yet which offers the means to build environmental policy that is both biophysically effective and socially relevant.

This book represents an attempt to rebuild environmental science in a more politicized way. The book is inspired largely by my own research experiences in the developed and developing world, but in part summarizes the concerns of a growing number of researchers about how we understand environmental problems. These concerns do not dismiss the need for environmental protection, or suggest that economic progress will solve all problems. Instead, the concerns are about the grave simplifications and inaccuracies within much environmental debate, often revealing different perceptions between people living in affected regions, and policymakers and concerned public elsewhere. These differences suggest there is a need to rethink explanations of environmental problems in ways that acknowledge the linkages between social factors and the gathering of information about biophysical change.

The book is located within the debate known as "political ecology" because this topic has become associated with assessing the political linkages between society and environmental change. The book, however, seeks to advance this debate by suggesting new ways to integrate political analysis with the formulation and use of "ecology" as the science underlying much environmental debate. It is subtitled *The Politics of Environmental Science* because the book argues that "science" cannot be separated from "politics" but that political factors underlie the formulation, dissemination, and institutionalization of scientific knowledge and networks. Such discussions, however, do not suggest that environmental concern is unwarranted, or that environmental science cannot have predictive success.

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Abbreviations

AIJ	Activities Implemented Jointly
CBA	Cost–Benefit Analysis
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resource Management
CCD	Convention to Combat Desertification
CDM	Clean Development Mechanism
COP	Conference of the Parties (to agreements such as the Kyoto Protocol)
CSE	Center for Science and Environment, Delhi
DIPS	Deliberative and Inclusionary Processes in Environmental Policymaking
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency (of the USA)
GBA	Global Biodiversity Assessment
GCM	General Circulation Model
GIS	Geographical Information System
GM	Genetically Modified
GMOs	Genetically Modified Organisms
IDNDR	International Decade for Natural Disaster Reduction
ICRAF	International Center for Research in Agroforestry
IGBP	International Geosphere–Biosphere Program
I = PAT	(Equation): Environmental Impacts = function of Population growth, Affluence, and Technology
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
JI	Joint Implementation
LRTAP	Long Range Transport of Air Pollution
LTG	Limits to Growth
NASA	National Aeronautics and Space Administration
NGO	Non-Governmental Organization
SBSTA	Subsidiary Body for Scientific and Technical Advice to the UNFCCC
SSK	Sociology of Scientific Knowledge
UNEP	United Nations Environment Program

UNFCCC	United Nations Framework Convention on Climate Change
USCSP	United States Country Studies Program (on climate change)
USIJI	United States Initiative on Joint Implementation
USLE	Universal Soil Loss Equation
WCD	World Commission on Dams
WCED	World Commission on Environment and Development
WCU	World Conservation Union
WED	Women, Environment and Development
WRI	World Resources Institute
WTO	World Trade Organization

Contents

1 Political ecology and the politics of environmental science

Abraham Lincoln once remarked that anyone who enjoys eating sausages and using the law should avoid seeing how either is made. The same can be said about many of the scientific "laws" and principles underlying environmental policy and debates today. This book is about why we should treat these apparent environmental "laws" with concern, and instead seek a more accurate and politically aware approach to environmental explanation. The book's key purpose is to show how we need to see the evolution of environmental facts and knowledge as part of the political debate, rather than as a pre-prepared basis from which to start environmental debate.

The time has never been better for reevaluating the political basis of environmental explanations. Few days go by without media reports of environmental crisis. Unusual weather events are taken as evidence of irreversible and catastrophic climate change. Increasingly complex environmental policies and agreements are being agreed, with progressively more control over different aspects of our lives. Inexorably, we seem to slip toward the "Risk Society" of Ulrich Beck (1992), in which lives and politics are organized around the avoidance of risk. Yet, in environmental terms at least, the causal basis of environmental risk, and the implications of proposed solutions to risk, are far from clear.

This book seeks to provide this reevaluation of environmental science by considering the intricate ways in which science and politics are mutually related. This project does not refer to conventional political debates such as public access to scientific information, or the ability to communicate scientific findings to policy. Instead, the project is to develop a political philosophy of environmental science that indicates how social and political framings are woven into both the formulation of scientific explanations of environmental problems, and the solutions proposed to reduce them.

Thus, when Michael Zammit Cutajar, the Executive Secretary of the United Nations Framework Convention on Climate Change commented that: "The science has driven the politics ... if the science is to continue guiding the politics, it is essential to keep the politics out of the science" (2001: 1), he adopted the classic position that environmental science is somehow disconnected from environmental values and politics. This book

does not adopt an anti-climate-change position, but seeks to indicate how different political actions and scientific methodologies have led to environmental explanations and solutions that are thoroughly embedded in social and political practices.

So, how does this book proceed? The key objective is to integrate debates in so-called "political ecology" with debates concerning the constructions of science. It is important to note that this approach does not imply rejecting environmental "realism" – or the belief in a biophysically "real world out there." Indeed, the book adopts debates within Philosophy of Science to indicate potential ways to integrate realist biophysical prediction with social and political constructions.

It is also important to note that this book is in no way a supporter of "brownlash," or the criticism of environmental concerns in order to support polluting industries or weaken environmental regulation. Nevertheless, this book does criticize some assertions of environmentalists about the ability of orthodox science to describe environmental change and problems in ways that are politically neutral.

More importantly, though, this book seeks to demonstrate two important and increasingly unavoidable anxieties. First, the adoption of environmental science without acknowledging how it is affected by social and political factors undermines its ability to address the underlying biophysical causes of perceived environmental problems. Second, the adoption of policies based on such unreconstructed science frequently produces environmental policies that unfairly penalize many land users – especially in developing countries – and may even increase environmental degradation and poverty by threatening livelihoods. This book seeks to address these two problems by exploring the links between science and society in order to avoid the replication of inadequate science, and to enable the production of more biophysically accurate, and socially relevant, science.

This initial chapter explains the rationale for this project. The chapter looks specifically at debates in "political ecology" and so-called science studies or science–policy. Readers not familiar with these debates may prefer to turn immediately to Chapter 2.

The separation of science and politics: some past trends in political ecology

It is widely accepted that debates concerning "political ecology" refer to the social and political conditions surrounding the causes, experiences, and management of environmental problems (e.g. Blaikie and Brookfield, 1987; Bryant, 1992; Greenberg and Park, 1994; Zimmerer, 2000). It is, however, remarkable that much writing about political ecology does not define what is meant by "ecology." A variety of authors over the years have revealed different approaches to the meaning of "ecology" in "political ecology."

First, some authors have approached political ecology by explaining

environmental problems as the phenomenological interaction of biophysical processes, human needs, and wider political systems. Blaikie and Brookfield wrote:

> The phrase "political ecology" combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself.
>
> (1987: 17)

Second, there is the "politics of ecology" in the sense of political activism in favor of Deep Green environmentalism and its critique of modernity and capitalism. Atkinson wrote: "Political Ecology is both a set of theoretical propositions and ideas on the one hand and on the other a social movement referred to as the 'ecology movement' or, latterly, the Green movement" (1991: 18).

Third, there is the use of "ecology" as a metaphor for the interconnectedness of political relations. This metaphor was adopted by the first book with "political ecology" in its title, *International Regions and the International System: A Study in Political Ecology* by Bruce M. Russett in 1967, even though the book itself had no discussion of biophysical environmental change or conservation. He wrote:

> I have termed this volume "a study in political ecology." As ecology is defined as *the relation of organisms or groups of organisms to their environment,* I have attempted to explore some of the relations between political systems and their social and physical environment.
>
> (Russett, 1967: vii, emphasis in original)

Yet, although this original book did not discuss environmental conservation, later volumes on environment have adopted a similar usage of the term, political ecology. Anderson, for example, wrote:

> Just as environmental ecology refers to interaction and interdependence among soil, air and water, the peasants' political ecology also refers to the interactive interdependence among spheres – the individual, the community, the natural world, and the national society.
>
> (Anderson, 1994: 6)

Fourth, political ecology has been defined as a more specific analysis of Marxist debates about materialism, justice, and nature in capitalist societies, with the view to achieving a fairer distribution of rights and resources:

> Political ecology, like the Marxist-inspired workers' movement, is based on a critique – and thus an analysis, a theorized understanding –

> of the "order of existing things." More specifically, Marx and the greens focus on a very precise sector of the real world: the humanity–nature relationship, and, even more precisely, relations among people that pertain to nature (or what Marxists call the "productive forces").
>
> (Lipietz, 2000: 70)

Finally, there is the use of "political ecology" to refer in general terms to the politics of environmental problems without specific discussion of "ecology." Bryant (1992: 13), for example, describes political ecology as an inquiry into "the political forces, conditions and ramifications of environmental change," and may include studies of environmental impacts from different sources; location-specific aspects of ecological change; and the effects of environmental change on socio-economic and political relationships (see also Lowe and Rüdig, 1986). In a later publication, Bryant and Bailey (1997: 190) suggest that "political ecology" as a debate focuses on interactions between the state, non-state actors, and the physical environment, whereas "environmental politics" as a debate concerns the role of the state generally.

This book differs from these approaches by seeking to establish the political forces behind different accounts of "ecology" as a representation of biophysical reality. In this sense, a "critical" political ecology may be seen to be the politics of ecology as a scientific legitimatization of environmental policy. The approach adopted in this book may be seen to differ with the historic approaches to political ecology listed above because these approaches either adopt a priori concepts of environmental science and explanation; or take insufficient steps to avoid the separation of environmental explanation and politics in the analysis of environmental politics. The following discussions describe some themes of these past approaches, and how this book may argue for different approaches. The section after this then discusses how science and politics may be integrated.

Ecology, the subversive science

The first usages of the term "political ecology" in academic publications were made in the late 1960s and 1970s (see Russett, 1967; Wolf, 1972; Miller, 1978; Cockburn and Ridgeway, 1979). Yet, before then, the possibility to integrate political analysis with environmental explanation was widely discussed. The first discussions of ecology as a science with political content emerged in the 1960s during the growing concern about human impacts on the biophysical environment. "Ecology" was seen as both the study of those impacts, but also the new philosophical approach of looking at people–environment interactions as a whole. Indeed, the mood was well represented by Aldous Huxley's paper, "The politics of ecology: the question of survival" (1963).

Rather than simply challenge existing economic development as dam-

aging, the early political ecologists emphasized the philosophical and methodological challenges of "ecology" to existing forms of science. In a collection of papers in the journal, *Bioscience*, in 1964, René Dubos – the future co-author of the companion book to the 1972 World Conference on the Human Environment, *Only One Earth* (Ward and Dubos, 1972) – rejected existing scientific approaches for being reductionist. Instead, Dubos sought a method of seeking "community" or "interrelationships" under ecology as a better basis for understanding environmental change (Dubos, 1964). Similarly, Eugene Odum, the author of *Fundamentals of Ecology* (originally published in 1953), wrote: "*The new ecology is thus a systems ecology* ... [it] deals with the structure and function of levels of organization beyond that of the individual and species" (1964: 15, emphasis in the original).

"Ecology," therefore, was a new science aiming to illustrate the connectiveness of humans and other species. Yet the achievement of ecology, by definition, depended simultaneously upon the development of a new scientific approach highlighting a level of "community" beyond simple individuals, and also the establishment of a new political agenda questioning the destructiveness of human behavior. "Ecology" was therefore inherently "political," and this was expressed most forcefully by Paul Sears in a paper entitled "Ecology – a subversive subject" (1964: 11–12):

> Is ecology a phase of science of limited interest and utility? Or, if taken seriously as an instrument for the long-run welfare of mankind [sic], would it endanger the assumptions and practices accepted by modern societies, whatever their doctrinal commitments? ... By its very nature, ecology affords a continuing critique of man's operations within the ecosystem.

This book shows how this early trend in the politics of ecology is still influential today. Yet, while this initial school is overtly political, the approach does not question how its statements about "community" and "mankind" [sic] might pose problems for establishing universal explanations of environmental problems. Instead, this book discusses newer approaches to less generalized explanations of environmental problems, and the localized and contextual nature of environmental threats.

The domination of nature

Another important theme underlying much debate within political ecology is the preoccupation with what writers have called the "domination" of nature. This theme is also closely linked to the discussion of capitalism as a primary cause of environmental degradation. Such debates have been particularly prevalent among writers influenced by the Frankfurt School of Critical Theory, and particularly Marcuse and Habermas, who described how "human nature" was dominated by the instrumental rationality and