Handbook of Global Environmental Politics

Edited by **Peter Dauvergne**

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Edward Elgar
Cheltenham, UK • Northampton, MA, USA

Published by
Edward Elgar Publishing Limited
Glensanda House
Montpellier Parade
Cheltenham
Glos GL50 1UA
UK

Edward Elgar Publishing, Inc.
136 West Street
Suite 202
Northampton
Massachusetts 01060
USA

A catalogue record for this book
is available from the British Library

ISBN 1 84376 466 0

Typeset by Manton Typesetters, Louth, Lincolnshire, UK
Printed and bound in Great Britain by MPG Books Ltd, Bodmin, Cornwall

Contents

Figures

Tables

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Acronyms

ACC	Administrative Committee for Coordination
ATCPs	Antarctic Treaty Consultative Parties
BASD	Business Action for Sustainable Development
CDE	capacity development for the environment
CEC	Commission of the European Communities
CEE	Central and Eastern European
CERES	Coalition for Environmentally Responsible Economies
CFCs	chlorofluorocarbons
CIDA	Canadian International Development Agency
CIFOR	Center for International Forestry Research
CIPEC	Center for the Study of Institutions, Population and Environmental Change
CIRIEC	International Center of Research and Information on Public and Cooperative Economy
CITES	Convention on International Trade in Endangered Species
CMC	Common Market Council
COPs	Conference of the Parties
CPR	Common Property Resource
CPRs	common-pool resources
CSD	United Nations Commission on Sustainable Development
CSR	corporate social responsibility
CTE	Committee on Trade and Environment
DCs	developed countries
DRC	Democratic Republic of Congo
DWT	dead weight tons
EDF	Environmental Defense Fund
EEA	European Environment Agency
EEZ	Exclusive Economic Zone
EIA	Energy Information Administration
EKC	Environmental Kuznets Curve
EMS	Environmental Management Systems
EPA	Environmental Protection Agency
ETMs	environmental trade measures
EU	European Union
FAO	Food and Agriculture Organization
FDI	foreign direct investment

FOCs	flags of convenience
FOE	Friends of the Earth
FOEI	Friends of the Earth International
FSC	Forest Stewardship Council
FSU	former Soviet Union
G8	Group of Eight
GATT	General Agreement on Tariffs and Trade
GC	Global Compact
GCC	Global Climate Coalition
GCI	Global Commons Institute
GDP	gross domestic product
GECHS	Global Environmental Change and Human Security Project
GEF	Global Environment Facility
GEO	global environmental organization
GEP	global environmental politics
GHGs	greenhouse gases
GIC	Global Industry Coalition
GMC	Common Market Group
GRI	Global Reporting Initiative
GWP	Global Water Partnership
HDI	Human Development Index
IAHR	International Association for Hydraulic Engineering and Research
IASCP	International Association for the Study of Common Property
IATTC	Inter-American Tropical Tuna Commission
ICAO	International Civil Aviation Authority
ICC	International Chamber of Commerce
ICID	International Commission on Irrigation and Drainage
ICOLD	International Commission on Large Dams
ICRE	International Conference for Renewable Energies
ICWE	International Conference on Water and the Environment
IDB	Interamerican Development Bank
IDGEC	Institutional Dimensions of Global Environmental Change
IEA	International Energy Agency
IEO	International Environmental Organization
IFF	Intergovernmental Forum on Forests
IFIR	International Forest Industry Roundtable
IFW	Initiative zur Föderung nachhaltiger Waldbewirtschaftung
IIASA	International Institute for Applied Systems Analysis
IISD	International Institute for Sustainable Development
ILO	International Labour Organization
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change

IPF	Intergovernmental Panel on Forests
IR	international relations
ISA	International Studies Association
ISGWR	Intersecretariat Group for Water Resources
ISIC	International Standard Industrial Classification
ISO	International Organization for Standardization
ITU	International Telecommunication Union
IUCN	International Union for the Conservation of Nature
IWA	International Water Association
IWRA	International Water Resources Association
IWRM	integrated water resource management
JREC	Johannesburg Renewable Energy Coalition
LDCs	less developed countries
LoS	Law of the Sea
LRTAP	Long-Range Transboundary Air Pollution
MBIs	market-based instruments
MEAs	multilateral environmental agreements
MMPA	Marine Mammal Protection Act
MNCs	multinational corporations
MNEs	multinational enterprises
MOUs	memoranda of understanding
NAFTA	North American Free Trade Agreement
NEPIs	'new' environmental policy instruments
NFF	UN Forum on Forests
NGO	nongovernmental organization
NIEO	New International Economic Order
NIPF	nonindustrial private forest
NRDC	Natural Resources Defense Council
NSS	National Security Strategy of the United States
ODS	ozone-depleting substances
OECD	Organisation for Economic Co-operation and Development
PIC	prior informed consent
PPMs	process and production methods
PVS	public voluntary schemes
PWT	Penn World Tables
REC	Regional Environment Center for Central and Eastern Europe
SGT 6	Working Subcommittee No. 6 on the Environment
TEDs	turtle excluder devices
TNCs	transnational corporations
TREMs	Trade-Related Environment Measures
TRIPs	Trade-Related Intellectual Property Rights

UNCED	United Nations Conference on the Environment and Development
UNCTAD	United Nations Commission on Trade and Development
UNCTC	United Nations Center for Transnational Corporations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USFS	United States Forest Service
VAs	voluntary agreements
VCLT	Vienna Convention on the Law of Treaties
WB	World Bank
WBCSD	World Business Council for Sustainable Development
WBGU	German Advisory Council on Global Change
WCED	World Commission on Environment and Development
WEO	World Environment Organization
WICE	World Industry Council on the Environment
WIDER	World Institute for Development Economics Research
WRI	World Resources Institute
WSSCC	Water Supply and Sanitation Collaborative Council
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWC	World Water Council
WWF	World Wildlife Fund

PART I

INTRODUCTION

1 Global environmental politics: handbook topics and themes

Peter Dauvergne

This book brings together many of the world's leading scholars of global environmental politics. Much of the foundational literature in this field is only a decade or so old. The core debates are therefore still dynamic and energetic. The intellectual arguments are vigorous, but almost never acrimonious, and scholars of global environmental politics are remarkably tolerant (especially of a demanding editor). Perhaps the shared concern for the health of the planet diffuses the desire for petty squabbles within some fields. Or perhaps it feels pointless to feud with others after the daily toil of thinking and teaching about looming doom and catastrophe. Whatever the reason, the collegiality of this field made my task as editor seem, well, not a task at all, but rather an honour and a break from my more laborious duties.

The book is split into four parts: an introductory section on the history of research; states, governance and security; capitalism, trade and corporations; and civil societies, knowledge and ethics.[1] The introductory chapters draw on the research in this book to examine the intellectual trends and evolving parameters of the field of global environmental politics. These chapters make a case for an expansive definition of the field, one that embraces an interdisciplinary literature on the connections between global politics and environmental change with a focus on thematic topics like states, regimes, sovereignty, institutions, capitalism, trade, corporations, financing, security, ethics, civil societies and private global governance. They point to several notable trends, including a deepening of the analysis of some themes such as global governance and regime effectiveness, a shift away from some themes such as trying to map the causal links between environmental change and violent conflict, and a move toward themes such as the transnational societal forces, global political economy and ethics.

Chapters 3 to 11 analyse the structures of global environmental governance and security. Marvin Soroos, with reference to climate change in Chapter 3, and John Vogler, with reference to aircraft pollution in international airspace in Chapter 4, focus on explaining ecological change and governance in the commons. Soroos sees Garrett Hardin's metaphor of a tragedy of the commons as a powerful way to explain the failure of the global community to control ecological change. Vogler to some extent agrees, but adds that the real

world of global environmental politics – with, for example, powerful international organizations and layers of international laws – is in many ways too complex to capture with a metaphor.

Chapters 5 to 8 add further insights into the literature on global environmental governance, analysing particular problems such as shipping and energy as well as more thematic issues such as the role of developing states in global environmental negotiations. In Chapter 5, Elizabeth DeSombre analyses the globalization of international shipping to assess whether flags of convenience generate a race to the bottom for environmental standards. These did initially lower regulations, yet notably she finds that states have, through measures such as more inspections for flags of convenience with lower standards, managed to raise some standards (such as labour, safety and fisheries) and thus avoid a full-fledged race to the regulatory bottom. In Chapter 6, Rowlands traces the global debate over the governance of renewable energy sources, from the 1961 UN Conference on New Sources of Energy to the 1992 UN Conference on Environment and Development, to the 2002 World Summit on Sustainable Development. He finds more verbal support for renewable energy over time, yet little real increase in global use or in support for renewable energy in developing states. In Chapter 7, Stacy VanDeveer reviews the literature on institutional capacity and environmental management in developing and transition economies, showing that political will only partly explains the failure or success of effective environmental governance. Insufficient institutional capacity in particular, especially in developing countries in Africa, Asia and Latin America and transitional economies in Central and Eastern Europe, is a critical factor. In Chapter 8, Adil Najam analyses, from the perspective of the collective South, the history and consequences of North–South differences in global environmental politics. Not only, he argues, do the environmental conditions and interests of the South and North differ, but as well, especially when viewed from the South, it becomes clear that the 'very purpose' of global environmental politics is different as the South pursues a broader agenda of reforming the global system.

Chapters 9 and 10 shift focus slightly, exploring more direct links between environmental governance and security. In Chapter 9, Richard Matthew points out the value of the research on environmental degradation, scarcity and violence for understanding the sources of internal wars. He argues, however, that some policy makers have appropriated this research to create alarmist scenarios that receive a disproportionate share of media attention – an outcome environmental security analysts need to remain vigilant to try to counter. Compared to Matthew, Indra de Soysa, in Chapter 10, is far more critical of the literature that links environmental degradation, scarcity and violence, drawing on quantitative analysis to argue that *abundance* of a resource such as diamonds better explains civil violence – what he calls the 'honey pot

effect'. Better global governance, he argues, will require more attention to the links between resource abundance, greed and corruption, and the failure of development. Oran Young, in the final chapter of this section, surveys the vast scholarly literature on global environmental governance and challenges scholars to develop a more unified approach. He believes it is possible, though certainly not easy, to bring together the insights of those who focus on more local processes of governance with those who focus more on international aspects.

Part III focuses on the political economy of global environmental change. Chapters 12 to 15 examine the role of private economic mechanisms in global environmental governance. Peter Newell shows in Chapter 12 that much of what shapes environmental governance increasingly occurs in private arenas. Environmental governance is being 'marketized' as private actors assume traditionally political functions to regulate environmental management. In Chapter 13, Andrew Jordan, Rüdiger Wurzel and Anthony Zito examine 'new' environmental policy instruments (NEPIs) – non-regulatory measures such as eco-taxes, voluntary agreements and ecolabels – in the European Union, as well as seven EU countries and Australia. All of the jurisdictions have adopted at least some of these measures, commonly to fill in gaps in government regulatory systems, although government regulation still dominates environmental management in these jurisdictions. In Chapter 14, Ronnie Lipschutz analyses the shift toward private environmental governance of forest management, focusing in particular on industry-led certification schemes. These have improved some aspects of forest management, yet for him markets alone cannot solve an essentially political problem such as protecting a forest. In Chapter 15, Abigail York, Marco Janssen and Elinor Ostrom analyse non-industrial private forest use in the United States. They employ a 'socioecological' framework to analyse four approaches to conservation (tax incentives, cost-sharing, certification and easement programmes), noting that these can create perverse incentives when policy makers fail to take full account of complex social, ecological and economic interactions.

John Barry and Graham Smith, in Chapter 16, survey the literature on green political economy, which critiques neoliberal environmental worldviews, to argue for its transformative potential in both theory and practice. They discuss in particular the social economy – which includes, for example, building societies, housing associations, marketing cooperatives, and social businesses engaging 'in economic activity (traded or non-traded) with a social remit' – exploring ways it can promote social justice, democracy, green citizenship, new forms of work and ecological integrity. Matthew Paterson, too, in Chapter 17, takes an approach critical of neoliberalism, calling for more systematic analyses of the material and cultural systems that cause ecological crises. For him, the global political economy of cars offers a

telling critique of how capitalism, ideologies and global politics can spread a technology that ends up completely transforming the natural and living environments of the world.

Jennifer Clapp, in Chapter 18, focuses more explicitly on the role of transnational corporations in global environmental governance, examining corporate lobbying, structural power and voluntary standards (such as corporate social responsibility). These corporations, she argues, are becoming more visible and powerful actors in global environmental affairs. Matthew Cole and Eric Neumayer, in Chapter 19, assess the explanatory value of the Environmental Kuznets Curve (EKC), the inverted-U graph that predicts lower pollution levels once GDP per capita reaches levels of medium wealth. They see merit in the EKC, but question the ability of all developing countries to follow the pattern of developed states, as a critical reason many of these were able to do so was the relocation of dirty industries to the developing world, although they add that with the correct mix of policies and technologies these states could perhaps 'tunnel through' the Kuznets curve.

Chapters 20 to 22 turn to trade and the environment. Kate O'Neill and William Burns, in Chapter 20, analyse the potential for conflict between the World Trade Organization and multilateral environmental agreements. They examine legal and organizational features of the WTO–MEA interactions to explain patterns of past and future tensions between these governance regimes. In Chapter 21, J. Samuel Barkin, like O'Neill and Burns, challenges any simplistic view of a global trading system in conflict with global environmental governance, arguing that recent WTO rulings are in many ways more accommodating of ecological objectives. For him, this suggests a need to keep environmental reform energies focused on transforming the WTO rather than on creating a new global institution like a World Environment Organization. Kathryn Hochstetler, in Chapter 22, adds further nuances to the trade–environment literature, looking hard at the thesis that free trade agreements ignite a race to the bottom as states reverse, delay or restrict environmental regulations to remain (or enhance) competitiveness. She looks in particular at the MERCOSUR free trade zone in South America, finding evidence of downward pressure on environmental standards, but, importantly, also evidence of countervailing domestic and global forces working to improve environmental governance – what she calls a 'race to the middle'.

Part IV turns to the role of knowledge, social forces and ethics in global environmental politics. Chapters 23 to 27 focus in particular on science, expertise and knowledge. Sheila Jasanoff, in Chapter 23, explores citizen interaction with science and environmental governance. The divide between 'citizens' and 'experts' is slowly breaking down, she notes, and, although there is a long way to go, this is helping to create a more 'meaningful notion of citizenship' (even for traditionally less powerful groups like women and

indigenous peoples) within the procedures and institutions of global environmental governance. In Chapter 24, Peter Haas analyses the reflexive relationship between science and environmental policy. Sometimes, he notes, organized science (what he calls 'usable knowledge') can mean 'power listens', with potentially great benefits for global environmental governance. Marc Williams in Chapter 25 also explores the role of knowledge in global environmental governance. In particular, he demonstrates the critical importance of knowledge for the formation and framing of environmental 'problems' as well as the development of 'solutions' to these problems. Marybeth Long Martello, in Chapter 26, assesses the responses of environmental policy making and science, specifically vulnerability analysis, to criticisms in the mid-1990s of an overly technocratic, reductionist and ethnocentric approach. She sees considerable progress, such as more community participation, although overall it still remains a largely 'top-down' approach. Ken Conca, in Chapter 27, traces the international development of the 'integrated water resources management' (IWRM) framework. He adds to the depth of the previous three chapters with a specific analysis of the way 'expert networks' interact with and influence global policy norms.

Chapters 28 to 30 conclude the *Handbook of Global Environmental Politics* with broad analyses of world order, ethics and understandings, and ecological and social outcomes. Paul Wapner, in Chapter 28, reflects on postmodern challenges to the idea of 'nature'. For him, environmentalism, which has a long history of adapting to sociohistorical change, can draw on postmodernist criticisms to explore profitably its intellectual roots and future directions. In Chapter 29, Lorraine Elliott explores how citizen rights and obligations within a cosmopolitan ethic could potentially rectify environmental harms and inequities. She considers the implications of a world order that recognizes moral obligations across borders, compensates for burden sharing and governs with consent. Finally, in Chapter 30, Karen Litfin draws on Gaia theory to explore core features of the global system, such as holism, self-regulation, feedback and networks, to emphasize the vulnerability and interdependence of life on Earth. She argues for a Gaian worldview to assist with imagining and constructing a new ecological order.

This review of the chapters in the *Handbook of Global Environmental Politics* shows the great diversity of perspectives and topics in this field. The next chapter builds on this to discuss past research and explore emerging trends.

Note

1. I am indebted to Sharon Goad and Joshua Gordon for their assistance with preparing this book for publication. I am also grateful to the Social Science and Humanities Research Council of Canada for financial support.

2 Research in global environmental politics: history and trends

*Peter Dauvergne**

What is global environmental politics? What are the core research questions and findings in this field of inquiry? Where do the disciplinary boundaries begin and end? There are no precise answers to these questions. The field of global environmental politics began to emerge in the late 1960s and early 1970s. Today, it is no doubt partly grounded in the discipline of political science – in an analysis of the role of states, global institutions, the global political economy, global power, norms and ideology, as well as in theories of international relations. Yet the very nature of almost every question on global ecological change means the research crosses disciplinary boundaries. It means, too, that some of the most innovative research is occurring outside of political science, in disciplines like geography, environmental studies, economics, sociology, law, history, philosophy, development studies, biology and human ecology. There is naturally considerable dispute about where the field begins and ends. The quick growth in the volume of research in global environmental politics over the last decade has further blurred the parameters of this field.

Some see the core of the field in the literature on states and global governance. Some see it embedded in international relations theories of environmental regimes.[1] Others see the core in the literature on the ecological impact of the global political economy, in the politics of growth, trade, corporations, financing and consumption. Still others see the field as spanning far more, embracing the literature on states and the global political economy, but also the literature on environmental security, ethics, civil societies and private global governance. Such a broad definition of the parameters of global environmental politics undeniably suffers from many of the same shortcomings as with all interdisciplinary efforts: in particular, the sheer volume and scope of research puts great demands on the time and intellectual flexibility of analysts. It is tempting at times to confine the field, to just read political scientists or define the scope of global environmental politics narrowly. Indeed no single researcher can possibly keep up with all of the breakthroughs in environmental and social sciences. Yet, in my view, the greatest strength of this field, and its greatest contribution to the pursuit of intellectual discovery, is the interdisciplinary range of the research.

This chapter draws on the contributions to the *Handbook of Global Environmental Politics* to map the interdisciplinary research in global environmental politics. This is not the first effort to do this. Others, including Michael Zürn (1998), Ronald Mitchell (2002a) and Matthew Paterson (forthcoming), provide alternative reviews.

Zürn (1998) focuses on the analysis of international environmental regimes, institutions and transnational networks, especially the contributions of international environmental politics to regime theory in international relations. He sees two generations of research, one in the 1980s that brought international environmental policy into the study of global politics, with links to security, economics, foreign policies and international institutions. He sees a second generation in the 1990s: more confident, with more precise questions and methodologies (generally qualitative designs with a low number of cases), especially for the study of global institutions and regimes. This second generation also brought in the role of transnational movements as well as science and knowledge (including, importantly, the work of Peter Haas, 1992, on epistemic communities). Zürn predicts a third generation of international environmental research, one that will focus more on large-scale quantitative and qualitative studies that methodically test theories and hypotheses.

Much of the second generation of research in international environmental politics, Zürn (1998: 618) correctly notes, assumes 'a postrealist consensus which holds that international institutions do matter, world politics is much more than intergovernmental politics and includes a wider range of actors than states, and world politics is not only about power and material interests but is also about nonmaterial interests, ideas, knowledge, and discourses'. In his review of this literature Zürn concentrates on the stages of regime development, from agenda setting to formation to implementation, and argues that two of the most promising literatures are on the effects of regimes and on the role of knowledge-based transnational networks. One result of this second generation of research is that 'It is no exaggeration to state that the developments leading to the ozone regime, to the regime for long-range transboundary air pollution in Europe, and to the regime on the politics of global climate change are three of the most carefully analyzed issues in contemporary international politics' (ibid.).

Like Zürn, Mitchell (2002a) also focuses on the literature in international relations on regimes and institutions. Mitchell adds more depth, however, on the causal explanations of the stages of the international environmental policy process (in part because he is focusing on the literature on international environmental politics and policy). For him the key questions driving research in international environmental politics and policy include: What are the causes of global ecological problems? Why do some issues reach the

global agenda? Why does the global community develop international agreements for some issues and not for others? Why are some international policies effective while others fail? What factors strengthen or weaken agreements over time? How does global environmental management improve? Mitchell's review, like Zürn's, calls for more methodological rigour among scholars of international environmental regimes and institutions. 'Methodologically,' Mitchell (ibid.: 512) writes, 'we need to supplement the almost-exclusive use of case studies with quantitative methods, formal modeling and simulation. … Empirically, we need to develop data for qualitative and large -N quantitative comparisons across issues.'

Like Mitchell and Zürn, Paterson (forthcoming) also concentrates on the literature in international relations, focusing in particular on theories within the field of international environmental politics. Rather than simply categorizing and describing the arguments in the field, he strives to uncover the underlying assumptions, both normative and methodological, of the various approaches to studying international environmental politics. He categorizes the literature into six groupings with the following starting points:

- international anarchy,
- knowledge processes,
- plurality of political actors,
- structural inequalities in the global system,
- capital accumulation,
- sustainability.

The anarchic structure of the international system (the lack of a central authority), Paterson notes in his first grouping, is a core assumption of much of the literature in international relations, infusing traditions like realism and liberal institutionalism. The central concern of this research is the power and influence of sovereign *states*. A second body of research focuses on the role of science and knowledge in the formation and evolution of international policy. A third thread of research begins with an intentional shift away from a state focus, and highlights the role of multilateral institutions, corporations and NGOs in global environmental politics; the underlying assumption is that these can play a significant, if not, in some cases, a larger, role than states in the process of global ecological change. A fourth strand begins with a focus on structural inequalities in the global system: ethnicity, class, gender, racism, North–South relations, consumption among the rich and poor, and humanity's place in nature. A fifth body of literature concentrates on capitalism, on the ecological effects of the process of extraction, production and accumulation. And finally, a sixth thread of research presents a radical critique of the politics necessary for true global sustainability, what some label

'green politics'. These scholars see a need to reject anthropocentric values and consider an entirely new global ecological ethic, calling for everything from full decentralization to full centralization of global authority.

These three previous reviews suggest a trend in the thinking of those in the field of international environmental politics. Zürn and Mitchell keep the focus on global institutions and regime theory. Paterson expands the parameters further, integrating far more of the literature on the role of the international political economy and the international processes of change outside of regimes and global policy. The present chapter builds on the reviews of Zürn, Mitchell and Paterson to propose even broader parameters for the scope and history of research in the field of global environmental politics.[2] It begins with a brief overview of the history of the field. It then divides the literature into three general themes: states, institutions, governance and security; the global political economy; and civil societies, knowledge and ethics. The logic of this division is straightforward. The first grouping deals with more traditional topics of international relations and the environment, topics that keep the analysis largely at the global level of states, international organizations, global governance and security. The second deals with more traditional topics of global political economy and the environment: capitalism, trade, corporations and financing. The third deals more with broader issues that tend to span the politics and economics of the international system – civil societies, the role of knowledge, and ethics – topics that tend to draw on the literature from the previous two groupings as well as more from disciplines outside of international relations, international law and economics. These groupings of research are not sealed categories: individual research inevitably crosses over in terms of substance and historical development. The groupings are useful, however, in terms of organizing the literature in global environmental politics in a way that reveals common themes and current trends. It also helps to demonstrate a core argument of this chapter: that academic research in global environmental politics is embracing an expanding set of research questions, theoretical constructs and methodological approaches, gaining confidence and independence as a field of social science inquiry. The aim of the chapter is not to develop a static picture of the field, but rather, as with all dynamic literatures, to show the current contours and possible future directions of research. It begins with a sketch of the history of the field.

History of the field

The history of research on global environmental politics is woven into the history of global environmental change. Environment, as a word with political or social meaning, is relatively new. In the 1950s, the limited times the word appeared, it referred to little more than the work or home environment (MacDonald, 2003: 151). Environmental issues began to emerge onto the

global agenda in the 1960s and early 1970s, culminating in the international policy world in the 1972 United Nations Conference on the Human Environment, held in Stockholm, Sweden (thus known as the Stockholm Conference). There was a steady, if relatively small, research community on the international politics of environmental change in the 1970s, though much of the research was comparative analysis of national policies, or broad analysis of the politics of Third World development. There was, within international relations, relatively few books and articles in mainstream journals. There were some major contributions, however, including books by Richard Falk (1971), Harold and Margaret Sprout (1971), William Ophuls (1977) and Michael M'Gonigle and Mark Zacher (1979). The journal *International Organization* also published a special issue in 1972 on 'International Institutions and the Environment Crisis' (in recognition of the Stockholm Conference). In the same year the International Studies Association established the Harold and Margaret Sprout Award for the best publication in international environmental affairs.[3]

There were, however, many great works outside of the discipline of international relations in the 1960s and 1970s that continue to this day to influence research in global environmental politics. This includes seminal articles such as Garrett Hardin's 1968 article, 'The Tragedy of the Commons', which, as Marvin Soroos argues in Chapter 3 of this volume, continues to have valuable explanatory power for understanding the politics of issues like climate change. It includes, too, bestselling books such as Rachel Carson's *Silent Spring* (1962), Paul Ehrlich's *The Population Bomb* (1968), Donella Meadows *et al*.'s *Limits to Growth* (1972), E.F. Schumacher's *Small is Beautiful* (1973) and James Lovelock's (1979, 1995) books on the theory of Gaia: that the planet is a living, holistic organism (see Litfin, ch. 30 this volume).

Political science research on the global environment began to expand over the 1980s (Young, 1981; Caldwell, 1984; Haas, 1989). The publication in 1987 of *Our Common Future* by the World Commission on Environment and Development, which called on the global community to integrate the principle of sustainable development,[4] along with the 1992 UN Conference on the Environment and Development in Rio de Janeiro, brought global ecological change to the top of the agendas of world leaders. Three academic journals devoted largely or in part to global environmental issues appeared around this time. Konrad von Moltke founded *International Environmental Affairs* in 1989. 'The purpose,' he writes, 'was to provide an outlet for academic research on international environmental affairs at a time when most peer reviewed academic journals were hardly taking the material.'[5] Three years later, Gordon J. MacDonald founded *The Journal of Environment and Development*.[6] The journal *Environmental Politics* was founded in the same year, accepting submissions on both domestic and international environmental politics.

Research on global environmental politics took off after the 1992 Rio Conference. Numerous doctoral students finished PhD dissertations on global environmental change in the 1990s, and increasing numbers of political science departments began to offer courses in global environmental politics. There were countless new academic books and journal articles on global environmental politics, including articles in mainstream international relations journals such as *International Organization*, *International Security* and *World Politics*.

International Environmental Affairs folded in 1998. The gap, however, was soon filled by the journal *Global Environmental Politics*, which I founded in 2001 along with Sharon Goad, Jennifer Clapp, Karen Litfin, Marian Miller and Paul Wapner. This journal explicitly invites 'submissions on contemporary international and comparative environmental politics'. Importantly the publisher of *Global Environmental Politics* is the MIT Press, which publishes the political science journal *International Security*, and which published *International Organization* until it shifted to Cambridge University in 2003. The backing of such a powerful press has helped *Global Environmental Politics* to reach into virtually all of the world's major university libraries, helping to assure the field of global environmental politics a lasting and significant impact on social science scholarship. One reflection of the growing strength of this field is the rapid increase since the mid-1990s in the number of general overviews of the politics of global environmental change suitable as university textbooks (Hempel, 1996; Bryant and Bailey, 1997; Dryzek, 1997; Dryzek and Schlosberg, 1998; Elliott, 1998; Conca and Dabelko, 1998; Connelly and Smith, 1999; Porter *et al*., 2000 – also the two previous editions; Paterson, 2000a; DeSombre, 2002; Maniates, 2003; Lipschutz, 2003; Switzer, 2004; Clapp and Dauvergne, 2005).

There have been, then, sweeping changes to the field of global environmental politics over the last decade. I now turn to outline the current state of research, beginning with the first of three overarching themes: the role of states, global institutions, international environmental agreements and international security.

A secure world of states, institutions and regimes

I divide this literature into three broad groupings, depending on the primary focus: the ecological impacts of the anarchic global system of sovereign states; international environmental agreements and institutions; and the links between environmental change and state security.

A common argument, especially among realists in the discipline of international relations, is that states, in pursuit of self-interest in a global structure of sovereignty, will destroy the commons (open access resources) unless radical constraints are put on state authority, such as a world government

(which many see as highly unlikely, if not, impossible). Garrett Hardin's (1968) parable of a tragedy of the commons captures much of the logic of scholars who see the sovereign state system as the core cause of the looming (or current) global ecological crisis (see Soroos, ch. 3 this volume). These arguments tend to assume that global institutions, regimes, norms and identities are epiphenomena – that is, these cannot fundamentally alter the characteristics of state impacts (see Litfin, 1998, for a sophisticated analysis of the sovereignty–global ecology relationship).

Many social scientists, notably Elinor Ostrom (1990), question the logic and accuracy of the parable of a tragedy of the commons, arguing that there are numerous cases of communities 'managing' common pool resources in ways that contradict Hardin's tragedy.[7] In a review of Hardin's parable, Joanna Burger and Michael Gochfeld (1998: 26) point out: 'Many of the examples of wise use management of common-pool resources involve local resources managed by small, relatively homogenous communities.' There is also significant research to suggest the 'real' world of ecological management is far more complex than Hardin's portrayal, with diverse policies and intricate governance structures (see, for example, Vogler, ch. 4 this volume; York, Janssen and Ostrom, ch. 15 this volume; Jordan, Wurzel and Zito, ch. 13 this volume). Much of this literature is now collecting under the banner of global governance, which often (although not always) strives to explore a more complex image of the driving forces and constraints (both formal and informal) on state and corporate activities (Hempel, 1996; Clapp, 1998b; Haas, 1999; Lipschutz, 1999; Conca, 2000; Vogler, 2000; Paterson *et al*., 2003; Vogler, 2003; Newell, 2003; Bretherton, 2003; Falkner, 2003; Jordan *et al*., 2003). There is great diversity of research here, although some scholars, like Oran Young (ch. 11 this volume), are now calling for a collaborative research effort to develop a unified theory of environmental governance.

The field of international environmental law strongly influences the study of the global politics of international environmental negotiations and agreements. Some political scientists are even publishing in international law journals (Lipschutz, 2001; DeSombre, 2001). At the same time, however, much of the international relations literature on environmental regimes is potentially valuable for a legal analysis of international environmental law. The international relations literature revolves around questions about the formation and consequences of regimes. Why do they form? What are the consequences? What are the most effective mechanisms to foster compliance? Are regimes effective? What is the influence of business, NGOs, networks of experts, knowledge, and science and scientific uncertainty on global regimes?

This literature has already added to the understanding of the formation and evolution of international regimes as well as state compliance with global

commitments (Young, 1989, 1994, 1998; Mitchell, 1994a; Elliott, 1994; Bernauer, 1995; Zürn, 1998; Hough, 1998; Joyner, 1998; Wettestad, 1999; Porter *et al*., 2000; Vogler, 2000, 2003). It has also contributed to understanding the history of environmental diplomacy and politics (Hurrell and Kingsbury, 1992; Brenton, 1994; Caldwell, 1996; Tolba with Rummel-Bulska, 1998), an evaluation of the impact of particular conferences and international meetings (Wapner, 2003; Rutherford, 2003; Rowlands, ch. 6 this volume), the understanding of the domestic sources of international environmental policy (DeSombre, 2000; Schreurs and Economy, 1997) and the role of the developing world (Miller, 1995; Steinberg, 2001; Najam, ch. 8 this volume). This literature has in particular advanced the broader social science efforts to measure the effectiveness of regimes (Susskind, 1994; Young, 1999, 2001b; Victor *et al*., 1998; Weiss and Jacobson, 1998; Wettestad, 1999; Kütting, 2000; Miles *et al*., 2001; Mitchell, 2002b; Hovi *et al*., 2003; VanDeveer, ch. 7 this volume).

Regime theorists assume it is rational for states to cooperate on global environmental affairs, as preserving this environment is in the long-term interests of the state. Unlike classical realists, these scholars assume that institutions do matter, that global politics involves more than just power and objective interests, but also perceptions, ideas, knowledge, identities and meanings. Scholars have studied in great detail the regimes to manage the ozone layer (Litfin, 1994; Benedick, 1998; Grundmann, 2001; Parson, 2003) and the earth's climate (Paterson, 1996, 2001; Soroos, 1997, 2001; Rowlands, 1995, 2000; Newell, 2000; Skjærseth and Skodvin, 2001). There is also significant research on other regimes: biotechnology (Newell 2003), desertification (Corell, 1999; Corell and Betsill, 2001), biodiversity (Mushita and Thompson, 2002), intentional pollution and shipping at sea (Mitchell, 1994b; Desombre, ch. 5 this volume), acid pollution (McCormick, 1997), whaling (Peterson, 1992; Stoett, 1997; Andresen, 2000, 2001), persistent organic pollutants and the 2001 Stockholm Convention (Lallas, 2000/2001; Schafer, 2002; Selin and Eckley, 2003; Downie and Fenge, 2003; Clapp, 2003; Yoder, 2003).

A related area of research focuses on the role of institutions in global environmental affairs (Haas *et al*., 1993; Keohane and Levy, 1996). Some of this examines institutions and international laws (Vig and Axelrod, 1999). Some focuses more on global institutions and assistance to developing countries to enhance capacity (VanDeveer and Dabelko, 2001; VanDeveer, ch. 7 this volume). There are studies of the impact of particular institutions such as the UN Environment Programme (Downie and Levy, 2000), the Global Environment Facility (GEF) (Fairman, 1996; Streck, 2001) and the World Bank (Rich, 1994; Le Prestre, 1989; Wade, 1997; Fox and Brown, 1998; Gutner, 2002). There is also increasing research on the implications of the interplay of environmental institutions (Rosendal, 2001; Andersen, 2002; Young, 2002; Selin and VanDeveer, 2003). There is also a growing debate on the need for a

new global environmental institution, perhaps called a World Environment Organization (WEO) (Biermann, 2000, 2001, argues for a WEO; von Moltke, 2001; Najam, 2003; Barkin, ch. 21 this volume, argue against; Whalley and Zissimos, 2001 examine some possible benefits and drawbacks). Some proposals for a world environment organization to some extent follow the logic of Hardin's (1974) and Ophuls' (1977) calls for a world authority to overcome what is, for them, a core reason for the overuse and ecological destruction of the commons (open access resources): states that pursue self-interest in an anarchic global system. Others, however, see a WEO more as a counter to the World Trade Organization rather than as an authority able to control states (as would, say, a world government).

There was also a significant strand of environmental research throughout the 1990s that focused on the links between environmental change, scarcity and security (especially of states). Much of this work refers to or builds on Thomas Homer-Dixon (1991, 1994, 1999). Homer-Dixon's research hypotheses and initial evidence appeared to have the potential to generate a lasting body of literature. The work of Richard Matthew and Ted Gaulin (2001), for example, builds nicely on his ideas. Yet many researchers over the last decade were unable to find a strong empirical link between environmental degradation and violent conflict. The criticism of Homer-Dixon's research by scholars like Dan Deudney (1990), Nancy Peluso and Michael Watts (2001), and Simon Dalby (2002), and the research by scholars like Indra de Soysa (2002 and ch. 10 this volume) who find stronger links between abundance and conflict, seems likely to further discourage future research on this topic (especially among graduate students). Homer-Dixon's research also appears to be moving toward new ground with the publication in 2000 of his Canadian bestseller, *The Ingenuity Gap*. That said, in chapter 9 of this volume, Richard Matthew adeptly argues for the literature on environmental security to develop further compelling research.

The research in international relations does not exist in an airtight box, and inevitably it overlaps with the research on the political economy of global environmental change – the topic of the next section.

Global political economy

Are there limits to growth? Is the globe heading toward a global ecological calamity? The work of Thomas Robert Malthus (1798), who foresaw a looming crisis for humanity as exponential population growth outpaced arithmetic increases in food, has influenced many to answer these questions with a resounding, yes! Paul Ehrlich (1968) is one of the most notorious Malthusian scholars. Others in this tradition include Donella Meadows (Meadows *et al*., 1972), Lester Brown (2003) and Norman Myers (1979).[8] Other scholars, however, label such research 'doomsaying', a result of a misunderstanding of

basic economics and a misrepresentation of global statistics (Simon, 1981, 1996; Easterbrook, 1995; Lomborg, 2001).

Numerous studies strive to document and explain the political economy of global environmental change (Newell, ch. 12 this volume). Much research focuses on industrialization, the changing nature of production and the role of economic growth (Carson, 1962; Davidson, 2000; Cole and Neumayer, ch. 19 this volume). Recently there has also been significant attention to the ecological impact of consumerism and a global consumerist culture (Princen *et al*., 2002; Maniates, 2001; Princen, 2001; Robbins, 2002; Rees and Westra, 2003). Matthew Paterson, for example, is now focusing his research efforts on a critique of car culture (Paterson, 2000b, as well as ch. 17 of this book). The environmental impact of the process of globalization is also generating increasing research (Conca, 2001; Fuchs and Lorek, 2002; Dauvergne, 2005), including calls for localization of the world economy (Mander and Goldsmith, 1996; Hines, 2000, 2003).

Others point more to the impact of capitalism and North–South structural inequalities, such as the research on the ecological shadows of Northern economies on the South (MacNeill et al., 1991; Dauvergne, 1997b). The concept of ecological footprints (Wackernagel and Rees, 1996) is one of the innovative ways scholars have tried to compare the ecological impact of individuals across the globe. This measures the total area in global hectares (one hectare of average biological productivity) needed to sustain a person's consumption of food, water, clothes, shelter, transportation and consumer goods and services. It vividly demonstrates the great inequality of global consumption. The average ecological footprint in 1999 was 2.3 hectares per person, with an average in Africa of 1.36 and in the USA of 9.7 (see WWF, 2002: 2–4, 22–8). There are also sweeping critiques of capitalism, with scholars like John McMurtry (1999) equating it to a cancer. Others have focused on the ecological impacts of particular aspects of capitalism, such as financial crises (Dauvergne, 1999), the position of the South in the global political economy (Arden-Clarke, 1992; Najam and Robins, 2001), Third World debt (George, 1992; Rich, 1994) and aid and financing for sustainable development in the South (Najam, 2002). There is also a large literature on what would constitute a green political economy (Daly and Cobb Jr, 1989; Barry and Smith, ch. 16 this volume).

The two largest bodies of research on particular aspects of capitalism are on trade and corporations. Recent research on free trade agreements and the World Trade Organization is particularly extensive (Esty, 1994, 2001; Charnovitz, 1995; Rao, 2000; Conca, 2000; Tussie, 2000; Neumayer, 2001; DeSombre and Barkin, 2002; O'Neill and Burns, ch. 20 this volume; Barkin, ch. 21 this volume; Hochstetler, ch. 22 this volume). Some scholars see trade as a core cause of global ecological harm, for example when prices do not

reflect the full ecological (or social) costs (which in turn encourages overconsumption) (Arden-Clarke, 1992; Daly, 1993, 1996; Dauvergne, 1997a). Others argue that trade is compatible with, indeed essential for, global sustainability, as it promotes economic growth (which reduces poverty) and fosters efficient use of the globe's resources (Bhagwati, 1993). Still others argue that trade is becoming increasingly compatible with global environmental goals, as institutions like the World Trade Organization become more attuned to environmental concerns (Barkin, ch. 21 this volume). There is also a large literature on the impacts of trade in particular products, such as hazardous waste (Krueger, 1999; O'Neill, 2000, 2001; Clapp, 2001).

The literature on corporations and environmental damage is at least as large as the literature on trade (for logging, see Marchak, 1995; Filer, 1997; Dauvergne, 2001; for mining, see Banks, 1993; Emberson-Bain, 1994; Jackson and Banks, 2003; for industrial waste, see Clapp, 2001; for oil, see Gedicks, 2001). There is also a big literature on how multinational firms spin language to appear to address environmental concerns – sometimes called 'greenwash' (Korten, 1995; Rowell, 1996; Greer and Bruno, 1997; Beder, 1997; Karliner, 1997; Welford, 1997). Another branch of this literature looks at the way multinational corporations (MNCs) influence global environmental negotiations and treaties (Susskind, 1992; Chatterjee and Finger, 1994; Levy, 1997). There is also an emerging literature on business and environmental governance (Laferrière, 2001; Levy and Newell, 2002; Levy and Newell, 2005; Clapp, ch. 18 this volume), and business as environmental actors (Levy, 1997; Levy and Egan, 1998; Newell and Paterson, 1998; Clapp, 1998a, 2001; Dauvergne, 2001; Garcia-Johnson, 2000). Scholars like Arthur Mol (2002) examine corporations in the context of ecological modernization. A strand of the corporations and environment literature examines (and debates) the prevalence of pollution havens (Clapp, 2002; Hall, 2002; Wheeler, 2002). This literature also integrates the effects of trade, dealing with questions such as the following. Do governments lower environmental standards and regulations to attract firms, creating a competitive 'race to the bottom'? Do developing countries become 'stuck at the bottom' as global competition exerts downward pressure on domestic regulations? Do multinational investors in effect export environmentalism and raise standards in developing countries? Is there 'a race to the top' as environmental regulations and technologies spread from the highly developed economies to the rest of the world (Vogel, 1995; Porter, 1999; Garcia-Johnson, 2000; Wheeler, 2001)? There are also in-depth studies of corporate compliance and initiatives within firms (Rowlands, 2000; Prakash, 2000), as well as the impact of certification schemes and private regulation on corporate conduct (Lipschutz, ch. 14 this volume). Less common are studies from within the business community, such as Stephan Schmidheiny's (1992) *Changing Course*.

Civil societies, knowledge and global ethics

The literature on civil societies, knowledge and ethics is pulling the field of global environmental politics away from a focus on states, formal institutions, security and the role of the global political economy. It is also drawing in more and more literature from disciplines outside of political science, international law and economics – the most important disciplines in the field in the 1990s.

Interest in the role of civil societies in international relations has grown steadily over the last decade or so. This in part reflects the great increase in the number of nongovernmental groups. But it also in part reflects a shift away from the view that states alone shape global affairs. There is now a vast literature on the role of the environmental movements and civil society in global environmental management (Princen and Finger, 1994; Princen, 1994; Lipschutz with Mayer, 1996; Wapner, 1995, 1996, 2002b; Kolk, 1996; Humphreys, 1996; Jasanoff, 1997; Keck and Sikkink, 1998; Auer, 1998; Lee and So, 1999; McCormick, 1999; Tesh, 2000; Betsill and Corell, 2001; Tamiotti and Finger, 2001; Bryner, 2001; Newell, 2000; Hochstetler, 2002; Ford, 2003). There are a wide range of specific research questions. How and to what extent do nongovernmental organizations (NGOs) influence global environmental negotiations? What is the impact of NGOs on the environmental behaviour of states and corporations? Are the actions of civil society groups altering the global culture? If so, what does this mean for the actions of states and firms and individuals? And what does this mean for the global allocation of scarce environmental resources?

The environmental literature on norms, consciousness, identities, meanings and the construction of global environmental discourse (Dryzek, 1997; Bernstein, 2001; Jasanoff, 2001; Wapner, 2002a) further pushes the literature in global environmental politics away from states (or at least from a focus on the structural power of states). So does some (though not all) of the literature on knowledge and the role of science. Some of the science and environment literature examines the influence of epistemic communities (Haas, 1992) and networks of experts (Keck and Sikkink, 1998; Conca, ch. 27 this volume) in global environmental management. Some explores the role of science and knowledge in global environmental governance (Jasanoff, ch. 23; Haas, ch. 24; Williams, ch. 25; and Martello, ch. 26 all in this volume). Some is more explicitly critical of so-called 'science' and the treatment by international institutions of non-Western knowledge systems (Ehrlich and Ehrlich, 1996; Shiva, 1997; Long Martello, 2001).

The literature on environmental ethics, too, is gradually expanding the scope of the field of global environmental politics further still. This literature is far too large to survey all of the arguments and themes here (see, to begin, Hardin, 1974; Pojman, 2000, 2001; Des Jardins 1999, 2001; Young, 2001a;

Wenz, 2001; Schmidtz and Willott, 2002; VanDeVeer and Pierce, 2003; Light and Rolston, 2003). There is also a fairly large literature on environmental justice, racism and feminism (Mies and Shiva, 1994; Hampson and Reppy, 1996; Dobson, 1998; Low and Gleeson, 1998; Shue, 1999; Bretherton, 2003). Much of this literature originates in the discipline of philosophy, in the field of political theory, or from within the activist community. So far it has had less impact on global environmental politics than one might initially expect, given that so many global environmental issues raise fundamental moral and ethical questions.

One reason is the place of normative theory within international relations, a relatively minor branch of study in today's political science departments within North America (Smith, 1992). It is stronger in Europe, but not enough to infuse global environmental politics with a strong tradition of ethical research. This does, however, seem to be changing, partly because ethics and normative questions are a natural area for scholars of global environmental politics, as many have an underlying normative belief in improving and protecting the global environment (see Stoett, 1997; and Wapner, ch. 28; Elliott, ch. 29; and Litfin, ch. 30, all in this volume).

Conclusion: the future of research?

It is hard, if not impossible, to predict future research output. New theories will inevitably emerge, as will new actors, processes and problems. The field of global environmental politics (GEP) will naturally continue to evolve. Yet it is possible to discern some emerging trends in current research, ones that at least *suggest* likely future directions.

Theoretically researchers will no doubt continue to explore the critical role of states, sovereignty, regimes and institutions. These literatures are now highly developed. Scholars of global environmental politics continue to break new ground in regime research even as much of the literature in international relations veers away from regimes and toward more formal legal processes, norms and nonstate forces of change (Conca, 2004). The environmental literature has been especially significant for improving the understanding of global cooperation and the creation of global regulations. It is also pushing forward the theoretical literature on global governance as international relations scholars explore ways to embrace a more holistic analysis of global environmental management.

The field of GEP is extending its reach, however, as more and more scholars explore issues through a local–global lens and with more stress on the exploitative nature of global capitalism: that is, on the ecological injustice and inequalities of patterns of global power and resource control. The theme of violence will continue within this research group, although not with as much attention to the degradation–scarcity–violence hypothesis, but rather

violence in the context of broader patterns of suppression and rebellion in a world of limited valuable resources.

The politics of some of the most intransigent global environmental problems, such as climate change, biodiversity loss, desertification, fresh water, transboundary pollutants and deforestation, will continue to generate significant empirical research. Original contemporary research on other issues such as ozone depletion and whaling seem destined for less research, although, as with Tora Skodvin and Steinar Andresen's (2003) article on the evolution of the whaling regime, more retrospective studies of such issues will no doubt continue to generate significant theoretical insights.

On the other hand, the research on transnational societal forces, ethics, corporations and capitalism (such as consumption) seems set to grow even further. Here I predict that scholarship in global environmental politics will naturally drift into more normative research, as so much raises gnawing ethical questions, from the personal to the global. This trend could perhaps even help to reinvigorate the broader study of normative theory in international relations.

More certain, it seems that research in global environmental politics will continue to expand beyond the discipline of political science. Already international law and economics are highly influential, but more and more political science scholarship draws on literature across an ever wider range of disciplines. Scholars in other disciplines, too, are gradually integrating the literature in international relations and comparative politics on the global environment.

This is changing the nature of research in global environmental politics. Over the last three decades much of the theoretical literature in global environmental politics aimed to contribute to political science (as with the research on measuring the effectiveness of environmental regimes). However, it is probable that more of the future literature will focus explicitly on trying to explain the political (defined broadly) causes and consequences of global environmental change. That is, the purpose will increasingly shift to explaining environmental change rather than, say, the formation of political institutions. Much of the future research will also, in this admittedly speculative view, overtly strive to advance the knowledge within an increasingly large and confident group of scholars within the field of global environmental politics.

Notes

* I presented an earlier draft of this chapter at the International Studies Association Convention (20 March 2004) and appreciate the constructive comments of participants. Please note, 'chapters' (for example, Dauvergne: ch. 1) in this text refers to the ones in this book.

1. Stephen Krasner's (1983: 2) definition of international regime remains the classic one for many international relations scholars: 'sets of implicit or explicit principles, norms, rules and decision making procedures around which actors' expectations converge in a given area of international relations'.

2. The literature reviews of Zürn (1998), Mitchell (2002a) and Paterson (forthcoming) all use the term 'international environmental politics'. I intentionally use the term 'global' instead of 'international' to stress the movement of the field well beyond a study of inter-state relations and the global environment.
3. For recent Sprout Award winners, see www.isanet.org/sections/ess/.
4. The World Commission on Environment and Development (1987: 43) defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.
5. Email correspondence between Konrad von Moltke and the author, 11 December 2003.
6. MacDonald was editor until his death in 2002.
7. Hardin (1998) acknowledges that he should have added the 'modifying adjective "unmanaged"' to the word 'commons'.
8. See Broswimmer (2002) for a more recent study of species loss.

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PART II

STATES, GOVERNANCE AND SECURITY

3 Garrett Hardin and tragedies of global commons

Marvin S. Soroos

Arguably no other work in the field of environmental policy has been as widely read and influential, and perhaps as controversial, as biologist Garrett Hardin's (1968) article 'The Tragedy of the Commons'. The article appeared as a first wave of environmental concern was building in the late 1960s that culminated in the first Earth Day in 1970 and the United Nations Conference on the Human Environment in Stockholm in 1972. It was the era of the *Torrey Canyon* oil spill in the English Channel and Paul Erhlich's (1968) book *The Population Bomb* that drew attention to the rapid global population growth rates of the 1960s. A few years later, the Club of Rome released its alarming report entitled *The Limits to Growth* (Meadows *et al*., 1972).

Over the years, many have criticized Hardin by questioning the inevitability of the environmental 'tragedies' he warns about or the ethics of his proposals for averting them. His later article, 'Living on a Lifeboat' was especially controversial for arguing against providing emergency food assistance programmes for nations suffering from famine in order to encourage demographic responsibility (Hardin, 1974; for a critique see Soroos, 1977). Nevertheless, as politically incorrect as some of Hardin's proposals have been, I have found myself repeatedly drawn back to his basic model, and the parables he offers to present it, as I have sought to explore the dynamics of international and global environmental problems and analyse the strategies that might be adopted to address them. Not all environmental problems conform to the dynamics of the tragedy of the commons, but several important ones do, at least in a general way. Among these is the depletion of many marine fisheries, pollution of the oceans and the atmosphere, and the littering of outer space with debris from spacecraft. Global population growth also has elements of the tragedy scenario, as Hardin suggests in his original article.

This chapter begins with a brief review of Hardin's theory, followed by a formal definition of the concept of the commons and an analysis of potential strategies that could be used to avert an environmental tragedy. It will then explain some of the ways in which the global environment is susceptible to overuse and misuse in ways that mirror the dynamic of the tragedy of the commons. Finally it will look at the problem of human-induced climate change as an evolving global tragedy of the commons and assess efforts that

are being made internationally to address this most compelling of environmental problems facing humanity.

Hardin's thesis

The impact of Hardin's writings is partly attributable to the parables he uses to explain his concern about the human proclivity to abuse the environment. In his essay 'The Tragedy of the Commons', he asks the reader to imagine an old English village with a common pasture that is available to the residents to graze their privately owned cattle, from which they derive a personal income. In the absence of enforceable limits on the use of the pasture, Hardin warns that the villagers can be expected to continue adding cattle even after it becomes apparent that their common resource is being seriously overgrazed. Each resident acts on the basis of a rational calculation that he will enjoy all of the income produced by each head of cattle he adds to the pasture, while the environmental damages caused by his additional cattle will be shared with the community. Thus, from the individual's standpoint, the gains from adding cattle outweigh the costs, at least until the tragedy runs its course and the common resource is seriously depleted or degraded, and thus of little or no use to anyone. In Hardin's words, 'ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons'.

But will the villagers not anticipate the impending tragedy and act responsibly to preserve the pasture by refraining from adding additional cattle? Hardin does not have much faith in self-restraint as in most communities there will be one or more users of a commons who persist in pursuing their individual advantage, even though their actions further aggravate the environmental tragedy that is unfolding. These irresponsible members of the community are referred to as 'free-riders', because they take advantage of the restraint of those who are trying to conserve the pasture. Those who act responsibly become disillusioned as they see that their sacrifices will fail to save the pasture, while their income falls relative to that of the free-riders. Hardin foresees that those who voluntarily exercise restraint for the common good become self-eliminating over time.

In his original essay, Hardin suggests that adopting and enforcing rules that coercively impose limits on the use of common resources can avoid environmental tragedies. To those who oppose such rules while insisting on enjoying the freedom to do as they like, Hardin has two responses: first, that 'freedom in the commons brings ruin to all' and, second, that 'freedom is the recognition of necessity'.

In his essay 'Living on a Lifeboat,' Hardin (1974) asks the reader to imagine being on a lifeboat riding the seas following a shipwreck. The lifeboat has a capacity of 60, but only 50 are on board, leaving room for ten

more people. In the waters are 100 desperate swimmers who have been forced off other, overcrowded lifeboats and are pleading to come aboard and be saved. What should the fortunate occupants of the uncrowded lifeboat do? Hardin rejects the idea of taking all 100 aboard, as doing so would sink the lifeboat and all would perish, including the original occupants. He also argues against allowing ten aboard, because this would jeopardize the margin of safety for the original occupants and require an ethically difficult decision on which ten to admit. Thus Hardin opts for a third course of action, denying admission to any of the swimmers, which would maintain the margin of safety for those already aboard.

Hardin likens the other overcrowded lifeboats to overpopulated countries that are unable to feed their populations adequately. He counsels the richer countries with food surpluses to resist the temptation to be altruistic and bail out these countries, either by providing food assistance or by allowing the excess people to immigrate to the richer countries. To do so would transform their food supplies into an international commons that would be exploited by food-deficit countries. Believing that additional food assistance will be available indefinitely into the future, the governments and peoples of overpopulated countries would see no need to restrain their fertility rates, leading to further population growth and even greater food needs that would eventually overwhelm the food-producing capacity of the developed countries. If denied food assistance, even in times of emergency, the poorer countries would be forced to become more demographically responsible, or nature would run its course in the form of a population dieback, as it does with other species whose numbers overshoot the food that is available in their habitats.

Hardin's 'lifeboat ethics' incorporates a second strategy for avoiding a tragedy of the commons, doing away with the commons arrangement for managing a resource by privatizing or nationalizing it. Thus the village pasture would be divided into sections assigned to individual households for their exclusive use. If a household overgrazed its private plot, it would bear all of the consequences. Likewise, rather than treating global food supplies as an international commons, nations would consume only the food produced within their borders. If a country's population exceeded its capacity to produce food, its people would go hungry. Such an arrangement, Hardin suggests, will instil 'intrinsic responsibility', by imposing an incentive for acting with restraint in order to conserve natural resources. While Hardin discourages food assistance because it undermines intrinsic responsibility, helping nations increase their agricultural productivity is an appropriate policy.

The concept of the commons

A jumble of related, but distinctive, concepts have been used to discuss issues pertaining to common resources, including commons, common property,

common pool resource, common heritage of mankind, collective good and public good. This short chapter will not attempt to define and distinguish these concepts, but rather will focus on the concept of a commons as presented in Hardin's writings on the 'tragedy of the commons'. Previously I have proposed the following criteria to define a commons (Soroos, 1997b, 2001). First, a commons is a 'resource domain' in which there are 'resource units' that may be useful to human actors (Ostrom, 1990: 30). In Hardin's story of the English village, the pasture is the resource domain, while the clumps of grass that cattle consume are the resource units. Resource domains could be a geographical space, such as a parking lot or a collectivity of resources, such as a fish stock. The resource units may be physical objects, such as trees that might be removed from a forest, or a medium in which objects or substances can be placed or discarded, such as a garbage landfill.

Second, a commons is available to multiple users to exploit for their individual gain. Commons may be open-access in the sense of being available to anyone who wishes to use the domain, or limited-access in being open only to a certain community of users, as in the case of the village. The high seas have traditionally been an open-access commons available to the fishing boats of any country. Likewise outer space has been available to any country with the means to launch artificial satellites into orbit. The European Union treats the fisheries within the 200-mile exclusive economic zones off its coasts as a commons that is available to all members, but not to other states.

Third, the resource units of commons are both finite, meaning that there are limited amounts of them, and subtractive, implying that, when a resource unit is consumed by one actor, it is no longer available to others. In Hardin's English village, the pasture is finite in the amount of grass it contains, and subtractive in that a clump of grass eaten by one person's cow is not available to others. Likewise fish stocks contain a finite number of fish and, once a fish is caught by one boat, it is no longer available to others. The atmosphere has a limited capacity to absorb pollutants such as sulphur dioxide and carbon dioxide without serious environmental consequences. Once that capacity is taken up by polluting actors, it cannot accommodate the emissions of others.

Ownership of commons

It is often assumed that the commons are owned collectively by the users, but this is not necessarily the case. For example, the pasture in the English village might be owned by the king or by a wealthy landowner, who permits the residents to use it. Or it could even have the status of being unowned and thus available for exploitation by anyone who comes along. The owner, if there is one, can presumably establish the rules for the use of a commons.

Some intriguing issues have arisen in regard to the ownership or jurisdiction of global and international commons. The oceans have traditionally

fallen under the legal doctrine known as *res communis*, which means that they have the status of being unowned and not being available for exclusive claims that might be staked by nations. This concept can be distinguished from the designation of *res nullius*, which recognizes a resource as being unowned, but available to being claimed as private property. Fish in the high seas have been looked upon as being unowned until they are caught, at which time they become the property of whoever harvests them. Thus the resource domain that comprises a commons can be looked upon as having *res communis* status, while the resource units are treated as *res nullius* resources (Soroos, 1997b: 215–21).

Not all global commons, however, are treated as being unowned. The seabed, for example, has a legal status that is different from the oceans above it. Interest in control over the seabed rose during the 1960s with the prospect of mining the bountiful mineral-rich nodules that lie on the deep seabed, especially in areas beyond the territorial jurisdiction of coastal states. As the states with seabed mining technologies raised the possibility of staking exclusive claims to promising regions of the seabed, Arvid Pardo, a UN delegate from Malta, spoke to the General Assembly on behalf of the majority of countries that lacked the technologies to engage in seabed mining. Objecting to the possibility that the seabed would be carved up into nationally controlled sections, Pardo argued that the domain should be designated the common heritage of mankind, which would imply that the region and its resources belonged to the peoples of all nations. Under such a status, the seabed would be used only for peaceful purposes. Moreover all states would participate in decisions about the exploitation of its resources and would share in the income that would be generated, regardless of whether they had the resources to engage in seabed mining (see Pardo, 1983).

Issues of ownership and jurisdiction have also arisen over other domains that are widely considered global commons. The status of the continent of Antarctica is especially ambiguous. During the first half of the twentieth century, seven nations – Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom – staked claims to wedge-shaped parts of Antarctica on grounds such as geographical proximity or discovery by early explorers. Some of these claims are overlapping, in particular those of Argentina, Chile and the United Kingdom. The United States and Soviet Union refused to recognize these claims, while holding out the option of later staking their own claims. The Antarctica Treaty of 1959 prohibited new claims, while finessing the controversy over existing ones by neither denying nor legitimizing them. The treaty provides that the entire continent is available for the research activities of all countries, which are to be conducted openly. The treaty prohibits the use of the continent for military purposes, including the testing of all weapons, most notably nuclear ones (see Peterson,

1988). The Madrid Protocol, adopted by the Antarctic Treaty Consultative States in 1991, places oil or mineral exploration and exploitation in the Antarctica region on hold for at least the next 50 years (see Joyner, 1998).

The international legal status of outer space has also been ambiguous. Outer space is the region beyond national air spaces, over which the states beneath them have jurisdiction. The boundary between air space and outer space is not specifically defined, except that air space is considered to extend up as high as aircraft can fly, while outer space is the domain in which artificial satellites orbit the earth. The legal status of outer space did not become an issue until space exploration began in the late 1950s. The Outer Space Treaty of 1967 declares that no part of outer space, including the moon and other celestial bodies, may be appropriated by any country, nor is the domain to be used for testing of nuclear weapons or stationing of weapons of mass destruction. The treaty has some language suggestive of the common heritage of mankind principle, in that it declares that the 'exploration and use of outer space … shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind'. However it also suggests that outer space 'shall be free for exploration and use by all states without discrimination of any kind', but provides that all activities in outer space should be conducted 'on the basis of equality'. The Moon Treaty of 1979 is more explicit in applying the terminology of the 'common heritage of mankind' to the moon and other celestial bodies, thus placing them in the same legal category as the seabed (Soroos, 2001: 47–9).

The atmosphere is the remaining resource domain that is commonly referred to as a global commons. As a mass of gases composed primarily of nitrogen and oxygen, along with a variety of trace gases and water vapour, the atmosphere circulates around the planet. Approximately 85 per cent of the gases comprising the atmosphere reside within its lower level, known as the troposphere, which extends upward to an average altitude of 10–12 kilometres. The troposphere is the most dynamic layer of the atmosphere, in which most clouds and storms occur. By contrast, the next layer of the atmosphere, the stratosphere, is relatively calm and for this reason a realm that is better suited to jet aircraft. Thus, most of the gases comprising the atmosphere circulate at levels in which they flow through national air spaces, much as rivers flow through national territories. However, because it is not possible for nations to take possession of the gases located in their air spaces at any given time, all of the atmosphere can be looked upon as a commons that is beyond the jurisdiction of nations (see Soroos, 1997b, 1998).

Preventing environmental tragedies

There are five basic approaches that may be used to try to avert overuse or misuse of a commons in ways that would deplete or degrade its resources. First, voluntary restraint in using the commons may be encouraged by appeals to the users to limit their activities in order to conserve the resources. As mentioned above, Hardin places little stock in such an approach, believing that at least some users will continue to act to maximize their private gain even at the expense of the larger public good. Second, restrictions or rules may be placed on the use of the commons. These may take the form of temporary or permanent bans on use of the commons, limits on the amount of use that will be permitted, or rules on the types of equipment or technologies that may be employed in making use of the commons. If quotas are assigned to individual users, they may be made tradable in whole or in part. Third, market incentives, such as taxes or fines, can be assessed to make it less profitable to overuse a commons. Fourth, some domains may be divided into sections that can be assigned to individual users for their exclusive use in order to instil what Hardin refers to as 'intrinsic responsibility' in his essay on lifeboat ethics. Fifth, use of the commons could be socialized, with use of it being limited to a community enterprise, which would distribute the resulting income to the members of the community. A community-appointed manager would seek to generate as much income from the resource as is environmentally sustainable (see Soroos, 2000; Mirovitskaya and Soroos, 1995). While in theory all of these strategies have some potential for avoiding an environmental tragedy, their success depends upon how they are implemented.

Three of these strategies have been most widely adopted in efforts to avert environmental tragedies in the use of international and global commons: voluntary restraint, limits and regulations, and division into sections. Market incentives would be possible, such as the payment of royalties on the harvesting of fish on the high seas, but thus far governments have not been receptive to the imposition of what could be described as international taxation. Likewise it is hard to conceive how the use of a global commons could be limited to an international enterprise, as in the case of fishing or using the atmosphere as a sink for air pollutants. The Convention on the Law of the Sea provided for such an enterprise that would mine seabed minerals on behalf of the international community, but it is doubtful whether such activities will ever prove to be practical or profitable. Furthermore the treaty permits simultaneous mining by private, nation-based firms. The so-called 'parallel' mining arrangement was designed less to conserve seabed minerals, which are plentiful relative to potential rates of exploitation, than to achieve equity for the developing countries that lack the technological and economic capacities to engage in seabed mining on their own.

Voluntary restraints are very much a part of international efforts to conserve the resources of global commons. The United Nations General Assembly and other international institutions adopt numerous resolutions and declarations by majority votes. Such documents fall into the category of international 'soft law' in that their provisions are not considered binding on nations, even on those who voted for them. An example is the General Assembly resolutions that call upon states to observe a moratorium on large-scale pelagic drift net fishing, beginning in 1992. Likewise, in 1995, the United Nations Food and Agricultural Organization adopted a Code of Conduct for Responsible Fisheries that has numerous suggestions for the way nations manage fishing operations under their jurisdictions. *Agenda 21*, the lengthy action plan adopted at the Earth Summit in 1992, spells out numerous recommendations that states are encouraged to implement to further the cause of sustainable development going into the 21st century. While compliance with the provisions of these resolutions is in most cases voluntary, such documents can be cited in an effort to use moral suasion to encourage states to act responsibly. Furthermore resolutions may be a preliminary step toward the negotiation of an international treaty that would be binding on the states that have ratified it.

There are numerous examples of rules and regulations that have been imposed on the use of global commons, most of which are set forth in international treaties. The atmosphere was available for the testing of nuclear weapons until the Limited Test Ban Treaty of 1963 completely prohibited such activity. The London Convention of 1972 outlaws the dumping of highly toxic substances in the oceans. The International Whaling Commission adopted a ban on the commercial harvesting of all whale species that went into effect in 1986. The Montreal Protocol of 1987, as amended in 1990, 1992, 1995, 1997 and 1999, established a timetable for the complete phasing out of chlorofluorocarbons (CFCs), halons and several other synthetic chemical compounds implicated in depletion of the ozone layer.

Other international agreements establish limits on the amount of use of global commons. The approximately 20 international fishery commissions established since World War II have tried a variety of strategies for keeping the catch of fish within levels known as 'total allowable catches'. In some cases, fishing has been limited to specified seasons; in others, fishing was allowed until the combined catch of all states reached a prescribed level. Many of the commissions assigned a quota for each fishing nation based on criteria such as proximity to a fishery or its historical share of the catch (see Peterson, 1993). European nations have accepted rules under protocols linked to the Convention on Long-Range Transboundary Air Pollution of 1979, which require them to reduce their emissions of acid-forming pollutants such as sulphur dioxide, nitrous oxides and volatile organic compounds (VOCs) by certain percentages by a specified date (see McCormick, 1998).

In some cases, restrictions have taken the form of rules on how an international commons is used or exploited. Several of the international fishery commissions have adopted rules on the type of equipment that can be used to catch fish, such as mandating the minimum size for the mesh of nets to allow small, younger fish to escape. The International Maritime Organization has adopted a variety of requirements for oil tankers that are designed to reduce the amount of oil pollution entering the oceans either from the normal operations of the ships or from accidents. Among these are segregated ballast tanks, specifications for navigational equipment, and double hulls on newly constructed tankers (see Mitchell, 1994).

There are few examples of international commons being divided up with jurisdiction over sections of the resource domains being given to individual states. The most notable example of nationalizing international commons is the offshore zones over which coastal states have jurisdiction as provided under international law. The Convention on the Law of the Sea provides coastal states with a 12-nautical mile band of territorial waters, over which they may exercise most rights of sovereignty. Beyond these territorial waters coastal states may claim an Exclusive Economic Zone (EEZ) out to 200 nautical miles within which they are given primary responsibility for managing exploitation of both living and nonliving resources of the waters and the seabed. The nutrient-rich waters of these EEZs are home to most of the productive marine fisheries. Thus the coastal states have the legal prerogative of limiting the harvesting of fish within their EEZs to sustainable levels (see Soroos, 1986: 261–93).

Another example of nationalizing an international commons has occurred in outer space, where individual countries have been assigned orbital locations for positioning satellites in the geostationary orbit, which is 22 300 miles above the equator. Satellites in this orbit remain over the same location on the earth's surface, which is advantageous for weather and communication satellites. Assigning orbital 'parking places' to individual countries seeks to ensure that the orbital space will not become overcrowded to the extent that satellites interfere with one another and that all countries will have an opportunity to use the orbit even if they do not yet have the technological means to use it (Soroos, 1987).

These strategies have not been especially successful in averting the overuse or misuse of international commons. Appeals for voluntary restraint usually have little impact on the governments of states, who normally are much more responsive to what they perceive to be the national interests than to appeals to make sacrifices to achieve a global good. Open and unlimited access to marine fisheries almost inevitably results in a collapse of the stock as the fishers of many nations race to harvest what they can, fearing that the fish they pass up in the interests of conservation will end up in the nets of

another boat. The success of international rules is mixed. The Montreal Protocol, as amended, has dramatically cut down on ozone-depleting substances flowing up to the stratosphere, but there is a thriving black market for regulated substances such as CFCs, which threatens to undermine the impact of the protocol.

Rules on fishing have been notoriously difficult to enforce given the financial payoffs that accrue to the fishers who break the rules and the improbability that their infractions will be detected and punished. Nor have the EEZs saved declining fisheries, as coastal states have lacked the means or the will to manage and control the fishing activities of their own or foreign boats. The spectacular collapse of the cod fisheries off the east coasts of Canada and the United States occurred after the two countries had declared exclusive fishery zones out to 200 miles. The two nations' fishers responded to the reduction in fishing by foreign countries by greatly increasing the scale of their own fishing activities, thus triggering a tragedy of the commons within the national fishing zones (see Soroos, 1997a).

Global warming as a tragedy of the commons

The atmosphere has long been an open-access commons that humans have used freely for disposing of gaseous or aerosol pollutants. When human populations were much smaller and less industrialized, the atmosphere had the capacity to disperse these pollutants in a relatively harmless way, with the exception of some of the more highly urbanized areas where air quality has threatened the health of the residents for centuries. By the mid-19th century it was becoming apparent that air pollutants such as sulphur dioxide from the burning of coal were significantly harming human health and the environment locally. In the 1960s, Swedish scientist Svante Odén confirmed that pollutants originating in the British Isles and continental Europe were causing heightened levels of acidification in southern Scandinavia that were damaging to forests and aquatic life. Mario Molina and Sherwood Roland (1974) called attention to the alarming possibility that CFCs, a family of synthetic chemical compounds used widely in industry and consumer goods, posed a threat to the stratospheric ozone layer that protects life on the planet from harmful frequencies of ultraviolet radiation.

Toward the end of the 19th century, Svante Arrhenius (1896), another Swedish scientist, had broached the possibility that growing concentrations of carbon dioxide (CO_2) in the atmosphere resulting from the burning of fossil fuels could trigger global warming. Arrhenius did not foresee how soon a doubling of CO_2 might occur, and welcomed the prospect of a warming trend as being advantageous for his cold country. By the end of the 20th century, concentrations of CO_2 in the atmosphere had risen to 367 parts per million, or 30 per cent over preindustrial levels of about 280 ppm. Temperature

records dating back to 1860 reveal that average annual global mean temperatures had already risen by about 0.6°C by the end of the 1990s, with a pronounced acceleration of the warming trend over the past 50 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) attributes this observed warming in large part to human additions of CO_2 and other greenhouse gases (GHGs) to the atmosphere. If present trends continue, the panel projects a global average warming of 1.4 to 5.8°C for the period 1990 to 2100 (IPCC, 2001: 2–10).

Global climate change illustrates the dynamic of the tragedy of the commons in several ways. Human communities have adjusted in complex ways to the climates that have prevailed in the regions where they reside. Thus significant climatic changes can be disruptive to their economies and lifestyles, and in some cases to their very survival (see Fagan, 2004). A relatively stable and benign climate could therefore be considered a global public good that all human populations can enjoy regardless of whether they have contributed to maintaining it.

As a global commons, the atmosphere has been an open-access resource domain that is available to all humans for the disposal of carbon dioxide and other GHGs. Humans derive private benefits from the activities that generate these GHGs, primarily the burning of fossil fuels to produce energy. As a sink for pollutants, the atmosphere does not have discrete resource units in the way that a pasture has clumps of grass or the ocean has fish. Nevertheless it has a limited capacity to absorb these pollutants without triggering intolerable amounts of climate change. Thus each share of this capacity may be looked upon as a resource unit which, when it has been used by one actor, is not available to others.

Global emissions of carbon dioxide increased dramatically during the 20th century as energy consumption increased roughly 16-fold. This trend was not, however, looked upon as a potential problem until the late 1950s, when Roger Revelle and Hans E. Suess (1957) suggested that human beings were unwittingly carrying out a geophysical experiment that could have an impact on the natural processes determining weather and climate. However it was not until the unusually warm global temperatures of the 1980s that the prospect of human-induced global climate change became a major public issue. Nevertheless, even while evidence mounted of a human imprint on climate with the prospect of increasingly significant climate changes in the future, scientific uncertainties remained that gave sceptics a foothold for questioning whether the unusually warm weather that continued through the 1990s could definitively be attributed to human emissions.

International efforts to address the threat of climate change commenced in the late 1980s, culminating in the adoption of the United Nations Framework Convention on Climate Change, which was adopted at the Earth Summit in

1992. As a strategy for averting an environmental tragedy, this treaty could be classified as one calling for voluntary restraint. The developed countries listed in Annex I of the convention embraced the 'aim' of bringing their emissions of GHGs back to 1990 levels by 2000, but did not adopt language that would make this target mandatory. As the decade passed, it became increasingly apparent that the emissions of most developed countries would be significantly higher in 2000, the principal exceptions being the states of the former Soviet bloc, whose economies shrunk significantly during the decade (see Soroos, 1997b: 196–202).

The Kyoto Protocol, which was adopted in 1997 at the Third Conference of the parties to the earlier framework convention, went a step further in that the developed countries agreed to differentiated mandatory targets. The European Union and several other European countries made a commitment to reduce their GHG emissions by 8 per cent from 1990 levels by the period 2008 to 2012, while the United States would reduce them by 7 per cent, and Japan and Canada by 6 per cent. The Soviet Union and Ukraine would hold emissions to 1990 levels, while Australia would limit an anticipated increase to 8 per cent. The protocol allows for emissions trading in which countries having difficulties achieving their targets through domestic emission reductions could purchase emission credits from countries that have more than exceeded their commitments. Russia and Ukraine were the most likely sources of such credits. Another option, known as joint implementation, would allow developed countries to receive credit for emission-saving projects in developing countries. It took several additional years to work out the details of the complex Kyoto Protocol before it was finalized in Marrakech in 2001.

There are several shortcomings of the Kyoto Protocol as a strategy for averting a global environmental 'tragedy'. The first has been the refusal of the United States to follow through on its commitment at Kyoto to reduce its GHG emissions by 7 per cent from 1990 levels. However, given the growth of its emissions during the 1990s by approximately 15 per cent, the United States would need to achieve a reduction of more than 20 per cent from current levels to comply with the protocol. After flatly rejecting the protocol in March 2001, the Bush administration offered a proposal that depends heavily on voluntary corporate initiatives that it was hoped would cause GHG emissions to grow at a rate that is 18 per cent slower than growth in the nation's economy. The United States is crucial to international efforts to address climate change because it accounts for nearly 25 per cent of global GHG emissions. Furthermore, on a per capita basis, American emissions are among the highest in the world and roughly double those of many of the other developed countries.

Most of the other countries involved in the negotiations on the Kyoto Protocol have decided to go forward with finalizing the document, even

without the prospect of the United States ratifying it. If approved by Russia, which has been giving mixed signals about its intentions, the agreement will have the required number of ratifications to enter into force and thus to become binding on the parties, but not on nonratifying countries. Steps are being taken in many of the ratifying countries and by the European Union to achieve the mandated emission reductions, as well as to set up the machinery for the various flexible mechanisms provided for in the protocol. The United States will in effect become an enormous 'free-rider' that enjoys whatever benefits result from the sacrifices of others in the form of a slightly more stabilized global climate, while not contributing to this global public good. The countries that are taking steps to combat climate change may be doing so in the hope that their actions will embarrass the United States into joining their efforts. It remains to be seen how far these other Annex I countries will go if the United States continues to refuse to cut back on its GHG emissions.

A second problem with the Kyoto Protocol is the absence of any specific expectations that the developing countries will curb their GHG emissions, which are expected to rise rapidly, especially in the nations that have immense reserves of fossil fuels and are industrializing rapidly, such as China and India. Increases in the emissions from the developing world are likely to exceed the reductions achieved by the developed countries, thus causing global emissions to continue to rise. Developing countries have resisted all efforts to discuss limits on their emissions, which on a per capita basis are only a small fraction of those of the developed countries. Furthermore these nations contend that their economic development depends upon the availability of affordable sources of energy, including fossil fuels, which was the path adopted earlier by the Annex I countries as they industrialized. Thus the developing countries have insisted that the industrial countries, which have previously helped themselves to the lion's share of the atmosphere's capacity to absorb GHG gases harmlessly, should significantly reduce their emissions to create capacity in the atmospheric commons to allow other countries to develop. Considerations of equity favour the position of the developing countries, but, without substantial restraint on their part, humanity's predicament with global climate change can only deepen.

A third limitation of the Kyoto Protocol is that, even with full compliance by the Annex I countries, including the United States, it would only be a small step toward the reductions that would be needed to stabilize global climate change over the long run. At best, the original protocol would achieve a 5.2 per cent decrease in the emissions of just the developed countries. However the array of flexible mechanisms, as well as compromises that were struck in the contentious negotiations on finalizing the document, significantly diminishes the reductions that can be expected. Stabilizing concentrations of GHGs in the atmosphere at current levels, which are already well above

preindustrial levels and triggering rising global temperatures, would require emission reductions in the range of 60 to 80 per cent by all nations. The struggles experienced in negotiating the Kyoto Protocol's small first step do not bode well for reaching international agreements that will avert potentially disastrous climate changes.

Conclusions

Hardin's model of the dynamic of the tragedy of the commons is applicable to the impact of human activities in international and global commons, with the overharvesting of marine fisheries and the emissions of large quantities of GHG into the atmosphere being two notable examples. The potential for such tragedies is especially great because of the multitude of users deriving private benefits from these commons, who lack a sense of community because they reside in numerous states. In the cases of the fisheries and climate, the tragedies were well advanced before international efforts were initiated to ameliorate them.

Rules that would avert, or at least lessen, environmental tragedies are especially difficult to create and enforce at the global level. Negotiating international treaties among as many as 190 sovereign states is inevitably a drawn out and contentious process. The resulting treaties tend to reflect the lowest common denominator of national interests, and thus are usually much weaker than what would be needed to address effectively the environmental problems at hand. Then, after a treaty has been finalized, it is up to each country to decide whether to ratify it and thus become obliged to implement its provisions. Thus even the 'mandatory' rules that are written into international treaties are in effect a voluntary form of restraint for states, and accordingly those over whom they have jurisdiction.

Given these limitations of the international legal system, it is remarkable that such widespread agreement has been achieved on a rather comprehensive response to the impending destruction of the ozone layer. It is also noteworthy that significant steps were taken in accordance with the 'precautionary principle', which calls for corrective actions to be taken to address potentially serious problems even before the science on the nature of the threat is conclusive. Several factors worked in favour of a strong international response to the threat of ozone loss. There was a general consensus that the consequences of significant ozone loss would be disastrous. The number of producers of CFCs and the other implicated chemicals was rather small. Furthermore there was the prospect of affordable substitutes that would be produced and sold with greater profits by the same companies that manufactured CFCs. Finally the United States provided leadership in international efforts to address the problem up to adoption of the original Montreal Protocol in 1987.

The success in fashioning a strong international response to the ozone depletion problem demonstrates that the international community can work together to avert a global tragedy of the commons. Ameliorating global climate change, however, poses a far more daunting challenge for international regime builders because of the continuing dependence of the world's population on fossil fuels for the energy needed to achieve and maintain modern life styles.

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4 Studying the global commons: governance without politics?

John Vogler

Propelled by bargain prices in an increasingly deregulated and competitive industry, the increase in air travel may seem inexorable. There are many implications, not least for globalization, but the consequences in terms of atmospheric pollution are often represented as a 'tragedy of the commons'. The global commons are conventionally defined as areas and resources that do not fall within the sovereign jurisdiction of states. This would include the oceans, the seabed beneath and the airspace above, as well as Antarctica, outer space, the radio spectrum and, latterly, the global atmosphere itself. Although the idea of the commons is very old, it has become inseparable from Hardin's (1968) well-known metaphor of tragedy. This is based, not upon extensive historical evidence, but upon assumptions about individual human acquisitiveness and inability to sacrifice immediate gratification in the interests of longer-term sustainability. Left to their own devices, villagers in a hypothetical open-access commons will, if unrestrained, have an incentive to over-graze or over-pollute and the ultimate consequence will be the degradation of the common resource and the 'ruin of all'. It is this outcome that is the 'tragedy'. In Hardin's fable the solution is to institute private property rights (enclosure) or to import some external authority to regulate access and use.

When applied to air transport the problem is not the congestion of international airspace but the high levels of carbon dioxide emitted by aircraft and their contribution to the enhanced greenhouse effect and thus to climate change. At present they represent the 'fastest growing source' of fossil fuel emissions (WBGU, 2002: 6). The 'tragedy' is thus likely to occur in the atmospheric commons. Although on a vastly greater scale, international aviation and climate change may be portrayed in terms of Hardin's village-based tragedy metaphor because there are incentives for individual airlines and national governments to promote increases in aviation at lower and lower prices regardless of the atmospheric degradation that results. The atmosphere cannot be enclosed (atmospheric quality has the characteristics of a public good) and neither, at the moment, is there an effective way to relate the price of aviation to its 'externalities' in terms of the costs of climate change. Indeed kerosene (paraffin), used for international flights, is almost unique among fossil fuels in bearing no tax. The phenomenon of 'tankering', where opera-

tors would be able to avoid nationally imposed taxes simply by filling up their aircraft elsewhere, has been deemed to render such an impost impracticable. Regulation by a government is apparently foreclosed by the anarchic nature of the international system and the unwillingness of users of the commons to be placed at a competitive disadvantage.

This is, of course, not the whole story, for an extensive framework of international governance has already been erected – at least in embryo – to manage the global atmospheric commons. Unfortunately greenhouse gas emissions arising from the bunkering of aircraft are excluded from the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and its 1997 Kyoto Protocol. The report of the German Advisory Council on Global Change, *Charging the Use of the Global Commons* (WBGU, 2002), aims to close this 'regulatory gap'. In a closely argued and technically sophisticated analysis it presents, inter alia, a scheme of international user charges based on kerosene consumption (the report was targetted at the Monterrey UN Conference on Financing for Development held in the March previous to the 2002 Johannesburg sustainable development summit). The charges would not only provide incentives to reduce the environmental costs of aviation, but also generate revenue which would be earmarked to provide the financial aid necessary for developing country participation in the scheme – without which it could not prosper. Effective implementation would require the involvement of an international organization, the International Civil Aviation Authority (ICAO), which, in the measured words of the report, had previously 'not especially distinguished itself in relation to climate change' in acting to ensure that aviation is excluded from the Kyoto Protocol. The technical argumentation is impressive, but it is the politics that prove difficult. In the ICAO the aim 'should be to ensure that global environmental objectives are given greater importance *vis à vis* the short-term economic interests of individual countries' (ibid.: 44). Much will be dependent upon the intangible 'political will' of all concerned.

The case of aviation and climate change provides just one recent example of the way environmental problems are represented and analysed by reference to global commons tragedies. Global commons are subject to desecration and collapse if the individualistic behaviour of users and national authorities is left unregulated. However, such regulation unfortunately requires the incorporation of sometimes obstructive and self-interested international organizations as well as an awareness that no progress can be made without responding to the development demands of the 'global South'. Above all there are 'political' factors upon which even the best and most rational schemes of regulation are dependent. Yet there is an evident disparity between the scale and depth of the economic/technical/legal argumentation and the paucity of political analysis.

The governance of the global commons

The 'tragedy of the commons' model captures the underlying structure of a particular class of international problem involving the management of resources beyond sovereign jurisdiction. It thus relates to one of a handful of key functions to be performed by international environmental cooperation alongside the reduction of transboundary pollution, the promulgation of common environmental standards and norms and the regulation of trade in environmentally harmful goods. This is the function of providing governance or, more precisely, common property regimes for the global commons. Hardin's famous tragedy metaphor, where the self-interested behaviour of individuals within an open-access commons leads to over-exploitation, resource collapse and consequently the 'ruin of all' has become the indispensable starting point of debate. His preferred solutions are either enclosure and privatization of the resource or the imposition of some external authority to levy charges, enforce rules and provide public goods. For the global commons such solutions are unavailable. It is the defining characteristic of the post-Westphalian international system that there is no centralized authority, rather somewhere in excess of 190 territorial sovereignties. Although parts of the ocean have been enclosed (with the 200-mile Exclusive Economic Zones agreed at the Third Law of the Sea Conference) and the parcelling up of Antarctica remains a possibility only put into abeyance by the 1959 Antarctic Treaty, it would be difficult to envisage the privatization of other global commons. Airspace may be divided into national territorial segments but not the atmosphere and stratospheric ozone layer and, while there may be some doubts about the continuing property status of the space commons, key orbits and even the moon are under no imminent danger of sovereign appropriation.[1]

The social science literature that has developed in response to Hardin's 'tragedy' is both rich and diverse (Berkes, 1989; Ostrom, 1990; National Research Council, 2002). With empirical findings based upon the close study of local commons regimes it has arrived at the clear conclusion that Hardin's 'solutions' are far from exhaustive. Instead there are many examples of self-organizing and sustainable local commons regimes that have avoided both enclosure and the imposition of centralized authority. For the student of the global commons this is important simply because it provides support for the view that effective Common Property Resource (CPR) regimes are, in principle, realizable through international cooperation. Using the commons literature also opens up the prospect of a unified social science approach that extends across spatial scales and enables us to be much more specific about the rules and decision making procedures that are required, and to flesh out the rather simple categories that have been the stock in trade of the regime approach to international cooperation over the last three decades. For example, rather than merely referring to rules as 'specific prescriptions or proscriptions for

action' (Krasner, 1983) it is possible by reference to work on local commons regulation to specify the rule-related functions that are likely to be required at the international level: standard setting, distribution, information, enforcement and knowledge generation (Vogler, 2000: 36–9). The comparative picture that emerges through regime analysis of global commons regimes is a variegated one. It ranges from areas where there are so few international standards and such an absence of collective decision making that it is difficult to speak of anything more than a proto-regime, for example for the management of space debris, to others which are heavily internationalized and institutionalized. The latter would include the arrangements for the protection of the stratospheric ozone layer, Antarctic ecology and the revised seabed regime (ibid.: 152–83).

Undertaking 'cross-scale comparisons' relies upon the assumption that there are analytical similarities (or isomorphisms) between local and global commons. The essential structure of the problem is recognizable at both levels. Objections may, however, be raised in terms of the size and heterogeneity of the institutions concerned and the scale of the commons problems involved. Local commons regimes typically engage a few score people with a real sense of community and face-to-face relations. How can this be comparable with a global commons regime involving well over a hundred state members superintending resources that exist on a world scale? References to the 'international community' notwithstanding, there is clearly a difficulty here, yet there is no agreement in the local commons literature that scale and heterogeneity must determine regime effectiveness (Dietz *et al*., 2002: 23–4). Stylized comparisons between local regimes, often with a long history and embedded in a local ecosystem, and formal international regimes portrayed as arrangements between state authorities may miss an essential point. This is simply that all regimes at whatever scale involve human interaction. Thus the significant community for international regimes may not be the 'community of nations' but rather the restricted human communities of individuals, usually government employees and experts, who are charged with developing and managing the regime. They are usually technical and scientific experts who interact with each other in the work of the Scientific Committee for Antarctic Research, the technical committees of the International Telecommunication Union (ITU) or the subsidiary bodies of the Montreal Protocol and UNFCCC. Although they may have overlapping membership with wider 'epistemic communities', they should be distinguished from them because of their transgovernmental character. Many of the same social dynamics found at the local level operate, for example, in dealing with problems of cheating and 'free-riding'. Witness in this respect the words of a national official involved in drawing up UNFCCC greenhouse gas inventories. He and his colleagues from other parties know each other and correspond regularly; they

'attend the same conferences, chat with each other and compete … it would be almost impossible to cheat and very difficult to fake your inventory' (Vogler, 2000: 220).

As well as the analytical similarities between global and local institutions the actual connections between institutions, both horizontally and vertically, have come to prominence in the study of 'governance' rather than government (Vogler and Jordan, 2003). In terms of climate change, the vertical relationship between regimes is manifest. The problems are so ubiquitous and many-layered that it makes sense to envisage a nested set of regimes from the global UNFCCC to the local. Local authorities in the West Midlands in the UK have climate change strategies, there are national policies such as the climate change levy and then, at the regional level, the EU's emissions trading system and Climate Change Programme which respond to Kyoto obligations. There is, however, a danger of generalizing from the climate change experience. Elsewhere the situation may be quite different. Antarctica is managed by a restricted set of countries operating through small groups of government-sponsored scientists and support staff. The emergent space debris regime provides another case where only a small number of 'space-faring nations' are involved and the critical decisions and actions are in the hands of their government agencies.[2] In contrast, where there is a commons problem involving the coordination of very widespread human activity (atmospheric, fisheries, marine pollution regimes) there is a need to understand the vertical connections between institutions if rules are to be effectively made and enforced. Here some speak of multi-level governance, a term which has its origins in EU studies and attempts to move away from intergovernmental or federalist assumptions in studying how many groups of stakeholders, at various scales, are involved in and bring different resources to a single process. Others refer to the significance of 'institutional interplay' and 'cross-scale interactions' (Young, 2002; Selin and VanDeveer, 2003).

The politics of the global commons

While acknowledging the importance of the institutional approach and the many insights that have been achieved into the effective design of regimes, this chapter seeks to make two cautionary and political points. The first relates to the largely unspoken assumptions underlying discussion of the commons problematic at all levels. The second relates to the distinctive problems of building commons regimes at the international rather than the local level.

Commons are constructs, and political constructs at that. In the past there has been some recognition of the political character of commons discourse of, for example, the Hobbesian character of Hardin's assumptions about

human behaviour (Ostrom, 1990). If the tragedy of the commons is about the distribution of property rights and conflicts over the enjoyment of resources it does, by definition, have an essentially political character. Yet an explicit acknowledgment of this is strangely absent from the growing body of social science work on the commons.[3] Instead there is a dominant concern with institutional efficiency and regulation: governance without the politics. Institutional approaches derive from an essentially positivist ontology and epistemology. Individual actors proceed by rational calculation in ways that may be considered collectively irrational and commons institutions serve to moderate behaviour through reordering such utility calculations. Critical scholarship portrays this, not as an objective social science of institutions, but as a particular and inherently political 'framing' in which institutions are depoliticized and local commons opened up to privatization (*The Ecologist*, 1992; Goldman, 1998). Reference to the global commons indicates a 'universalizing discourse' in which local environmental problems are now presented as essentially global in character. In the service of capital accumulation 'These late twentieth-century discoveries/inventions of the globalized commons have created more than new scientific evidence: they have created new demands for global regulatory institutions and sciences' (Goldman, 1998: 4).

One does not necessarily have to accept the world view of 'political ecology' to agree with the proposition that commons are both constructed and inherently political. To describe a resource as a commons does not require that it possess certain inherent and objective characteristics (although the economists speak of 'natural commons'). Indeed the social construction of global commons dates back at least to the 17th-century debates between Grotius and Selden on their rival views of the status of the oceans (*mare liberum versus mare clausum*). Philip Steinberg (2001) has provided us with a revealing historical analysis of the long-term construction and reconstruction of ocean space. The way in which the Antarctic was designated as a global commons resulted from a set of fortuitous and potentially reversible political decisions taken at the high point of the first Cold War. The notion of an atmospheric commons is a recent construct in part designed to facilitate action on climate change. The contrary case of biodiversity and other resources, that are generally excluded from the category, is instructive. It might be argued that, because forests, for example, are physically located within the sovereign territory of states, they cannot represent a true global commons in the same way as the oceans or the deep seabed, even though they represent a vital part of the global ecology. Yet it is also the case that to designate them as a commons and perhaps even part of the common heritage of humankind would have unacceptable implications for property rights and the cherished economic sovereignty of states (as famously expressed in the 1972 Stock-

holm Declaration of the United Nations Conference on the Human Environment, Principle 21).

Thus we may also regard the 'tragedy of the commons' itself as a powerful construct, albeit with a dubious historical basis and one that, when employed, has significant consequences for 'who gets what, when and where' and more especially for who is excluded. This observation applies to all commons regimes at whatever scale and provides a reason to think critically about both definitions and their beneficiaries. While it might, for instance, prompt some uneasiness about the apparently neutral and apolitical character of a term such as 'institutional interplay' when used in the context of commons regimes, it does not necessarily mean that the analytical connection between global and local is invalid. Nonetheless some scepticism is in order, for global-scale regimes exist under the special conditions of the international system and they are, furthermore, entangled in the politics of international organization.

Global commons governance and international politics

Too often commons institutions are studied in isolation. Oran Young is surely correct in his assertion that most commons analysts proceed on the 'assumption that a consideration of forces exogenous to individual institutions is not essential' to the explanation of their formation, performance and evolution (Young, 2002: 263). At the local level this may be justifiable, but for global commons institutions it clearly cannot be. It is an obvious, but underemphasized, point that they remain subject to the vagaries of the international political system and the shifting priorities of powerful state governments. For the latter, environmental and commons issues generally remain at the margins of governmental concern. The 1972 Stockholm Conference is often credited with spawning the development of environmental ministries worldwide, yet they generally occupy a subordinate and, at present, relatively declining position in governmental hierarchies. Environmental units within foreign offices, though fulfilling an important function, are hardly at the centre of foreign policy making. In national politics (and in the politics of the European Union) environmentally beneficial policy is habitually trumped by security or economic priorities. The real significance of the 'environment–security' debate that occurred in the developed world during the 1990s is that securitization of an issue will serve to increase its political salience, and for some time there was evidence that this was occurring. The sustenance of the global commons and a recognition of the long-range threats posed by climate change, water shortages, desertification and sea level rise had started to appear on national security agendas. One effect, however, of the events of 11 September 2001 was to reorientate security thinking, and hence governmental priorities. Thus the securitization of the environment, along with much

else, appears, in the medium term at least, to have been eclipsed by the triptych of 'terrorism, weapons of mass destruction and failed states'.[4] Perhaps, when applied to the desecration of the atmospheric commons, the Hardin metaphor contains a central existential truth that ruin on an undreamed-of scale will attend continued heedless consumption. Yet the fact that this could be represented as the most profound security challenge is understandably lost in the day-to-day political battle over immediate national and corporate interests. Such interests are well to the fore in national policy towards global commons. Examples are hardly necessary, but one could cite a lack of military interest in Antarctica as opposed to serious strategic concern with the development of the Law of the Sea and most particularly with the management of the space commons.

The observation that the effective governance of the global commons is frequently subordinated to the short-run economic and security priorities of governments and public opinion should not obscure the fact that commons regimes are also moulded by some of the deeper characteristics of the international system. It would not be too far-fetched to speak of a profound 'ideational' change that has enveloped the system since the end of the Cold War. In essence it may be represented as a shift from a global-scale competition between collectivism and market-based capitalism to a situation where a single liberal orthodoxy prevails. This has left its imprint on development policies and indeed on the globalization of economic activity, but it may also be read in the evolution of the principles underlying commons regimes. Following the landmark speech of Arvid Pardo to the UN General Assembly in 1967, the idea of the deep seabed as 'common heritage' rapidly took root as part of a wider campaign by the South for a New International Economic Order. In retrospect this was only possible because of the circumstances of Cold War competition and the legitimacy of the idea that there should be some equitable distribution of the fruits of a global resource that should not simply be left open to appropriation by those with the necessary financial and technological muscle. In the event the manganese nodules of the deep seabed have not proved to be easily or economically harvestable, but it is the institutional relationships that were created that were significant. They were contained in Part XI of the 1982 Law of the Sea (LoS) Convention and envisaged a complex arrangement of International Seabed Authority and Enterprise which would operate to compensate nonmining states for the extraction of the metals which were designated a common heritage. By 1988, a similar, although little known, common heritage arrangement had been devised by the ITU to provide for the equitable sharing of another global commons resource, positions and associated frequencies in the geostationary satellite orbit. While over 170 countries were awarded slots, the vast majority of recipients had no possibility of actually using them. In 1979, the moon had also been declared

a common heritage, but in a treaty with significantly few signatories, none of whom were potential space travellers.[5]

Even by the time of signature of the LoS Convention in 1982, the common heritage concept was already under attack by the USA and its allies. The treaty lay unratified until 1994, when a revised agreement dismantled critical elements of the common heritage, replacing them with more 'market-friendly' provisions such as to allow US ratification. There was never any possibility that the newly constructed atmospheric commons would be declared a common heritage (still less Antarctica). The UNFCCC is careful to note that, like biodiversity, it is a 'common concern' and the supremacy of market instruments is established.

The LoS experience indicates how global commons regimes will be affected by the prevailing power structure. The possibility of centralized authority is envisaged in theoretical discussions of solutions to the tragedy of the commons and aligns, in studies of international regime formation, with the hegemonic stability thesis. The development of most of the contemporary global regimes occurred in a period when, despite discussions of loss of American hegemony, it was not clear that such leadership was available. Establishment of new arrangements, such as the Antarctic Treaty or wholesale modification of the existing institutions covering the oceans or outer space, was dependent upon bargains agreed to by leading states in the international system. These, as has previously been pointed out, were as much conditioned by a range of strategic and other considerations as they were by the endogenous features of the 'tragedy' or potential tragedy. In the last decade, what the French have described as the 'hyperpower' of the USA has become the central characteristic of the system. Even before the arrival of the administration of George W. Bush it was becoming evident that the USA would not exploit its supremacy in ways that would have benign consequences either for multilateral cooperation or for the sustenance of global commons regimes. Since 2001, the US stance towards the Kyoto Protocol has shifted towards outright opposition and political wrecking activities and on occasion joining forces with surprised NGOs to demand access rights for non-parties (Ott, 2002). The mantle of leadership in the climate change and number of other regimes has fallen upon the European Union. It has attempted to operationalize the Protocol and to develop its own emissions-trading system for the atmospheric commons. Whatever else it is, the EU is an unlikely hegemon and it remains to be seen whether the very limited provisions of Kyoto can be achieved in the absence of cooperation from the largest carbon dioxide-emitting non-party.

An essential criticism of Hardin's model is that it neglects another tragedy that has been an historical consequence of commons 'solutions', which we may refer to as the 'tragedy of dispossession'. As Mark Imber (1988: 154)

has noted, the commons never meant much to those too poor to possess a pig to graze upon them. For those villagers that did, enclosure solutions frequently resulted in destitution and to increasing disparities of wealth, but the effects were offloaded onto the local parish or resulted in bands of 'sturdy beggars' who roamed Elizabethan England. Commons (mis)management at the local level does not seem to have been seriously disrupted by economic inequality. However, if this dimension of commons use is scaled up to the international level, the situation is quite different. The international system is characterized by extraordinary and increasing economic inequalities, as are many individual societies. But at the international level the demands of the dispossessed can receive serious political expression through the actions of a majority of states, especially within international organizations. Thus virtually all the major discussions of global commons issues have occurred within the context of demands for developmental justice in North–South relations. The necessary political juxtaposition between environment and development has been evident since the 1972 Stockholm UN Conference on the Human Environment and has been a recurrent theme. It was central to the debates over the seabed and common heritage and over 'equity in orbit'. Although the Antarctic regime was managed by a set of self-selecting Antarctic Treaty Consultative Parties (ATCPs) even they could not be immune from demands for the inclusion of developing world representation, couched in the demand to bring the regime within the ambit of the United Nations. This demand has been resisted, but the ATCPs have been careful to strengthen their position by recruiting China and India as new members. The development of the global stratospheric ozone regime required that compensation be arranged (in the 1990 London Agreement) for potential developing world producers of CFCs. Construction of the climate change regime was predicated on the recognition of the 'common but differentiated responsibilities' of members and the controversial duty of the developed Annex I parties to take the initial steps in greenhouse gas emissions reduction. The relationship between environmental degradation of the commons, poverty and sustainability is a very complex one and, for some, observing the 2002 Johannesburg Summit, it may appear that the development and poverty reduction agenda has overtaken and subsumed the strictly environmental agenda.

A further important difference between local and global commons management is that the former are not obliged to operate through international organizations. Here it is important to make the, often neglected, distinction between institutions and organizations. Some of the discussion of global governance serves to confuse because it conflates the two. Institutions and organizations are not the same – and governance is not a synonym for organization, although it often seems to be so. Local commons regimes, like global regimes, can be portrayed and compared as social institutions

performing equivalent governance functions. However they will not exhibit the same degree of formal organization. It is true that there are examples of global commons regimes that existed without being superintended by international organizations. The permissive oceans regime of the 19th century or the Antarctic regime which existed for many years without a permanent secretariat provide examples. However the dominant trend has been to build formal international organizations. It would be possible to cite a very long list: the International Whaling Commission, the ITU, the International Maritime Organization (IMO), the United Nations Environment Program (UNEP), the International Seabed Authority, the Secretariats and Conferences of the Parties of the atmospheric regimes and so forth.

International organizations (IOs) have a peculiar politics of their own. They appear to be almost impossible to close down as they acquire secretariats, budgets and their own set of interests. Governments, too, may often be more concerned with their rights and status within organizations than with the issues that are formally on the table. Even nongovernmental organizations (NGOs) have been known to become overly concerned with their own rights of access to IOs. Organizations provide the framework for and the arena within which the politics of the global commons are conducted. They are necessary for the international production and legitimation of scientific knowledge and for the provision of multilateral funding, but they also add a great deal of complexity. This is particularly so when it comes to decision making, where, in the words of EU Trade Commissioner Pascal Lamy (2003), their practices are 'medieval'. His observation was directed at the World Trade Organization (WTO) but it would equally apply to the one-state, one-vote procedures that apply in most environmental IOs and conferences of the parties.

As well as causing complication and delay, the internal processes of IOs can also represent a source of organizational power for the otherwise weak. The G77 and China, if united, can always command plenary majorities which may lead to the kind of counterintuitive outcome that could not be predicted either by reference to studies of institutional design or by a simple application of the prevailing power distribution. A characteristic of some key global commons regimes is that they reflect high levels of interdependence among users. In consequence, new avenues of organizational power are open to those who can threaten to block or impede the working of a valued regime (Vogler, 2000: 193–5). There is evidence of this factor at work in the acceptance of the principle of 'common heritage' and it played a part in the long-drawn-out Law of the Sea negotiations. It was also significant in the development of the climate change regime, evolved under the auspices of the General Assembly, where the UNFCCC would not have been negotiable without a clear understanding on the differential obligations of developed and developing nations.

Conclusion

The use of the commons concept, as in the *Charging the Use of the Global Commons* report, has a number of analytical advantages for the study of international environmental cooperation. Not the least of these is the way in which it connects with a rich seam of literature on local commons regimes which have evidently managed to avoid Hardin's trap and which allow us to consider the similarities between governance institutions at various levels. Another advantage is that there may now be significant actual and potential connections, in multi-level governance and 'institutional interplay'. The interconnection between the local and global institutions is clearly a coming theme. However, there are also some serious problems with this approach, hinted at in the study of aviation and the global atmospheric commons. It tends towards the depoliticization of the global commons and the neglect of the political struggles which must bear upon the creation and operation of institutions. The study of commons management can become just that, a preoccupation with the scientific design of optimal institutional reforms and the refinement of international law. Both have demonstrated great vitality – dare we say progress – in the last decade or so. There has been a thickening institutionalization with new concepts of precaution and implementation review and a new understanding of the integration of science with policy. One should not underestimate the significance of institutions and their interconnections but it must also be understood that they and the metaphors that sustain them are politicized constructs. The 'interplay' between them will be a political relationship in which organizational and other struggles are fought out. For global policy making, the political salience of the commons issues at stake in the domestic system of the USA will often be critical, along with their fit with the development agenda. International action will then have to proceed through the thickets of international organization, all some distance from the simplicities of the 'tragedy' model. If reliance on the latter leads to an exclusive concern with governance rather than the complex politics of the global commons, it is likely to lead to disappointment.

Notes

1. There was an unsuccessful attempt in 1976, by a group of equatorial countries, to assert sovereignty over the geostationary satellite orbit in the 'Bogota Declaration'. Otherwise outer space, the moon and other celestial bodies are defined by the 1967 Outer Space Treaty as the 'province of all mankind'.
2. This emergent regime has not been widely publicized but it is potentially very important. It attempts to find coordinated countermeasures to deal with the growing environmental problem in near-space arising from increasing amounts of orbital debris, the detritus of nearly 50 years of human space activity: discarded rocket stages, obsolete satellites and even hand tools and bags of frozen astronaut's urine. At orbital velocities even paint flakes can damage sensitive spacecraft and there is a danger of 'collision cascading'. For brief details of regime-building activities see Vogler (2000: 104–8).

3. The impressive collection contained in National Research Council (2002), which runs to 521 pages, has only three index references prefixed by 'political' and two to 'power'.
4. A good example is provided by the EU Security Concept under development by High Representative Solana, which contains only a vague initial reference to climate change but is very extensive and specific on terrorism, WMD and failed states (Solana, 2003).
5. The references are to Appendix 30B to the Final Acts Adopted by the Second Session of the ITU WARC on the use of GSO and the Planning of Space Services Utilizing it (ITU 1988) and to the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (*International Legal Materials*, **18**, 1434).

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5 Globalization and environmental protection on the high seas

Elizabeth R. DeSombre

As a report from the Australian Parliament noted, 'it is a world of too many ships that are over aged and under maintained chasing too little freight for too little return' (Parliament of the Commonwealth of Australia 1992: x). Most of these ships, as measured by number or by weight, are now registered in what are called 'flags of convenience' (FOCs) or open registries. This trend challenges the ability or willingness of states to regulate activity undertaken by their nationals in a way that epitomizes the concerns that many express about globalization generally. Ocean shipping thus serves as the quintessential example of a globalized industry; it is both an industry that has led many of the globalization trends that anyone studying this issue would recognize and an area in which the standard economic globalization that scholars and activists address more broadly is in fact carried out, since so much of world trade is conducted via ships on the oceans.

Ninety-five per cent of goods traded internationally as measured by weight, and two-thirds as measured by value, are transported on the oceans by ships (Steinberg, 2001: 14), most of which fly flags of convenience. States compete for ship registrations by intentionally keeping taxes and fees low and by having lax, or poorly enforced, environmental, safety and labour standards; ship owners respond by flying these convenient flags in an effort to compete internationally through lower operating costs.

This ability to choose a level of international regulation by choosing where to register a ship introduces considerable difficulties for those trying to protect the marine environment and ensure the well-being of those who work or travel on ships. It also engages important theoretical questions about the role of international regulation in a globalized economy, the role of the state and the impact on sovereignty under these conditions, and the extent to which international competition increases the incentive to keep regulatory standards low. What does the extent and pattern of foreign flag registry (and degree of regulation adopted by individual ships) tell us about when we should expect regulatory races to the bottom or upward harmonization? What does the process of responding to lowered standards on ocean vessels suggest about the role of the state (or of nonstate actors) in responding to the regulatory problems created by a system that

allows states, or individual businesses, to opt out of global regulatory structures?

There are two trends coinciding to produce the current state of international shipping. The first is the changes in the industry that affected ship owners and increased their incentives to find the cheapest way possible to run their business in an increasingly competitive market. The second is the rush by states to offer ship registries that allow ship owners to operate with lower costs, by avoiding high taxes and fees from traditional registries and avoiding a set of costly requirements on environmental, safety and labour protection (both national and international) that they would have to follow if registered in their home states.

The first of these trends concerns the increasing globalization of shipping. Despite the fact that shipping has been one of the most global industries for the last several centuries, the early 1970s nevertheless saw a dramatic change in the scale of international shipping. The size of ships increased as well as their numbers, and the way they were purchased and operated changed. First, a revolution in technology made possible sizes of ships that had previously been unimaginable. Where formerly the largest oil tankers had a capacity of about 28 000 dead weight tons (DWT, a measurement of the amount of oil or other cargo the ship can carry), tankers of 250 000 DWT became common and those up to 330 000 DWT became possible. Likewise cargo ships went from about 10 000 DWT to 200 000 DWT in a two-decade period, and new container vessels replaced about seven conventional break bulk liners (Couper, 1999: 10).

At the same time, the structure of the industry was changing as well. In particular, the increase in ship size increased the amount of capital required to purchase a ship. While previously owners would buy a ship with close to 100 per cent equity, few owners could afford that kind of investment in the new large ships. Banks increased their financing of such purchases to a point where it was common for ship owners to finance up to 90 per cent of the cost of a ship, thus allowing them to purchase bigger and greater numbers of ships. Ship manufacturers also increased available credit to encourage purchases, and governments introduced new tax breaks for those who bought ships in an effort to increase the size of fleets under their national flags. This dramatic change in financing lured many into the shipping industry, often borrowing against expected future income (ibid.: 9–11). Initially the investment in a ship proved cost-effective: ships could almost triple in value in five years (Sohmen, 1983). But as global shipping capacity increased, and as many states subsidized their shipbuilding industries, the economics were bound to change. By the early 1980s, there was more shipping capacity than demand for it (Broeze, 1998). When ships were repossessed there was no economic advantage to scrapping them, so their

new owners (be they governments or banks) kept them operational, only adding to the surplus capacity and increasing downward pressure on freight rates. An additional impact of this economic downturn in the industry was the increasing management of ships by third-party ship management companies. As banks repossessed ships owned by those who could no longer afford to pay the mortgages, they needed to hire someone with shipping expertise to run the ships profitably. As these companies took on management tasks, they determined that economies of scale in such things as crew hiring and management could be achieved through managing large numbers of ships, and sought to expand their role in managing ships. Now most seafarers are hired via ship management companies rather than directly by ship owners or captains (Bloor *et al*., 2000: 331–2).

During this period, some of the major players that had been traditionally involved in international shipping bowed out. The oil majors, steel corporations and others that used to own their own shipping fleets began to sell them off and instead charter ships owned by independent ship owners (Couper, 1999: 11). This led to increased competitiveness pressures as individual ship owners began to compete for the business of those who had previously owned their own ships. The main ways to compete were based on low cost or freedom from regulation.

The second trend, the proliferation of ship registries, arose to meet this desire by ship owners for the avoidance of costly regulation as a way to keep operating costs low. For centuries, ship registration was a reasonably simple process. Ship owners registered ships in their country of citizenship, and a ship's operations were thus covered by the laws of that state, both domestic and international. Occasional ship owners have strategically chosen to fly another state's flag for almost as long as there have been shipping records. Widespread use of such flags, however, came only with the decision by certain states, beginning around the 1920s, to create open registries, where ships were not required to have onerous ties to a state in order to register. Open registries are generally characterized as those that do not require the citizenship of ship owners or operators, levy no or minimal taxes, allow ships to be worked by nonnationals and have neither the will nor the capability to impose domestic or international regulations on registered ships (Morris, 1996: 22). The first state to create such a registry was Panama, followed shortly by Honduras and later Liberia. These three were the primary FOC states until recently, when they were joined by such states as Cyprus, Greece, Malta, Singapore and the Bahamas. Some of the original FOCs are still among the most important, however. Since 1993, more ships have been registered in Panama, as measured both by number of ships and by gross tonnage, than anywhere else in the world. Second in both categories is Liberia (Lloyd's Register Fairplay, 1993: 12; 2002: 11).

There are advantages to the states that run open registries and few disadvantages. In Panama, for instance, the fees charged for the registry contribute 5 per cent of the national budget (Morris, 1996: 22). In Liberia, where revenue from the registry accounted for approximately 10 per cent of the national budget before the civil war, it now contributes up to 30 per cent (Freudmann, 1998: 2B). Moreover running an open registry presents a potentially easier form of lowering global standards than do standard pollution havens. From the perspective of ships, registration in an open registry does not require physically relocating an industry; in fact, many ships registered in such localities never even visit their flag states. From the perspective of a state that runs an open registry and attracts ship registrations by keeping environmental standards low, it bears no more of the environmental cost of the lowered standards than does any other state. In fact, if the ships it registers never visit its ports or pass through its national waters, it may bear less of the environmental damage than do other states. At a minimum, the environmental situation is one of a common pool resource, in which the state of registration bears all the advantages and only a small portion of the costs. In a standard pollution haven situation, the state that draws environmentally detrimental industries itself suffers the primary effects of the pollutants.

The registries themselves, often with a connection only in name to the state whose flag they peddle, are in the business to earn money as well. For example, International Registries, the company based in Reston, Virginia that used to run the Liberian Registry and still runs the registry of the Marshall Islands, earns 18 per cent of the gross revenue of the registry (Baldwin, 1999: 1B).

Globalization and standards

Those concerned about globalization have long been concerned that international competition will lead to a convergence of environmental standards internationally, and that such a convergence will be downward. This could happen individually – states could competitively lower standards in an effort to lure industry and thus gain economic advantage – or it could happen collectively, as international standards mandate a least-common denominator level of regulation.

Others, however, argue that a globalized world leads to upward harmonization and increased levels of regulation. Certainly the incentive exists for states that have already passed domestic regulations to push for international acceptance of these standards to avoid competitive disadvantages for their industries (DeSombre, 2000). In addition, multinational corporations, operating simultaneously in many states, face several incentives to raise standards across their areas of operation: if regulated strictly in one state they may prefer to hold all operations to that higher standard so as to avoid working

with different procedures in different locations; they may hold the actual goods produced to similar standards regardless of production location because in a globalized world the products would thus be able to be sold in states with the strictest requirements; or they may bend to political pressure and promise that goods produced elsewhere will not be made with lower standards than those in their home state.

Existing evidence suggests that downward pressure on international levels of regulation does sometimes happen. But the evidence also suggests that harmonization, the upward convergence of regulatory standards, can occur instead in response to globalization and free trade, and that different levels of regulation, with states seeking their own regulatory niches, can also result. Globalization does indeed complicate domestic regulation on a variety of issues by exposing it to competitive pressures from abroad. But governments that respond to these pressures can do so by lowering their own standards, by working to raise standards internationally, or by choosing an intermediate level of regulation that makes sense for them domestically and yet gives them some ability to compete in an internationalized market.

The logic for a 'race to the regulatory bottom' is sound: in a world of mobile capital and free trade, and with the assumption that there is a cost to regulation, producers will choose to produce in an area that will cost them less. H. Jeffrey Leonard points out that there is more to the question of location of industry than naturally existing comparative advantage and that, in particular, 'artificial factor endowments [such as low levels of regulation] created by governments have become at least as important as natural factor endowments' for states that want to attract industries (Leonard, 1988: 6).

Substandard shipping itself confers a competitive advantage. Even apart from wages and labour standards, an OECD report found that lack of compliance by ships with international safety and environmental regulations conferred economic benefits on ship owners. The study concluded that non-observance of these standards distorts competition in the shipping industry (OECD, 1996). Moreover another OECD study found that owners of substandard ships manage to externalize the costs associated with these ships, and rarely suffer serious economic loss from the problems that arise from a lack of adherence to collective standards (SSY Consultancy and Research, 2001).

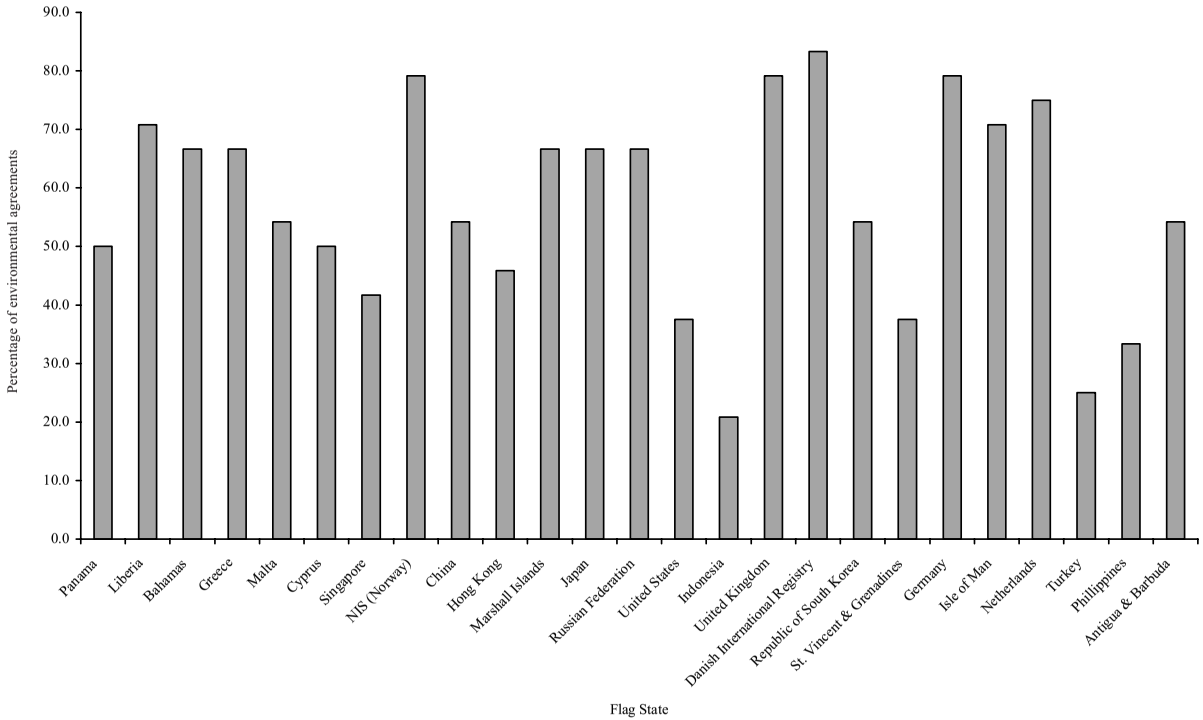
If there are races to the regulatory bottom anywhere, shipping is among the most likely venues for finding them. The situation of open registries for ships at first appears to suggest globalization-induced races to the bottom. Moreover it was clear that open registries were using their lax standards to lure ship registrations, with (as indicated above) a great deal of success. Not only do many registries advertise on the Internet but some even allow registration on-line. In addition to oblique comments about lax environmental standards ('shipowners can transfer foreign-registered vessels under twelve years old to

the Bahamian flag without a survey') (Bahamas Investment Authority, 2001), open registries promise low registration fees, tonnage taxes and inspection fees, as well as no nationality requirements for owners or shipworkers.

Shipping standards

Evidence of environmental (as well as safety and labour) standards in the shipping industry suggest that globalization does indeed facilitate a downward pressure on regulation, or at least allow large numbers of actors to choose lower levels of regulation than would have been possible before the industry became truly global. What is clear, however, is that, over time, the level of regulations taken on (and enforced) has varied dramatically, with different states at different times adopting widely varying standards, as shown in Figure 5.1. What this suggests is that, rather than the creation of races to the bottom or even pollution havens, the process more generally is one of specialization across a variety of regulatory niches. Open registry states choose a level of regulation that will allow them to compete effectively for ship registrations. When the level of regulation of a registry gets so high that substandard ships cannot meet it, new registries, with lower standards, offer their services.

What accounts for the strategies that flag states choose in terms of the levels of regulations they adopt? If there is such an economic advantage to avoiding costly regulations, why do some open registries nevertheless uphold them? Understanding this process is not only important analytically, but can suggest strategies for combating low levels of environmental regulation adopted by those attempting to compete internationally. In the case of shipping, several mechanisms have persuaded registries to raise the levels of regulation they adopt. These include port state control, the role of international labour unions, insurance and classification, and economic sanctions by consumers of products. For the purposes of this discussion, only the former is considered, but the mechanics of the processes, though not the political levels at which they operate, are similar. What they all have in common is the process of exclusion of substandard ships from some of the benefits that would otherwise come from the lower costs from avoiding regulation. But all also work within a complicated relationship between globalization and sovereignty, in which the major maritime states, who decry the problems with flags of convenience, are only willing to go part of the way towards addressing these problems. What ultimately results is a variety of levels of international regulation that are higher than would exist without some international cooperation to raise these standards, but that allow for ships to choose among levels and types of standards and allow the continuation of the system that these historically important maritime states decry but refuse to undermine.



Source: Lloyd's Register Fairplay (2002), International Maritime Organization (2003).

Figure 5.1 Percentage of ship-related environmental agreements of the top 25 flag states

Port state control

Port state control is the power of actors from a state to 'board, inspect, and where appropriate detain a merchant ship' flying a foreign flag that enters its port (Hare, 1997: 571). The legal authority to do so can be found in a number of international agreements from the past three decades, many of them under the auspices of the International Maritime Organization (IMO). More recently, specific memoranda of understanding (MOUs) have been negotiated among states within a region, the first of which, negotiated with the help of both the International Labor Organization and the IMO, and initially involving 14 European states, became the Paris MOU of 1982. There are now MOUs covering most regions of the world.

The MOUs in some ways make no new laws pertaining to ships; they refer to existing international agreements on safety and environmental protection that ships must uphold, and they do so largely by incorporating these obligations into their domestic law. These agreements do, however, create a systematized process of enforcing these existing international rules, which thus brings into being new obligations specifically for the port states that participate. In the existing MOUs the port state authorities agree to inspect some percentage (for the Latin American agreement it is 15 per cent and for Paris and Tokyo it is at least 25 per cent) of ships that enter their ports during the course of a year, and to use a standard inspections process that, while it allows discretion on exactly how the inspection is done, holds ships to a set list of international obligations. It also sets up a process for sharing information with the other members of the agreement, which thus requires of member states that they provide information of a particular sort and in a given format.

As a result of the inspection process, a ship can be found to be 'clean' (to pass with no problems), can have some number of recorded deficiencies and, if there are enough deficiencies or they are serious enough, can be detained in port until the most egregious ones are corrected. One of the most important aspects of this regime is that discrimination in inspection is encouraged: port states determine which ships to inspect according to the record of the individual ship, the type of ship it is and, most importantly, characteristics of the flag state in which it is registered. Average detention rates are kept for all ships and are aggregated by flag state. An overall average detention rate (a three-year rolling average) for all inspected ships is calculated, and flag states whose ships exceed the average during that period are then identified as those that should be more frequently inspected. The Paris and Tokyo MOUs also list states on black, grey and white lists to indicate the overall level of risk attached to ships that fly that state's flag. (The Paris MOU black list is further disaggregated into levels of risk.) The goal across a given MOU is to increase the odds that a given ship will be inspected in at least one of the ports at

which it stops, and to select for inspection those ships that the port states believe are most likely not to meet the required standards.

Port state control has created an incentive for increased standards. Individual vessels would prefer not to be detained, and flag states do not want to gain a reputation for requiring more than their fair share of inspections, particularly since their attractiveness as a registry decreases with the inconvenience borne by vessels flying their flag. As Julio Sosa, the Panamanian Maritime Consul in Houston put it, 'No one wants to be in a flag where the coast guard is going to be fingering you all the time' (Morris, 1996: 22). Under a system of port state control, truly substandard ships have fewer options about what ports to enter.

Liberia is the quintessential case for the impact of port state control, though the process happened before the MOU process (with its clear record keeping) was in place. Liberia used to be the standard example of the worst problems of flag of convenience shipping. Liberian ships were more prone than average to have accidents, and had older equipment that was not especially well maintained. Now Liberian-registered oil tankers are among the safest and least polluting on the seas, and have better records than some traditional registries, such as Norway. The mechanism of port state control provided the context in which oil companies worked for increasing standards to be taken on by the Liberian registry, but primary action nevertheless took place outside a state-centric context.

It was in the context of the nascent port state control regime that Liberian-registered oil tankers sought to take on higher standards than their registry required. This change came into being in the wake of several major oil tanker disasters in the late 1960s and early 1970s. American ship owners that registered their vessels in Liberia realized that increased scrutiny of the Liberian FOC might result in lost advantages. They therefore convinced the Liberian government to ratify the SOLAS convention and the registry to implement an inspection programme for all Liberian-flagged vessels (Perkins, 1997: 198). Liberia joined most of the major International Maritime Organization agreements relating to oil pollution in 1980 or 1981 (including MARPOL, the main agreement to prevent intentional oil pollution at sea, and a variety of agreements on preventing or addressing accidental oil spills). The state was willing to do so to protect its revenue from the registry (and the registry was willing to do so to protect its revenue as well); ship owners were willing because the tax and labour advantages of Liberian registry far outweighed any cost of increased safety inspections, and they hoped that an improved safety record would remove international pressure to address FOC issues more intensively. In addition, for some ship owners who already met the proposed safety standards, proposing such regulations could only help their position both competitively and in terms of public relations (Carlisle, 1981: 185–6).

While port state control, and fear of greater international regulation, provided the context for this change, it is important to note that the action taken was by Liberian-flagged ship owners, convincing the Liberian registry (which has little to do with the actual Liberian state) to create a regulatory framework: a club of ship owners that met higher standards than their competitors. This club was able to benefit from the increased reputation for safety its registry created. Oil tankers that could not meet the higher standards registered elsewhere. It is worth noting that the timing of Liberia's niche as a registry with moderately high standards on oil pollution prevention coincides with a somewhat dramatic decrease in registered tonnage, beginning just after 1980. Likewise the decrease in Liberia's registered tonnage came at the same time that Panama and other registries grew.

Ships, states and sovereignty

One of the central theoretical concerns about globalization is the question of its implications for state sovereignty, and the efforts of states to respond to the growth of open registry shipping and the lowered standards that resulted are one aspect of that phenomenon.

In particular, many offshoots of the globalized economy, often lumped together under the term 'offshore' (Palen, 2003), are seen as indications that states can no longer control economic activity or even regulate the actions of their citizens in a way they might previously have been able to do. When currencies can be traded without oversight from central banks, Internet sites can provide services deemed illegal in states from which they can be reached, and citizens can earn income out of reach of the taxation processes of their states, it appears that states have lost their regulatory capabilities and no longer have a powerful hand in the shape of the global economy. That most of the world's shipping is registered in states with scarcely the population to work them suggests that flags of convenience indeed challenge the sovereignty of the traditional maritime states.

Others argue however that, while these offshore activities are indeed the result of globalization, their consequences for sovereignty are less dire: that offshore is in some ways the process that allows for globalization to happen within the existing state system, mediating between the twin state goals of territorial nationalism and globalization. As Ronen Palen (ibid.: 15) puts it, 'offshore provides the perfect legitimization of the goals of neoliberalism' while preserving the sovereign state system by providing an outlet where all the activities that cannot otherwise be subsumed within a state system in a globalized world can operate. 'Far from being an opportunistic development at the margins of the world economy, the rise of offshore is an inherent tendency of an internationalizing economy operating within a particularistic political system' (ibid.: 9).

Scholars of shipping acknowledged this relationship early on in the use of open registries. For example, Rodney Carlisle noted that the rise of the Panamanian flag in the 1920s and 1930s was one of the ways around 'the conflict between national interest and social justice' that plagued American shipping (1981: 35). Carlisle, however, does not see the design of open registries as an intentional effort to reconcile these competing elements in the light of globalization, though he argues it eventually did so. Rather he suggests that US ship owners simply considered short-range concerns: 'how to compete and make a profit in the glutted world market when "hampered" by reforms' (ibid.: 37).

It could easily be argued that the most powerful states in the international system could prevent most FOC registration, or the extent to which that registration influences international standards, if they wanted to. That most open registries are not only in developing countries but arguably in failed states supports this contention. It can thus be inferred from the at least passive complicity of the major maritime states in the current structure that, despite protestations to the contrary, they benefit in some way from the FOC system and have no real interest in fundamentally altering it. To the extent that they benefit from the cheaper trade made possible by flags of convenience, while being able to keep their domestic standards high, there is little incentive to change the broader structure within which open registries exist. In fact, though states like Spain that are the victims of major oil spills cry foul whenever they happen (and generally new safety and environmental regulations are passed in the wake of these events), they nevertheless benefit from participation in the broader economic globalization made possible by such a system. Moreover, since states (or individual communities or economic entities within them) do not know in advance that they will be the ones to suffer from a major shipping-related disaster, there is generally not a mobilized segment of society strongly in favour of fundamentally reforming the way shipping standards are upheld. But those who benefit from access to cheap goods (via ocean transport) are both those powerful actors who gain from being able to provide them and the diffuse population who would not choose to pay more for goods in exchange for the remote chance that it could some day decrease their likelihood of having to endure a major oil spill. In other words, it should be no political surprise that states have been unwilling to change the fundamental system of shipping regulation, preferring instead to improve standards at the margin.

This explanation would see harmonized standards only in the case where major maritime powers gain from harmonization, and not otherwise. There is some evidence to support this contention. That no one has made a noticeable effort to change the biggest incentive – low taxation of vessels – of FOC registries may suggest that the most powerful actors in the system acquiesce

to changes at the margins of the regulatory structure as long as the option of retaining the overall open registry system remains. In addition, states themselves are also responsible for some of the actions taken to create mechanisms of exclusion and thus increase regulatory standards on shipping, suggesting that they do participate in changing the system (albeit through the exclusionary mechanism identified here) when it is to their advantage to do so. That they are not always willing to stop ships in port or use economic sanctions suggests that they are selective about which standards they want to take the trouble to increase globally.

Conclusions

Flags of convenience are manifestations of international free-riding in a way that is particularly obvious. As long as the flag states gain from running open registries and ship owners can benefit from avoiding international standards, the phenomenon is not going to disappear. The initial experience with open registries demonstrates that regulatory havens do exist; there are locations that intentionally keep environmental, safety and labour standards low to attract industrial actors. Most ships are now registered in these locations, and this phenomenon had at least an initial impact in lowering the overall level of regulation followed by ships on these issues. What is notable, however, is that these havens do not create full-fledged races to the regulatory bottom, and that states that avoid certain international regulations to attract ship registrations nevertheless take on others, with a resulting set of regulatory niches.

The improvements we can expect to see in addressing FOC issues may therefore be modest. But we have seen a general raising of labour standards, increased compliance with fisheries agreements and gradually improving safety regulations by vessels, even by those that fly flags of convenience. The changes come largely through increasing the cost to FOC vessels of not adhering to international standards, examined in this chapter by the cost of flying a flag from which ships are more likely to be inspected by port states.

Despite efforts by ship owners to avoid costly regulation through flag of convenience registration, there has been, as Braithwaite and Drahos note, 'a decisive triumph of global harmonization of standards over national sovereignty in ocean shipping' (Braithwaite and Drahos, 2000: 431). Not only are these standards created, most frequently through international organizations, but non-governmental or intergovernmental organizations then work to increase the extent to which they are actually adopted and followed, despite the relative ease of opting out of such regulations or avoiding detection when not following them. Most frequently such international pressure has led to increased standards when actors have been able to create a way to deny access to a benefit to those that do not accept the standards in question.

The extent to which these standards have been successfully enforced appears to hinge primarily on the ability of actors to create mechanisms for excluding ships from the benefits they would otherwise gain by avoiding an international regulatory system. Because there may still be advantages to continuing to fly a flag of convenience, ships that do so may want to reform their behaviour sufficiently to ensure that they will not have to abandon those flags. Open registry states, similarly, may be willing to undertake such reforms as are necessary to protect their ability to continue to gain revenue from running a registry where ships will want to flag. A combination of international pressure and individual incentives may therefore be what is needed to hold ships to international standards in a globalized world in which states are not willing to change the underlying process of regulating ships.

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6 Renewable energy and international politics

Ian H. Rowlands

Energy has traditionally been defined as 'the capacity, or ability, to do work' (Alexander, 1996: 4). It is central to all that occurs on this planet. Indeed it is critical to the use of virtually any good or service. It can be 'delivered', however, in different forms, in different ways and to different ends. Consider, as but one small example, the act of writing this chapter. Electrical energy powers the computer being used, solar energy casts light on the notes beside the computer and various kinds of energy are 'embedded' in the coffee mug beside the computer. Although all of these forms of energy (and others not mentioned) are critical, they are not all 'created'[1] in the same way. Hence the overall 'sustainability' of energy supply and use will vary, being a function of the entire life cycle and the broader context. While the sunshine streaming into this office is, arguably, sustainable, at least on timescales usually used, the way in which the electricity for the computer is generated is not sustainable.[2] The sustainability of the energy embedded in the coffee mug, finally, may be harder to determine. If, for example, large-scale hydropower or natural gas were used in the manufacture of the mug, then the level of sustainability may end up falling somewhere between those of the sun and of the coal-fired power plant.

In any case, the sustainability of energy supply and use is a key question for societies around the world today. The purpose of this chapter is to examine some of the international political activity surrounding efforts to move global energy supply and use from its present unsustainable path to a more sustainable path.[3] Although what is often characterized as 'sustainable energy', or alternatively 'energy for sustainable development', has potentially many different components (energy conservation and energy efficiency are but two additional key elements), the focus of this chapter is on only one of those elements, namely, what is often called 'renewable energy'.[4]

Space limitations preclude an exhaustive evaluation of all renewable energy activities in international politics. Instead a number of key international meetings are examined to provide a sense of the way in which the discussions, debates and actions have developed at the global level. Interested readers are encouraged to consult other sources (for example, Steiner *et al*., 2004) in order to find out more about other important activities, including those of the United Nations and its affiliated bodies (United Nations, 2002),

as well as various regional and other subglobal organizations, for example the European Union and the International Energy Agency (Lauber, 2002; Janssen, 2002: 9–12). Moreover, given that the focus of this chapter is upon intergovernmental activities, readers may also want to supplement their study by investigating relevant civil society organizations (for example, Friends of the Earth International, Greenpeace International or the WWF) and private sector groups (for example, the World Energy Council or Eurosolar's call for an International Renewable Energy Agency, Eurosolar, no date), as well as more explicitly multi-stakeholder endeavours (for example, the Global Forum on Sustainable Energy).

Energy unsustainability and the need for international cooperation

It is broadly accepted that the world's present patterns of energy provision are unsustainable. As Table 6.1 shows, almost 80 per cent of the world's primary energy supply came from fossil fuels in 1998. The sustainability impacts of this are considerable, with air pollution at various scales (that is, smog, acid precipitation and global climate change) being some of the most prominent problems (Holdren and Smith, 2000). Nuclear power and large-scale hydropower, of course, also have their own sets of difficulties: for example, the disposal of waste in the case of the former and the disruption of habitats in the case of the latter (see, generally, IEA, 2001). Additionally that which is often identified as the largest 'renewable' – that is, the use of traditional biomass (firewood, dung and charcoal, for instance) – is by no means always used sustainably (ibid.: 201–5). Moreover the challenge is not only to make existing energy supply and use patterns more sustainable, but

Table 6.1 Fuel shares in world primary energy consumption, 1998

Fuel	Percentage share
oil	35.3
coal	23.1
natural gas	21.1
traditional biomass	9.5
nuclear power	6.5
large-scale hydropower	2.2
'new' renewables	2.2

Note: Figures do not add to 100 per cent because of rounding. New renewables include modern biomass, small hydropower, geothermal energy, wind energy, solar energy and marine energy.

Source: 'World Energy Assessment Overview' (2000: 6).

also to ensure that meeting the anticipated increase in future energy demand will be done in a sustainable manner. It has been estimated, for example, that developing countries will need to invest approximately US$1.5 trillion between now and 2020 in new power plants (ibid.: 211). Many argue that renewable energy, with its associated benefits in terms of emissions reductions, local job creation and security of supply enhancement, for example, could help to achieve that goal.

While international cooperation is not necessarily required in order to increase the use of renewables in global energy supply, it could conceivably aid in the development and application of such alternatives. International energy programmes, to date, have largely focused upon 'data gathering and exchange, research and development, and public information' (Caldwell, 1996: 265). Most of this attention has been paid to conventional sources of energy. However these same kinds of international cooperation could be employed to a much greater extent on renewable sources. This, in turn, could help to stimulate learning in national programmes and thus move different societies along the so-called 'experience curve' (IEA, 2000). Other kinds of activity could also be undertaken. International cooperation, for example, could serve to catalyse market developments through, for example, the promotion of technical (standards) protocols or economic (trade) agreements. Although just any kind of international action will not necessarily be beneficial, well-designed global activities could conceivably increase the development and use of renewable energy.[5]

The following section considers some of the main events in the evolution of international cooperation on renewable energy. The particular events selected were chosen not only because of their scope and scale, but also because they serve to give the reader a good indication of the ways in which renewable energy themes have developed in both specific energy fora and broader environmental discussions.

History

United Nations Conference on New Sources of Energy (Rome, 1961)

Often identified as the first major international meeting on renewable energy (for example, United Nations, 1981: 44), the United Nations (UN) convened a 'UN Conference on New Sources of Energy' in Rome in August 1961. Focusing specifically upon solar energy, wind power and geothermal energy, the conference was intended to be primarily concerned with 'practical applications' of these technologies (de Breuvery, 1963: 10). This, indeed, turned out to be the case, for, as one participant (Calder, 1961: 570–71) noted, 'the energy developments [discussed] were essentially things which countries could do for themselves, with accessible science and available know-how'.

Thus much of the deliberations concentrated upon relaying experiences in the use of renewable energies. The main 'international' aspect of the conference was to do with the sharing of these practices.

United Nations Conference on the Human Environment (Stockholm, 1972)

The first major UN conference on the environment took place 11 years later. Entitled the United Nations Conference on the Human Environment, it was held in Stockholm, Sweden in June 1972. Particularly noteworthy is that energy received relatively little attention both during the proceedings of the conference and within its final agreements (Clarke and Timberlake, 1982: 18). For example, the Stockholm Declaration, that is, the 26-principle statement regarding ways in which people should be 'inspire[d] and guide[d]' in 'the preservation and enhancement of the human environment', makes no mention of energy of any kind (Stockholm Declaration, 1972). The more-elaborated Stockholm Plan of Action (the 109 recommendations for advancing the agreements of the Conference) pays some attention to energy issues, broadly defined. That attention, however, mainly focuses upon the need to learn more about the consequences of energy use patterns, as they then existed (Stockholm Plan of Action, 1972: Recommendations 57–9), and 'renewable energy' is not mentioned by name at all.

Perhaps this relative lack of attention accorded renewable energy is best explained by the fact that energy supply issues were not yet a major concern for the global community. It is important to remember that, at the time of the Stockholm Conference, the world had yet to experience a major oil crisis (Clarke and Timberlake, 1982: 18). Moreover the consequences of energy use had yet to be fully recognized. Although acid precipitation helped initially to stimulate interest in the Stockholm Conference, global warming was – in 1972 – largely still a topic of academic discussion. In any case, energy received relatively little attention at the Stockholm Conference, and renewable energy even less.

United Nations Conference on New and Renewable Sources of Energy (Nairobi, 1981)

Nine years after the Stockholm Conference, the international community gathered to examine renewable energy issues specifically. Representatives from 125 countries met in Nairobi, Kenya in August 1981 for the 'United Nations Conference on New and Renewable Sources of Energy'. The aim of the Nairobi Conference was to elaborate:

> measures for concerted action designed to promote the development and utilization of new and renewable sources of energy, with a view to contributing to meeting future overall energy requirements, especially those of the developing

> countries, in particular in the context of efforts aimed at accelerating the development of the developing countries. (UN Resolution 33/148, 20 December 1978, noted in United Nations, 1981: 2)

Noteworthy is the emphasis placed, in the UN Resolution, upon two particular themes. First, although this was an international conference with widespread participation, the focus was clearly upon developing countries: that is, how the uptake of renewable energy could be increased in these parts of the world. This particular emphasis was largely driven by energy supply concerns: the then-recent oil shocks (1973 and 1979) had dramatically increased the cost of oil and this had imposed a particularly heavy burden upon oil-importing developing countries. Because the era of 'cheap oil' was perceived to be over, countries' representatives were thinking about developing other sources of energy. New and renewable sources of energy were thus seen as a means of promoting an 'energy transition', which would help 'meet future overall energy requirements, especially those of developing countries' (Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy, reprinted in United Nations, 1981: 7).

A second theme served to link developing and developed countries. More specifically, the 'concerted action' noted in the UN Resolution (above) is (largely) shorthand for 'North–South transfers of technological, financial and other resources'. Southern countries' representatives were looking for assistance from Northern countries in the development of renewable energy sources, and they used the Nairobi Conference to press their claims.

Although agreement was reached on the final 'Nairobi Programme of Action', that does not mean that the conference was completely free of debates and conflicts. For their part, representatives from many developing countries not only wanted firmer commitments to technological and financial resource transfers, but many also supported the establishment of a new international organization to monitor the follow-up to the conference. Representatives from some developed countries, alternatively, resisted these calls. These two sets of positions symbolize, in many ways, the intersection of two eras in Nairobi. The 1981 meeting represented, firstly, part of the end of the calls for a New International Economic Order and, secondly, part of the rise of the second Cold War and higher priority upon market-oriented policies in many industrialized countries. With developing countries emphasizing the ideals of the former and developed countries, particularly the newly-ensconced Reagan administration in the United States, (Stansell 1981: 511) focusing upon the themes of the latter, differences of opinion were virtually inevitable (see also, for example, Biswas, 1981).

The lack of firm commitments (including specific means of implementation) at the Nairobi Conference led some to suggest that the conference was a

'failure' (for example, 'Waste of Energy', 1981: 506). Others, however, emphasized the value in having renewable energy elevated up the international agenda; they labelled the conference a qualified success (for example, Caldwell, 1996: 267; Tinker, 1981: 1079). Whatever the conclusion, the Nairobi Conference has remained an extremely important milestone in the international politics of renewable energy.

United Nations Conference on Environment and Development (Rio de Janeiro, 1992)

Eleven years after the Nairobi Conference, the – at that time – largest environment (and sustainability) conference ever held took place in Rio de Janeiro, Brazil. Entitled the 'United Nations Conference on Environment and Development', one of the most significant outputs of the conference was *Agenda 21*. Intended to 'set out an international programme of action for achieving sustainable development in the 21st century' (Grubb *et al*., 1993: 97), it is a 700-page document that covers virtually every conceivable issue-area related to sustainable development. Interestingly enough, however, energy is not the primary focus of any single chapter. Nevertheless 'energy', broadly, receives attention in different parts of *Agenda 21*; so too does 'renewable energy'.

More specifically, renewable energy is mentioned in a brief manner in three chapters of *Agenda 21* (1992): in Chapter 4 on 'Changing Consumption Patterns', in Chapter 14 on 'Sustainable Agriculture' and in Chapter 16 on 'Management of Biotechnology'. In each the references are relatively predictable, simply calling for increased uptake of renewable energy. In Chapter 7 (on 'Human Settlements') of *Agenda 21* (1992, Chapter 7–51(b)), there are more references to renewable energy, although most of them, again, simply highlight the need to increase use. However two of the themes coming out of the Nairobi Conference reappear in Rio. First, it is noted that the 'increased use' of renewable energy should occur, in particular, in developing countries. Second, it is declared that 'International organizations and bilateral donors should … [support] developing countries in implementing national energy programmes in order to achieve widespread use of energy-saving and renewable energy technologies, particularly the use of solar, wind, biomass and hydro sources.'

In Chapter 9 ('Protection of the Atmosphere') (*Agenda 21*, 1992, Chapter 9–12(g)), finally, there is also explicit mention of 'renewable energy'. In this, the emphasis is upon international activity, namely, the importance of coordinating 'energy plans regionally and subregionally, where applicable, and [studying] the feasibility of efficient distribution of environmentally sound energy from new and renewable energy sources'.

A few explanations for the relatively light attention accorded energy, generally, and renewable energy, in particular, in *Agenda 21* can be offered. First,

because the mid to late 1980s saw a decline in the price of oil, there was an associated reduced interest in the development and utilization of renewable energy as a means to address economic challenges (United Nations, 1994: 2). This argument certainly highlights the fact that so-called 'source' issues were not as dominant as they had been in the 1970s and early 1980s (when some foresaw the short-term depletion of the world's fossil fuel resources). The flip-side to this, however, is that 'sink' issues, that is, the issue of where the emissions from the combustion of fossil fuel resources eventually 'go', received more and more attention during the 1980s and early 1990s. Indeed this leads to an alternative explanation.

Second, it may be that energy received relatively little mention because so much attention had been given to energy issues during the negotiations around the Framework Convention on Climate Change (something that was opened for signature at the Rio Conference). More specifically, government representatives may have thought that the issue was being adequately dealt with in a parallel, international process. If this were indeed the case, then their confidence may have been misplaced, for the Framework Convention process has tended to put most of its energy emphasis upon changing to lower-carbon kinds of fuel and energy efficiency, rather than renewables (Rowlands, forthcoming).

Third, it may well be that limited, though forceful, opposition to any attention being accorded renewable energy was the key determining factor. Grubb and colleagues (1993: 115), for example, argue that the Arab group of countries, led by Saudi Arabia and Kuwait, were opposed to any text in *Agenda 21*'s Chapter 9 that supported the promotion of energy efficiency and renewable energy (see also ENB, 1992). The consequences for the demand for, and therefore the price of, conventional energy supplies (particularly oil) may have been these countries' motivation. The United States – infamous in Rio for its reported assertion that its 'lifestyle is not on trial' (quoted in May, 2002–3: 15) – may have also strengthened this resistance.

Whatever the reason, the world's system for energy supply and demand did not attract the level of attention that might be expected at a global conference on sustainable development. Indeed it was not even scheduled to receive consideration during the sessions of the United Nations Commission on Sustainable Development (CSD), one of the main outcomes of the Rio Conference and the institution charged with monitoring the follow-up to the Earth Summit.

The Commission on Sustainable Development's Ninth Session (New York, 2001)

The CSD organized its work so that it considered part of *Agenda 21* every year. However it was not until 1997, at a Special Session of the United

Nations General Assembly, that it was agreed that at least part of one of the CSD's annual sessions would be devoted to the issue of energy. Thus, in 2001, at the ninth meeting of the CSD, energy was examined as one of two 'sectoral themes' (the other being atmosphere), in addition to two 'cross-sectoral themes' (information for decision making and participation, and international cooperation for an enabling environment) and one 'economic sector theme' (transport). Nine years after the Earth Summit, attention explicitly turned to energy.

Using text developed by an open-ended intergovernmental group of experts on energy and sustainable development as a starting point (United Nations, 2001a), negotiators agreed, in the end, to a number of statements related to renewable energy. Interestingly the previous emphasis upon 'developing countries' seemed to have dissipated by 2001, for it was argued that the 'main challenge lies both for developed and developing countries in the development, utilization and dissemination of renewable energy technologies … on a scale wide enough to significantly contribute to energy for sustainable development' (United Nations, 2001b, para. 16). While this signals something of a shift in the first theme coming out of the Nairobi Conference, that meeting's second theme, the need for North–South transfers to promote 'energy for sustainable development', remained (ibid., para. 17(i)).

While CSD-9 did a good job of focusing attention upon the range of issues involved in promoting energy in a sustainable development context, critics of the process were quick to condemn the outcomes. Consider, for example, the following report on the session: 'For many observers, CSD-9 was about preserving sovereign interests and narrowing down options for consideration at the 2002 [World] Summit [on Sustainable Development], rather than engaging in frank discussions on sustainable development with a view to defining specific policy-oriented recommendations' (ENB, 2001). Meanwhile, another report maintained that 'strong national interests and narrow-mindedness characterized the [CSD] negotiations – after all, the preparations for the [World Summit on Sustainable Development] were also part of the agenda and nobody wanted to give up too much national sovereignty' (Heinrich Böll Foundation, 2001).

The G8 Summit (Genoa, 2001)

Changing tack – that is, moving away from UN bodies to other international fora – we consider here a certain set of activities of the Group of Eight (G8). The G8 is an intergovernmental organization consisting of representatives from eight of the world's largest industrialized countries (Canada, France, Germany, Italy, Japan, Russia, United Kingdom and United States). Although extremely exclusive in terms of its membership, the G8 is, arguably, one of the most important international organizations because of the power of its

members and the impact of its agreements. (For more information on the G8, see, for example, Kirton *et al*., 2001.)

In July 2000, at its Okinawa (Japan) Summit, the G8 agreed to establish a 'Renewable Energy Task Force'. It was charged with looking at ways in which the use of renewables could be promoted in developing countries. Made up of a range of stakeholders (including those from outside the G8), the members of the task force delivered their report to the G8 leaders the following year at the 2001 Summit in Genoa (Italy). Among their more interesting conclusions was the recognition that promotion of renewables in developing countries will be aided by promotion of renewables in developed countries. The members of the task force maintained that increased uptake in Northern countries would serve to drive prices down, which, in turn, would make renewable energy more accessible in Southern countries. In the words of one of the co-chairman (Moody-Stuart, 2001), 'expansion has to be commercial and we therefore need to look at the global market … we cannot simply look at the developing country markets in isolation'. The G8 report was generally well received by many nongovernmental stakeholders, from both business and civil society sectors (for example, Greenpeace, 2001).

Some in government, however, were less receptive. More than one report identifies representatives from Canada and the USA as among those who were concerned about the content of the report and its subsequent impact ('G8 Task Force …', 2001; Greenpeace, 2001; Moody-Stuart, 2001). They reportedly had reservations about the emphases placed upon the importance of targets for renewables and the need to move financial support away from conventional sources of energy. Even though this opposition meant that the G8 never formally adopted the report, many of the themes advanced therein have influenced the broader global agenda on renewable energy.

The World Summit on Sustainable Development (Johannesburg, 2002)

Designed as an explicit follow-up to the 1992 Earth Summit, particularly to focus upon the implementation of Rio's commitments, the World Summit on Sustainable Development (WSSD) was convened in 2002 in Johannesburg, South Africa. As with its predecessor some ten years earlier, preparations took place over an almost two-year period before the opening of the Summit. With energy identified as one of the five top priorities of the Summit (Annan, 2002: 11), renewable energy became a key issue early during this process, and many of the discussions continued through the four preparatory conferences and the Summit itself. Three key debates that potentially had a direct impact upon renewable energy emerged.

The first was the proposal to set internationally agreed 'targets and timetables' for the adoption of renewable and other clean sources of energy. One

specific target that was advanced was a proposal to ensure that renewable energy accounts for up to 15 per cent of global energy supply by 2010 (Renew On Line, 2002). Although this appears relatively modest in light of the 13.9 per cent figure in existence in 1998 (see Table 6.1), given both growing energy demand and the limited scope for expanding production of hydropower and firewood (the largest contributors now), meeting the 15 per cent target would require dramatic growth in the so-called 'new renewables' (like solar and wind).[6] Members of the European Union, who had just agreed to their own Union-wide target for renewable electricity, were among those most vocally calling for targets and timetables. While the candidate countries of Eastern Europe supported their call, others opposed it, suggesting either that targets would 'divert attention away from the primary goal of ensuring universal access to energy services for the poor' (according to many representatives from developing countries) or that a 'one size fits all' approach would not be sufficiently flexible to increase the use of renewable energy (according to representatives from, for example, the USA, Australia, Canada and Japan) (ENB, 2002; Vidal, 2002).

The second was language urging nations to phase out energy subsidies, including a proposal that developed countries reduce energy subsidies substantially by 2007. This would clearly have implications for the competitive position of renewable sources of energy, both nationally and internationally, as well as the cost of energy and other goods and services more generally. The European Union, along with Iceland, New Zealand and Norway, supported inclusion of this proposal, while the USA, 'supported by the G-77/China, Australia, Canada and Japan', opposed it (ENB, 2002).

The third key debate concerned efforts to encourage the transfer of environmentally sound energy technologies to developing countries, including preferential and concessionary terms. Although this call had been evident for at least 20 years, development assistance levels in this area (and, indeed, in many areas) remained well below the expectations of many.

Although energy generally, and renewable energy in particular, received more attention in the final 'Plan of Implementation' than they had in its predecessors of ten and 30 years previously (*Agenda 21* and the Stockholm Plan of Action, respectively), that does not mean that these three contentious issues were resolved. Instead debates meant that only broad principles could be endorsed. As examples, consider the following three passages from the Plan of Implementation, each of which relates to one of the three aforementioned debates:

> With a sense of urgency, substantially increase the global share of renewable energy sources with the objective of increasing its contribution to total energy supply, recognizing the role of national and voluntary regional targets as well as

> initiatives, where they exist, and ensuring that energy policies are supportive to developing countries' efforts to eradicate poverty, and regularly evaluate available data to review progress to this end. (Johannesburg Plan of Implementation 2002, 19(e))

> Policies to reduce market distortions would promote energy systems compatible with sustainable development through the use of improved market signals and by removing market distortions, including restructuring taxation and phasing out harmful subsidies, where they exist, to reflect their environmental impacts, with such policies taking fully into account the specific needs and conditions of developing countries with the aim of minimizing the possible adverse impacts on their development (Johannesburg Plan of Implementation 2002, 19(p); see, also, Johannesburg Plan of Implementation 2002, 19(q)), [although it is recognized that any policies] … should be decided by each country, and that its own characteristics and capabilities and level of development should be considered, especially as reflected in national sustainable development strategies, where they exist. (Johannesburg Plan of Implementation 2002, 19(r))

> Take further action to mobilize the provision of financial resources, technology transfer, capacity-building and the diffusion of environmentally sound technologies (Johannesburg Plan of Implementation 2002, 19(a)); in particular to developing countries, on favourable terms, including on concessional and preferential terms, as mutually agreed. (Johannesburg Plan of Implementation 2002, 19(i))

Many critics argued that concerns about national sovereignty again impeded agreement around more innovative international actions on energy (for example, ITDG, 2003). Others, meanwhile, focused attention upon the multi-stakeholder partnerships that were agreed in order to highlight the progress that was being made (for example, Casado Cañeque, 2003).

Post-WSSD activities

During the WSSD, two related, but distinct, initiatives were launched. One was the establishment of a new international coalition to promote renewable energy. Disappointed by the fact that the WSSD had failed to set specific targets and timetables for renewable energy, the European Commission and the members of the European Union took matters into their own hands at the end of the Summit. Highlighting the 'way forward' on renewable energy, 66 countries initially pledged themselves not only to work together to further develop and promote renewable energy technologies, but also to adopt renewable energy targets. By the middle of 2003, over 80 countries had joined what had become known as the 'Johannesburg Renewable Energy Coalition' (JREC, 2003).

The other initiative was the announcement at the WSSD, by German Chancellor Gerhard Schröder, that his country would host an international conference on renewable energy. After further details were subsequently finalized, the 'International Conference for Renewable Energies' was sched-

uled to be held in Bonn in June 2004. Organized and hosted by the German government, the conference was intended to attract representatives – politicians, civil servants, people from the private sector, nongovernmental organizations and the rest of civil society – from around the world. All were meant to address the following question: 'How can we substantially increase the proportion of modern renewable energies in industrialized and developing countries?' It was expected that international cooperation would be part of the outcomes of the conference. Organizers anticipated that the conference would show 'commitment to … regional targets' and that 'a single international action plan … based on regional cooperation' would result (ICRE, 2003).

Future prospects

In some areas, there is broad (though not necessarily unanimous) international agreement with regard to renewable energy. It is, for example, widely accepted that increased use of renewable energy has the potential to meet a range of environmental and developmental goals. Thus it is also broadly agreed that renewable energy should be part of every country's public policy agenda. Finally it is generally believed that international cooperation of some kind can help to catalyse increased use of renewable energy. Any broad consensus evaporates, however, when attention turns to the details of that international cooperation.

Some argue that a set of globally agreed national targets represents one of the best means to promote renewable energy. Others, meanwhile, emphasize globally agreed commitments to national market reforms and international market liberalization as ways to increase the use of renewable energy. While each position appears to have its merits, each still has its problems as well. Effort, therefore, could usefully be expended towards finding a new approach. Let me elaborate. Consider, first, the advantages of national targets for renewable energy. If widely agreed, they could send clear signals to businesses, consumers and institutions and could thus change energy investment patterns for the better. Indeed, momentum could quickly build up and targets could be met in cost-effective ways. Such 'win–wins' resulted in the case of regulating the use of ozone-depleting substances through globally agreed national targets (Rowlands, 1995). Moreover the simple presence of such targets could help to ensure that renewable energy remains a public policy priority and thus continues to attract the level of attention that its supporters maintain it deserves. The fact that these targets would be globally agreed would also lessen the chances that some countries could obtain a competitive advantage (admittedly only fleeting) by refusing to implement renewable energy projects. In this way, free-riders would not be able to exploit collaborators; a 'tragedy of the commons' could thus be avoided.

But these advantages would appear to come at some costs. For one, it may be hard to identify 'appropriate' targets at any particular point in time, even for the world as a whole, let alone for individual countries. Technological advances (only some of which can at present be foreseen) and market developments may mean that a set of targets that seemed wholly appropriate soon comes to be perceived as an impediment to the effective development of renewable energy. Moreover a target for one particular set of technologies within one particular sector (more specifically, 'renewables' within 'energy') appears unsuitable once the 'cumulative effects' of sustainability challenges are recognized. If specific parts of an individual sector are addressed, problem displacement may well result. Such displacement occurs, for instance, 'when an air pollution problem is solved by creating a water pollution problem – for example, prohibition of the burning of waste may lead a company to discharge the waste into watercourses instead' (Dryzek, 1997: 81). Therefore promotion of renewables may unexpectedly exacerbate problems in other areas. Finally targets may serve to 'force' societies to follow ultimately inappropriate paths. For example, the existence of targets may oblige a developing country to promote a cost-ineffective and technologically unsuitable renewable energy while ignoring lower-polluting alternatives (like kerosene). In this way, development aspirations may not ultimately be advanced.

Turning to the liberalization of international markets, there also seems to be potential advantages and disadvantages. While 'flexibility' (allowing citizens and corporations to adopt renewable energy options at different rates) would seem to be encouraged, extreme forms of globalization appear to place too much faith in the market to achieve society's goals. Indeed, in the case of energy, this faith seems particularly misplaced. Not only do energy markets not usually 'get the prices right' (as they often reward those who are able to externalize their costs onto others), but experience with renewable energy development reveals that local participation in project planning and implementation is critical to its success (for example, Wiser, 1998: 113). Moreover even those on both sides of the 'renewable portfolio standards' versus 'feed-in tariffs' debate in renewable electricity (see, for example, Menanteau *et al*., 2003) appear to agree that the government needs to play a critical role in 'managing' energy markets.[7]

So what we need is to be able to combine the strengths of each position so that international cooperation can serve to catalyse renewable energy development in an effective way. Acceptance of the contributions of different levels would seem to be pivotal. On the one hand, globally coordinated action is critical, so that broad principles and norms regarding renewable energy can be agreed upon. In this way, countries can reduce the risks of working at cross-purposes, or being exploited by 'free-riders'. Moreover international sharing of experiences would also seem to be important, not only in terms of

technologies (as has traditionally been the case), but also in terms of policies and broader strategies. Finally North–South financial transfers are required, so that, ultimately, the flow of private resources can be stimulated in the developing world.

On the other hand, significant action also needs to occur at the subglobal level (however defined). Communities need to think about what kinds of renewable resources are appropriate for them (and to what uses they should be put in their broader 'energy for sustainable development' strategy). They also need to think about the ways in which renewable energy can be positioned as a catalyst for their society's other goals, for example clean air, local employment, poverty reduction or security of supply. These links need to be made much more vigorously than they have been to date.

Conclusions

For more than 40 years, international society has formally considered renewable energy. This chapter has reviewed this period by focusing attention upon a number of key international political events. As with many stories, there appear to be elements of both 'good news' and 'bad news'. The good news is that there is now widespread acceptance that renewable energy is a global challenge, requiring the participation of all around the world. It is also increasingly being recognized that renewable energy can be part of the way in which sustainable development, however defined by different communities, can be promoted. These are positive developments.

However the bad news is that renewable energy, particularly the 'new renewables', still constitutes a negligible part of the global energy picture. (Indeed the figure is less than one-fortieth of the world's energy supply.) Moreover North–South support for renewable energy has remained small, this in spite of the fact that 'over 2 billion people in the world are without access to electricity and an equal number continue to use traditional solid fuels for cooking' ('World Energy Assessment Overview', 2000: 7). There may, however, be reasons for optimism. As this chapter has attempted to demonstrate, global/subglobal interactions have the potential to secure progress in the supply and use of renewable energy. Who knows? Perhaps whoever writes a piece on 'renewable energy and international politics' in ten years' time will make much more use of renewable energy when they produce their review. For global society's sake, let us certainly hope so.

Notes

1. The first law of thermodynamics states that energy can be neither created nor destroyed. Instead, it is simply 'transformed'. When, therefore, talk of energy creation or production is used in common parlance, it strictly refers to the process of transforming energy: for example, from the chemical energy embodied in coal, to the electrical energy represented by electrons 'flowing along' high-voltage transmission lines.

2. This chapter is being written in the Province of Ontario (Canada), where, during business hours, the 'marginal fuel' in the power system is usually coal. Coal-fired power stations have significant environmental impacts.
3. This has often been characterized as efforts to move society from a 'hard path' to a 'soft path' (Lovins, 1976).
4. There is no universally accepted definition of 'renewable energy'. One definition is 'the term used to cover those energy flows that occur naturally and repeatedly in the environment and can be harnessed for human benefit. The ultimate sources of most of this energy are the sun, gravity and the earth's rotation' (UK Renewable Energy Advisory Group, quoted in Alexander, 1996: 27).
5. For ideas about the advantages and disadvantages of international energy research and development cooperation, see Gray *et al*. (1985) and Geller (2003: 211).
6. Note that there was much ambiguity regarding what this 15 per cent figure would include: for example, would it include all hydropower and all biomass?
7. See also the arguments, in the context of renewable electricity, specifically, in Rowlands and Patterson, 2002.

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7 Effectiveness, capacity development and international environmental cooperation

Stacy D. VanDeveer

Issues associated with states' capacities (or abilities) to meet their international environmental commitments are now ubiquitous in the practice and analysis of international environmental cooperation. The number and complexity of environmental 'problems' seems to be growing, even as the number of multilateral and bilateral environmental agreements also increases. By 2003, there were over 770 multilateral environmental agreements and at least 1200 bilateral ones.[1] These numbers do not include the many additional voluntary international agreements such as joint declarations, action plans and suggested guidelines and standards. If international environmental agreements are to address seriously the environmental and/or social problems they identify, they must influence the behaviour of various agents, including states or state bodies, consumers, NGOs, firms and societies.

Recent research on the implementation of international environmental commitments and the domestic effects or impacts of environmental multilateralism identifies various types of 'capacity' as a central factor explaining states' compliance with, or implementation of, particular commitments (Haas *et al*., 1993; Keohane and Levy, 1996; Victor *et al*., 1998; Weiss and Jacobson, 1998; Schreurs and Economy, 1997; Miles *et al*., 2002; Mitchell, 2003). Such work often focuses on the capabilities of states, viewing these as intervening variables or background conditions that help to explain the domestic impacts of international institutions such as law, regimes and assistance programmes (VanDeveer and Dabelko, 2001). As the effectiveness of international environmental agreements and its relation to state capacities became the subject of increased analytical attention over the last ten to 15 years, calls for more 'capacity building' efforts also increased. In other words, as analysts and practitioners of international environmental politics identified lagging capacity as an explanation for failures to comply with or implement environmental agreements, they designated capacity building programmes as a solution to this problem.

For the purposes of this chapter, capacity building and capacity development refer to efforts and strategies intended to increase the 'efficiency, effectiveness, and responsiveness of government performance' (Grindle, 1997: 5). These general terms should not be understood to imply a total

absence of capacity for particular functions in a given location or group. Because capacity building research, often done under the auspices of donor agency reviews, increasingly sees capacity building as a more open-ended learning or developmental process, the term 'capacity development for the environment' (CDE) has become the dominant one within international development circles. In other words, though the practice of capacity building often focuses on state bodies or functions in the global South, there is no reason to assume that these 'targets' of such assistance programmes are the only ones in need of capacity development to achieve more sustainable outcomes. In fact, much evidence suggests otherwise (Carmin and VanDeveer, 2005; VanDeveer and Sagar, forthcoming). Thus capacity-building efforts can be focused on any number of 'sites': government bodies in the North and the South, NGOs and civil society, independent unions, political parties, scientific and technical communities, private sector actors and publics. Also a host of different agents may seek to build capacity across borders, including states, multilateral organizations, NGOs, firms and individuals.

Even a cursory Internet search of secretariat websites associated with global and regional environmental agreements demonstrates that attempts to expand public sector capacities have gained prominence in current global, regional and bilateral environmental agreements. Across a host of UN bodies, European Union programme areas, multilateral development banks, treaty secretariats and bilateral foreign assistance programmes, international and national policy makers are struggling to enhance state, local and NGO capacities to meet international environmental commitments of various types. Capacity development programmes populate these organizations, nearly all aimed at less developed and/or transition countries.

This chapter reviews the recent turn toward the study of effectiveness in international environmental politics. Since this literature identifies various types of capacity as part of the explanation for variable implementation of such agreements, the chapter then provides a brief description and history of capacity development research. Next, the chapter offers a brief summary of CDE programmes and results in Central Europe during the region's transition toward more democratic, market-oriented institutions and membership of the European Union (EU). The chapter ends by drawing some lessons from over a decade of capacity development experience and research around environmental issues.

The 'effectiveness turn' and capacity

In general, the turn toward research on the effectiveness of international environmental cooperation manifested itself over the course of the 1990s. As the numbers of international environmental treaties, voluntary commitments and ministerial meetings and UN conferences continued to grow, many ana-

lysts demanded improved methods and data with which to assess what could be said about the general social, political and environmental impacts of all of this environmental cooperation.[2] In fact, research on the influence of international environmental cooperation can be said to have shaped the intellectual direction of the broader international relations literature (O'Neill *et al.*, 2004; Mitchell, 2003; Chayes and Chayes, 1998, Downs *et al.*, 1996; Simmons, 1998; Zürn, 1998). In much of this work, the capacities of state actors – or the ability of international institutions to change the capacities of various types of domestic actors – are identified as an important influence on the overall effectiveness of many international environmental regimes.

Scholars of regime 'effectiveness' have proposed numerous definitions of the term and focused on a host of different independent and dependent variables. The literature's many approaches to effectiveness range from attempting to adduce whether particular cooperation arrangements leads to any change in a relevant variable, through behavioural and legal changes by signatory states (implementation and/or compliance), to stronger definitions, whereby 'successful institutions … 1. Change the behavior of states and other actors in the direction intended by the cooperating parties; 2. Solve the environmental problem they are supposed to solve, and 3. Do so in an efficient and equitable manner' (Bernauer, 1995: 358). Other leading studies define effectiveness, implementation, and/or compliance in different ways, although Young's (1994: 143–9) sixfold definition remains the most comprehensive. Such work generally distinguishes between adhering to the substantive and procedural terms of an agreement (compliance) and taking specific measures in domestic law and regulations pursuant to achieving one's procedural and substantive requirements (implementation). The higher standard associated with actually solving the problem identified within the cooperation regime, or at least improving aspects of it, can be termed 'effectiveness'. Some scholars look for a wide range of impacts of international cooperation, including indirect effects or domestic political effects of cooperation, whereas others stick to a more narrow, goal-oriented definition (such as asking whether emissions of particular pollutants have declined because of particular multilateral policies).

Studies of international regimes and their design are common in the effectiveness literature. Such characteristics are identifiable, generally thought to be policy-relevant, and they can provide bases for comparing the effectiveness of various international institutions (Mitchell, 1994, 2003; Susskind, 1994; Victor *et al.*, 1998; Weiss and Jacobson, 1998). Such work focuses on regime characteristics, looking at issues of incentive-based versus punishment-based mechanisms, the degree of transparency involved, perceptions of the agreement's equity, monitoring and reporting requirements, and the strengths and weaknesses of the convention protocol method of bargaining

and institutional development. Victor *et al*. (1998: 16) examine 'systems for implementation review' within agreements: institutions through which the parties share information, compare activities, review performance, handle noncompliance and adjust commitments (see also GEA, 1997). Such studies tend to prioritize the relatively transparent generation of quality information about environmental and social factors, often arguing that various informational factors are the key to effective international environmental cooperation. That is, this research demonstrates that high-quality information (and various processes of its assessment) can help to produce the informational bases from which effective, efficient (and sometimes fair) policies can be developed and implemented by participants. Issues associated with capacity may enter into such analyses of regime effectiveness in a number of ways. For example, one might ask if all state parties to a convention are able to produce the types of reliable information needed to assess and address particular problems. One might also ask if different state and societal institutions are more or less able to respond to various types of information for policy (see GEA, 1997).

Regimes with the highest degree of compliance may be among the weakest in terms of environmental effects, often because they essentially formalize the status quo. Other reviews highlight problems of isolating regime effects, as well as methodological problems such as finding adequate data to measure environmental impacts (Bernauer, 1995; Haas *et al*., 1993; Mitchell, 2003; Young, 2001). These concerns generate a sizable literature on methodologies for studying regime effectiveness, in particular to assess the weight of the regime's impacts independent of other exogenous factors which influence outcomes (Mitchell and Bernauer, 1998; Sprinz, 2000; Young, 2001). By extension, attempts to assess the outcomes of capacity-building programmes are fraught with similar methodological perils. In particular, isolating the influence of a particular assistance programme from the many related factors is always problematic – as is settling on realistic and acceptable metrics for effectiveness or 'success'.

In addition, many international environmental problems are complex and uncertain in their causes, outcomes and distributive impacts. Some basic characteristics may render certain environmental issues more amenable to effective cooperation than others: that ozone layer depletion is simpler than climate change, for example (Alberty and VanDeveer, 1996; Downie, 1994; Miles *et al*., 2002). However the assumption that issue area characteristics determine outcomes or indeed regime design has been challenged by the more constructivist literature, which argues that problems are framed by social and political interaction and not 'given' by particular natural or social relationships (GEA, 1997; Jasanoff and Martello, 2004; Social Learning Group 2001). From this perspective, it can be said that the effectiveness literature likely needs to take problem framing more seriously. Instead of

resting on typologies of 'problems' (as though these are set parameters), more attention is needed on the way problems are framed and who does the framing at various stages of the policy process (Jasanoff and Martello, 2004; O'Neill *et al*., 2004).

Much of the effectiveness research also argues that national politics and institutions are important factors shaping implementation, compliance and effectiveness of international environmental commitments. International agreements must pass through domestic regulatory and/or legislative processes in order to be implemented. Generally resultant laws must change the behaviour of domestic actors, both private and public, in order to be effective. A growing literature demonstrates that domestic institutions and practices constrain and/or enable such processes (DeSombre, 2000; O'Neill, 2000; Skjærseth, 2002; Schreurs and Economy, 1997; Carmin and VanDeveer, 2005; Weiss and Jacobson, 1998). Stronger arguments claim that international environmental cooperation can transform national politics, when, for example, engagement in international cooperation helps to socialize new state actors in the former Soviet Republics and Eastern Bloc (VanDeveer, 2002; Weinthal, 2002).

Early work on more effective international agreements found that they improved domestic contractual environments, levels of environmental concern and capacity to deal with particular issues (Haas *et al*., 1993). A decade of research on implementation and effectiveness demonstrates that states often fail to achieve compliance or to seriously attempt implementation because they lack various aspects of capacity such as the resources, personnel and/or expertise to meet treaty obligations (VanDeveer and Dabelko, 2001). Several works point out the importance of aid and transnationally driven restructuring processes in understanding and improving capacity and thus effectiveness (Grindle, 1997; Sagar, 2000; Carmin and VanDeveer, 2005). While capacity is occasionally used as an international-level variable (Miles *et al*., 2002), the concept remains primarily applied to developing countries.

Recently some effectiveness literature has taken a more constructivist turn (Downs, 2000). Here international cooperation in general, and capacity building programmes in particular, can be viewed as processes that may engender learning or changes in beliefs, expectations and preferences. Cooperative agreements and capacity development programmes can transmit norms and policy ideas (in addition to material resources or specific institutions for policy) from government to government or from the international to the domestic level (Conca and Dabelko, 2002; Cortell and Davis, 2000). Such work draws on ecological modernization theory and addresses how new ideas about environmental regulation are transmitted across national borders (Mol, 2002; Mol and Sonnenfeld, 2000). By helping to institutionalize shared norms or innovative ideas, such processes, which may also operate 'below' the regime level (for example, Wapner, 1996), enhance and reinforce regime

effectiveness, though possibly in indirect and unintended ways (Risse, 2000). Furthermore this explicitly normative literature recognizes the agency of various actors as carriers and transmitters of new norms and ideas (O'Neill *et al*., 2004).

Scholarly literature on learning (Princen and Finger, 1994; Social Learning Group, 2001) takes a broad view of the way actors learn through cooperation, and the literature on assessment demonstrates elements of reflexivity (GEA, 1997; Victor *et al*., 1998). Most international regimes contain some mechanisms for monitoring, evaluation and amendment. One could therefore understand effectiveness as a learning process, rather than an end in itself. Pushing this notion further, one might attempt to understand how norms and ideas may change or transform states' domestic capabilities and institutions, their interests/preferences or their role in the international system.

Yet, across the burgeoning effectiveness literature, its attention to capacity-related concerns, and the proliferation of capacity building programmes under the auspices of multilateral and bilateral environmental agreements, one finds a general vagueness and some frequent contradictions (VanDeveer and Dabelko, 2001; VanDeveer and Sagar, forthcoming). Given the empirical prominence and analytical importance of public sector capacity, many researchers and practitioners in international environmental cooperation have not made adequate use of the decades of research on capacity building in international development arenas. In short, though widely alluded to in international organizations, assistance programmes, and scholarship, 'capacity building' often has no clear definition and does not evoke a common set of strategies among its users.

Capacity development for the environment (CDE)

Political science and public policy research has often been most interested in administrative capacities, or 'the ability of non-governmental organizations and domestic political institutions to translate concern … into policy' (Keohane, 1996: 12). However research that places capacity building at the centre of analysis takes a much broader view, calling attention to the quality of public sector human resources, organizations and institutions as central to good governance (Grindle, 1997). This view of capacity building pushes the concept well beyond the technical assistance and administrative training programmes often conducted under the title of 'capacity building', to include concerns such as administrative and organizational abilities, public education, NGO capacity, legal and regulatory clarity and the 'fit' between international commitments and long-standing domestic social and political institutions (to name only a few). Grindle (ibid.: 26) argues that detailed research on capacity building programmes demonstrates that

> good governance requires time, commitment, innovative ideas, consensus building, changed behavior and norms for those who work in the public sector, new rules of the game, efficient design and resource allocation in technical assistance… building state capacity also requires effective efforts to develop human resource capacity, particularly among technical and professional staff; organizational strengthening initiatives, particularly those focused on incentive and managerial systems; and institutional reforms, particularly those that address underlying constraints on government to contribute more effectively

These insights remain underutilized in much of the study and practice of international environmental politics.

The international development literature has included concepts associated with capacity building since the 1950s (Fairman and Ross, 1996; Grindle, 1997; OECD, 1995; Sagar, 2000).[3] Changing ideas and practices in international development resulted in the waxing and waning of interest in building or enhancing the capacities of public sector actors and institutions (Hildebrand and Grindle, 1994; World Bank, 1997). Since the late 1980s, an invigoration of capacity issues has followed a (re)recognition of the importance of domestic-level capacities for tackling various national and global policy issues facing developing countries. Debates about how to combat the dramatic spread of the HIV virus and how to treat AIDS/HIV in the developing world illustrate one such task facing national officials and international organizations. Also dissatisfaction with the high costs and lack of effectiveness of technical assistance programmes forced donor agencies like the World Bank and UNDP to re-examine technical cooperation programmes and their assumptions and design (Sagar, 2000). Such studies ushered in renewed attention to the essential role of national capacities in successful development.[4]

Analyses of capacity development among donor agencies began to converge on a more process-oriented, complex and nuanced perspective on capacity building, recognizing the importance of multiple dimensions and levels of capacity from individuals to the institutional (Hildebrand and Grindle, 1994). A multiplicity of state and non-state organizations contribute to national capacity (public, private and civil society actors). Consequently, simple one-shot training programmes or narrowly focused technical assistance or technology transfer programmes may fail to achieve their goals because of organizational or institutional factors, for example. The more process-oriented approach to capacity development focuses on strengthening human resources, organizational effectiveness and efficiency and broader institutional development. In fact, attention to process has led 'capacity development' slowly to supersede 'capacity building' as the term of choice, with the understanding that the former is a process-based as well as an outcome-based approach (VanDeveer and Sagar, forthcoming).

Development assistance discussions about capacity development have shaped discourse in environmental assistance as well (OECD, 1995, 1997). In fact, 'capacity development for the environment' (CDE) emerged as an important element of donor agency programmes and discussions. In addition, the ushering in of 'sustainable development' as a framework for global summits and cooperation brought with it a clearer recognition that environmental management cannot be entirely separated from national economic development. For example, discussion of capacity building became an important component of the 1992 UN Conference on Environment and Development in Rio. For example, *Agenda 21* states that 'capacity-building encompasses the country's human, scientific, technological, organizational, institutional, and resource capabilities'. Furthermore it posits that 'A fundamental goal of capacity-building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environmental potentials and limits and of needs as perceived by the people of the country concerned' (UNCED, 1992). UNDP's 'Capacity 21' programme, launched in 1992 at the UNCED, aims to help developing countries to build their capacity to integrate the principles of *Agenda 21* into national planning and development.[5]

Generally CDE programmes either attempt to build capacity in donor agencies, attempting to improve their own efforts in recipient countries, or strive to build particular capacities in recipient countries (VanDeveer and Sagar, forthcoming). CDE programmes aimed at developing, recipient countries often focus on issues considered fundamental, such as environmental economics, environmental law and assessment and monitoring tools. Much of the effort to build capacity has taken a top-down approach: for example, building planning capacity in ministries, or developing expertise in environmental economics and law that can then be integrated into national or local environmental management approaches (see, for example, UNDP, 2001). Official planners and decision makers are not the only targets of CDE efforts. Increased involvement of NGOs and other community-based organizations, for example in environmental protection, is another aim of some CDE programmes (Carmin and VanDeveer, 2005). There is also an increasing recognition of the importance of systems of data collection and monitoring (VanDeveer and Sagar, forthcoming). The substantive focus of these efforts includes local/regional issues such as industrial, air and water pollution, and biodiversity and habitat protection as well as transnational issues such as chemicals management, climate change and ozone layer protection. Many such programmes receive funding from the Global Environment Facility (GEF), World Bank programmes or bilateral programmes intended to support particular multilateral environmental agreements.

CDE experience from Central and Eastern Europe

In the 15 years of transition from Soviet style state socialism to membership of the European Union, Central and Eastern European (CEE) countries have struggled to meet the demands and requisites of harmonizing their domestic law and regulation with the large body of EU environmental policy (the so-called 'environmental acquis'). While some areas of state, NGO and private sector capacities to implement environmental policy and manage resources and environmental issues have increased dramatically, numerous areas of lagging capacity remain across CEE countries (Auer, 2004; Carmin and VanDeveer, 2005; Andonova, 2003; KPMG, 1998).

Although notable gaps in capacity exist across the region, it is also clear that there is more public, NGO and private sector environmental expertise and policy capacity in CEE states and societies than was present ten or 15 years ago. Most CEE environmental ministries remain understaffed and underfunded, with organizational, financial and human resource capabilities that cannot meet their mandates. Furthermore, their domestic political importance remains low compared to the more traditional and powerful ministries, such as those associated with defence, economic development and labour. Environmental officials struggle to keep pace with the growing volume of international and domestic laws and regulations that they must implement. These problems appear even greater at the regional and local levels, where environmental agencies and offices are given the task of monitoring, enforcing and implementing a host of complex and expensive policies (Ecotech, 2001). Often the limited capacity for innovation and implementation of new policies and practices results in CEE countries relying on readily available and time-honoured approaches to environmental protection. Many of these challenges are long-standing complaints among environmental policy analysts and advocates in other countries as well (Holzinger and Knoepfel, 2000). While these are critical in CEE states, they also give environmental policy makers and advocates in these states common interests with their counterparts across and beyond Europe.

Civil society actors and organizations also wrestle with capacity limitations (Carmin and VanDeveer, 2005). Since the fall of communism, NGOs have gained a presence in the region and have the potential to play critical roles in the implementation and enforcement of environmental policies. However many of these organizations are not only struggling to meet their basic expenses, but are also faced with shortages of new talent to take the place of leaders who are retiring (Beckmann et al., 2002). If implementation of EU environmental policy requires an engaged civil society, then resource constraints seen among CEE environmental groups may pose a challenge for implementation. CEE environmental NGOs face domestic challenges beyond resources. Given the general lack of environmental mobilization and activism

among CEE publics, CEE NGOs must overcome a kind of mobilization deficit if they are to realize their potential influence on policy development and implementation (Auer, 2004; Borzel, 2002).

Despite the gaps in capacity across the EU and general critiques raised about the limits and impacts of external funding on CEE governments and nongovernmental organizations (for example, Mendelson and Glenn, 2002; Gutner, 2002; Wedel, 1998), programmes aimed at capacity development for the environment can work. Such programmes improved CEE environmental capacities (VanDeveer, 2000; Selin and VanDeveer, 2004). As a result of these efforts, governmental and nongovernmental actors are engaged in the policy process and new environmental laws, regulations, modes of assessment and evaluation have been put into place. Furthermore even limited international financial support has led to the formation of new policy instruments and to investments and improvements in areas such as sewage treatment, drinking water quality, nuclear power plant safety, air quality and habitat protection (Gutner, 2002). At the same time, training programmes, such as those organized under the auspices of the Regional Environment Center for Central and Eastern Europe (REC) or built through long-term international partnerships with NGOs such as Friends of the Earth, have enhanced the technical and administrative expertise of environmental organizations.

Combating marine pollution in oceans and regional seas has been the subject of extensive international environmental cooperation, globally and between eastern and Western European institutions, for over 25 years (Haas, 1990; 1993: 133–82; Skjærseth, 2002; Mitchell, 1994). Recent comparative research on this growing environmental cooperation demonstrates the centrality of state capacity in explaining variance in multilateral and domestic-level outcomes (VanDeveer, 2000; VanDeveer and Dabelko, 2001; Selin and VanDeveer, 2004). Virtually all European regional seas cooperation regimes have programmes to 'build capacity' in participating states. Most focus rests on enhancing scientific and technical capacity in the less-developed or post-communist states across Europe and North Africa. Such programmes have increased the size and influence of scientific and technical communities around these seas. Such programmes and communities are often the vehicles for the promulgation of new policy norms and administrative models. Yet, if states do not have the capacity to make, implement and reform environmental policy over time, promulgated norms have no institutional 'location' in which to take hold. Similarly assistance programmes within the multilateral environmental cooperation regime around the Black Sea have helped to increase and enhance the number and effectiveness of NGOs.

In comparison to the Baltic and Mediterranean regimes, however, the states of the Black Sea region are little influenced by regional cooperation and they have gained little ground in terms of policy reform, implementation

or enforcement (VanDeveer and Dabelko, 1999). Black Sea states generally lack the political commitment to environmental protection, public sector capacity and material resources present in some quarters around the Baltic and Mediterranean regions. Black Sea regional cooperation remains mired in early efforts to organize regional research, monitoring and policy-making institutions (VanDeveer, 2000). Mediterranean environmental cooperation has focused primarily on expanding scientific and technical capacity around the region (and the capacity to give scientific and technical advice to policy makers). Baltic cooperation, on the other hand, has developed programmes to improve state environmental law and regulation and national policy makers' ability to acquire and utilize scientific and technical input (VanDeveer, 2000; Selin and VanDeveer, 2004). As a result, environmental law and regulation in the newly independent Baltic States has been shaped by regional international cooperation much more than the states earmarked for assistance in the Mediterranean region.

The success of some multilateral and bilateral assistance programmes, often sponsored by EU bodies, development banks, EU member states and international NGOs, demonstrates that international assistance can build domestic governance capacities (Carius, 2002; Carmin and VanDeveer, 2005; KPMG, 1998; VanDeveer, 2000; VanDeveer and Dabelko, 1999, 2001). To improve their chances of success, such programmes must assess and concentrate upon underlying causes of incapacity (not just symptoms) and avoid simply replicating donor-driven programmes across countries in 'cookie cutter' fashion (Grindle, 1997; Sagar, 2000; VanDeveer and Sagar, forthcoming). If an 'era of implementation' is to characterize EU environmental policy in the future, public sector actors, both in the East and in the West, will need to draw lessons from previous capacity-building experiences. Furthermore they will need improved understanding of the ways that domestic and international liberalization and privatization influence environmentally important behaviours and the state's capacities to respond to such changes (Andonova, 2003).

Lastly, lessons from capacity building efforts in the CEE region also demonstrate that simple one-way transfers of expertise and policy from wealthier countries to poorer ones will not solve the implementation and effectiveness gaps in international environmental cooperation. For example, recent studies of the implementation of environmental policy commitments demonstrate that long-standing and wealthy EU member states may lack implementation capacity as well (McCormick, 2001; Knill and Lenschow, 2000; Skjærseth, 2002). Contrary to commonly held notions of CEE states being environmental laggards vis-à-vis Western Europe, many aspects of the implementation challenges in Europe increasingly look similar in CEE and wealthier Western European states (Carmin and VanDeveer, 2005).

Drawing lessons about effectiveness and CDE

The CDE-related programmes and discussions in international environmental politics have grown much richer since the 1992 Earth Summit in Rio. Many programmes to build capacity have been launched and numerous analyses of their effectiveness undertaken. Yet these developments are due in large part to growing concern that the lengthening list of global environmental agreements (like the many declared social justice and public health goals associated with sustainable development) remain unimplemented (Sanderson, 2002; VanDeveer, 2003; World Resources Institute, 2003). The attention to implementation concerns has helped shift debates around international environmental agreements away from the very unhelpful notion that only political will (or intent) constrains states from meeting their international commitments toward attention to capacity issues.

Capacity development for the environment is now being treated, by international organizations and the donor community, as a central element of these international environmental management efforts. However present discussions of CDE are focused mainly on capacity to implement environment projects and to integrate environmental management in developmental activities. This often leads to narrow, technocratic approaches focused on implementation of particular agreements, but less on overall environmental effectiveness. A recent review of the CDE agenda (VanDeveer and Sagar, forthcoming) argues that capacity to promote sustainable environmental management and sustainable development may need to focus more on what is needed to realize these concepts and less on just implementing existing agreements – particularly as many of them are quite weak. If the notion of capacity in environmental politics were expanded beyond implementation, one might understand it as consisting of three overlapping needs: (1) capacity to recognize, analyse and help define environmental problems and their causes; (2) capacity to decide jointly on appropriate management processes; and (3) implementation capacity. Thus international debates and programmes regarding internationally supported CDE might go beyond implementation and include more attention to research, assessment and learning capacities as well as to the capacity needs associated with policy formulation, agenda setting, negotiations and consensus building. This typology calls attention to the social processes that are often prior to the 'policy implementation phase' and it emphasizes the roles of different kinds of systems and institutions for information and knowledge generation, their links to decision making and implementation processes, and of feedback mechanisms.

A last set of concerns regarding CDE is worth mentioning. Because CDE programmes remain so focused on improving environmental management in Southern and transition countries, Northern policies, actions and behaviour patterns remain largely unexamined. Donor agencies and analysts appear

unable to 'turn the lens around' and carefully examine practices and institutional and learning capabilities in their own home countries (Sagar, 2000). For example, one striking absence in current CDE discussions is the general lack of attention to the role of Northern behavioural patterns and policies as causal variables driving unsustainable development patterns and undermining Southern public sector capacity. Northern consumption patterns, well illustrated by per capita fossil fuel consumption or waste generation rates, remain at unsustainable levels (Cohen and Murphy, 2001; Princen *et al*., 2002; Woolard and Ostry 2000), yet Northern policy makers and donor agencies purport to train Southern policy makers on sustainable development without highlighting the model they are presenting to developing countries. Furthermore Northern behaviours can and will easily overwhelm whatever small set of incentives are offered by international environmental agreements and secretariats. For example, while many high environmental policy standards have been 'exported' to Central and Eastern Europe by the CDE programmes and the EU enlargement processes described above, also exported are unsustainable patterns of transportation investment, waste production and consumer behaviour (Carmin and VanDeveer, 2005). In sum, capacity development for the environment, as it relates to domestic and international institutions and the informational, decision making and implementation needs of diverse actors, is an important factor in the creation and maintenance of effective international environmental cooperation.

Notes

1. See Mitchell (2004). These numbers include treaties, such as conventions and protocols, as well as the many agreed amendments to such treaties.
2. This subsection draws on a much longer treatment of the effectiveness literature's contributions to international cooperation theory and research (O'Neill *et al*., 2004).
3. This section draws on VanDeveer and Sagar (forthcoming).
4. In should be noted that many of the lessons 'learned' from these assessments of foreign assistance remain unapplied by the donors who commissioned them (Sagar, 2000; VanDeveer and Sagar, forthcoming).
5. See http://www.undp.org/capacity21/ for details of this programme's activities and history.

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8 Why environmental politics looks different from the South

Adil Najam

The 'North–South' divide, ostensibly signifying the differences between the more industrialized economies of the global 'North' and the relatively less developed and developing countries of the global 'South', has been, and continues to be, a defining feature of global environmental politics.[1] The goal of this chapter is to understand why North–South differences have been as prominent in international environmental politics as they have. We shall do so explicitly from the perspective of the collective South. This is not to suggest that individual developing countries are unimportant in environmental politics, nor to presume that they indulge in environmental politics only through the collectivity of the global South. All developing countries (like all industrialized ones) seek their national self-interest in international politics, and many have come to play an increasingly important individual role in global environmental issues. However all of them continue to operate partly (and to varying extents) within the frameworks of the collective arrangements of the South, most notably the Group of 77 (G77). Moreover, since scholars and practitioners routinely talk and act within the language of alleged 'North–South' relations, it is only fair that we try to understand the meaning behind this language.

Our focus, more than anything else, is on North–South environmental *politics*. It is the contention of this chapter that it is not only that the conditions of the North and South are different (one is rich and the other poor), nor only that their interests are dissimilar (each has distinct sets of environmental priorities), but it is also that the very goal and purpose of global environmental politics is different, when seen from the South, from what it seems to be for those viewing this politics from the North. It is the last of these differences that we wish to explore.

Let us lay out, at the very outset, the gist of the most important (and possibly contentious) argument this chapter seeks to make. Viewed from the North, the purpose of 'global environmental politics' is self-explanatory and contained within the nomenclature used. Quite obviously, it must be politics that seeks to improve the state of the 'global environment'. Viewed from the South, things do not seem quite that obvious. Developing countries were not the original *demandeurs* of global environmental policy. At and before the

1972 Stockholm Conference, they had vigorously resisted the onslaught of contemporary global environmental politics (Rowland, 1973). They still remain rather hesitant participants in what has now become a growth industry of global environmental negotiation and policy (Khor, 1992; Agarwal *et al*., 1999; Najam, 2002). From the very beginning – and certainly as they stumbled towards greater acceptance of global environmental concerns under the rubric of the much more expansive notion of 'sustainable development' – developing countries have sought not simply to improve the state of the 'global environment' but, more importantly, to improve the state of 'global politics' (Krasner, 1985; Thomas, 1992; Williams, 1993; Najam, 1995). For those of such persuasion, North–South relations are not just one of the many lenses through which to understand the global environmental project; instead global environmental politics is one subset of discussions within the larger enterprise for more just and meaningful North–South relations. The key goal of this politics, then, is not just an improvement in the global environmental condition; it is an improvement in larger North–South relations and, thereby, the creation of a more fair and just international order.

In the following sections we will seek to elaborate upon this idea by unravelling two political concepts that scholars and practitioners of global environmental politics from both North and South routinely use, but which still hold very different meanings for Southern and Northern sensibilities. The first of these is 'South' and the second is 'Sustainable Development'. Our interest here is not in coming up with a precise empirical definition of either; arguably such an empirical definition is not possible. Our goal, instead, is to focus on the politics that has emerged around each of these terms, and to do so from the perspective of the developing countries. We do so in order to better understand and explain the manifestations and motivations of North–South tensions in global environmental politics.

The politics of the 'South'

Much like the title character in Baroness Orczy's novel, *The Scarlet Pimpernel*, the South is omnipresent yet elusive in discussions of international environmental politics. Scholarly, diplomatic and journalistic accounts alike are replete with references to 'the South' in the singular and for many it is the term of choice when referring to the developing countries as a group; yet it is conspicuous by its absence as an analytical category, except in the most general of terms (see Najam, 2004a).

Of course, there seems to be a strong undercurrent of, often unstated, doubt about whether the South is a meaningful entity today, even if it had been at some earlier point in time. Interestingly the prevalence of such doubt is to be recognized less by the works of those who express it than by those who refute it (see, for example, Adams, 1993; Williams, 1993; Najam, 1994; Ayoob,

1995; Grant, 1995). At the simplest level, Roger Hansen's (1979: 2) refrain from two decades ago still rings true: if over 130 countries insist on acting as a diplomatic unit in negotiation after negotiation, at forum after forum, for over 30 years, then it is fair to say that they deserve analytic attention. However the South deserves attention for more than its persistence. Even as some in the industrialized countries of the 'North' find the impulse for collective bargaining by the developing countries to be irksome, most developing countries continue to operate, even if nominally, under the collective banner of the global 'South' in international environmental negotiations. The insistent choice to use the term 'South' is more than a matter of semantics and reflects an important aspect of their collective identity in international politics (Najam, 2004a).

The popular view that the North–South divide is a binary distinction between 'haves' and 'have nots' is a powerful, and not untrue, way of understanding the concept – as long as one remembers that what the South wishes to 'have' is not simply economic development, but a say in the political decisions that affect its destiny (Krasner, 1985; Thomas, 1987). The danger, however, is that the distinction is too often distilled only to its economic dimensions, leading to the image of a South forever knocking at the North's door with a begging bowl in hand. Aware of this danger, the 1990 South Commission defined the term in a decidedly more political context. It talked, not merely about economic poverty, but about the 'poverty of influence'. For the South Commission (1990: 1), the defining feature of the South is not merely its economic weakness, but also its political dependence. The self-definition of the South, therefore, is a definition of exclusion: these are countries which believe that they have been 'bypassed' and view themselves as existing 'on the periphery'.

While most of the people of the North are affluent, most of the people of the South are poor; while the economies of the North are generally strong and resilient, those of the South are mostly weak and defenseless; '*while the countries in the North are, by and large, in control of their destinies, those of the South are very vulnerable to external factors and lacking in functional sovereignty*' (ibid.: 1; emphasis added).

To redress what they consider to be an imbalance of influence, the developing countries have sought the vehicle of global negotiations, often referred to as North–South dialogue (see Menon, 1977; Haq, 1980; Jones, 1983; Murphy, 1984). By the early 1960s the language of 'North–South' relations was already in use within the 'development community' (Ward, 1965: 3) and gained wider public recognition in the 1970s as part of the rallying cry for a New International Economic Order (NIEO). During the 1980s, as the NIEO movement faded from global attention, the term was also confined largely to specialized academic discourse. However the publication of the South

Commission Report in 1990 and the term's wide use by governments, nongovernmental organizations (NGOs), the media and officials during the UN Conference on Environment and Development (UNCED) process revitalized it in popular environmental contexts.

For some, the term 'South' is just another synonym for 'Third World'. While this may once have been so, it is no longer so today. The two terms came into usage around the same time, were originally used to convey the same meaning and still refer to roughly the same set of countries. However, in the context of popular, journalistic and even academic usage, their intent has substantially and substantively diverged. While 'South' retains its intent of being a political entity, 'Third World' has become a predominantly economic concept referring to poor countries, and more generally to the poor.

This is a serious deviation from the original conceptual intent of the term 'Third World'. Alfred Sauvy, French demographer and economic historian, is generally credited with having popularized the term (Wolf-Phillips, 1979: 105; Love, 1980: 315; Keyfitz, 1993: 3). Writing at a time when the Cold War was at its coldest, he introduced it in an influential article in *l'Observateur* (14 August 1952; no. 118, p. 5), titled *Trois mondes, Une planète*:

> *Nous parlons volontiers des deux mondes en présence, de leur guerre possible, de leur coexistence, etc. oubliant trop souvent qu'il en existe un troisième, le plus important … C'est l'ensemble de ceux que l'on appelle … les pays sous-développés… ignoré, exploité, méprisé … veutlui aussi, être quelque chose.*
>
> [We gladly speak of two worlds facing each other, of their possible war, of their coexistence, etc., forgetting too often that there is a third one, *the most important* … That is the group of those that are called… the underdeveloped countries… ignored, exploited, scorned … *that want, they too, to be recognized*].

The term *tiers monde* as it first became popular in French – and then got translated into English as 'Third World' – brought with it a certain history: its antecedent being French political concepts including 'Third Force', 'Third Estate', 'Third Way' and 'Third Camp' (see Wolf-Phillips, 1979; Love, 1980; Otter, 1981). Each term carried a distinct, nuanced meaning. The commonality was that 'Thirdness' represented a sense of distance from the dominant poles rather than a descending numerical order; it was used specifically to highlight exclusion, independence, alienation, powerlessness and a rooted desire to change the order of things. These connotations and the historical context of earlier French use of 'Thirdness' made *tiers monde* an apt phrase for the newly independent, formerly colonized, poor states that were just entering the international system in the 1950s. This same sense of alienation and exclusion was later captured in the concept of 'periphery' in the *dependencia*

literature which grew out of the 'historico-structuralism' of Raúl Prebisch (Packenham, 1992). Love (1980: 316) explains:

> When Alfred Sauvy coined *Tiers Monde* in his 1952 article, '*Trois mondes, une planète'* his analogy was to the *Tiers État.* He wrote, '… this Third World [is] unknown, exploited, despised like the Third Estate; it, too, wants something'. Here, of course, he was alluding to the Abbé Sieyès' ringing phrases of 1789: 'What is the Third Estate? Everything. What has it been till now in the Political Order? Nothing. What does it want to be? Something.' Thus, in addition to the idea of non-alignment (discussed by Sauvy in the same article), in this use of the term we find neglect, exploitation, and revolutionary potential.

The essence of the original 'Third World' – which is all but lost in its current use – was that poverty was *a* symptom, rather than *the* cause of the commonality. What bound the countries of the Third World, despite all their internal differences, was not that they were (for the most part) economically impoverished but that they all felt politically disempowered. They had only recently become part of an international system that they had no hand in shaping, over which they had limited influence and no power, and which they considered unsympathetic to their interests. It was this system that they wished to change. Or, to use Sauvy's metaphor, the 'ignored, exploited, scorned' of the world sought 'something': they wanted 'to be recognized'.

The above discussion may seem archaic, but its purpose is to underscore the important point that the term 'Third World' originally evolved as a *political* concept. Over the years its meaning has changed dramatically, to an economic connotation (Muni, 1979; Mountjoy, 1980). As a political concept, the expression denoted 'neither an inferior value structure, nor a descending numerical order' (Muni, 1979: 128). As an economic concept it has been corrupted to imply exactly that. As an economic term, 'Third World' has become a useful concept, but it no longer does justice to its original essence. That essence is better captured by the term 'South'. It is this political essence that the scholars and leaders of the South attempt to capture by making South their descriptor of choice, and it is this political essence that is on display when these countries choose to negotiate collectively.

As Williams (1993: 9) argues, the South is 'essentially a political coalition':

> Efforts to depict the Third World as an economic or cultural concept mistakenly attempt to reduce political behavior to a non-political explanation. … The unity of these countries arises, in the first place, from the inability of these states to exert significant influence on world events. … material weakness and an inability to influence policy making provides a powerful stimulus of an alliance of the powerless. … the international division between the 'haves' and 'have-nots', did not by itself create the coalition although it established necessary conditions for bringing it into existence.

It is critical, therefore, to remember that the Southern coalition is bonded together not just in a common desire for economic justice, but in a shared demand for a fundamental restructuring of international institutions and regimes. In *The Poverty Curtain*, Mahbub-ul-Haq (1976: 167) stresses that the struggle of the Southern collective is against 'systemic discrimination'; thus 'the basic struggle is for equality of opportunity, not equality of income'. On a similar note, though in making a different argument, Stephen Krasner (1985: 27) argues that Southern solidarity is motivated by a desire for political influence as much as by a search for economic wealth and development; that 'vulnerability, not simple poverty' is the motivating force for the Southern coalition.

In short, while there is agreement about *who* we are talking about when we refer to the South, there is much misunderstanding about *what* we are talking about. For many in the North, the term remains yet another notation for 'poor' countries. However, for those who define themselves as such, the South is a collective of the marginalized, rather than a collective of the poor. The term denotes a shared sense of being left on the periphery of global decision making and a common desire to change the rules of the international system.

A final point to be made is that, when studying international politics or international negotiations, it is useful to consider carefully the question posed by Howard Raiffa (1991): 'What is the game?' For analysts focusing only on particular issues or negotiation episodes (say, negotiations related to climate change or biodiversity, or to a particular treaty), it is easy to mistake the 'game' as being that particular episode or that particular issue. For the players, the 'game' – particularly in international affairs where the number of players is relatively small and fixed – is often bigger and tends to be the summation of the various episodes or issues. For the developing countries of the South, the 'game' has been much larger than any particular environmental issue and relates more to its continuing quest for a change in the terms of North–South relations.

Indeed this has been particularly true for issues on the global environmental agenda which, according to most in the South, remains North-driven (Khor, 1991; Banuri, 1992; Agarwal *et al.*, 1999). A recognition of the larger 'game' helps explain much of the South's behaviour in global environmental affairs. Understanding the motivations of the South is essential to appreciating its political nature. In evoking the language of the South in global environmental politics, developing countries are clearly signalling that they view this as one more arena to pursue their long-standing goals of creating a more fair and amenable international order. Consequently, an improvement in the global political condition (in terms of the North–South imbalance of influence) is as important, if not more important, a goal for

developing countries as improvements in the state of the global environmental predicament.

The politics of 'sustainable development'

Much has been written on the concept of sustainable development and its importance to contemporary global environmental politics (Lélé, 1991; Munasinghe, 1992; Banuri *et al*., 1994). It is not our purpose to revisit, or even summarize, these discussions. Our goal, instead, is to review how the developing countries of the South have viewed and used the new politics that has emerged around this politics to advance their long-standing goals and how the promise of larger systemic change that is embedded in this concept has been appealing to the South.

It could be argued that sustainable development as a concept – and certainly the international politics around the realization of this concept – has been a direct consequence of Southern unease with giving a primacy to 'environmental' politics. Arguably bringing 'global environmental politics' closer to a presumed 'global politics of sustainable development', even if only nominally, has been the price that needed to be paid for gaining the active participation of developing countries. One needs to emphasize, for example, that, at the Stockholm Conference of 1972, developing countries were not only uninterested in giving policy priority to environmental concerns, they were actively resistant to this notion (Rowland, 1973). The World Commission on Environment and Development (WCED, 1987) offered the South the concept of sustainable development as a means to add the development dimension to the global environment project. In the run-up to the Rio Earth Summit of 1992, and at the Summit itself, the South was still hesitant not only about global environmental action but also about the very concept of sustainable development (Khor, 1992; Banuri, 1992; Susskind, 1994). By the 2002 Johannesburg Summit, however, a remarkable transformation had happened and the developing countries had not only become engaged in the global environmental enterprise but had become active participants in it (Najam, 2002; Sachs, 2002). However, it should be underscored that this transformation was brought about by the promise of sustainable development, which has been viewed by the South as a means to actualize its long-standing desire for a more just and fair international order and of more balanced North–South relations, as discussed earlier.

This evolution is most clearly manifest in the nomenclature of the three summits we are considering. It is not an accident that the Stockholm summit was a United Nations Conference on the *Human Environment*, an emphasis very reflective of its substantive focus on a pollution-centric understanding of the environmental challenge. The development argument made by the South before and at Stockholm did, in fact, bear fruit and resulted first in the World

Commission on Environment and Development (WCED) and later in the Rio conference being called the United Nations Conference on *Environment and Development* rather than the second UNCHE as some had suggested. The replacement of what had largely been an 'or' between environment and development at Stockholm with this 'and' was a significant achievement in itself. Indeed, one could argue that ultimately the greatest achievement of UNCED from the South's perspective was the placement of the 'and' between the 'environment' and 'development' and the subsequent representation of the 'and' within *Agenda 21* and other UNCED documents. Subsequently, the official nomenclature of the World Summit on *Sustainable Development* was a reflection of the fact that, at least rhetorically, the politics of environment had now morphed into the politics of sustainable development; or, at the very least, that the developing countries would now accept no less than this. In this regard, the fact that the developing countries, which had themselves arrived at the concept of sustainable development somewhat reluctantly and hesitantly, had now internalized and accepted the concept is a major achievement of this agenda advancement (Najam, 2002).

While this change in the vocabulary of the negotiations may be small consolation, it is not insignificant. This movement reflects a growing acceptance of the link that the developing countries have always sought to establish between environment and development. Although the link has not yet been realized through implementation, or through implementable decisions, the very fact that it has been acknowledged and internalized is a step in the right direction for the South. A key manifestation of this structural shift is that sustainable development is now not only the defining moniker for all environmental negotiations but for a whole variety of development discussions; for example, sustainable development is now nominally the goal of both the World Bank and of the World Trade Organization (Banuri and Najam, 2002).

Importantly, however, this evolution signifies a shift in the substance of global environmental politics much more than it does in the South's positions. Indeed, from the very beginning, the developing countries recognized environmental concerns in the North as a distinctively North–South issue and, in some cases, as an effort to sabotage the South's developmental aspirations (see Mahbub-ul-Haq, 1976). The intellectual leadership of the South very poignantly set out to redefine the environmental problematique in a decidedly North–South context and pushed the discourse towards what we are now calling the politics of sustainable development. The most telling example was the so-called 'Founex Report' (Founex, 1972) produced by a distinguished group of Southern intellectuals as part of the UNCHE preparatory process. The report left a deep and lasting impact on the Stockholm conference and it is considered to have 'marked the turning point in the definition of the international environmental problem' (Williams, 1993: 18). It is relevant to

the argument here for two very important reasons. First, the tone and substance of the report mirrored, nearly exactly, what was soon to become the rhetoric of the NIEO. Second, the tone and substance of the report mirrored, again nearly exactly, the rhetoric of the South at UNCED and at major environmental forums before and since. Some excerpts (Founex, 1972: 5–6):

> The developing countries would clearly wish to avoid, as far as feasible, the [environmental] mistakes and distortions that have characterized the patterns of development of the industrialized societies. However, the major environmental problems of the developing countries are essentially of a different kind. They are predominantly problems that reflect the poverty and very lack of development in their societies.… These are problems, no less than those of industrial pollution, that clamor for attention in the context of the concern with human environment. They are problems which affect the greater mass of mankind.… In [industrialized] countries, it is appropriate to view development as a cause of environmental problems… In [the Southern] context, development becomes essentially a cure for their major environmental problems.

The point to be underscored is not simply that the Founex Report remains one of the most authentic and articulate enunciations of the South's collective interests on issues of environment and development, but that a) these interests have remained unchanged over time, b) they are the same interests which informed the NIEO ideology, c) these same interests lie at the heart of today's global politics of sustainable development; and d) these interests pertain not simply to improving the state of the global environment but, in fact, to a deep desire to improve the state of global politics itself.

Williams (1993: 20–1) identifies a 'remarkable degree of consistency [that] is apparent in the aspirations and demands voiced by the developing countries on environmental issues since 1971'. He goes on to define four central themes which underpin the common Southern position: the insistence that the responsibility for global environmental problems resides in the North; the contention that any ameliorative measures taken must not hinder the South's development prospects; the demand for free transfer of technology from North to South; and the demand for transfer of additional resources to the South to enhance environmental protection. These demands have become more nuanced, but have scarcely changed over the last three decades. At one level we can view this simply as the poor countries wanting the rich to clean up their own mess and seeking assistance from the rich in the form of technology and resources by invoking the polluter pays principle, the common but differentiated principle, and seeking assistance in capacity building (Hunter, Salzman and Zaelke, 1998; Porter, Brown and Chasek, 2000). However, for more Southern sensibilities, these demands form the basis of the Southern desire for systemic change in global political relations. As Chris K. Mensah (1994: 38) points out, Southern leadership at the 1992 Rio conference had explicitly formulated its

negotiation strategy around two key goals. First to 'ensure that the South has adequate environmental space for its future development' and secondly to 'modify global economic relations'. Developing country strategy since Rio and into the Johannesburg conference of 2002 remains grounded in similar concerns and desires and is now increasingly articulated by the South as the goal of a new politics of sustainable development (Najam, 2002).

Around the time of the Rio Summit there was a certain misplaced buoyancy among those who argued, if only for effect, that sustainable development might be the 'trump card' that the South had been looking for all along. The North's new concern for global environmental problems, it was argued, provided the South with considerable leverage and bargaining power because without the participation of the developing countries many such problems cannot be addressed effectively. A Caribbean official was reported as suggesting that 'for the first time in more than a decade, the developing countries have an issue [that is the environment] where they have some real leverage', while India's environment minister went even further to proclaim that 'the begging bowl is [now] really in the hands of the Western world'.[2]

In retrospect, the enthusiasm was decidedly exaggerated and with time it has certainly mellowed (Najam *et al*., 2002). Although the South was not entirely powerless in Rio, it soon found that its 'leverage' lay not as much in influencing what went *into* the treaties as in what was kept *out* of them. Such 'negative power' has been a recurrent feature of the South's behavior in the global politics of sustainable development (Agarwal, 1992; Mello, 1993; Najam, 1995). Studies of just how much real leverage the environment might provide the developing countries on particular issues have yielded more sober, although not entirely pessimistic, assessments. In looking at the ozone case, for example, Rajan (1992: 147) found that the evidence does 'not justify the view that the environmental issue has delivered into the hands of the South a potent new bargaining weapon'. However, he would most likely agree with Miller (1995: 141), who focused on global regimes relating to the ozone layer, hazardous waste and biodiversity and found that 'when there is a shared perception of environmental vulnerability, the Third World is able to gain a *modest* bargaining advantage' *(emphasis added)*. Sell (1996), in looking at North–South environmental bargaining on ozone depletion, climate change and biodiversity, and Mello (1993), in analyzing the forestry negotiations at UNCED, arrive at similar conclusions. In short, the evidence suggests that while the South may have some leverage in the global politics of sustainable development, its extent is limited, its application is largely to avoid defeat, and its use is conditional on the existence of a high level of concern, even alarm, for the said issue in the North.

One should add that while some might proclaim that the emergence of global environmental issues has the potential to fundamentally change the

nature of international relations, sober voices are justifiably more guarded. In outlining the remarkable stability of the international system in the face of massive changes in the science and technology landscape of the planet, and in particularly discussing climate change – considered by many to be the most poignant of global environmental issues – Eugene Skolnikoff (1993: 191–2) reminds his reader that 'the effects on international affairs… is essentially to add a new and arresting issue to international politics – one that raises particularly difficult questions for governments… but not one that is inherently unfamiliar'. The same would be true for other contemporary global environmental issues, often to a greater extent. For those who consider environmental issues as a possible trump card that could drastically change the balance in the international system, Skolnikoff's assessment is more than just cautionary: 'unless the threat of global warming moves to [a much higher, and possibly catastrophic, level] the consequences for the political structures of the international system are not likely to be substantial'. The international system, iniquitous as it may be, is in no danger of being fundamentally overturned any time soon.

From the South's perspective such assessments are sobering but not melancholy. The South's desire for systemic international change is enduring but, over the last many decades, it has been tempered by more realistic assessments – the impatience that once characterized the South is no longer as evident. Moreover, the defining essence of the collective South is the desire to minimize risk, rather than to maximize gain. Given the South's perceptions about the post-Cold War (im-)balance of power (Chubin, 1993), vulnerability in a hostile international order (Ayoob, 1995), and fears of the environment being turned into a tool for ecocolonialism (Adams, 1993), the South's achievements in the global politics of sustainable development, thus far, although not spectacular, have also not been disastrous. In fact, from its standpoint, the Southern collective has been able to do exactly what it set out to do: minimizing the risk of being bulldozed by a Northern agenda, maintaining a North–South focus to the dialogue, and eking out little victories (in terms of global transfers) whenever possible (see Adede, 1992; Hyder, 1994; Mensah, 1994). While this should be read as an appeal to lower one's sights on the extent of the potential for a new North–South bargain being constructed around the global politics of sustainable development, it should not distract from the point that a potential – no matter how small – does, in fact, exist.

The potential is most apparent in how the global environmental agenda has slowly – painfully slow for many in the South – crept towards incorporating the notion of sustainable development. While many, including this author (Najam, 2002; Sachs, 2002), have lamented the slow pace and the often cosmetic nature of this transformation, it is only fair to acknowledge that the transformation has, in fact, begun to happen. Even though most of the refer-

ences to sustainable development in international policy tend to be cursory, declaratory, and ritualistic, the notion seems to be very slowly beginning to take root in global environmental policy. As evidenced by a recent study (Najam and Cleveland, 2004) which looked at how the energy issue was dealt with at the three major global environmental conferences of 1972, 1992 and 2002, the global agenda has moved from being predominantly 'environmental' at Stockholm to becoming increasingly framed in the issues pertaining to sustainable development in both the economic and the social dimensions.

This, of course, does not amount to the change in systemic conditions that the South has long sought and the promise of which had attracted developing countries to the notion of sustainable development. It is an advance, nonetheless. One should hasten to note, however, that for weak political actors – and the South is certainly that – aspiration must not be confused with expectation. Even as the South has held a long-standing and deep conviction in its desire for systemic global change, there is no evidence to suggest that developing countries actually believe such change to be imminent, easily achievable, or likely. In fact, their very definition of the prevailing global conditions is based on the hypothesis that such change is *not* imminent, easily achievable, or likely (South Commission, 1990). They do seem to believe, however, that not only is their desire for systemic change a morally just desire, but also that in foregoing or ignoring it they might become individually and collectively weaker. This, in part, explains why developing countries expend such great energy in trying to negotiate as a collective and retaining a modicum of group unity. For example, the negotiations leading up to the global desertification convention (Najam, 2004b) demonstrated the very high level of resources and effort that the Southern collective would use in maintaining its group unity. It also demonstrated that the South tends to participate in the politics of sustainable development not simply to address particular environmental issues – even Southern priority issues such as desertification – only for the sake of addressing the environmental dimensions of that issue, but also places a tremendous emphasis on what was described earlier in this paper as the 'larger game' and therefore frames the issue in terms of the greater goals of sustainable development and also of broader North–South relations.

Explaining the 'North–South tension'

The scope of our discussion here has, of necessity, been broad. The previous sections have tried to understand how the developing countries, as a collective, have tended to view and act within the politics of the South and the politics of sustainable development. It would be all-too-easy to find examples within specific developing country experiences in global environmental politics that defy the general characterizations above. As soon as one shifts one's focus from the Southern collective to individual developing countries, or to

narrow and specific issues or treaty arrangements, one could reasonably argue that a fascination with broad terms such as 'South' or 'sustainable development' is inappropriate. Our point, however, is not to deny the importance of individual developing countries, their individual interests, or individual environmental issues. Of course, individual developing countries – particularly the larger and more powerful ones – retain, and vigorously pursue, their specific national interests, either within the collective or separately. Arguably, this tendency might even magnify as global environmental politics moves from its still declaratory phase to a more substantively regulatory arena. Equally, it is self-evident that there are many important distinctions within the South, just as there are within the North; or for that matter within any single country, North or South. However, for the last three decades and still today, developing countries have projected a collective image, spoken with a collective voice, and focused on a collective platform in global environmental politics. At a minimum, the scholarship should be interested in figuring out – even if very broadly – why developing countries congregate under as broad an umbrella as that of the 'South' and pursue as broad an agenda as 'sustainable development'.

The previous two sections suggest that while both terms are infuriatingly broad, they are not meaningless; certainly not to the Southern sensibility. Moreover, the meaning – and the importance – attached to each of these terms may be rather different depending on whether one views them from a Southern perspective or not. Most importantly, these nuanced differences of meaning may be the most important key to understanding and explaining the prevalent and pervasive North–South tension that has been (and remains) a key defining variable of global environmental politics. Moving away from defining the North–South divide as a simple rich-poor divide, this chapter proposes that the distinction is not only about the different prevailing conditions and different environmental priorities of the North and the South, it is about the different ultimate goals that each seeks from this politics.

On the one hand there is the view – what we are calling a more Northern view – that the defining goal of the enterprise is to improve the state of the global environment. However, over the last many years those holding this view have come to accept that environmental concerns needs to be contextualized within the boarder politics of sustainable development, which is itself contextualized within the even broader context of North–South politics. The core of the issue, in such a formulation, is the environmental condition. As such, sustainable development and North–South relations are merely contextual frameworks within which this core issue has to be dealt with. Such an articulation is reflected in the language of most chapters in the collection (and of the larger literature), and is recognized by the centrality given to discussions about the state and condition of the physical environment.

An alternative articulation – what this chapter suggests is a more Southern view – defines the central and defining problem as the uneven, unfair and inappropriate state of the global system and, particularly, of North–South relations. Over the years, and particularly over the last decade-and-a-half, those forwarding this view have come to accept the global politics of sustainable development as one vehicle through which their goals of system change can be advanced, and have also come to grudgingly accept the environmental priorities as one element within this politics of sustainable development. The core of the issue, in such a formulation, is the desire to reform the state of North–South relations. As such, the politics of sustainable development, or global environmental politics within that, becomes one of the many means that are to be employed to seek a reform in North–South relations. Previous sections in this chapter have highlighted the dimensions of such an articulation, demonstrating that it favors a greater focus on the state of structural and political inequities and injustices.

These two competing articulations reflect, at a general and not precise level, the Northern and Southern view of the central purpose of global environmental politics, respectively. It is the tugs and pulls created by these competing views that often translate into the frustration that is described by scholars and practitioners of global environmental politics as 'North–South tensions'.

In conclusion, this chapter has sought to better understand and explain the manifestations and motivations of North–South tensions in global environmental politics. This is a worthwhile task because such tensions have been, and remain, a key aspect of global environmental politics. One hopes that a proper diagnosis of the nature of this tension is a first and critical step and will help those scholars and practitioners who are engaged in the much more important task of figuring out what might be done about the tension and about relieving the strain that it leaves on global environmental politics.

Notes

1. For the purpose of this chapter, 'North' and 'South' refer only to countries and not to individuals or communities within countries.
2. Both statements are quoted in Rajan (1992: 135–6). Rajan cites an *International Herald Tribune* (18 March 1992: 23) report, 'Environmental War Heats Up', as the source for the statement from the Caribbean official, and a report in *India Today* (15 June 1992: 26), 'The Earth Wars', as the source for the statement by Indian Environmental Minister Kamal Nath.

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9 Man, the state and nature: rethinking environmental security

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The 300-year period of the Industrial Revolution, during which humankind established dominance within nature, was defined by many distinctive features including a cascade of powerful, transformational technologies and a strong link between happiness and consumption that encouraged the rapid reformatting of natural resources into private property and other commodities.[1] Industrial technologies made possible food production, sanitation and trade at unprecedented levels, and introduced life-extending antibiotics and vaccines. The human population entered a steep growth period as infant mortality declined and life expectancy increased. Armed with motivation and capability, industrial man rarely turned away from an opportunity to transform nature into material.

Early in this process, Thomas Malthus (1798) wrote *An Essay on the Principle of Population* in which he argued 'that the power of population is indefinitely greater than the power of the earth to produce subsistence for man'. The imbalance between human needs and food availability, Malthus predicted, would lead to famine, disease and war. As the age of global change matured, the link between environment and security gained more attention. In 1948, Fairfield Osborn (1948: 200–201) wrote: 'When will it be openly recognized that one of the principal causes of the aggressive attitudes of individual nations and of much of the present discord among groups of nations is traceable to diminishing productive lands and to increasing population pressures?'

Reacting to the experience of two world wars, Osborn (ibid.: 201) concluded that 'Every country, all the world, is met with the threat of an oncoming crisis.' This notion surfaced regularly throughout the latter half of the 20th century in writings such as Paul Ehrlich's *The Population Bomb* (1968) and the World Commission on Environment and Development's report, *Our Common Future* (1987).

Given the growing environmental toll taken by the process of industrialization, it was perhaps inevitable that research and policy interest in the links between environmental change and security would grow over time. In the early 1990s, conditions were ripe for an especially vigorous foray in this direction. A flood of reliable scientific information about global climate

change and biodiversity loss was channelled into the 1992 Rio Summit. At the same time, the end of the Cold War triggered a wide-ranging process of rethinking security. The Malthusian perspective, enriched by the Canadian scholar Thomas Homer-Dixon (1999) and others, became a significant part of this rethinking exercise and quickly attracted government and foundation interest. Flush with new resources, the subfield of environmental security expanded rapidly.

In the following pages I make a three-part argument. First, I contend that post-Cold War research and debate on environmental security has had a variety of positive effects, which are described briefly. Second, I argue that alarmist elements of this research and debate have received a disproportionate amount of attention in the policy, defence and mass media communities, and have helped to create a worldview in which the imminent prospect of 'coming anarchy' legitimizes other alarmist discourses and helps provide a generalized justification for aggressive pre-emptive actions. Third, and finally, I suggest that with a bit of restructuring the field of environmental security has the potential to inform a compelling, policy-relevant, evidence-based and reason-based worldview that differs from the 'coming anarchy' position in significant ways without rejecting the insights it offers.

The analytical and policy utility of environmental security research[2]

As noted above, the literature on environmental security that emerged in the 1990s has roots that extend back at least to Malthus. During the Cold War era, the great importance attached to ideological conflict and the threat of nuclear war tended to marginalize other security concerns. Today's environmental security researchers, as Daniel Deudney (1999: 25–57) argues, 'bring nature back in', by recalling the complex and continual interplay between natural geography and human history. They thus draw attention to the environmental underpinnings of historical patterns of conflict and insecurity that, during much of the 20th century, were linked primarily to processes of economic development, colonialism, state building and ideological rivalry.[3]

The insecurities to which environmental stress contributes in places such as Cambodia, Indonesia, Nepal, Pakistan, Liberia and Rwanda are all grounded in patterns of insecurity based on long-standing political and economic practices of exclusion and exploitation which reshaped the natural environment. The British, for example, set up institutions in South Asia and Africa that gave some groups greater access to natural resources such as water and arable land than others. Political independence and multiple reform efforts have not been able to efface these inequalities from the fabric of social and economic life throughout these regions. The new and more virulent forms of environmental degradation characteristic of the 20th century have aggravated practices of violence and insecurity that have long histories.

In addition to situating current conflicts in ecohistorical contexts, environmental security researchers also help in identifying the particular contemporary conditions that are conducive to conflict and insecurity. Written in 1948, Osborn's analysis combined resource scarcity, weak political institutions, willingness to use coercion, unchecked population growth and unsustainable economic practices, predicting a looming crisis.[4] The fact that much modern writing reiterates Osborn's argument does not undermine the insights of either generation. Rather it suggests that for decades this set of relationships – concerning, above all, population growth, environmental degradation and conflict – has worried analysts.

It also suggests, however, that the field has for decades been stuck at a high level of generality making claims that are obvious to many observers. Fortunately more quantitatively oriented studies, such as the ones by Paul Collier (2000), Wenche Hauge and Tanja Ellingsen (2001), and the 'State Failure Task Force Report: Phase II Findings' (1999), have succeeded in adding some specificity to this literature. Although further research is required, one can abstract from the existing literature a typical scenario that is highly conflict-prone: it includes an economy dependent on a lucrative natural resource (gold or oil rather than water or biodiversity) to which access can be controlled; a fractious ethnic cleavage that the dominant group has been unable to resolve; low education and high infant mortality rates; inadequate dispute resolution mechanisms and corrupt governance institutions; a history of violent conflict; and a diaspora community of angry emigrants and refugees forced to leave and willing to back one side in a civil war. Under these conditions, individuals accustomed or attracted to the use of force may be motivated by greed, injustice or scarcity to take up arms. Indeed conflict may be most likely where a range of motivations converge to persuade sufficiently large numbers of people that a resort to violence is justified, profitable, inevitable or transformational. Environmental stress will figure in some, but not all, of these motivations, and hence it will be an elusive but at times significant element of the causal network that generates conflict and insecurity.

Of course, as extensive research on conflict makes clear, the outcome of any cluster of variables is never assured. Why this is the case is explained, at least partially, by those environmental security researchers who study the capacity of communities at all scales to adjust and adapt to many forms of stress, including those related to environmental change. The simplified, Malthusian-inspired, scarcity–conflict story culled by critics, journalists and policy makers from the environment and security literature obscures, ignores and, in some cases, explicitly denies this capacity (Homer-Dixon, 2000). But recent human history identifies few Easter Islands (states confronted with severe environmental stress that have collapsed into violence and subsequently

disappeared) and many Rwandas: states confronted with severe environmental stress that have experienced great violence and then begun to recover. In fact, many of the cases used to demonstrate the validity of the scarcity–conflict thesis are not nearly as straightforward as has been suggested.[5]

For example, in 1969, Honduras and El Salvador clashed in a conflict often attributed to land scarcity, which had pushed a large number of Salvadorans across the border into Honduras (Myers, 1993: 124–5). But today it appears that both countries have found ways to adapt to environmental stress, which has not disappeared or even diminished. These adaptive strategies include migration to the United States, development assistance from the United Nations and other sources, bilateral development projects and democratization. These strategies have brought in skills and knowledge, strengthened political institutions, encouraged internal and crossborder cooperation and fostered economic growth, all of which have bolstered the adaptive capacities of these two countries.

The case of Chiapas, Mexico, made for a dramatic rendering of environmentally induced conflict as armed and masked guerrillas fought for farmland, but this image is somewhat less gripping when it is situated in a larger time frame (Homer-Dixon, 1999). Today one might well describe the conflict in Chiapas in 1994 as a single moment in a larger struggle for political power and institutional reform. From an analytical perspective, the image of Subcomandante Marcos waving a machine gun has proved less telling than the image of him marching into Mexico City to exchange his arms for political voice. It is not that the conflict was insignificant, but rather that analyses limited to the moment of conflict are incomplete.

The 'Turbot War' between Canada and Spain is another popular example of scarcity-induced conflict, one often used to show that the industrialized North is not safe from this threat. But as Beth DeSombre and Samuel Barkin (2002) make clear, the larger and more accurate story is one of two states finding a viable institutional solution to the common pool resource problem of overfishing in the North Atlantic. The shots fired and ships seized were a brief and theatrical departure from decades of complex negotiations – negotiations that were reinvigorated by the clash and soon thereafter arrived at a regulatory regime satisfactory to all concerned parties.

Through the sort of work noted above, the environmental security literature has connected itself, and contributed, to three other contemporary research and policy foci. The first concerns the issue of human security.[6] The concept received its most familiar early definition in UNDP's 1994 *Human Development Report* (p. 22): 'security has far too long been interpreted narrowly: as security of territory … or as protection of national interests … or as global security from the threat of nuclear holocaust…. Forgotten were the legitimate concerns of ordinary people who sought security in their daily lives.'

Since it is entirely reasonable to relate the success of the modern state, which emerged in Europe in the mid-17th century and within 300 years became the model for political organization worldwide, to its unprecedented capacity for bringing security in its most basic sense – freedom from danger – to the lives of ordinary people, the retreat from this constitutive role may well be deemed unacceptable and alarming. The authors of the UNDP report suggest 'human security' as a concept that can recover the earlier on-the-ground focus of the state's security practices.[7]

Human security can be said to have two main aspects. It means, first, safety from such chronic threats as hunger, disease and repression. Second, it means protection from sudden and hurtful disruptions in the patterns of daily life (UNDP, 1994: 23). This sentiment was immediately seized upon in the environment and security field and became a guiding principle for the Global Environmental Change and Human Security Project (GECHS) established in 1996.[8] Within three years GECHS had refined a theoretical accommodation of environmental security and human security, and had set up participatory research offices in Australia, Canada, Costa Rica, Norway and the United States. Although the concept of human security has been criticized as too broad to be analytically useful, and it certainly has not proved to have the immediate inside-the-beltway appeal of Kaplan's 'coming anarchy' thesis, its development has been steady and it has demonstrated considerable attraction for scholars, policy makers and activists in the developing world and Europe.[9]

Tariq Banuri (1996: 163–4), for example, offers a concise argument in defence of human security:

> security denotes conditions which make people feel secure against want, deprivation, and violence; or the absence of conditions that produce insecurity, namely the threat of deprivation or violence. This brings two additional elements to the conventional connotation (referred to here as political security), namely human security and environmental security.

In this conception, structural insecurities and violence associated with the world economy and the legacies of colonialism, together with modalities of violence and insecurity associated with environmental change, two force fields that are themselves interactive and historically related, combine to ensure that large portions of humankind – primarily in the South but not exclusively so – are rarely, if ever, free from danger. The fact that 'human security' embodies a great deal may make it less analytically interesting to some scholars, but it would be wrong to suggest that there is not much analytical value in broad inclusive concepts that tell a compelling general story.[10] In his analysis of the concept, Roland Paris (2001: 102) notes that such a high level of inclusiveness can 'hobble the concept of human security as a useful tool of analysis', but he ultimately concludes:

> Definitional expansiveness and ambiguity are powerful attributes of human security … human security could provide a handy label for a broad category of research … that may also help to establish this brand of research as a central component of the security studies field.

Much of the effort to focus the concept of human security and use it as a basis for analysis has been undertaken by scholars in the field of environmental security.[11]

The second research and policy area to which environmental security has made substantive contributions relates to the issue of globalization. Globalization is another broad and overdetermined concept that nonetheless is contemporarily powerful and valuable for both researchers and policy makers. I understand it to refer to a process driven largely by technological innovation, in the global context of expanding capitalism and democracy, that has empowered nonstate actors in ways that have no precedent during the modern age of the state (that is to say, at least since 1648, when the Treaty of Westphalia acknowledged the political primacy of the sovereign state in Europe).[12] Globalization is characterized in large measure by an enormous increase in the speed, density and character of cross-border transactions that sovereign states have not been able to regulate or manage (for example, information flows and sales of goods and services via the Internet). Its impacts on fundamental human issues such as justice, security, welfare and environmental quality have been mixed, and debate has raged over whether the negative effects will overwhelm the positive ones or vice versa.[13] It seems that, for every local community fighting injustice or insecurity that is strengthened through transnational processes, another is exploited and transformed into a hub for sex tourism or cheap labour.[14] The environmental security literature examines the links between global processes, environmental change and conflict, thereby enriching our understanding of the positive and negative impacts of globalization.

The third focus area to which research on environmental security contributes concerns the larger set of transnational security challenges that have risen to prominence in recent years.[15] Transnational security challenges are unconventional, non-military threats to national and human security that have been enabled or amplified by processes of technological innovation, diffusion and empowerment. Some are clearly unintentional, such as the spread of infectious diseases like HIV-AIDS and SARS, climate change and national and regional economic problems linked to global currency trading and rapid fluctuations in the global private sector's level of confidence in a given economy or its willingness to respond aggressively to alarming but imperfect information. Other threats are clearly intentional, such as terrorism and computer hacking. The environment stands at the crossroads of intentionality and nonintentionality because, while many dangers emanating from environmen-

tal change are the unfortunate externalities of economic processes and other human practices, the environment is also a viable conduit or target for intentional attacks by angry nonstate actors.[16] The general findings of this research may therefore be of value across a range of current security issues.

Finally it is worth briefly noting that the literature on environment and security has also made contributions to a range of more specific intellectual, policy and activist pursuits. There have been some positive assessments, for example, of efforts to harness security assets to environmental goals.[17] These fall into two broad categories: greening the military and making military and intelligence assets available for environmental activities. In the first case, Kent Butts argues that compliance with environmental regulations, base clean-up and green technology research have all increased in the Department of Defense as part of the effort to integrate environmental security into its programmes. In the second case, the most widely cited example is the Medea Project initiated by Vice-President Al Gore, which brought together CIA analysts and civilian scientists to assess the value of archived satellite imagery for assessing phenomena such as deforestation rates and climate change. Additionally the Army Corps of Engineers has publicized (perhaps excessively) its role in restoring the ecology of the Chesapeake Bay area, and throughout the world reforestation programmes have been undertaken with military support.

Environmental security may have had two other positive impacts on military and intelligence communities in the USA and abroad. First, it has encouraged unprecedented levels of inter-agency cooperation, leading to such outcomes as the 1997 Memorandum of Understanding signed by the Departments of Energy and Defense. As it becomes increasingly clear that the planning and implementation of the 11 September attacks were made easier because of the poor flows of communication within and among government agencies such as the FBI, CIA and Immigration and Naturalization Service, the need for inter-agency cooperation is being underscored and the experiments undertaken in the 1990s under the banner of environmental security may prove very useful in improving the learning curves elsewhere.

Second, throughout the 1990s many workshops and conferences were held on the topic of environmental security that were organized by NATO, or by the militaries of the USA, Australia and other countries. They brought together representatives of many defence organizations for discussions about the need to build trust, encourage dialogue and exchange information. Today the war on terrorism is expanding upon cooperative practices that were taking shape throughout the 1990s. Just how great a contribution these will make to world peace cannot be estimated today, and there are obvious concerns about intrusions of the military into other policy arenas,[18] but frank dialogue, higher levels of trust among military establishments, a sense of shared fate, trans-state

networks of cooperative practices and institutions, and better information flows may ultimately lead to peaceful outcomes in at least some cases.

Equally difficult to assess, but also worth mentioning, are the potential benefits that the language and findings of environmental security offer to those interested in conservation and sustainable development.[19] This is in large measure because much of the environmental security literature emphasizes the importance of development assistance, sustainable livelihoods, fair and reasonable access to environmental goods, and conservation practices as the vital upstream measures that, over the long run, will contribute to higher levels of human and state security. Organizations such as the Organisation for Economic Co-operation and Development (OECD) and the International Union for the Conservation of Nature (IUCN) have been quick to recognize that embracing the language of environmental security can benefit them in several ways. First, in response to the scarcity–conflict thesis, they want to be prepared for the possibility that they will find themselves working on environmental rescue projects in regions that are likely to exhibit high levels of related violence and conflict. Second, they are aware that the association with security can bolster their acceptance in some countries where the militaries have political control and authority and also expand their constituencies. For the first time in the history of the modern environmental movement it is possible to regard military and intelligence agencies as potential allies in the struggle to contain or reverse human-generated environmental change (Conca and Dabelko, 2002; Matthew *et al*., 2002).

Similarly, the language of security has provided a basis for some fruitful discussions between environmental groups and representatives of extractive industries. In many parts of the world, mining and petroleum companies have become embroiled in conflict. They have been accused of destroying traditional economies, cultures and environments, of political corruption and of using private militaries to advance their interests, and they have also been targets of violence. Work is now under way through the environmental security arm of the International Institute for Sustainable Development (IISD) to address these issues with the support of multinational corporations.

Third, the general conditions outlined in much environmental security research can help organizations such as USAID, the World Bank and IUCN identify priority cases, areas where investments are likely to have the greatest ecological and social returns. For all these reasons, IUCN elected to integrate environmental security into its general plan at the Amman Congress in 2001; IISD has established an environmental security office; and many other environmental groups and development agencies are taking this perspective seriously.

Environmental security alarmism[20]

In spite of its rich and varied content, the field of environmental security has often been characterized through reference to the Malthusian arguments about scarcity-induced conflict that captured the interest of post-Cold War policy makers, especially in the William J. Clinton administration. In this context they had a double impact. First, and most obviously, they brought the concerns of environmentalists to new groups such as the military and intelligence communities by identifying a link between environmental stress and violent conflict. Peter Gleick (1989; 1993) envisioned wars over water and discussed the security implications of climate change. Edward Wilson (1992) predicted catastrophic social consequences of rapid biodiversity loss. And Thomas Homer-Dixon (1999: 177) argued that the 'incidence of [civil] violence will probably increase as scarcities of cropland, freshwater, and forests worsen in many parts of the developing world'.

But, second and perhaps more important, the proponents of these arguments became messengers to the security community from the world's highly respected knowledge community of natural and social scientists. Their concerns about the future of humankind had immediate credibility. This was partly because they extended a path that had been pioneered by the authors of the new environmentalism that emerged in the 1960s and 1970s. Its repertoire of disaster scenarios included Paul Ehrlich's (1968) 'population bomb', Garrett Hardin's (1968) 'tragedy of the commons', Barry Commoner's (1971) arguments about the negative externalities of production technologies, and Donella and Dennis Meadow's (1972) 'limits to growth' thesis. As insightful as the arguments of each author may have been in a limited sense, their cumulative effect was to create a whole that, in retrospect, was excessive in confidently predicting imminent catastrophe.

The post-Cold War formulations of these arguments provided indirect support to other claims about threat and vulnerability, contributing to a discursive landscape grounded in a widespread sense of impending – but hard to prove – disaster that could only be averted or mitigated through aggressive, preventive policies.[21] The George W. Bush administration, for example, clearly reflects the panicky anxiety of contemporary environmentalism and uses a familiar rhetoric of disaster and anarchy to persuade people that our world is a very dangerous place to be, a place in which national and human security depend on extraordinary measures.[22]

Of course the principal threat described by the Bush administration (transnational terrorists armed with weapons of mass destruction) may be a very real and significant threat.[23] It may warrant billions of dollars of defence expenditures, and an aggressive offensive strategy for disabling terrorist organizations as they emerge at home and abroad. But it is important that this threat be established, insofar as it is possible, on the basis of accurate data and

rigorous analysis. Unfortunately, when citizens and policy makers have already been assured that the world is full of threat by experts in areas such as conservation biology, epidemiology and demography, similar assertions made by other 'experts' – and the policies they demand – may be accepted without serious reflection or scrutiny. Perceptions are very important in the security field. Misguided perceptions of offensive advantage were a key factor in triggering and sustaining World War I. Misguided perceptions about socialism contributed to aggressive (and flawed) American policies towards Vietnam, Nicaragua and Cuba. Certainly the threat of terrorism has many advocates with excellent research credentials. At the same time, there are good reasons to ask whether our understanding of the threat and our vulnerability to it are reliable enough to justify massive expenditures and dramatic new policy initiatives.

For example, on 20 September 2002, President George W. Bush issued 'The National Security Strategy of the United States' (NSS), which is required annually by the Goldwater–Nichols Department of Defense Reorganization Act (1986).[24] This particular report provides outlines of the way in which the government intends to protect the USA from various threats, including terrorism. In February 2003, the government released a companion document, 'National Strategy for Combating Terrorism'.[25] Insofar as strategic doctrine is concerned, the most important innovation of the 2002 NSS might be its expansion of the concept of pre-emption in the fifth section of the report, 'V. Prevent Our Enemies from Threatening Us, Our Allies, and Our Friends with Weapons of Mass Destruction'. In a speech at West Point preparing the country for this innovation, the president stated: 'Some have said we must not act until the threat is imminent. Since when have terrorists and tyrants announced their intentions, politely putting us on notice before they strike? If this threat is permitted to fully and suddenly emerge, all actions, all words and all recriminations would come too late.'[26] In the 2002 NSS, this sentiment is reiterated and bolstered with assertions that 'traditional concepts of deterrence will not work against a terrorist enemy' and 'we must adapt the concept of imminent threat to the capabilities and objectives of today's adversaries'.[27]

In an analysis of the 2002 NSS, Michael E. O'Hanlon *et al*. (2002) write, 'preemption, narrowly defined, has long been an important and widely accepted policy option for the United States. But the Bush administration argues that preemption must be extended to include "preventive" attacks even in the absence of an imminent threat'. The authors note that 'prevention is a far less accepted concept in international law, even though the United States has threatened or utilized it in previous eras as well, and even though it may be a necessary tool at times'.

The first application of the new doctrine occurred the following year against Iraq. Prior to the war, John Mearsheimer and Stephen Walt (2003: webtext)

argued that the justifications being offered for a pre-emptive strike were weak, and that such an attack was likely to be costly and counterproductive: 'Advocates of preventive war use numerous arguments to make their case, but their trump card is the charge that Saddam's past behaviour proves he is too reckless, relentless and aggressive to be allowed to possess WMD'. But, Mearsheimer and Walt contend, there is 'one problem with this argument: It is almost certainly wrong'. Their carefully honed realist analysis challenges claims about Saddam's aggressive and reckless past behaviour, his willingness to use chemical weapons against Western countries, the state of his nuclear weapons programme, and the likelihood that Iraq does or ever would support al Qaeda or similar terrorist organizations. Mearsheimer and Walt (ibid.) conclude that 'Saddam, though cruel and calculating, is eminently deterrable' at low cost. Their thoughtful analysis, however, received little attention in early 2003, especially in comparison to the attention given to the bold assertions made by the president and by Secretary of State Colin Powell regarding Iraq's alleged weapons of mass destruction programmes, surge capacity and support for global terrorism. Although evidence in support of these assertions has never been provided, perhaps because it does not exist, they nonetheless provided grounds for action that satisfied much of the American public and Congress, and the pre-emptive attack took place between March and May.

Some nine months after the war ended, in spite of growing concern about the basis for the decision to go to war, the Bush administration forcefully defended its pre-emptive attack:

> Defense Secretary Donald H. Rumsfeld reaffirmed the administration's doctrine of preemptive military action … and offered an impassioned defense of the decision to invade Iraq, saying former president Saddam Hussein's defiance had forced the United States to act.
>
> While acknowledging that the decision to attack an enemy before being attacked depends on having 'elegant intelligence' about the opponent's intentions and arsenals, Rumsfeld argued forcefully for striking first, particularly in cases involving the potential use of a biological agent or other weapons that could cause thousands of deaths.
>
> 'The greater the risk and the danger, the lower the threshold for action,' he said, speaking at a conference on U.S. and European security issues here.
>
> The invasion of Iraq marked the first application of the Bush administration's preemptive approach. The disclosure recently of errors and gaps in the U.S. intelligence assessment of Iraq's weapons programs before the war has raised fresh concerns about the U.S. doctrine, both in the United States and abroad.[28]

Clearly, one of two things must be true. Either the hostile, threatening worldview advocated by the Bush administration, which incorporates explicit

references to weapons of mass destruction as well as terrorism, is an accurate one – or it is not. In the first case, a generous doctrine of pre-emption may be warranted, although it would have to clear many moral, legal and pragmatic hurdles before being palatable to much of the world. In the second case, it is hard to imagine how such a doctrine could ever be defended. Since so much is at stake, one might expect this worldview, which cobbles together disparate phenomena such as the anthrax scare in the USA, the basement bioweapons programmes of Saddam Hussein and the ambitions of al Qaeda to produce a terrifying but quite unsubstantiated image (here of a sophisticated global network of well-armed terrorists cooperating with Saddam's Iraq), to be vigorously debated in a democracy.[29] This has not happened. Perhaps it has not happened because during the latter half of the 20th century Americans were flooded with doomsday scenarios, and no longer need much evidence to accept very strong claims about grave threats, looming crises, bold preventive actions and firm responses. Many of these scenarios came from the environmental movement.

Of course, environmentalists were not the sole source of alarmist discourse at the close of the 20th century. Sociologists like Ulrich Beck (1992) have written extensively about America's heightened sense of being encircled by life-threatening risks ranging from genetically modified foods to tropical diseases, from global mafias to soulless street gangs, from climate change to air pollution. Moreover the level of concern expressed by the public and its political leaders does not correlate with severity or probability, at least in those cases where these can be measured (Tengs *et al*., 1995). America is often afraid, even when the grounds for fear are empirically quite thin.

While it may be impossible to weigh the contribution of environmental discourse to the current political culture of fear, a sense of its importance can be had by considering the predominant arguments formulated in the process of rethinking security. They have come in large measure, although not solely, from the country's most senior scholars and powerful journalists, individuals who are not only prominent in the knowledge community, but who often serve as conduits from it to the policy community. Perhaps the most discussed and cited text in this regard is Robert Kaplan's 1994 essay, 'The coming anarchy'. Kaplan (1994: 58) writes:

> 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.

Kaplan draws heavily on the work of Homer-Dixon.

Later that same year, Matthew Connolly and Paul Kennedy (1994: 69) picked up this line of argument in another *Atlantic Monthly* essay, 'Must it be the rest against the West?' They focus on the possibility that

> We are heading into the twenty-first century in a world consisting for the most part of a relatively small number of rich, satiated, demographically stagnant societies and a large number of poverty-stricken, resource-depleted nations whose populations are doubling every twenty-five years or less.

In both scenarios, demographic and environmental variables figure prominently as factors contributing to conflict and insecurity. Of course, not all of the influential predictions about the security challenges of the near future generated after the Cold War emphasized environmental factors, but many of them shared Kaplan's and Connolly and Kennedy's sense of impending catastrophe.[30] In this sense, they fed a general malaise that quickly became available for political manipulation.[31]

Claims about terrorism and neo-Malthusian arguments about scarcity and violence have been loudly endorsed by groups that hope to benefit if their assertions succeed in informing policy. These groups include civil servants and defence contractors, and also some academics and activists. The public and policy makers accept these claims even when they are not well supported because they have been persuaded that the world is both a threatening and an interdependent place. Conceptually the move from climate change to al Qaeda is not that great. Unfortunately the bold actions that follow may, from a security perspective, do more harm than good, while lining the pockets of a few bureaucrats, contractors and consultants. In consequence, the world does become a little more threatening, creating the conditions for a new round of alarming, Y2K-style assertions. To exit from this vicious cycle we need, at the very least, to demand analysis that meets minimal standards for evidence and reason. The arguments against invading Iraq formulated by Mearsheimer and Walt provide a very accessible model of such standards.

Redirecting environmental security

The first section of this chapter argued that the environmental security literature has made many significant intellectual and pragmatic contributions to both modern environmentalism and the project of rethinking security. Unfortunately, or so I argued in the second section, it has also contributed to a culture of fear that accepts aggressive and costly foreign policies even when they are poorly conceived, explained or defended. But the culture of fear is not without any foundation. Nor are alarms about the potential for horrifying social and other consequences as a direct result of the profoundly degraded state of the planet's environment. One need not be much of a cynic to suggest

that multilateral environmental agreements are lipstick and mascara on the faces of a generally unattractive and compromised policy community. This section outlines briefly an approach to linking environment and security that preserves its alarmist voice while situating it in a more complex world of interactions between society and nature. In my view, the environmental security literature undervalues two factors, inequality and state building, which, because of their great explanatory power, I try to integrate into a simple analytical framework.

By 'inequality' I mean to refer to scalable differences in property, position and choice. 'State building' refers to activities designed to increase the power and functional autonomy of the juridically sovereign state. While these concepts are constitutive of the Western tradition of political thought and in this sense need little justification, it may be worth noting that their significance became much clearer to me personally during a long series of field trips to the developing world taken between 1997 and 2004. In November 2000, for example, my cut-rate, Expedia.com ticket to Cambodia put me on a plane with a group of Western sex tourists, apparently insulated from the consequences of their aberrant behaviour (at least this is what I imagined) by all of the prejudices of global domination. On the ground, the insulation proved much thicker than mere prejudice. During my first day in Phnom Penh a Cambodian colleague took me to a large outdoor market where we ran into an American doctor. She introduced us, we spoke for a few minutes, and he left. 'He is a sick man and has been arrested for pedophilia,' she told me as he walked away, 'but he provides cheap medical care and so no one really wants him in jail.'

Two weeks later my colleague was able to organize an interview with Hun Sen. Flanked by interpreters and guards, he met a small group of foreign environmental researchers in a large, dark, cool room. As he smoked and drank Coke, the prime minister lamented the dire environmental situation in his country and the scarcity of options for addressing the interrelated challenges of population growth, infectious disease, food scarcity and low economic development. 'For decades my people have suffered greatly,' he said, 'They have lost many family members. Now they want to have children. Given all they have lost, it would be inhumane to stop them from having children. But I do not know how we will feed them. We need to build the state so that we can do the things we are supposed to do, but because we are so far behind we need help from the rest of the world to achieve this goal. Otherwise our future is very bleak.'[32]

Without denying the existence and importance of global civil society and global governance, one must acknowledge powerful factors that work against these solution structures.[33] These factors include the tight link, at least in practice, between political authority and military and law enforcement

capabilities, something that is generally unavailable at the global level. Also important is the issue of accountability. State constitutions serve to protect against the abuse of power, and while they are not always effective, like human rights they function as a legitimizing discourse for the dissent of victims of abuse. But perhaps the most significant factor is policy entropy: states are hard-pressed to develop and implement policies in many complex areas such as health, education and the environment, even with a monopoly of the legitimate use of force and a platform of constitutional support. So many different interests exist within states that it can be difficult to formulate effective policies. Groups conflict, energy is dissipated and the process grinds to a suboptimal conclusion, if not a halt. In many cases, external pressures further complicate matters.

At the global level the large n problem reaches its peak and is amplified because the most significant group – the world's 192 states – are remarkably different in terms of priorities and capabilities. Moreover in many sectors it is not clear that there is a common ground across humankind on which to construct global policy except in very abstract and nonthreatening terms. Everyone wants peace, justice and dignity. The difficulty comes in constructing policy – identifying realistic objectives, formulating a strategy and mobilizing the appropriate resources – that will advance such goals.[34] Vast inequalities across virtually all dimensions of human activity may be at the root of this difficulty. As James Wohlfenson[35] writes:

> The fault-line imbalance of our time is the great divide between rich and poor. In our world of 6 billion people, one billion own 80 per cent of global wealth, while another billion struggle to survive on a dollar a day. Two billion people have no access to clean water; 150 million children never get the chance to go to school; more than 40 million people in the developing countries are HIV positive – with little hope of receiving treatment.

In short, the predominant political structure of the planet is the state, and a reasonable argument can be made that the most salient social feature of humankind is the set of inequalities that divides it. It is in this context that I want to resituate environmental security, or more generally the strained relationships between nature and civilization that render both insecure.

As a first take on this issue, two data sets, one on human development indicators and the other on ecological footprints, provide an interesting basis for constructing a simple 2×2 matrix for organizing states (Table 9.1).

'Environmental toll' is a measure of the size of a state's ecological footprint, and the difference between this and its available ecological capacity. To situate actual states I make two decisions. First, if a state consumes more than its territory's capacity, then its environmental toll is high, and if it does not, then it is low. Second, if it consumes more than the world

Table 9.1 Typology of states

	High Human Development Index (HDI)	Low Human Development Index (HDI)
High environmental toll	A. Augmented state e.g. USA	B. Failing state No current examples
Medium environmental toll	C. Park state e.g. Canada	D. Wild state e.g. South Africa
Low environmental toll	E. Eco-state e.g. Chile	F. Battered state e.g. Bangladesh

Table 9.2 Environmental toll

	Above capacity	Below capacity
Above world average	USA, Japan (HIGH)	Canada, Australia (MEDIUM)
Below world average	Bangladesh, Pakistan (LOW)	No current examples (TRACE)

average, then it is high, and if it does not, it is low. This creates four cases (Table 9.2).

For example, the ecological footprint of Bangladesh extends beyond the country: it consumes 0.5 hectares of productive land per capita (h/c), but it has available only 0.3 h/c. But while it lives beyond its means, its consumption rate is well below the global average of 2.8h/c. Its environmental toll is deemed 'low'.[36] In contrast, Japan consumes 4.3 h/c but has available only 0.9 h/c. It consumes above the global average and beyond its own means and therefore its environmental toll is assessed as 'high'. Canada, which consumes 7.7 h/c but has 9.6 h/c, counts as 'medium'. Its ecological footprint does not extend beyond its borders but it consumes at a higher rate than the global average.[37]

The UNDP's Human Development Index (HDI), is a widely accepted measure of human development that incorporates income, education and health factors.[38] At 0.502, Bangladesh ranks 139 out of 175 states and is clearly at the low end (the UNDP's medium value is 0.684). In contrast, Japan's HDI is 0.932, ninth out of 175 and well above the threshold for 'high', which the UNDP has identified as 0.908. For this exercise I ranked

states as high if their HDI was above 0.684 and low if it was below this number. Using these two variables, it is possible to place specific states into the above categories as shown in Table 9.1.

I have tried to imagine matrices that are simpler and matrices that are more complex, but I have not been able to add or subtract categories in ways that seem to me compelling. Of course, for the purpose of this chapter, organizing the world's states into six categories is simply a device designed to encourage the field of environmental security to carry out research and theorize in new ways. My particular objectives are to create a context for (a) situating the priorities and problems of different states in a simple format that facilitates comparison, and (b) creating the rudiments of a systems model that might identify the positive and negative relationships, and especially the relationships of asymmetry or inequality, among different state types.

For example, the USA is a vast country with enormous natural wealth, and it provides its citizens with a high standard of living. But look at Table 9.1. Unlike Canada or Chile, which also offer a high standard of living, it lives well beyond its means. Why is this the case? Perhaps it is the cost of empire. The extensive US military consumes at such a high rate and takes such a toll on the environment that it pushes the USA into a different category than Canada. Or perhaps it is the weather, which makes Canada a much less congenial place to live: fewer people, less ecological burden. Or, again, perhaps there is a cultural explanation: for some reason, the US population is remarkably wasteful or inefficient. There is some sort of value attached to having a lot of stuff – many pairs of shoes, many appliances, many CDs – and to having the most up-to-date items that has matured out of the experiences of the founders of the country, the Depression, and so on, such that Americans are content psychically only if they possess much more than they need.

And what are the implications of this situation? Perhaps the US way of life is, ultimately, less sustainable than the way of life of other advanced states. How can this perspective help us to understand the relationships the USA has with other state types? Given its enormous, augmented rate of consumption, one might ask whether its expensive military activities in the Middle East, for example, are guided primarily by economic factors – in this case, the need for cheap oil. If this is the case, it is hard to understand why the USA has not moved more aggressively toward alternative energy sources such as solar power. Such a transition, no matter how partial, would reduce its ecological footprint and hence the elaborate military architecture required to preserve this footprint. It would provide the same level of consumer satisfaction at considerably less cost and with considerably less risk. What forces have succeeded in persuading the American public that such a commonsense solution is not tenable or desirable? Is the USA – paradigm of liberalism – actually an irrational state?

Similar questions can be asked of each category of states, and the whole can also be examined in terms of the practices, values, institutions and beliefs that might be common and those that might conflict.[39]

Conclusions

Environmental security is a promising field that, as Deudney and others have noted, has roots in antiquity. In the 1990s, it enjoyed a renaissance that was intellectually vibrant and attractive to the policy community in the USA and elsewhere. However, for a variety of reasons, such as the political agendas of foundations committed to family planning, the particular interests of the Clinton administration and the influence of journalists such as Robert Kaplan, the Malthusian perspective enjoyed a distinct ascendancy. While this helped introduce the environment to institutions and actors which had long ignored it, it also created a distorted impression of the field and contributed to the legitimization and expansion of an early warning culture focused on particular modalities of risk, especially the low probability, high-impact kind that can be extremely profitable for consultants and civil servants if they are pushed up the political agenda.

Rather than abandon the field because of its excesses, it might be more productive to revitalize it by introducing and weaving into it other analytical vocabularies. I have focused on state building and inequality, but many others are just as promising: gender, the vast literature on conflict and cooperation, urban planning and design, and so on.

Notes

1. On the origins of private property, see Locke (1690: ch. V 'Property') of the Second Treatise.
2. This section is a much compressed and revised version of Matthew (2002b: 109–24).
3. See, for example, Diamond (1994) and Deudney (1999).
4. Osborn (1948: pt II, esp. ch. 8, 'Russia').
5. See Matthew *et al*. (2003) for a full discussion of this point.
6. For a general overview see Hampson (2002); and Khagram et al. (2003).
7. For a discussion of security and the origins of the modern state, see Poggi (1978) and Matthew (2002a).
8. See Lonergan *et al*. (1999).
9. See, for example, Thomas and Wilkins (1999), Tehranian (1999), Suhrke (1999) and Yuen (2001). A more explicit union of environmental security and human security is evident in Nauman (1996).
10. Concepts such as 'class relations', 'human rights' and 'democracy' are broad and inclusive and yet do an enormous amount of work in contemporary political analysis.
11. Details available at www.gechs.org.
12. For a pioneering discussion, see Rosenau (1990).
13. On the primacy of the negative effects of globalization, see Kaplan (1994) and Huntington (1997). On the primacy of the positive effects, see Fukuyama (1997) and Friedman (2000). For an influential overview, see Barber (1995).
14. Compare, for example, Wapner (1996) and Nettle and Romaine (2001).
15. Commonalities among transnational threats are examined in detail in Matthew and Shambaugh (1998; 2002). On this topic, see also Klare and Thomas (1994), Klare (2001),

Williams and Black (1994) and the special issue of *National Security Studies Quarterly* on new security threats, IV, Autumn 1998. The ease with which specialists in environmental security have brought their analytical expertise to bear on the challenge of terrorism is evident in recent work by Thomas Homer-Dixon.

16. See Chalecki (2002).
17. For example, Butts (1999).
18. On this see Deudney (1999) and Dalby (1996).
19. This issue is well-covered in Matthew *et al*. (2002).
20. This section borrows from a chapter on bioterrorism written for a volume being developed by Betsy Hartmann and Banu Sumerian.
21. As a long-time contributor to this literature I want to emphasize that my concern is with some of the real-world consequences of well-intentioned efforts to raise environmental issues on policy agendas, and very sincere convictions that the world's environment is in dire straits. Moreover environmentalists have hardly been alone in contributing to the thickening of the American 'risk society'. From epidemiologists to economists, we have been bombarded by a steady stream of disaster warnings.
22. Concern about the alarmism of present-day environmentalism receives a compelling treatment in Ferry (1992).
23. This may be equally or even more true of climate change, biodiversity loss and other forms of anthropogenic environmental change.
24. A copy of the strategy is available at www.whitehouse.gov/nsc.
25. A copy is available at http://usinfo.state.gov/topical/pol/terror/strategy/.
26. See http://www.globalsecurity.org/military/library/news/2003/02/mil-030226-24187d9d.htm.
27. See www.whitehouse.gov/nsc, page 9 of 18.
28. See http://www.washingtonpost.com/wp-dyn/articles/A22155-2004Feb7.html.
29. It is interesting to note that this cobbling process might be said to reflect one of the most fundamental precepts of environmentalism: everything is connected to everything. Through this utterly unproven claim, al Qaeda can be connected to Iraq and also to the anthrax scares in the USA in order to make claims about the imminent threat of large-scale bioterrorism.
30. A useful overview of the debate of the late 1990s is Zakaria (1997). The chapters by John Mearsheimer, 'Back to the future: instability in Europe after the Cold War', and Samuel P. Huntington, 'Clash of civilizations?' have been especially influential. In the same volume, Francis Fukuyama's 'The end of history?' provides one of the few well-known optimistic accounts of the near future.
31. Of course this malaise was also a valid statement of concern about new security needs requiring a confident political response.
32. These are not direct quotes but rather attempts to capture what Hun Sen said, based on my field notes.
33. On global civil society, see the work of Paul Wapner, especially Wapner (1996).
34. For a compelling perspective on this, see Walzer (1994).
35. James Wolfensohn quoted at http://www.sidsnet.org/latestarc/other-newswire/msg00149.html.
36. The data are from 1993 and come from http://www.ecouncil.ac.cr/rio/focus/report/english/footprint/ranking.htm. I use this source because it includes measures of actual and available h/c. The rankings are fully compatible with more recent data, such as http://www.redefiningprogress.org/publications/footprintnations2004.pdf, which provides similar data for 2004.
37. Data for ecological footprints are available at http://www.ecouncil.ac.cr/rio/focus/report/english/footprint/ranking.htm and http://www.redefiningprogress.org/publications/footprintnations2004.pdf
38. These data for 2003 are from http://hdr.undp.org/reports/global/2003/indicator/indic_8_1_1.html.
39. This is the goal of a book project, *Environmental Insecurities: Man, the State and Nature*, scheduled for completion in early 2005.

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10 Filthy rich, not dirt poor! How nature nurtures civil violence

*Indra de Soysa**

> The greatest crimes are caused by excess and not by necessity. Men do not become tyrants in order that they may not suffer cold. (Aristotle[1])
>
> Men of a fat and fertile soil are most commonly effeminate and cowards; whereas contrariwise a barren country makes men temperate by necessity, and by consequence careful, vigilant, and industrious. (Jean Bodin[2])
>
> Whatever the soil, climate, or extent of territory of any particular nation, the abundance or scantiness of the annual supply [output] depends on the skills, dexterity, and judgement of its labour [humans]. (Adam Smith[3])

During the past few decades, the environment has emerged as a matter of high politics. Concern over the health of the planet and traditional security issues, which had preoccupied military and diplomatic circles for over four decades after the end of World War II, began to mesh (Gleditsch, 2001; Esty *et al*., 1999; OECD, 1997). The gradual parting of the 'iron curtain' dividing East and West refocused attention on the 'poverty curtain' dividing North and South. However calls for renewed growth were moderated by fears of endangering the health of the planet and degrading natural resources upon which future generations would also depend, leading to calls for 'sustainable development' as a fresh model for eradicating poverty and ending Third World violence. Scholars expounding the idea of 'ecoviolence' insert themselves in this post-Cold War, security–development nexus. Apparently Third World insecurity and underdevelopment may be explained from an environmentalist perspective that sees peace and ecological security as intertwined, where civil violence is largely about the 'fight for survival' under conditions where the environment is 'on the threshold' of collapse (Dobkowski and Walliman, 1998; Homer-Dixon, 1999; Homer-Dixon and Blitt, 1998; Kaplan, 1994; Renner, 1996; Schwartz et al., 2000).[4] A degraded environment has increased scarcities that undermine civil peace. The path to peace, thus, is easing environmental pressure.

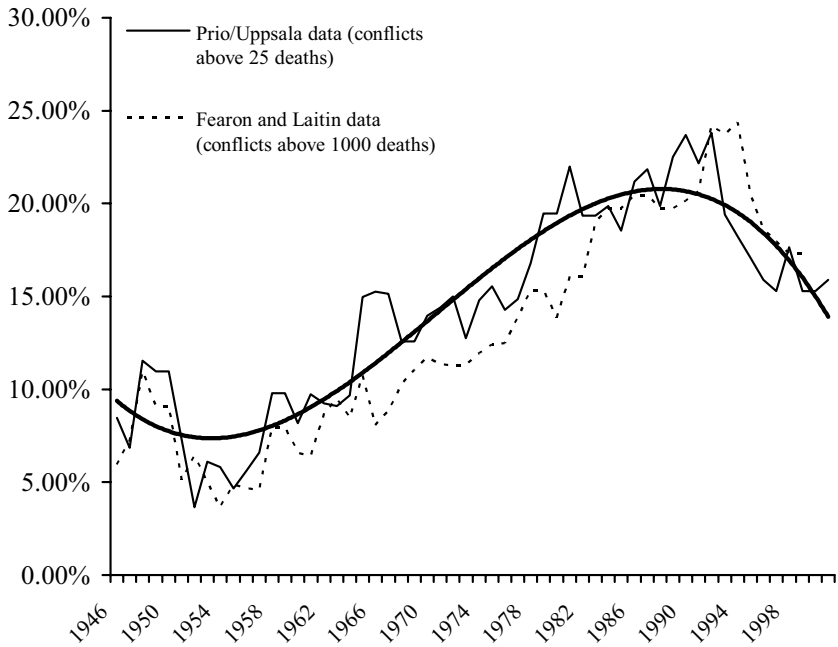
This neo-Malthusian view is challenged by others who see resource abundance as more of a curse than a blessing. As they see it, large natural resources provide a 'honey pot' over which to fight (Collier, 2000b; Collier and Hoeffler, 1998; de Soysa, 2000). Since violence is costly and requires

organization, resources provide the finance for war: grievance and desperation rarely generate large-scale violence by themselves. Hungry and destitute people look for food, starve in silence (as in North Korea today), or they get coopted into violent movements that are rarely about serving justice (de Soysa and Gleditsch, 1999; de Waal, 1990; Keen, 1994). Many of these movements exist, however, in comparatively rich environmental areas. Countries suffering large-scale civil war, particularly in Africa, such as Angola and the Democratic Republic of Congo (DRC), are relatively sparsely populated and 'cursed' with an abundance of natural wealth. Moreover resource wealth has tended to spawn conditions of socioeconomic deprivation and environmental decline (Auty, 2001; de Soysa, 2000; Le Billon, 2001; Ross, 1999). Given that peace and development are urgent global priorities, the debates are not merely 'academic'. This chapter highlights the main theoretical propositions of the proponents of ecoviolence, discusses the evidence against their claims and suggests how in fact possessing relatively abundant natural resources generates violence and perpetuates unsustainable development.

Coming anarchy?

Today, civil war of varying intensities is more or less the only form of organized armed violence in the world (Gleditsch *et al*., 2002). Such conflicts are also predominantly located among the poorest countries. As a result, Malthusian arguments about 'the population explosion'(Ehrlich and Ehrlich, 1990) and the 'coming anarchy' acquire wide currency in the media and subsequently the public at large (Kaplan, 1994). The outbreak of genocidal violence in places such as Yugoslavia and Rwanda gave much impetus to the idea that the world was 'flying apart' because of social pressures wrought by environmental decay. Journalistic accounts notwithstanding, it seems that the literature focusing on environmental scarcity as a cause of civil violence won many policy converts. Consider the following statement by President Clinton: '[Civil wars in Africa] are caused not only by historic conflicts but also by … deterioration of not only the economy but the environment in which people live' (cited in Peluso and Watts, 2001).

The reality about the incidence of civil war, however, is hardly 'a world flying apart'. In fact, things are generally getting better in the post-Cold War years (see Figure 10.1). Tracking the incidence of armed conflict is a thorny issue, but several good data sets exist. Two data sets are used here to compute the average risk of war since the end of World War II. These data are widely used and published in leading academic journals in political science. Figure 10.1 shows clear decline in the average risk of civil war in the post-Cold War world.[5] The risk of conflict steadily increased after the late 1950s with the beginnings of decolonization, particularly in Africa and Asia. This trend reached its peak in 1992 with new outbreaks of civil war, mainly as a result of



Note: Trendline based on third polynomial.

Source: (Gleditsch *et al*., 2002; Fearon and Laitin, 2003).

Figure 10.1 Average annual risk of civil war, 1946–2001

the collapse of the Eastern Bloc and the Soviet Union, but the risk has declined significantly since.[6] A simplistic reading of the larger trend that connects civil war directly with deteriorating environmental conditions, or resource scarcity, is forced to admit that the environment might be improving, or that other factors might matter a whole lot more.

As argued below, it is development failure that explains civil war, not the scarcity of natural capital. Indeed the failure of development may be traced to relative abundance of natural capital, not its scarcity. It is likelier that the relative wealth of natural capital, development failure and civil violence relate to each other in a negative feedback loop. In other words, I turn the 'ecoviolence' arguments on their head. Lootable natural wealth is a honey pot that produces large incentives for powerful (state and private) agents to undermine sound politics and economics that ensure sustainable development and peace. The net result is sheer wastage of resources because economic, social and political processes in resource-abundant countries hamper the

transformation of natural capital into wealth (Ascher, 1999). This is the theme of the rest of the chapter. By focusing on explanations of environmental scarcity and conflict propounded by Thomas Homer-Dixon and colleagues, who argue explicitly that environmental scarcity is the 'causal mechanism' behind civil conflict, I will show that theoretical and empirical evidence suggests that resource wealth is likelier than resource poverty to be more of a problem for development and peace. The policy implications derived from such a position are already beginning to be felt. I will examine some implications and assess what they mean for continued research on this important subject.

Scarcity of what?

Arguments about impending scarcities of resources that would undermine well-being of humans and impede continued development are not new. Thomas Malthus's claims about population growth and food are by now the most infamous of prophecies. Arguments about the 'limits to growth' because of resource scarcities resurfaced in the 1970s, largely owing to the oil crisis and global slowdown in growth. The 1980s saw growth resurgent, but neo-Malthusian arguments found renewed credence along with concerns about sustainable development, perhaps largely as a result of state-led strategies of development exemplified by the Soviet and Eastern European experience where 'impressive' growth was achieved at the expense of massive environmental damage. Environmental catastrophes like Chernobyl and the Aral Sea highlighted the need to make development more eco-friendly. It is in this context that the environment entered the security discourse, and the peak in civil conflicts in the early 1990s allowed some to make the connection between population pressure, resource scarcity and civil conflict (Baechler, 1998; Homer-Dixon and Blitt, 1998; Homer-Dixon, 1999; Kahl, 1998). While the causal pathways from scarcity to conflict are explained in many complex ways, I address specifically the arguments that stress the importance of resource scarcity as the primary underlying cause determining other proximate causes of conflict explained traditionally as being based in issues of identity, ideology, poverty, and so on. Strong proponents of the resource scarcity school, represented best by the Toronto group headed by Thomas Homer-Dixon, are unambiguous when they claim resource scarcity to be the 'causal mechanism' of many of today's conflicts (Schwartz *et al*. 2000). I begin by examining the claim that poverty and conflict are locked in a vicious cycle because of natural resource scarcity.

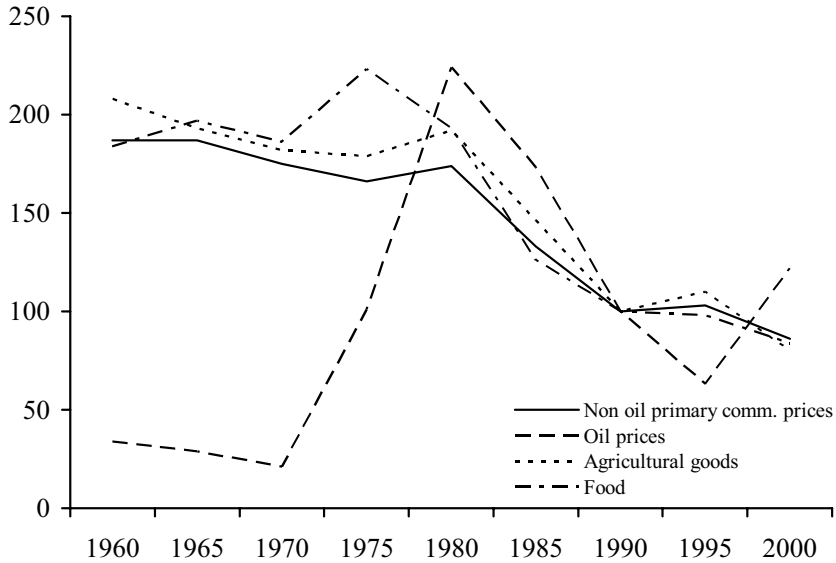
Contrary to a large body of literature on the causes of economic growth, ecoviolence theorists have argued that natural resource scarcity impedes economic growth and social innovation. Apparently scarcity is a barrier against the production of ingenuity and adaptation to economic hardship, arguments

they link to new growth theories to show that the lack of natural resources constrains social (institutional) and technical innovation, thereby creating conditions that trigger conflict. This is clearly the indirect link offered by the Toronto school.[7] According to Barbier and Homer-Dixon (1996), endogenous growth theory, which stresses the importance of endogenous technical change for sustained economic growth (a proxy for economic capability and innovation), fails to take into account resource scarcity as a restraint on a society's ability to innovate.[8] They argue that there is an incapacitating effect of resource scarcity on the capability of poor societies to adapt to socioeconomic pressure because scarcity causes lower growth and hampers effective social investment.

This argument is generally not borne out in empirical evidence. Notice that the causal chain is that resource scarcity prevents economic growth, that does not allow effective social investment, that produces the ingenuity to maintain conditions conducive to peace. In other words, 'cornucopians', or resource optimists are deemed to be wrong in anticipating innovation induced by growing scarcity because innovation requires some degree of social stability. Since scarcity does not allow this stability, social innovation could be hampered.

The concept of 'scarcity' is rather slippery. Since a plethora of subjective factors determine what is scarce, how to evaluate scarcity objectively is of paramount importance. The degree of scarcity is potentially as large as the claim. The relative price of resources over time is one way in which to track the trajectory of scarcity. Unfortunately for those dependent on selling these resources on the world market, the trend shows decreasing value, which is alternatively thought of as 'growing abundance'. As Figure 10.2 shows, the price of non-oil primary commodities has been declining rapidly since the 1970s. The same is true of agricultural goods and food. Clearly poor countries highly dependent on exporting these resources need to break their dependence on them, or add value to these products by making finished goods for the market. While prices tell us something about the global need for these resources, we also need to assess 'how much' natural resources matter in terms of their contribution to national wealth. Surely wealth is a proxy of available 'ingenuity'.

The World Bank estimates the total wealth of countries disaggregated as natural resources, produced assets and human capital in standardized terms.[9] These data are constructed for roughly 100 countries for the year 1994 and this is the first disaggregated measure of the actual wealth of nations. The data are values for total natural assets composed of cropland, land, pasture, timber, non-timber assets, protected areas and all subsoil assets (minerals). Human assets are computed as the value of labour based on education and health, and produced assets are basically man-made objects such as buildings, roads, ports and so on.



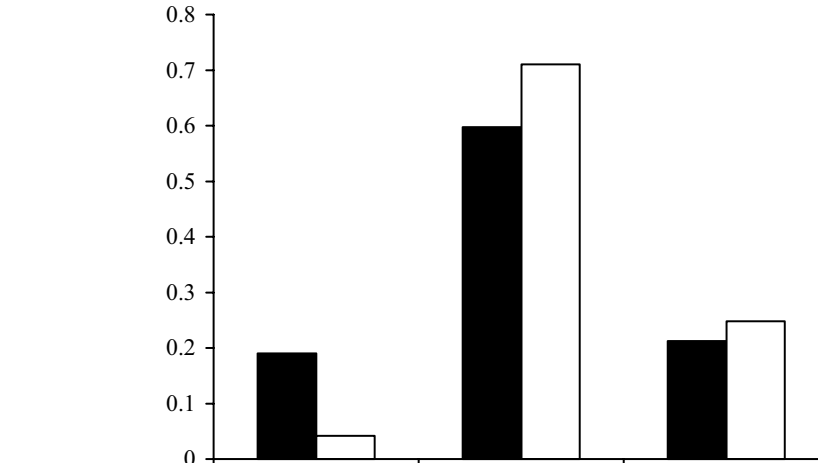
Note: Index base year 1990=100.

Source: World Bank (2002).

Figure 10.2 Prices of selected commodities, 1960–2000

The World Bank's estimate of the total wealth of countries is highly revealing. The largest portion of the wealth of countries, both developed and developing, is made up of human and produced assets. In other words, the wealth of most countries is based largely on the labour of human beings, as Adam Smith recognized several centuries ago (see the quotation above). Figure 10.3 displays the average share of the three forms of capital in total wealth among the richest and poorest countries.

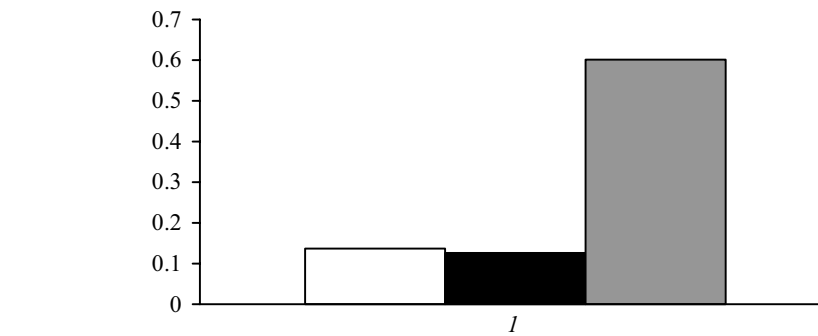
As Figure 10.3 demonstrates, the poorest countries have roughly five times more natural capital as assets in their total wealth compared with what the richest countries possess. Being wealthy is a function of the productivity of labour: healthy, wealthy and wise! As countries grow rich their dependence on natural wealth becomes minimal. The best way to avoid abusing nature and ensure its services into the future is to develop human resources and increase wealth. Indeed the smallest wealth gap between rich and poor compared in per capita terms is natural wealth. Figure 10.4 shows the share of the poorest countries' natural, produced and human assets as a percentage of the richest countries' total.



	1	*2*	*3*
Poorest countries	*0.190362545*	*0.597483455*	*0.212154*
Richest countries	*0.041854302*	*0.710048635*	*0.248097063*

Note: 1 = natural capital assets; 2 = human capital assets; 3 = produced assets.

Figure 10.3 Average share of natural, human and produced assets in total capital assets among the richest and poorest countries



Human capital	*0.137283397*
Produced assets	*0.12581573*
Natural capital	*0.60110705*

Figure 10.4 Poor countries' average per capita share of natural, produced and human capital relative to the richest countries' share

Thirty-eight of the poorest countries have 60 per cent of the total natural capital of the richest (19 countries). This is a remarkable portion of the rich countries' total assets that the poorest enjoy, even though on average the poorest countries have roughly 2 per cent of the per capita income of the richest countries.[10] It is impossible to say from these statistics that the poor are poor because of the relative generosity of nature. Relative poverty is a lack of nurture, not nature. The poorest compare dismally in terms of human assets (14 per cent) and produced assets (13 per cent). The comparison shows clearly that what poor countries lack relative to the rich is not natural capital, but income derived from human and produced assets. Another way to approach the question is to ask also whether scarcity allows faster rates of income growth and human capital development. Does scarcity hamper the production of ingenuity? Is socioeconomic development hampered by resource scarcity?

Resource scarcity and development: blessing or curse?

According to ecoviolence theorists, conflict is generated by the scarcity of natural resources in at least two primary ways. First, resource scarcity has direct effects on conflict when scarcity drives elites to 'capture' resources, marginalizing powerless groups in the process. According to Homer-Dixon (1999: 177), 'resource capture occurs when the degradation and depletion of renewable resources interact with population growth to encourage powerful groups within a society to shift resource distribution in their favor'.

Such a process is often cited in connection with violence in Haiti, Mexico (Chiapas), Rwanda, South Africa and the Philippines.[11] Secondly, the indirect effect of scarcity is also important in the larger picture. According to Homer-Dixon (ibid.: 5, 7),

> scarcities can overwhelm efforts to produce constructive change and can actually reduce a country's ability to deliver reform. Consequently, environmental scarcity sometimes helps to drive society into a self-reinforcing spiral of violence, institutional dysfunction, and social fragmentation. … A persistent and serious ingenuity gap raises grievances and erodes the moral and coercive authority of government, which boosts the probability of serious turmoil and violence … If these processes continue unchecked, countries with a critical ingenuity gap therefore risk becoming trapped in a vicious cycle…

As Barbier and Homer-Dixon claim, over time, an 'ingenuity gap' develops because society is unable to deal with environmental scarcity, leading ultimately to social disarray and conflict.

Barbier and Homer-Dixon (1996) have little to say about human capital, which is latent capacity to be innovative and, as we have seen above, one of the most important components of the wealth of nations. They suggest that re-

source scarcity prevents the generation of ingenuity and thereby endogenous technical change because scarcity produces social friction.[12] Endogenous growth theory arose in response to neoclassical growth theory, which suggested that the capital-poor developing countries would 'catch up' with the rich because of diminishing returns to capital. These models predicted that capital should flow from rich to poor countries and create a higher rate of growth in the backward economy while capital-rich states slow down (Solow, 1956). In this way, the incomes of the poor countries converge with the rich. Endogenous growth theory suggests that convergence has not taken place as neoclassical theory predicted because there are increasing returns to capital within rich states because of new ideas and innovation that keeps capital at home and sustains growth there (Lucas, 1988; Romer, 1993). A large body of empirical evidence suggests that the convergence of poor countries with the rich is conditional on a given level of human capital; that is, poor countries grow faster than richer countries only for a given level of human capital, not natural capital, or even institutional capital (Barro, 1998; Temple, 1999). Much theory and empirical evidence in economics views abundant natural capital as a curse rather than a blessing because overreliance on natural capital rents can kill incentives for sound social and economic policy making (Auty, 2001; Lal and Myint, 1996; Rodríguez, 1999; Ross, 1999; Sachs and Warner, 2001).

Economists, such as Sachs and Warner (1995, 2001) and Lal and Myint (1996), present strong empirical evidence suggesting that resource wealth has been problematic for economic growth. These scholars argue that endogenous technical change does not occur in resource-rich countries because they become dependent on natural resource rents and fail to innovate. This view directly contradicts Barbier and Homer-Dixon (1996). The ill effects of resource rents work through the perverse incentives they create for allocating capital, labour and innovative energies to manufacturing. Resource rents also provide an incentive to close the economy, which reduces the opportunity for learning by doing (Sachs and Warner, 2001). This perspective relies on arguments that base economic development and innovation on 'linkages' between and within sectors. Innovation progresses more rapidly within the manufacturing sector, as opposed to agriculture, because this sector is linkage strong and offers greater opportunity for 'learning by doing' and because of increasing gains from trade (Arrow, 1962).

It is not merely mineral wealth that is salient to these arguments; so is renewable resource wealth, such as abundant cropland, timber and agricultural assets (Sachs and Warner, 2001; Wood and Berge, 1997). Despite ecoviolence arguments about land scarcity and conflict, formal models of innovation in agricultural economics and development studies offer counter perspectives, which suggest that agricultural growth occurs when population density leads to the scarcity of land, whereby the larger number of mouths to

feed leads to the intensification of agriculture, and thereby to innovation. Excess labour is then freed for other economic activities that support intensive farming (Boserup, 1965).[13] Others demonstrate that the abundance of arable land leads labour and capital away from manufacturing, thereby stemming the progress of invention through 'learning by doing' (Matsuyama, 1992). Some present strong evidence suggesting that abundance of land is to blame for the high levels of income inequality, particularly in Latin America. They suggest that the rich are more likely to plough their money back into agriculture rather than invest in manufacturing because of the abundance of agricultural assets, thereby hampering the accumulation of skills and delaying industrialization (Leamer *et al*., 1999).

Resources also hamper social investment. As some show, rents from natural resources lead to lower investment in education and distort governance and the policy environment by increasing rent seeking and corruption (Gylfasson, 2001; Leite and Weidmann, 1999; Torvik, 2002). The results from a long-term study at the United Nations University's World Institute for Development Economics Research (WIDER) show clearly problems associated with abundant resource wealth (Auty, 2001). The lead researcher of the WIDER project, Richard Auty (1998), points out that various measures of resource abundance, such as the share of primary goods export, the intensity of manufacturing, land availability and the extent of the available natural resource rents make countries prone to growth collapses.

Apart from economists, political scientists have long been interested in the pernicious political effects of resource rents (Lane and Tornell, 1996; Moore, 2000). Large rents from resources do not lead to the state–society bargains that result in outcomes beneficial to the larger collectivity. Resource rents make society superfluous to ruling elites, who have the luxury of relying on 'unearned income', which allows social control and conversely no incentive for social investment (Lane and Tornell, 1996; Moore, 2000). Large rents from resources lead to the withering of institutions around taxation and public goods provision, leading to the underdevelopment of state structures and weak state capacity. The weakening of state institutions around public goods provision and the continuation of bad policies arrests broad social development (Moore *et al*., 1999). A recent econometric investigation of the links between resource wealth and growth confirms a strong negative effect between abundance of natural resources and economic growth (Papyrakis and Gerlagh, 2003). The study investigates several avenues through which resource wealth affects growth and finds the investment channel in particular to be the most important. The authors conclude that 'a natural resource economy that suffers from corruption, low investment, protectionist measures, a deteriorating terms of trade, and low educational standards will probably not benefit from natural resources' (ibid.: 13).

There is a large, theoretically coherent and empirically strong literature on the 'resource curse' that poses a formidable challenge to theorists of ecoviolence. The supposed indirect link from resource scarcity to large-scale conflict simply cannot be explained through the underdevelopment channel, the so called 'ingenuity gap', unless of course one is willing to overlook how abundance of natural wealth has failed to deliver. The recent literature on the economics of civil war offers the most serious direct challenge to ecoviolence perspectives.

Abundance and conflict

Recent research at the World Bank finds strong empirical support for the proposition that natural resources motivate rapacious behaviour and allow the financing of civil war.[14] Holding other salient variables constant, the share of primary exports in total exports exhibits the strongest effect on the incidence of civil war (Collier and Hoeffler, 2000; Elbadawi and Sambanis, 2000). This result is interpreted as support for the position that natural resources are instrumental in supplying the motive and finance for war. It is common knowledge that many of today's most durable conflicts, such as in Angola, Liberia, the Democratic Republic of Congo and Sierra Leone are fuelled by the struggle for control of oil, diamonds, timber and other resources, and various conflicts in Asia and Latin America are fuelled by the profits from trade in illegal commodities, such as drugs, or hardwood timber, and other forms of contraband (Addison *et al*., 2001; Berdal and Keen, 1997; Berdal and Malone, 2000; Le Billon, 2000; Ballentine and Sherman, 2003).

Collier and associates have modelled this wisdom using microeconomic theory, demonstrating the strength of the evidence with econometrics. In short, resources act as a 'honey pot' that provides incentives for profit-seeking groups to engage in violent actions.[15] As Collier notes (2000a: 91), war is detrimental to society at large, but small, organized groups stand to 'do well out of war'. This logic explains why conflict appears and reappears frequently despite the deleterious effects of wanton destruction in civil war situations; war is not universally harmful, since some will always be better off by fighting than from peace. In order to get beyond the contested claims and counterclaims that make up the discourse within zones of conflict, these studies gauge which of the proxies of greed and grievance predict conflict best using cross-country data. They find that the economic variables that proxy greed-motivated rebellion outperform the proxies for grievance-motivated rebellion. Ethnic heterogeneity and inequality of income are mostly unrelated to conflict. Primary goods exports and average years of schooling in the male population are strongly related to conflict. They find these results to support opportunity cost explanations that underlie their model of rebellion as loot seeking rather than justice seeking. As Collier and Hoeffler

(2000: 5) put it: 'a country with *large natural resources*, many young men and little education is very much more at risk of conflict than one with opposite characteristics'.

The World Bank's results are supported by several others, who use case study-based methods, econometrics and a variety of different data (de Soysa, 2002a; 2002b; Humphreys, 2002; Le Billon, 2001; Ross, 2004). Some tried to show that the main variable measuring lootable resources used by the World Bank's studies does not capture dimensions of scarcity and abundance because the share of primary commodities in total exports measures resource dependence, not availability per se. Thus countries running out of resources they depend on could be facing social instabilities while simultaneously suffering lower total exports, the denominator. Using a more precise measure of natural resource availability per capita, de Soysa (2002a; 2002b) corroborates Collier's findings. A larger per capita availability of mineral wealth raises the risk of civil war, while greater availability of renewable resources has no effect on conflict. De Soysa (2002a) also demonstrates harmful effects of resource wealth, not scarcity, on supposed indirect effects on conflict, such as economic growth, human development and level of democracy. He concludes that there was no evidence in any of the tests to suggest that renewable resource scarcity has either an indirect or a direct effect on conflict. Portions of the resource curse argument are now instructing earlier advocates of ecoviolence. According to a recent World Watch Institute publication (2003: 120), 'abundant natural resources, such as oil, minerals, metals, diamonds and other gem stones, drug crops, and timber, have helped fuel a large number of conflicts in developing countries'.[16]

Others, while corroborating the World Bank's main theoretical contribution showing opportunity (greed) to be a greater reason for there being civil war as opposed to motive (grievance), have been unable to replicate the World Bank's results when controlling for oil dependence (Fearon and Laitin, 2003; Humphreys, 2003). According to Fearon and Laitin, countries that derive at least one-third of their exports from oil double their risk of conflict. They propose that, unlike the Collier–Hoeffler model of looting rebels, the mechanism is likely to be that state strength is weak under conditions of oil extraction because of 'political Dutch disease' working through state institutions. While there will be considerable debate into the future as to whether the exact mechanism from natural resources to conflict works through looting or state capacity, there is little evidence in the theoretical and large-N empirical literature suggesting a direct link from resource scarcity to conflict. On the other hand, there is much evidence to suggest that large rents from natural resources hamper state capacity and socioeconomic progress, factors directly linked to conflict. As Aristotle's wisdom from antiquity suggests, 'the greatest crimes' are caused by human greed and excess, not for the sake of justice and survival.

Researching scarcity and conflict: problems of method?

There are many aspects both substantive and methodological that need to be resolved concerning the polar-opposite conclusions of those who see relative abundance as problematic for socioeconomic development, good governance and peace, and those who see environmental scarcities as the 'causal mechanism' behind violent conflict. There are by now several critical evaluations of the neo-Malthusian research already: on analytical, substantive and methodological grounds (see Barnett, 2000; Deudney, 1990; Levy, 1995; Gleditsch, 2001). As some have suggested, the work on scarcity and conflict, particularly that of the Toronto school, is merely theoretical rather than empirically driven (Barnett, 2000).

Homer-Dixon and associates rely on case studies, using a technique of 'process tracing' to answer the question as to *how* the environment is related to conflict. They choose their cases on the basis of the dependent variable, which is methodologically problematic (Gleditsch, 1998; Varshney, 1997; Collier and Mahoney, 1996). Collier and Mahoney (1996: 72) provide an excellent examination of the dangers of selection bias and of generalization from a small number of cases, warning that 'for the qualitative researcher an important part of the risk may lie in *overestimating* the importance of explanations discovered in case studies of extreme observations'. King *et al*. (1994: 130) are less subtle about 'no-variance' research designs; their advice is simply to 'avoid them!' As some have argued, the discourse within zones of conflict is dominated by stories of grievance. The discourse of perceived scarcity, whether of physical resources, or of political and social resources, are a huge part of this discourse of conflict. In such situations, even the keenest researcher is liable to miss underlying 'issues' and mistake the byproducts of conflict for its causes (Collier and Hoeffler, 2000; de Soysa, 2002b; Varshney, 1997). The discrepant research results and theoretical disputes cannot be blamed on issues relating to the ways in which quantitative data are aggregated compared with thick descriptive studies because there are numerous qualitative, descriptive studies that dispute the claims of the ecoviolence research addressed here (Leach and Mearns, 1996; Peluso and Watts, 2001; Tiffen *et al*. 1994).

Scholars of conflict are likely also to confuse what they want to explain (underlying causes of violent conflict) by conflating contests within the political arena, which may create a dominant discourse. Violence, however, might in fact be quite independent of the contests that drive the dominant discourse. The discourse dominating zones of conflict is heavily laced with stories of grievance, and objective factors are likely to be well masked, particularly to academics and journalists. In these situations, one can find just about any narrative of grievance to provide the basis of the causal story. For example, the focus on obvious differences between groups fighting, which is a natural

function of the 'enemy-image', is an especial feature of political contests and violence. In such situations, cultural differences in particular may come to be overemphasized in games of 'us versus them', even though the participants in disputes rarely speak with one voice. The discourse of grievance is often unrelated to objective truth, which makes the discourse highly dependent on the nature and form of the violence itself. It is a daunting task indeed for the researcher to enter this perplexing environment and come away with a clear picture of who the 'good' and 'bad guys' are (one man's terrorist is another's freedom fighter). It is difficult, indeed, to identify the objective facts that may underlie all (or even most) violent conflict so as to understand its causes systematically.

In many instances of violent conflict, the nature of the violence itself defines the complaint, which means that the group organized enough to fight first, determine the cause and the subsequent discourse of grievance. Thus an organizational advantage for carrying out violence determines the discourse of grievance, not objective causes. In such a way, Marxist narratives, ethnic grievance and so on gain ascendancy according to who is able effectively to organize violence. However the reasons driving capabilities to organize violence and objective factors generating individual and group grievance are totally different things, even if they sometimes go together. If mafias are well organized for perpetrating violence, as was the case clearly in much of the post-Soviet instances argued by many, does this represent legitimate grievances (Kaldor, 1999; Mueller, 2000)? As Varshney (1997: 2) points out in reference to communal violence in India,

> It is impossible to establish the truth . . . about cause and effect in communal violence. Contemporary communal violence has become horribly tangled in discursive 'contestations' and politically manipulated 'representations'. Indeed facts and representations cannot be separated. It is not that facts do not exist, but that the most important facts necessary to make causal arguments simply cannot be culled from the morass of representations.

He suggests, however, that contemporary social science should bring in a 'sense of variance' to the study of conflict, so that fact and representation can be separated and general theory built, not on the basis of the aggregation of similar cases, but on the relative strengths of the competing narratives in a world marked by variation.

The ecoviolence literature conflates the environment and natural resources, sometimes conflates types of resources (that is, renewable and non-renewable) and rarely specifies the type of civil violence predicted by scarcity. There will be little disagreement between most scholars that 'all conflict' is about a 'scarce resource', and there is much localized violence in many parts of poor countries over renewable natural resources such as land, but these conflicts

rarely concern anyone outside of the authorities within the affected states. Moreover many of these conflicts exist in countries that are resource-wealthy, such as Brazil (land conflicts), Colombia (land conflicts), Burma (timber) and Indonesia (timber). Thus the solution to some of the conflicts involving forest resources, land, and settler–indigenous populations is reform of institutions and better governance. Nevertheless the Toronto school claims that civil wars are caused by environmental scarcity without really examining cases of conflict where little scarcity exists, or demonstrating why scarcity does not lead to conflict except in the few cases they do examine. The policy maker, however, wants to know how much of a problem scarcity is relative to abundance, so as to maximize impact. This question cannot be answered by thick description of single cases. As one reviewer of Homer-Dixon (1999) has also pointed out, 'he undermines his case by building political factors into his definition of environmental scarcity. More robust conclusions concerning the effects of environmental trends on violent conflict are possible … only by clearly disentangling the physical sources of such conflict from its political, economic and social determinants' (Dessler, 1999: 100). If abundance of resources correlates so strongly with the political environments that ecoviolence theorists argue relates to scarcity, then the onus is on them to demonstrate the empirical validity of these claims. The evidence as it stands today remains unconvincing.

Conclusions

Creating a good natural environment and making sustainable use out of natural resources are worthy goals to strive for. The natural environment offers mankind more than just material goods because it enhances total well-being, which is more than just food, shelter and clothing. However ending civil violence and aiding economic progress in poor countries is an urgent need, not only for ending human suffering but for easing the toll on the environment emanating from wasteful behaviour, whether from missed opportunities because of poor policy, wasteful military spending or destruction of human and physical resources. Efforts to link environmental scarcity to conflict may increase heat without generating the light required for better policy making. We have shown that violent civil conflict is likelier to be driven by the 'honey pot' effects from resource abundance because violence is costly and requires organization. The weight of the evidence supports those who argue that 'resource curse' effects on the economy and society may have indirect effects on conflict, contrary to arguments about scarcity and ingenuity gaps. Natural resources have corrosive effects on socioeconomic and political development by encouraging poor institutional quality, rent seeking and corruption, lower economic performance, lower levels of social capital, higher income inequality, poorer levels of education and political repression.

Ecoviolence theorists have failed to demonstrate clearly what proportion of the problem of civil violence scarcity causes.

The problem of relative abundance and resource dependence has a clear lesson for policy that is concerned with development, the environment and human security. Resource abundance is a problem that can be rectified with better policy, as countries such as Botswana and Malaysia, among others, have illustrated. While Burma finds logging profitable, in Malaysia the forests serve other purposes such as tourism, or provide aesthetic services of a nonmonetary nature. Logs tend to be valuable when logging is the 'only game in town'. Clearly many states may need assistance managing their resources, especially curbing public and private corruption and promoting good governance. Such action would also have to be bolstered by greater emphasis on developing human resources by concentrating on health and education. The environment too is bound to benefit from good governance and social and human capital development because the latter will help societies break their dependency on unsustainable resource extraction through innovation and change. Giving countries access to technology and markets is likely to be helpful here. While several recent policy initiatives, such as World Bank management of natural resource funds (transparent oil), codes of corporate conduct, the certification of blood diamonds and so on are a good start, the rich countries need to go a long way towards opening up markets to the products of poor countries and encourage private direct investment to supply the jobs and technology for growth and diversification.[17] Continued higher tariffs on products from poor countries, particularly agriculture and textiles, and the subsidization of exports from the rich countries, are likely to be counterproductive. These peace-damaging policies are unlikely to be compensated for by aid, which is by now highly scarce.

Unravelling the complex relationship between the 'honey pot' effect, 'resource curse' effect, dysfunctional politics and conflict will prove to be a promising direction for future research. In particular, one needs denser analyses of the way resource abundance is associated with conflict through what some observers characterize as the 'spoils politics' of clientelism, corruption and extrainstitutional 'governance', a pervasive feature of politics in resource-abundant countries, particularly in the Middle East, Central Asia and North and Sub-Saharan Africa (Allen, 1995). Analysts of conflict will do well to pay heed to economic aspects of resource abundance that lead to the criminalization of economic activity and the retardation of political instruments of constraint that are designed to moderate the ubiquitous forces of human greed. If environmental scarcity is the 'causal mechanism' of conflict, low growth, low human development, and undemocratic government as some have suggested, then its effects are as well hidden as the true motives of the 'filthy rich' who expend massive resources on organizing violence that victimizes the 'dirt poor'.

Notes

* This study draws heavily on two previously published articles. See de Soysa (2002a, 2002b).

1. Aristotle, *Politics*, trans. Ebenstein and Ebenstein, 1992: 84.
2. Bodin (1576), cited in Sachs and Warner, 1995: 4.
3. Smith (1777), cited in World Bank (1997: 19).
4. There is an acrimonious debate about the extent of Malthusian problems globally, with some even arguing that environmental problems are becoming less severe despite population increase, see Leach and Mearns (1996) and Lomborg (2001). For the classic debate between Norman Myers and Julian Simon, see Myers and Simon (1994). For a careful case study challenging Malthusian views, see Tiffen *et al*. (1994).
5. See also World Watch Institute (2003) and Center for Systemic Armed Conflict's webpage (http://members.aol.com/cspmgm/conflict.htm) for similar trends on the incidence of civil wars.
6. See Fearon and Laitin (2003) and Gleditsch *et al*. (2002) for more detailed discussions and explanations of civil war risk and data. Interestingly the risk of civil war has fallen even further since the war on terror, with ceasefires and peace talks resumed in places such as Sri Lanka, the Sudan and elsewhere.
7. See Barbier and Homer-Dixon (1996), Homer-Dixon (1999) and a book by Homer-Dixon (2000) devoted entirely to the question of the 'ingenuity gap' written in a somewhat popular style.
8. This view stands in opposition to induced innovation theories on population pressures and agricultural productivity: see Boserup (1965) and Hayami and Ruttan (1985). Homer-Dixon (1999) dismisses theories of induced innovation for being overly optimistic.
9. For details of the composition and construction of these data, please consult Kunte *et al*. (1998), Dixon and Hamilton (1996) and Hamilton (2001).
10. This figure is based on the average per capita income of PPP $450 for the World Bank's low-income category and PPP $28 000 average for the OECD.
11. The belief that scarcity drives elite greed is highly problematic because it assumes that such greed will not exist under conditions of abundance. In other words, the voracity of elites is driven by scarcity, not the fact that abundance is a 'honey pot' over which to fight. Scarcity theorists do not specify who the conflicting parties could be: does scarcity promote intra-elite violence over a resource (self-centered, rational action)? Or does violence erupt between haves and have-nots (relative deprivation).
12. The term 'ingenuity gap' is similar to Paul Romer's (1993) use of 'idea gaps' to distinguish human capital from physical capital (object gaps).
13. See López (1997) for a thoughtful presentation of pessimistic views on the possibility of a Boserupian sequence, given poor environmental quality, which, coupled with the lack of social and economic resources, prevent the heavy investment required to promote a virtuous cycle. Others argue that the Boserupian sequence works: see Tiffen *et al*. (1994).
14. See Collier *et al*. (2003); and several special issues of journals on the subject of civil war, such as *Journal of Conflict Resolution* (2000), *Defence and Peace Economics* (2002) and *Journal of Peace Research* (2004).
15. Homer-Dixon (1999) suggests that the conflict in the Senegal River valley in 1989 was a case of scarcity leading to resource capture by the Mauritanian white elite (Moors). However it was in reality an increase in arable land as a result of new irrigation works that prompted a scramble for land: the honey pot effect. Dessler (1999: 101) also points out this ambiguity.
16. It should be noted, however, that in the same section as the cited statement the authors of the report go on to mention environmental scarcity and degradation as factors that also drive conflict. No evaluation is made of which of the two statements matters most, except to cite the work of the Toronto school in support of the latter statement.
17. See the Center for Global Development/Foreign Policy Magazine's 'commitment to development index', which measures the generosity of 21 of the richest countries in terms of aid, openness of markets to poor countries, levels of investment in poor countries,

commitment to peacekeeping, levels of pollution and openness to immigration. Details are available at www.cgdev.org.

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11 Why is there no unified theory of environmental governance?

*Oran R. Young**

As a participant in the US National Research Council's project focusing on institutions for managing the commons and endeavouring both to assess recent advances in knowledge in this field and to set a research agenda for future work (Ostrom *et al.*, 2002), I found myself becoming puzzled, perplexed and, in the end, frustrated. The growth of scientific understanding regarding the roles that social institutions play as determinants of the course of human–environment relations in small-scale social systems is undoubtedly a major achievement. Yet the rapidly growing literature on small-scale systems is by no means the only significant recent development arising from the study of environmental governance. Equally impressive streams of research focus on environmental regimes at the national level and especially at the international level. Increasingly, we are aware as well that there is substantial interplay among institutional arrangements operating at different levels of social organization. An obvious strategy, under the circumstances, would be to compare and contrast bottom-up perspectives and top-down perspectives in this realm in the interests of developing more powerful or general propositions about the institutional dimensions of human–environment relations and ultimately formulating a unified theory of environmental governance.

Yet even those who ought to be its natural advocates have made little effort to pursue this strategy. Why is this the case, and what can we do to stimulate greater interest in cross-scale comparisons on the part of researchers in the future? This chapter addresses these questions in three steps. The first section argues that the core concerns of those working on the institutional dimensions of human–environment relations are essentially the same regardless of the level of social organization that constitutes their primary focus. The next section seeks to identify the reasons why serious efforts to compare and contrast major findings across levels of social organization have been few and far between. It concentrates particularly on the sources of parochialism in the thinking of analysts working on small-scale, local systems and analysts concerned with international and especially global regimes. The final section discusses steps that those who feel, as I do, that a unified theory of environmental governance is both desirable and feasible can take to overcome these sources of parochialism. My goal is to propose a research agenda that will

encourage researchers to pool their findings in the interests of broadening and deepening our knowledge of the institutional dimensions of human–environment relations.

Our common agenda

The common core of the concerns of those who address these issues from the bottom up and from the top down is both easy to identify and substantial. We are all concerned with the roles that institutions play in both causing and addressing environmental changes (Young, 1999a). We all want to formulate, test and refine propositions about the ways in which institutions shape the content of collective outcomes in the realm of human–environment relations. Most of us are motivated not only by an interest in adding to the stock of scientific knowledge about such matters, but also by a desire to contribute to our capacity to design institutional arrangements that can play a role in improving the sustainability of human–environment relations. The fact that we find ourselves today concerned increasingly with human-dominated ecosystems simply reinforces the importance we attach to expanding the stock of usable knowledge in this field (Vitousek *et al*., 1997).

The good news in this context is that most of us share a broadly compatible outlook on the nature of institutions. For the most part, we subscribe to the basic precepts of the new institutionalism in the social sciences (March and Olsen, 1989; Rutherford, 1994; Scott, 1995). In my own writing, I generally define institutions as set of rules, decision making procedures and programmes that define social practices, assign roles to participants in these practices and guide interactions among occupants of those roles (Young, 1994a; 1999b). This formulation draws a clear distinction between institutions and organizations treated as material entities with offices, personnel, equipment, budgets and so forth. At the same time, it leaves open the prospect that institutions can vary greatly in terms of formalization and that some institutions may be largely or even wholly informal in nature. The important distinction introduced by Elinor Ostrom (1990) between rules in use and rules on paper is highly relevant in this context. There are, of course, numerous other specific definitions of institutions; many of them point to other features or attributes of institutional arrangements that are relevant to the study of human–environment relations. By and large, however, it is fair to say that those of us who work in this field are not burdened by pressures to devote any sizable fraction of our time and energy to efforts to resolve definitional disagreements.

A prominent category of institutions that loom large in our thinking about human–environment relations encompasses systems of property rights (Manne, 1975), but a consideration of systems of property rights also leads directly to the propositions that institutions can and often do become complex structures and that seemingly small differences between or among specific institutional

arrangements can have profound consequences in terms of their impacts on the course of human–environment relations. It is easy enough and useful as a point of departure to draw gross distinctions among systems featuring private, public and common property, but it quickly becomes apparent that systems of property rights encompass bundles of specific arrangements including possessory rights, use rights, exclusion rights and disposition rights, and that there are many different ways to combine these rights into bundles devised to deal with specific biophysical and socioeconomic circumstances (Hanna *et al*., 1996). What is more, each of these components of structures of property rights can be subjected to a wide range of restrictions. Use rights can include important restrictions on times and methods of use, for instance, and disposition rights can restrict the liberty of holders to transfer property to others via sale, gift or inheritance. Small wonder, then, that those who appear to be on the same side as advocates of common property or private property can disagree dramatically among themselves regarding what is required to promote or maintain sustainability in human–environment relations.

That said, most of us who work on matters of environmental governance share an interest in understanding the roles that institutions play both in causing problems and in addressing or solving problems associated with human–environment relations. Many analyses of the sources of environmental problems point to institutional failures or mismatches as major causal factors underlying these problems. The sorts of situations captured in the metaphor of the 'tragedy of the commons', for example, are regularly attributed to the operation of open-to-access or null property arrangements that allow all the members of a group to exploit living resources in the absence of any agreed-upon rules imposing restrictions on the behaviour of users or, as Ostrom (1990) calls them, appropriators, needed to avoid severe depletion or degradation of the resources in question (Hardin, 1968; Hardin and Baden, 1977; Baden and Noonan, 1998). Conversely many analysts interpret major forms of pollution as social costs or externalities allowed under the provisions of systems of private property that do not impose restrictions on the actions of owners that cause harm to their neighbours or to the functioning of ecosystems whose importance extends well beyond the interests or concerns of the holder of the private property rights.

It is a short step from these assessments of institutional causes of environmental problems to the development of ideas about the roles that institutions can and sometimes do play in solving or at least ameliorating such problems. If open-to-access arrangements are the source of actions leading to the depletion or degradation of resources, a natural response is to think in terms of introducing systems featuring some form of limited entry. Similarly, if pollution is correctly understood as an externality of behaviour intended to achieve other goals, an obvious response is to consider introducing rules, regulations or

standards that require the relevant actors to internalize social costs or give them incentives to eliminate or minimize these costs. Of course it is both possible and common for analysts to share the view that institutional arrangements are major determinants of the course of human–environment relations while disagreeing profoundly about how to (re)design institutions in order to solve or alleviate specific problems. Whereas libertarians typically prescribe some form of private property as a method of avoiding the tragedy of the commons, for instance, many of those who work on small-scale systems are convinced from their reading of the evidence that various forms of restricted common property are effective mechanisms for avoiding environmental depletion or degradation under a variety of circumstances (Anderson and Leal, 1991; McCay and Acheson, 1987). Whereas some observers prescribe command and control regulations as the appropriate means to suppress or minimize environmental externalities, to take another example, others argue that incentive mechanisms featuring tradable permits or charges are likely to prove more effective – not to mention more efficient – in dealing with problems of this sort (Portney, 1990). First introduced in domestic settings, such incentive-compatible arrangements have become a prominent feature of environmental negotiations regarding global concerns as well (for example, climate change).

Note, however, that all these analysts, including those who espouse diametrically opposing views regarding solutions to specific problems, are united in assuming that the operation of institutions accounts for a substantial proportion of the variance in human–environment relations. No one is foolish enough to argue that institutions make all the difference or, in other words, that institutions are the only important determinants of human–environment relations. It is easy to see that a variety of biophysical and socioeconomic drivers (for example ecological cascades, demographic changes) that operate independently of institutions are important factors in this realm. Yet there is consensus among those who are interested in environmental governance on the proposition that institutions are major drivers. What is more, institutions under most conditions are more malleable than other drivers. We cannot repeal laws of nature controlling biophysical systems; it is often beyond our capacity to control socioeconomic forces like trends in human population or the development and diffusion of new technologies. But institutions appear to be decision variables or, in other words, arrangements that we can (re)design in the interests of solving specific problems or pursuing specific goals (Ostrom, 1990; Koremenos *et al*., 2001; Young, 2002a). In reality, it is easy to overestimate our capacity to (re)design institutions in a purposive manner. Even so, there is no mystery in the importance of institutional design as a common denominator among students of environmental governance, regardless of the level of social organization on which they focus.

So what is the problem?

With so much in common, it seems odd that there is not a rich and vibrant dialogue among those working on issues of environmental governance at different levels of social organization. Given the absence of centralized political institutions in many small-scale, local societies and in international society, it seems especially hard to understand the low level of communication between those working on local arrangements dealing with human–environment relations and those seeking to understand the roles of international or global environmental regimes. Yet the fact remains that there is no dialogue to speak of between these research communities. Even when participants in one community seek to apply their findings to issues arising at the other level of social organization, they typically do so without serious attention to the work of participants in the other community (Ostrom *et al*., 1999).

Why is this the case? This section argues that the low level of communication is a function of divergent choices regarding research strategies, conceptual fixations and conflicting methodological practices. Those working on small-scale systems have focused almost obsessively on the problem of avoiding the tragedy of the commons, become enmeshed in conceptual confusions regarding common-pool resources, emphasized common property to the exclusion of other systems of property rights and relied excessively on qualitative case studies. By contrast, those analysing international or global environmental regimes have failed to define the core of their research programme crisply and clearly, wasted time and energy in sectarian battles among different approaches to the subject (for example disagreements among neorealists, neoliberals and cognitivists), made little effort to integrate the contributions of political scientists, economists and lawyers, and encountered problems in devising appropriate methods for the pursuit of their research goals. The following paragraphs subject these summary assertions to close scrutiny.

In some respects, the focus on avoiding the tragedy of the commons has been a source of strength for those working on small-scale systems. It provides a central thread tying together the work of a large number of individual analysts. And because it is comparatively easy to show that many (though by no means all) local and especially traditional societies have been quite successful in avoiding the depletion and degradation predicted by the model underlying the tragedy of the commons, and in doing so without introducing conventional forms of private or public property, research in this field has been able to produce results that are widely seen as important (Ostrom *et al*., 2002). But this success has come at a price. In many cases, it is a stretch to characterize conditions on the ground as the same as those implicit in the tragedy of the commons model. Many real-world situations are better treated as cases of shared natural resources in which living resources straddle or cross back and forth between areas controlled by different individuals or as

cases of environmental externalities in which the actions of individual users in their own areas have an impact on the welfare of their neighbours in significant ways. The result is an effort to force a range of situations that differ from one another in important ways into a single conceptual framework. Predictably this leads to a growing uneasiness among those seeking to evaluate the results. If the universe of cases expands to encompass a range of substantially different situations, simple conclusions about avoiding the malign consequences of the tragedy of the commons become harder and harder to interpret in an unambiguous fashion.

What makes this problem particularly troublesome is that the literature on small-scale systems rests on confusing practices regarding the concepts of common-pool resources and common-property institutions. Common-pool resources or CPRs are generally defined as resources characterized both by subtractability or rivalness (that is, use by one member of a group diminishes the availability of the resource or its value to others) and by nonexcludability (that is, there is no way to supply the resource to one member of a group without making it accessible to others) (Ostrom, 1990). This is an intuitively appealing notion, but a little thought will suffice to make it clear that these defining attributes, and especially the characteristic of nonexcludability, are socially constructed. The extent to which most resources commonly regarded as CPRs – fish stocks and freshwater at the local level or the planet's life support systems at the global level – exhibit the characteristic of nonexcludability is a matter of the institutional arrangements created to manage human activities affecting them. Systems of rights designed to function as exclusion mechanisms have long been familiar regarding human uses of freshwater (Anderson, 1983). In recent years, a great deal of creative energy has gone into the development of limited-entry systems intended to serve as exclusion mechanisms in marine fisheries (National Research Council, 1999). The idea of creating tradable permits for emissions of carbon dioxide and other greenhouse gases is driven by the desire to introduce exclusion mechanisms applying to uses of the Earth's atmosphere as a repository for industrial wastes or residuals (Oberthür and Ott, 1999).

Nor can we take much comfort from the tendency of those who study small-scale systems to overextend the idea of common property in thinking about the institutional arrangements that have emerged to guide human–environment relations at the local level. Given the propensity of Garrett Hardin and his followers to proclaim that the introduction of public or especially private property arrangements is necessary to overcome the tragedy of the commons (Hardin, 1968), it is understandable that analysts of small-scale systems have made much of the fact that many local groups have succeeded in achieving sustainable relations with the environment without resorting to arrangements that are easily recognizable as either public property or private

property. But this understandable tendency has had confusing consequences for two distinct reasons. There are a number of options open to those seeking to avoid or overcome the tragedy of the commons. So the interesting question becomes: what are the relative merits in terms of criteria like sustainability, efficiency and equity of alternative mechanisms for limiting the sorts of depletion and degradation associated with open-to-entry access to various natural resources? Beyond this, real-world institutions often take on features that cannot be captured easily with simple distinctions among private, public and common property. Successful arrangements can and ordinarily do feature the evolution of significant restrictions on the actions of holders of property rights, and they regularly give rise to complex bundles of property rights that incorporate features of two or even all three of the main categories of systems of property rights. Under the circumstances, insistence on perspectives in which local systems are examined through the conceptual lens of common property can easily become a hindrance to understanding. What is needed is a wider vision in which the focus is on the role of various types of institutions as determinants of the course of human–environment relations.

These difficulties are compounded by the fact that those studying arrangements governing human–environment relations in small-scale settings have exhibited an overwhelming preference for the use of case study methods. The resultant research has yielded a rich collection of highly contextualized descriptions of discrete institutional arrangements. But these results are not conducive to the formulation and testing of generalizations showing how various combinations of institutional features are associated with well-defined outcomes described in terms of criteria like sustainability, efficiency and equity. Some participants in this stream of work (Elinor Ostrom is the most prominent example) have sought to extract design principles relating to long-enduring institutional arrangements by seeking to identify conditions necessary for longevity or sustainability from the many case studies compiled by students of small-scale systems (Ostrom, 1990). But these efforts have yet to produce a collection of well-tested generalizations spelling out specific relationships between clearly defined dependent variables and systems or combinations of property rights that fall naturally into categories like private, public and common property. If anything, the conclusions suggest that it makes more sense to cast this exercise more broadly as an effort to understand the role of institutions in human–environment relations in contrast to a study of the capacity of common property systems to prevent serious depletion or degradation of natural resources.

Lest anyone conclude that I am picking unfairly on the work of those who focus on small-scale systems, let me turn to a parallel set of observations about the work of analysts concerned with international or global environmental regimes. Studies of international regimes license the conclusion that

problem-specific governance systems can solve or substantially alleviate problems arising from human–environment relations under a variety of conditions. But this stream of research lacks the focus given to studies of small-scale systems by their concentration on the puzzle of explaining why the tragedy of the commons often fails to materialize in situations that seem, at least on the surface, to feature the conditions that Hardin and others identify as giving rise to the tragedy. As many analysts have pointed out, it is a straightforward matter to model the tragedy of the commons as an example of the collective-action problem known as the 'prisoner's dilemma' (Ostrom, 1990). Collective-action perspectives are also common among those who work on international regimes (Oye, 1986). But there is no presumption that all collective-action problems at the international level can be modelled as instances of the prisoner's dilemma. Analytically this can be interpreted to mean that the central concerns of those examining small-scale systems constitute a subset of the range of problems considered in studies of international regimes. Yet this does nothing to alter the fact that there is a certain diffuseness about regime analysis at the international level that contrasts sharply with the crispness characterizing the central thrust of studies of institutional arrangements guiding human–environment relations in small-scale settings.

This problem is exacerbated by the fact that there are lingering debates among students of international regimes regarding definitional matters that lead to complications when it comes to determining the boundaries of the universe of cases in this realm (Hasenclever *et al*., 1997). There are analysts who argue that a global forestry regime exists despite the absence of explicit or formal agreements in this realm, for instance, and others who argue that there is no global climate regime despite the fact that the UN Framework Convention on Climate Change is now over a decade old. Slowly but surely, leaders in this field of study are devising procedures to overcome this difficulty (Levy *et al*., 1995), but it is hard to deny that the prominence of definitional battles in this realm has diverted attention from more substantive matters and given rise to an understandable perception that the field is preoccupied with debates about the location of the starting line, in contrast to theoretically interesting debates about the roles that institutional arrangements play in guiding human–environment relations at the international level.

Further complications stem from the fact that studies of international regimes are afflicted by sectarian battles among proponents of divergent interpretive frameworks or paradigms and fragmented by methodological differences that few participants have tried to bridge. As to paradigmatic matters, the field includes neorealists who point to the role of power and, in the extreme, dismiss institutions as epiphenomena (Strange, 1983; Mearsheimer, 1994); neoliberals who emphasize the significance of interests and see institutions as products of processes of bargaining or negotiation; and

cognitivists who espouse the perspectives of social constructivism and focus on the role of ideas and discourses as the substrate on which institutions rest (Hasenclever *et al*., 1997). Epistemological and, in some cases, ontological differences make it hard to find procedures that can succeed in joining the efforts of these groups of researchers into an integrated stream of work on the roles that institutions play in guiding the course of human–environment relations. Although many participants have sought to stake out middle grounds in the resultant battles, others find themselves disagreeing profoundly about such matters as the value of positivistic approaches to knowledge in contrast to hermeneutics or phenomenology as suitable approaches to the study of international regimes. All this contributes to the sense that the members of this community of researchers are more concerned with conceptual and methodological matters than with advancing understanding of major substantive issues like identifying the conditions under which environmental regimes will produce outcomes that fulfil various criteria of sustainability, efficiency or equity.

Under the circumstances, it will come as no surprise that studies of international environmental regimes divide into several subsidiary streams that are seldom compared and contrasted in any systematic manner. Broadly speaking, there are three major subsets: studies by social scientists seeking to formulate and test empirical generalizations about international institutions (Haas *et al*., 1993; Young, 1999c; Miles *et al*., 2002), studies by economists endeavouring to extract conclusions relevant to international institutions from formal models of collective action (Sandler, 1997; Barrett, 2003) and studies by lawyers addressing the rapid growth of international environmental law (Chayes and Chayes, 1995; Sands, 1995; Sand, 1999). In an ideal world, the existence of these streams should be a source of strength; pooling insights from the different streams could help to subject creative ideas to constructive criticism and to trigger innovative thinking needed to generate new ideas. But, for the most part, this is not the course that this field of study has taken. Rather those contributing to one or another of the three streams typically talk past one another, publish in different journals, and make little effort to show how their findings relate to the findings of those associated with the other streams.[1]

My purpose in setting forth these observations is not to complain about the practices of those who think about environmental governance at one level of social organization or another. Rather I have sought to explain the following paradox: why is it that analysts who share so much in terms of their basic perspective on the role of institutions as determinants of the course of human–environment relations nevertheless find it so difficult to engage in a mutually beneficial dialogue, much less to work toward the development of a unified theory of environmental governance? The explanation I have offered

is a relatively simple one. Those who study the role of institutions in small-scale societies and in international society are divided by the research strategies they have developed, blinded by a number of conceptual and paradigmatic fixations, and separated by their commitments to divergent methodologies. Overcoming these differences in the interests of initiating a productive dialogue that could set us collectively on the road toward the creation of a unified theory of environmental governance will not be easy.

What is to be done?

One response to the story I have unfolded in the preceding section is to conclude that the obstacles to launching a productive dialogue between those who approach environmental governance from the bottom up and those who examine the same subject from the top down are simply too great to overcome. It is certainly possible that we may find ourselves forced to accept this conclusion at the end of the day. But I believe it would be undesirable to accept this outcome before making a concerted effort to explore methods for overcoming the obstacles. The issues are too important and the potential gains from a constructive dialogue among the groups of researchers in question are too great to give up on this prospect without a struggle.

What, then, can we do to foster a richer and more effective dialogue between those who think about 'governing the commons' in small-scale settings and those who think about international and even global environmental regimes in international society?[2] In my judgment, two distinct but reinforcing strategies are likely to prove fruitful in this context. We can focus on questions that can only be answered by pooling the insights drawn from bottom up and top down analyses or that constitute major puzzles in the work of both groups of analysts. In addition, we can organize common activities that bring leading representatives of the two groups together in settings that are conducive to the development of a productive and mutually beneficial dialogue.

Common questions

An obvious point of departure in this realm is to direct attention to what is becoming known as the problem of scale in human–environment relations. Although the problem of scale is a prominent concern throughout the natural sciences, social scientists are just beginning to recognize the relevance of this concern in the study of human systems. In the present context, the central question concerns the extent to which we can scale up findings derived from the study of small-scale or micro-level systems to apply to macro-level systems and, conversely, scale down findings resulting from the study of international institutions to apply to small-scale systems (Young, 1994b; 2002a). There are some obvious differences between micro-level and

macro-level systems that should instil in us a healthy sense of scepticism about facile generalizations in this realm. Whereas community (and culture more generally) looms large in many accounts of resource management at the local level, there is little evidence that community in any ordinary sense of the term is a major factor in the creation and operation of international environmental regimes (Agrawal and Gibson, 2001). For their part, international environmental regimes typically involve a two-step process in which states serve as the formal members and assume responsibility for eliciting compliance on the part of individuals, corporations and nongovernmental organizations operating within their jurisdiction, a process that has no clear-cut counterpart in small-scale systems. Significant as they are, these differences should not be taken to mean that the prospects for scaling up or down in this context are poor. What is needed is a cooperative effort on the part of members of the two groups of researchers to engage in a systematic effort to compare and contrast their findings regarding the roles that institutions play in guiding the course of human–environment relations.

Another area in which dialogue may generate important insights involves what has become known as 'institutional interplay'. Given the complexity of most institutional arrangements, it is perhaps understandable that analysts looking at both micro-level and macro-level arrangements have exhibited a pronounced tendency to examine specific institutions as though they were self-contained or stand-alone arrangements. Yet it has become apparent that distinct institutions interact with other arrangements not only horizontally or at the same level of social organization but also vertically or across levels of social organization. In the context of this discussion, the growing realization of the importance of vertical interplay is the relevant point of departure (Berkes, 2002; Young, 2002b). As the impacts of globalization spread, the performance of local institutions is affected by institutional arrangements operating at the national level and increasingly at the international level. There is no way to understand local occurrences affecting biological diversity in the Amazon Basin, for instance, without understanding international and even global forces affecting rates of deforestation in the region. Similar remarks are in order regarding the effects of local practices on the performance of international environmental regimes. Thus it is hard to understand trends in emissions of carbon dioxide without taking into account local forces that influence patterns of land use and developments relating to the burning of fossil fuels.

A somewhat different but equally interesting focus for dialogue centres on the relative merits of what are often called 'collective-action models' and 'social-practice models' as approaches to understanding the role of institutions as determinants of the course of human–environment relations (Young, 2001). The central issue here concerns the nature of the actors in such situations and

the forces that guide their behaviour. Thus collective-action models assume that actors are rational utility maximizers, focus on the logic of consequences (March and Olsen, 1998) and endeavour to explain the attractions of institutions to those who approach situations in terms of benefit–cost calculations. Social-practice models, by contrast, focus on the logic of appropriateness (ibid.), assume that actors respond to feelings of legitimacy or propriety as well as the impact of socialization processes, and emphasize the links between knowledge and institutions (Social Learning Group, 2001). Although it has not been widely discussed, the literature on small-scale systems, produced by a mix of anthropologists, economists and political scientists, has long featured a deep division between those whose work is rooted in one or the other of these approaches. With the rise of social constructivism, research on international environmental regimes has come to feature a similar division between mainstream collective-action perspectives and increasingly influential social-practice perspectives. The goal here is not to demonstrate which of the two types of models is likely to give rise to the most substantial additions to knowledge regarding the institutional dimensions of human–environment relations. Rather the existence of the same basic analytic division in studies of both micro-level and macro-level systems creates an opportunity for constructive dialogue between those who work on small-scale systems and those who study international environmental regimes.

Common activities

To promote the sort of dialogue described in the preceding paragraphs and to ensure the widest possible dissemination of the results, it would help to organize some common activities that would bring together leading scholars approaching the institutional dimensions of human–environment relations from the bottom up and from the top down. The organization of one or more workshops could play a major role in this connection. The National Research Council, which organized the project referred to at the beginning of this chapter, could take the lead in this connection. Alternatively a leading university-based research centre, such as the Center for the Study of Institutions, Population and Environmental Change (CIPEC) at Indiana University, could serve as the initiator and coordinator of such an endeavour. Yet another possibility is to make this endeavour a priority activity for the international project on the Institutional Dimensions of Global Environmental Change (IDGEC), a core project of the International Human Dimensions Programme on Global Environmental Change (Young, 1999a). IDGEC, which has identified both scale and institutional interplay as major analytic concerns and which has a worldwide network of individuals interested in this research agenda, could easily collaborate with organizations like the National Research Council or CIPEC in an activity of this kind.

Beyond this lies the option of interesting key scientific organizations in the prospect of developing a unified theory of environmental governance. Without doubt, the International Association for the Study of Common Property (IASCP) constitutes the principal arena for reporting and debating new work on the role of institutional arrangements in small-scale systems. Although the situation is less clear-cut with regard to international environmental regimes, it is fair to say that the International Studies Association (ISA) provides the most important arena for the presentation and discussion of new work on institutional arrangements at the international level. Ideally it would be desirable to persuade the IASCP and the ISA to co-sponsor efforts to compare notes across the divide between bottom up and top down approaches to the institutional dimensions of human–environment relations. It is not immediately obvious how two organizations of this sort can collaborate to address such a problem. Encouraging individual members to participate in each other's meetings is comparatively easy and may make a difference. Finding a way for IASCP and ISA to act as joint sponsors of one or more workshops designed explicitly to foster communication between bottom up and top down approaches might prove more effective. But the central issue is clear. There is a need for the major scientific organizations in this field to join forces to encourage key players in the two research communities to move beyond tokenism to a fully-fledged effort to evaluate the relevance of each other's findings for their own work and to identify ways to make common cause in developing new studies of interest to those working at different spatial scales.

Conclusion

Although analysts working on the institutional dimensions of human–environment relations have much in common with regard to the content of their research agendas, they have made little effort to compare notes concerning their findings. The result is that we have made little progress as a community of scientists and practitioners toward the development of a unified theory of environmental governance. In this chapter, I locate the causes of this situation in divergent research strategies, conceptual fixations and conflicting methodological practices. These are not easy barriers to overcome, yet there is no reason to throw up our hands and conclude that there is no way to bridge this gap. For starters, I recommend a conscious effort on the part of leading members of the two communities to formulate common questions and engage in common activities. There is no way to guarantee the success of such efforts, yet I believe that the potential benefits arising from the development of a unified theory of environmental governance are sufficiently large to justify a strategy of taking calculated risks in this realm.

Notes

* This chapter began life as a paper prepared for the 9th Biennial Conference of the International Association for the Study of Common Property, June 2002 and has been extensively revised and updated since that time.

1. For an exception that seeks to compare and contrast the works of international regime theory and economic theories of international cooperation, see Neumayer (2001).
2. 'Governing the Commons' is the title of Ostrom (1990).

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PART III

CAPITALISM, TRADE AND CORPORATIONS

12 Towards a political economy of global environmental governance

Peter Newell

The Global Environmental Outlook report for 2000 notes:

> The global human ecosystem is threatened by grave imbalances in productivity and in the distribution of goods and services…. This unsustainable progression of extremes of wealth and poverty threatens the stability of the whole human system, and with it the global environment … Environmental gains from new technology and policies are being overtaken by the pace and scale of population growth and economic development. The processes of globalisation that are so strongly influencing social evolution need to be directed towards resolving rather than aggravating the serious imbalances that divide the world today. (UNEP, 1999: xx)

Despite acknowledgments such as this, that patterns of globalization render the fragile systems of global environmental governance irrelevant or impotent, current theorization of the challenge of managing global environmental change within International Relations (IR) continues to look to international regimes for the answers. Even if it can be argued that this focus is appropriate for IR specialists wanting to account for institutional arrangements that have been constructed at the global level to protect the environment, this question cannot increasingly be divorced from an understanding of the nature of the contemporary global political economy and its implications for the future direction of environmental politics. This is especially so amid increasing evidence of private actors assuming public functions of regulation and stewardship with regard to natural resources. As Saurin notes, 'international political analysis continues to be conducted as if environmental goods and bads are produced, accumulated and therefore regulated by public organizations. They are not' (2001:80).

Taking evidence of the construction of regimes at the international level as an indication of institutional effectiveness, all would appear to be well amid proliferating and denser forms of global cooperation on the environment than at any point in history. When combined with the 'success' of the ozone regime, the key elements of which were concluded amid significant scientific uncertainty, the fact that the climate regime has two agreements to its name and managed to conclude them over a relatively short period, the track record appears quite impressive. Yet, as the quotation from the UNEP report makes clear, environmental devastation proceeds apace, apparently unchecked by

this flurry of global institutional activity. Given this, the question becomes one of how to account for the ineffectiveness of current policy responses to environmental problems.

There are many possible explanations, but I argue in this chapter that many of the answers can be derived from the complex relationship between the global political economy and patterns of environmental change. Tracking shifting patterns of trade, production and finance will tell us much about the sources and drivers of environmental change. Likewise, studying the investment decisions of firms, banks and government agencies and the political mobilization of these actors in environmental debates will provide the basis for understanding what forms of action are possible and practicable in the contemporary neoliberal global economy. Both in terms of their influence, financially and politically, as well as their ecological footprint, they dwarf the role of state environmental agencies that remain the point of reference for IR specialists.

This seemingly banal and increasingly obvious proposition implies, nevertheless, a realignment of our priorities for theoretical enquiry and practical application. The appeal of existing modes of engagement is that they draw on prevailing theoretical orthodoxies and assumptions about the role of international institutions, the nature of the international system and the organization of global politics. Normatively, however, if we start from a desire to understand the political nature of environmental change and a commitment to identifying the most effective types of political intervention, we assume an obligation to think outside of traditional and convenient theoretical parameters.

There is not space here to rehearse the argument fully that the key pillars of the global economy (trade, production and finance) are central to understanding patterns of natural resource use and form a more appropriate starting point for an enquiry into the sources of environmental degradation, as well as the context within which short-term solutions will have to be found. To illustrate the broad argument that these features of the global economy have a strong bearing on policy responses to patterns of environmental change, it is necessary to identify in specific terms the ways in which they enter and shape the world of environmental politics. A case study on the 'marketization' of environmental policy helps to demonstrate this. It highlights the intimate connection between the structure of the global economy, the institutions set up to manage it and the ideologies that rationalize and legitimate that system.

Marketizing environmental policy

The purpose of this section is to demonstrate the range of forms that marketization takes. Marketization, in this context, refers to a trend towards viewing the market as the source of innovation, efficiency and incentives

necessary to combat environmental degradation without compromising economic growth. In this sense it is legitimized by broader notions of 'ecological modernization' which set themselves apart from 'apocalyptic' accounts of the impact of globalization on the environment by identifying evidence of environmental reforms taking place either in spite of, or in some cases because of, globalization (Mol, 2003: 53). In policy arenas this belief system is advanced by key actors such as the World Bank that are able to use their economic power to promote the marketization of environmental policy globally. Marketization is more than an ideology, however. It is a practice that has become increasingly popular within national systems of environmental governance, as well as globally. It is shown below that the use of market tools and reliance on market actors to deliver environmental improvements are now entrenched characteristics of the modern landscape of global environmental politics.

Marketization refers, therefore, to an ensemble of strategies of market governance including practices of privatization and commodification of natural resources which derive from a common belief in the ability of markets to provide the public good of environmental protection in the most efficient way. Taken in isolation, none of the individual components of this ensemble of practices provides sufficient evidence of a trend towards marketization. It has also been argued elsewhere that this trend takes on distinct forms in different parts of the world and is certainly, therefore, neither hegemonic nor uncontested (Newell, forthcoming). Taking the strategies together, however, we can observe the myriad ways in which the possibilities of environmental politics are being defined according to their ability to serve the broader end of global market expansion. As a case study for this chapter, 'marketization' therefore provides a useful entry point for exploring the importance of a political economy approach to understanding contemporary forms of global environmental governance.

Market solutions

The privileging of market-based solutions to environmental problems is one obvious manifestation of this trend. From the use of tradable permits to tackle regional problems such as acid rain in North America to discussions about incentivizing global action on climate change, the exchange of 'pollution rights' through the market has become an increasingly popular way of 'internalizing' the costs of environmental action. The ideology of market efficiency is invoked to justify the claim that permit trading can produce large cuts in emissions at a lower cost than traditional 'command and control' measures by providing financial incentives for heavier polluters to reduce their emissions and a reward system for lower polluters that are entitled to sell surplus permits (Lunde, 1991). The inclusion of flexible mechanisms that

create markets for pollution has been a key precondition for the participation of leading polluters in the climate change negotiations.

Ecological taxation is another market tool that has become popular in academic and policy circles. It is sold as an instrument that can make the polluter pay at source for the production of pollution, thereby incentivizing measures to reduce its generation in the first place. It is far more popular in Europe than in the USA, where opposition to taxes in any form is deeply entrenched. European governments have also encountered political opposition to the implementation of measures, however, given the high rates at which taxes often have to be set in order to generate changes in behaviour. The European Union's carbon tax ended in spectacular failure after Europe's industrialists mounted a successful offensive to crush the proposal (Newell and Paterson, 1998). While environmental taxation continues to be applied, therefore, it should be considered one of the weaker areas of the marketization of environmental policy, in most cases because of the resistance of market actors to being taxed.

The environmental labelling of products has been another surrogate for environmental regulation, allowing market preferences for greener products to determine acceptance of higher environmental 'standards'. In the case of biotechnology, labelling has been used to try and reassure consumers about the safety of foods containing genetically modified (GM) ingredients. This, and the fact that some firms regard labelling as positive branding of an 'improved' product, has allowed the labelling of products to take off (Newell, 2003). In this instance, labelling has served as a post hoc mechanism for notifying risks associated with products that have been approved by a regulatory system which lacks the trust of the public. In other instances, positive brand recognition is sought to reward investment in responsible environmental practice. The Forestry Stewardship Council and the Marine Stewardship Council operate in this way, for example. As with other examples of marketized environmental policy, such schemes are at once born of a failure of state regulation, but also come to be seen as an adequate substitute for it.

The market is also held up as the answer to broader questions of global institutional reform in relation to environmental issues. Whalley and Zissimos (2001) call for a World Environment Organization that would internalize environmental costs through global deal brokering of financial funds between the developed and developing world. The appeal of such a proposal for its advocates is that it provides the possibility of bypassing the messy politics of allocating responsibility and dealing with distributive justice by creating an 'open' market of supply and demand of environmental goods. Such proposals have been criticized on grounds of political practicability and desirability and ecological effectiveness (Newell, 2001b), but reflect nevertheless the pervasive logic of market solutions to problems that are fundamentally political or institutional in nature.

Private regulation

Alongside the trend towards using the market as a tool of environmental regulation, the persistent questioning of the effectiveness of state-based action associated with neoliberalism has manifested itself in the environmental field in the systematic privileging in discourse and practice of forms of private and 'soft' regulation. This bias, evident in the publications of the World Bank, as well as the reports of bodies such as the Business Council for Sustainable Development, reflects the preferences of many corporations for voluntary, flexible and market-based forms of regulation (Schmidheiny, 1992; World Bank, 2000). It has also become the favoured option of companies themselves, providing for a more rapid process of standard setting and with the added attraction of pre-empting calls for state-based regulation. Concrete manifestations include the growth of codes of conduct and equivalent voluntary measures, as well as standards set by industry itself, such as the 'Responsible Care' programme in the chemical industry. At the international level, examples would include the Business Charter for Sustainable Development and the standards set by the International Organization for Standardization (ISO) which prescribes global standards of environmental management.

For Clapp (1998), such standards amount to the 'privatization' of global environmental governance. She shows how the growth of private standards-setting bodies has led to hybrid regimes whereby both states and private authorities are heavily involved in the creation and maintenance of international principles, norms, rules and decision making procedures. The ISO 14000 standards, in particular, are being adopted by standards-setting bodies in some states as national standards of environmental management and are now recognized by the World Trade Organization (WTO) as legitimate public standards (Finger and Tamiotti, 1999), effectively creating an international ceiling for environmental management systems. Industry has been very supportive of ISO 14000 standards, hoping that adherence to them may pre-empt or soften present and future environmental regulations. Advocates of ecological modernization celebrate such attempts at harmonization of regulation as 'One of the most obvious contributions of globalization processes to the strengthening of environmental reform' (Mol, 2003: 103). The legitimacy of bodies such as the ISO to establish global norms for environmental behaviour is in question, however, when it is not clear that their membership and procedures are open to the participation of developing countries that are currently under-represented in the organization (Krut and Gleckman, 1998). There are also questions regarding the overall effectiveness of standards set by market actors for market actors, but which carry enormous implications for governments and publics alike.

Setting product standards that facilitate market access is a far cry from effective action to regulate the environmental impacts of business activity.

There has been a notable lack of recognition in international environmental agreements of the role of TNCs in causing environmental problems. Provisions within environmental agreements that question, however implicitly or indirectly, the impact of increased market activity on the environment have often been subject to veto. The issue of TNC regulation was dropped from the UNCED agenda and, while a UN body was set up in 1973 to address the issue, it was unable to conclude negotiations on a code of conduct and was subsequently dissolved. This has raised concern about the imbalance between the promotion and protection of investor rights over investor responsibilities in international law, regulation *for* business rather than regulation *of* business (Newell, 2001a). The attempt to create a Multilateral Agreement on Investment and the WTO TRIPs (trade-related intellectual property rights) agreement are examples of regulation *for* business aimed at facilitating investment opportunities and creating protection for investments. They are indicative of a broader power shift in which regional trade organizations, such as NAFTA (North American Free Trade Agreement), permit companies to challenge governments and local authorities about environmental restrictions on their operations.

Property rights

A third way in which marketization is promoted as a solution to environmental problems is through emphasis on the role of property rights in incentivizing action on the environment. In conventional economics, property rights are central to the efficient functioning of the market. In practice this emphasis takes a number of forms, from the protection of investor rights through intellectual property protection to advocacy of the World Bank 'enabling' vision of the state in which enforcement of property rights becomes a central state function (World Bank, 1987). In the former case, the purpose of the World Trade Organization's TRIPs agreement, as it applies to environmental resources, is to allow for the patenting of living organisms. This has prompted controversial debates over access to genetic resources, especially where the rights of multinational companies are seen to conflict with the traditional rights of farmers and communities to save and exchange seed (Yamin, 2003). The question of the extent to which individual property rights can apply to living resources held on a communal basis is in many ways a test case of how far the logic of commodification can be extended to all areas of life.

Property rights also play a significant part in some versions of proposals for a World Environment Organization (Whalley and Zissimos, 2001), discussed above. In order for deal brokering to proceed along the lines suggested, property rights would have to be allocated and enforced. This has raised concerns about who would allocate and enforce such property rights, particularly in settings where rights of access and use of natural resources are highly

contested. It also raises questions about the effectiveness of marketizing environmental goods in this way, bypassing as it does complex questions of institutional reform and the causes of environmental degradation (Newell, 2001b).

Marketizing environmental rules

Besides the prominence given to market-based solutions to environmental problems, described above, there has been increasing policy (and academic) attention to the relationship between rules aimed at facilitating international trade, investment and market integration, on the one hand, and those whose aim is to provide a framework for environmental protection, on the other. Despite the explicit, and often implicit, anti-state bias of many of the solutions proposed above, it should come as no surprise to students of political economy that markets rely, not just on property rights for their operation, but also on institutions to create and enforce rules of engagement. The contest, as was mentioned above, is in many ways between *regulation for* and *regulation of* business.

The most obvious manifestation of this conflict is the debate about the appropriate relationship between trade rules and MEAs (multilateral environmental agreements). Environmentalists are concerned about the ways in which the use of policy instruments aimed at protecting the environment are increasingly questioned on the grounds that they are incompatible with trade rules and disciplines. Expressing this concern, LeQuesne (1996: 73–4) notes:

> current WTO rules provide an inadequate framework for sustainable development precisely because they do undermine governments' ability to legislate in favour of environmental sustainability … current trade rules discourage governments from pursuing a strategy of internalising costs precisely because they prohibit governments from protecting their domestic industry from cheaper competition from countries who have not internalised costs to the same extent.

In the past, for example, bans, border taxes, subsidies and other trade restrictions have been used to discriminate explicitly between environmentally destructive and environmentally benign activities. While economists may approve of the use of carrots and sticks to create incentives and disincentives regarding behaviour towards the environment, they strongly disapprove of these forms of direct intervention in the market. As van Bergeijk (1991: 106) argues, 'A solution on the basis of trade impediments will waste the potential contribution that international specialization can make to global environmental efficiency … liberalizing trade is probably a necessary (but not sufficient) condition for sustainable development'.

Most problematic for environmentalists is the fact that discrimination on grounds of production process is prohibited by trade rules, as the tuna-dolphin

and many subsequent cases have clearly demonstrated. This is the basis of their campaign for the incorporation of PPMs (process and production methods) into trade rules. It is increasingly difficult to maintain a distinction between production processes and products in the light of growing emphasis on life cycle approaches, the popular use of ecolabelling and efforts to address the use of energy which are necessarily caused by the PPM and not the product. As LeQuesne notes (1996: 81), 'from an environmental point of view, there is no meaningful distinction to be drawn between environmental harm which is generated by a product, or the harm generated by its process and production methods'.

A related concern in this regard is the use of trade-restricting measures in MEAs. Many such agreements employ, in different ways, restrictions on the trade in substances considered to be harmful to the environment. The Montreal Protocol on substances that deplete the ozone layer, for example, restricts the trade in CFCs to those that have signed up to the accord, thereby excluding non-parties from the trade in ozone-depleting substances and therefore violating the most-favoured nation principle (Brack, 1996). The rationale behind this is to create positive incentives for countries to comply with the accord and reduce the potential for free-riding by non-parties to the Protocol. Similarly the Basle convention on the trade in hazardous wastes outlaws certain forms of trade (Krueger, 1999). The use of trade embargoes in these instruments violates WTO prohibitions against quantitative restrictions.

The CTE (Committee on Trade and Environment) of the WTO has identified 22 MEAs that require or cause governments to implement trade measures that may violate their WTO obligations, yet the use of TREMs (trade-related environment measures) in these MEAs has not been challenged to date (Morici, 2002). The 1996 Singapore ministerial meeting endorsed the CTE finding that members may bring to the WTO disputes concerning MEA-related trade measures, but no conclusions have been reached on proposals to modify Article XX of the GATT to incorporate MEAs explicitly (Williams, 2001). What is interesting is that their use in new legal instruments has been shaped by the need to anticipate and pre-empt conflicts with trade rules. The 2000 Cartagena Protocol on Biosafety provides a case in point in this regard. The preambular language to the Protocol reflects strong differences of opinion between the EU and USA over what was known as the 'savings clause' determining the extent to which the provisions contained in the Protocol should be subordinate to the trade rules of the WTO. There is growing resistance, however, to the way in which environmental agreements are assumed to be subservient to trade regimes. While some would like to see a general exception for environmental measures from WTO rules (Morici, 2002), others endorse a more full frontal attack on the mentality of 'the market über alles' (Hines, 1997: 5).

It is often also the case that market integration is the driving rationale for environmental measures. The imperative of constructing a 'level playing field' often requires harmonized product standards and environmental policy provides a means to this end. Grant *et al*. (2000) show how key environmental initiatives within the EU are regarded as valid only to the extent that they enable completion of the internal market. European Commission White Papers on energy policy, for example, spell this out explicitly. Policy has to be rationalized in terms of its contribution to this aim and in broader terms to the achievement of economic growth. For some environmentalists, there is a disturbing irony in the fact that claims for environmental action have to be validated according to their ability to contribute to the very patterns of economic growth that are threatening sustainability in the first place.

Accounting for the marketization of environmental policy

This section of the chapter seeks to account for the manifestations of the trend towards the marketization of environmental policy, described above. It is important to understand the conditions in which the marketization of environmental policy has come about in order to understand how deeply and over what time frame it is likely to leave an impression on the conduct and effectiveness of contemporary global environmental politics. The combination of material, institutional and discursive explanations that are advanced form the basis of a broader political economy of environmental governance (Levy and Newell, 2002).

A prevailing context of corporate-led globalization has to feature in any explanation of marketization. To the extent that the forces of globalization constrain state autonomy, this clearly has implications for environmental policy. Businesses fearing the onset of environmental regulation have repeatedly invoked the threat of capital flight and relocation to a less burdensome regulatory climate. Often it is the case that claims regarding the economic impact of environmental regulations on firms bear no relation to the actual costs. The costs of meeting environmental standards constitute a small part of the overall costs faced by industry and certainly pale into insignificance compared with other factors such as labour, with costs to industry from domestic environmental regulation estimated rarely to exceed 1.5 per cent of overall production costs (Williams, 2001: 5). Nevertheless, the threat to relocate operations has a direct impact on the possibilities of environmental policy. While the extent of this trend and evidence of the resulting 'race to the bottom' in environmental standards are contested, there does seem to be evidence of 'regulatory chill' where governments refrain from adopting new environmental regulations or demonstrate a reluctance to enforce existing regulations for fear of deterring potential investors. In this environment, it becomes easier to see the attraction of voluntary and market-based solutions

which require fewer interventions from government and reduce the risk, therefore, of being disciplined by investors for interventions in the market.

In this regard, we should recall that capital mobility merely adds to a plethora of strategies available to firms seeking to contest regulatory developments which threaten their interests and to promote market solutions. Party funding, contribution to the tax base of governments and the employment opportunities that firms create afford corporations extensive structural influence. We are reminded of this by current events in the USA where 'roll back' of environmental measures has proceeded apace under President Bush at the behest of firms that contribute significantly to party coffers, most especially the oil companies with whom the president has notoriously close ties. This national level lobbying exists alongside patterns of intense corporate lobbying at the international level, either against types of regulation threatening to their interests, or in favour of market-enabling regimes (Levy and Egan, 2001). In understanding efforts to promote the marketization of environmental policy, it is also important to note the role of conservative environmental NGOs that have leant their support to the use of market measures such as permit trading and ecological taxation. Elite NGOs such as ED (Environmental Defense) and NRDC (Natural Resources Defense Council), part of the Washington 'Big 10', have also enabled the growth of voluntarism by working with firms on particular projects, such as the infamous collaboration with McDonalds (Murphy and Bendell, 1997). Often these are successful in yielding short-term environmental benefits, but politically they serve to entrench the acceptability of partnership-based voluntarism over state-led regulation.

Another important development has been the way in which the lack of state capacity to enforce environmental regulation has been invoked as an added validation for marketized environmental policy. This lack of capacity has been used as an argument for self-regulation by industry or for the adoption of private market standards such as ISO 14001, which can largely bypass state authority. But it is also used to underscore the advantages of delivering pollution abatement through broader market reform. The World Bank's *Greening Industry* report, for example, advocates national level economic reforms to enable environmental improvements. Unsurprisingly privatization, liberalizing trade and the removal of subsidies are highlighted in this regard (World Bank, 2000). What is lacking in such policy recommendations is a recognition of the key role for a strong state in tax collection and redistribution such that problems of inefficiency and corruption cannot so easily be ignored by looking to the market for answers.

At a broader level, the shift away from 'command and control' measures, on grounds of efficiency and effectiveness, has also been justified by the failure of Soviet-style environmental regulation and the ecologically disastrous legacy left by former Communist regimes in Central and Eastern Europe.

Such experiences are cited as vindication for the argument that state-led regulation generates waste and inefficiency and fails to harness the power of the market to the goal of environmental reform. While the World Bank recognizes the importance of the state for allocating property rights and providing legal frameworks for the orderly conduct of market transactions, the 2003 World Development Report on 'Sustainable Development in a Dynamic Economy' advances the idea that the spectacular failure to tackle poverty and environmental degradation over the last decade is due to a failure of governance, 'poor implementation and not poor vision' (Foster, 2002). The report notes, 'Those [poverty and environmental problems] that can be coordinated through markets have typically done well; those that have not fared well include many for which the market could be made to work as a coordinator.' The challenge for governments is, therefore, to be more welcoming of private actors through, among other things, 'a smooth evolution of property rights from communal to private' (World Bank, 2003: 3.22). As the Environment Group at the Institute of Development Studies (2002) comment in relation to the report:

> Looking only at how the 'dynamic economy' helps to open up options and not at the ways in which new economic forces and relations also constrain what policy interventions are possible, presents a one-sided reading of the challenges of achieving sustainable development in a context of globalisation.

In reflecting on the role of the Bank, we are necessarily drawn to the politics of knowledge production and the knowledge brokers that provide the intellectual legitimation for the project of marketizing environmental policy. Besides the broader political and material shifts described above, the privileging of market solutions to environmental problems in policy discourse also results from the privileged role of economists in environmental decision making. While the high profile of scientists in environmental debates has been subject to increasing scrutiny through debates about the sociology of science, economists have managed to preserve a protected status, despite critiques from academics and activists (Jacobs, 1994). The use of conventional cost–benefit analysis as a basis for making judgments about the costs associated with particular environmental policy measures, and therefore for marketizing environmental entitlements, has drawn particular fire. The Global Commons Institute (GCI) became embroiled in a dispute with the IPCC (Intergovernmental Panel on Climate Change) over the use of cost–benefit models which drew on assumptions that the life of people in many less developed countries was worth one fifteenth of the value of someone living in the more developed world. 'Willingness to pay' (rather than willingness to accept) assumptions allowed economists to arrive at such controversial assumptions, dubbed the 'economics of genocide' by GCI (Newell, 2000). Despite efforts to contest

the ethics of rationalizing action and inaction on the environment in such ways, cost–benefit analysis continues to be the most popular way of assessing the costs of environmental policy choices.

We can see, therefore, how a potent combination of material, institutional and discursive forces combine to advance the marketization of environmental policy. Capital mobility and demands for global market access place constraints on policy options. The global neoliberal institutions of the World Bank and the World Trade Organization play their part in creating and institutionalizing the conditions in which interventions in the market are regulated and constrained. The assumptions upon which their policy prescriptions and agreements are founded are supported by the work of neoliberal economists that serves to reinforce the idea that market solutions to environmental problems are more effective and efficient than state-based alternatives.

None of these forces is static or uncontested. Though promoted strongly through global institutions and the actions of private actors, marketization is not accepted or enforced evenly or predictably. The resources and influence of its proponents guarantee it global salience and purchase among policy elites, but diverse regulatory cultures and institutional structures can dilute or subvert its reach and intent. Global market actors and the institutions that act on their behalf have also been forced to accommodate the concerns of environmentalists as well as opposition from many developing countries on the periphery of the world economy. The reality of the way markets operate in practice has also brought about a belated recognition of the importance of 'governance' and the role of the state, as the World Bank's World Development Report of 2003, discussed above, makes clear. Possibilities for redefining a new environmental politics, one that is not subjugated to the logic of the market or the rules that are created to ensure that environmental goals do not restrict the globalizing ambitions of capital, will continue to proliferate in the future. This can be expected in a context in which popular concern continues to mount about the benefits of a global economic system organized around the principle of 'market über alles'. As member, negotiator and implementer of the agreements that circumscribe environmentally motivated interventions in the market, as the source of authority to regulate business actors, and the primary ideological battleground for policy debate, the state will continue to provide the venue for many of these contestations in the first instance.

Conclusion

The marketization of environmental policy provides an illustrative case of a broader trend whereby the causes of environmental degradation emanating from global economic processes are increasingly protected from policy interference. This trend is manifested in a number of ways. We have seen the increasing use of trade rules to restrict the conditions in which health

and environmental concerns can be invoked to justify a barrier to trade. This carries serious implications for governments' autonomy to act on risks, environmental or otherwise, that are of concern to the publics they claim to represent. We are also witnessing concerted efforts to reduce governments' scope to pursue policies which discriminate against environmentally destructive forms of investment. Attempts to conclude investment agreements to secure investor rights and provisions within regional trade accords that permit investors to sue governments for loss of income from environmental regulations provide evidence of this. It is to be expected, therefore, that future environmental negotiations will increasingly be conducted in the 'shadow' of the WTO, operating in a constrained space in which trade-restrictive environmental measures that have proved to be so central to the effectiveness of MEAs in the past will increasingly be off the menu of possible policy options.

As the beneficiaries of market-enabling regimes and of market-oriented environmental solutions, we increasingly need to hone our analytical lenses on the activities and priority-setting processes of multinational companies and leading financial institutions in order to gauge signals about the future direction in which policy may evolve. Insofar as shifts in the corporate strategies of leading firms circumscribe the policy space available to environmental regulators whose actions, in turn, bring about shifts in technological choices, investment options and production processes, we need more dynamic theoretical frameworks for describing and accounting for these reciprocal relationships. Levy and Newell (2002) have constructed one possible framework for such an enquiry, and issue-specific (Newell, 2003) and comparative work (Levy and Newell, 2000) that has sought to understand and weight the significance of different drivers of corporate behaviour in relation to environmental policy, suggests future directions for research. Greater attention is needed, though, to the role of financial actors (banks, stock markets and credit rating agencies) that steer flows of finance in the global economy, with enormous implications for cycles of environmental degradation.

Insofar as material, institutional and discursive patterns of power interact and reinforce one another in the ways described above, theoretical tools drawing from the neo-Gramscian tradition in International Relations appear to offer significant analytical traction (Andree, 2005; Newell, 2000; Levy and Newell, 2005). To feed the potential of these new forms of theoretical enquiry requires a different empirical focus, one which seeks to explore the ways in which particular environmental practices are embedded within broader relations of political and economic power which determine the limits of the possible and the likely sites of resistance. Increasingly, then, we need to understand the intimate relationship between the economic forces that generate environmental change and the political coalitions and institutional forms

which assume the responsibility for delivering environmental protection. It is not enough to study global actors and institutions that identify themselves as environmental in isolation from the global economic processes in which they are embedded and which ultimately they will have to regulate if they are to make a difference.

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13 Environmental governance … or government? The international politics of environmental instruments

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Academia is awash with neologisms, none more pervasive than 'governance'. But what is governance and to what extent has it taken root in the environmental sector? In this chapter, we draw upon recent work (Jordan *et al*., 2003a; 2003b) to address these two questions. In so doing, we analyse the deployment of so called 'new' environmental policy instruments (NEPIs) in the European Union (EU) and seven member countries, namely Austria, Finland, France, Germany, Ireland, the Netherlands and the UK. The addition of Australia offers an insight into whether the same dynamics of change are present within a broadly comparable, non-EU state.

Broadly speaking, policy instruments are the tools by means of which governments seek to achieve policy goals. By 'new' environmental policy instruments, we mean non-regulatory tools of environmental policy such as market based instruments (MBIs) (that is, ecotaxes and tradable permits), voluntary agreements (VAs) and ecolabels. As traditional ('command and control') regulation is widely regarded as the very quintessence of *government* (see Héritier, 2002b), a significant uptake of NEPIs could be regarded as heralding a new era of environmental *governance*. In this chapter we suggest that the uptake of NEPIs relative to traditional regulatory instruments provides a simple but concrete way to assess how much change away from traditional government towards new modes of governance has taken place in the environmental field. If the adoption and implementation of NEPIs relative to regulation in our nine cases is not widespread, perhaps governance is not as widespread or as novel as many analysts seem to assume.

There are certainly many more NEPIs in place today than there were even ten years ago. In 2000, the European Commission reported that the number of MBIs had grown 'substantially' (CEC, 2000: 2) since 1990. Voluntary agreements and ecolabels are also becoming much more prevalent (EEA, 1997; Jordan *et al*., 2003a). This shift is not, of course, confined solely to Europe. In a wide-ranging assessment, Golub (1998: xiii) recently concluded that the world is witnessing a 'fundamental transition' in environmental policy. If a transition is indeed what is taking place, what does it tell us about the

putative shift from government to governance? So far, the term 'governance' has generated a great deal of theorizing but very little detailed, comparative empirical work. There is now a growing recognition that such work is needed to add flesh and policy relevance to the continuing theoretical discussions (Flinders, 2002: 55). By carefully documenting and comparing the use made of NEPIs in our nine cases, we hope to offer a simple but revealing empirical test of the claim that governance has replaced, to a significant extent, environmental government.

On environmental government and governance

Traditionally the word 'governance' was used as a synonym for 'government' (Stoker, 1998: 17), but more recently political scientists have started to use it to refer to 'a *change* in the meaning of government … a *new* process of governing; or a *changed* condition of ordered rule; or the *new* method by which society is governed' (Rhodes, 1996: 652–3). For Bevir *et al*. (2003: 13), governance is a 'shorthand phrase for encapsulating the changing form and role of the state in advanced industrialised societies'. The two main sub branches of political science, namely international relations (IR) and comparative politics, use the term 'governance' in slightly different ways. For instance, IR scholars tend to be more interested in the international drivers and manifestations of governance in a global society that has never experienced world government (Rosenau and Czempiel, 1992; Rosenau, 1992: 8–9), whereas comparativists are usually more interested in studying how shifts to governance affect the internal attributes and functions of 'the state' *qua* government.

However, these differences should not be overplayed, as both branches are united on a number of fundamental points. First and foremost, both implicate the same drivers in the putative shift from government to governance, namely globalization, Europeanization (Jordan and Liefferink, 2004), new public management and the emergence of new, cross-cutting policy problems such as the environment, that demand more cooperative solutions to collective action problems (Héritier, 2002b; Rosenau, 2004: 60–68; Richards and Smith, 2002).

According to Stoker (1998: 17), the term 'governance' refers to the emergence of 'governing styles in which boundaries between and within public and private sectors have blurred'. The second fundamental point of agreement is that this process of blurring is associated with a decline in central governments' ability to steer society. Pierre and Peters (2000: 83–91) have argued that the state is losing its steering ability as control is displaced: upwards to regional and international organizations such as the EU; downwards to regions and devolved localities; and outwards to international corporations, NGOs and other private or quasi-private bodies.

Thirdly, governance and government should not be treated as fixed entities, but two poles on a continuum of different governing types. If the extreme form of government was the 'strong state' in the era of 'big government' (ibid.: 25), then the equally extreme form of governance is a self-governing network of societal actors. Crucially, such networks 'involve not just influencing government policy but taking over the business of government' (Stoker, 1998: 23). They are 'self organizing' in the sense that they actively resist government steering (Rhodes, 2000: 61). To use Osborne and Gaebler's (1992) popular distinction between steering (setting goals) and rowing (delivering those goals), they 'steer' as well as 'row'.

Finally, governance is characterized by a growing use of nonregulatory policy instruments, which are commonly viewed as being emblematic of governance. Writing from an IR perspective, Rosenau (1992: 4) claims that governance equates to policy 'goals that may or may not derive from legal and formally prescribed responsibilities and do not necessarily rely on police powers to overcome defiance and attain compliance'. Working from an intra-state perspective, Gerry Stoker (1998: 17) similarly claims that: 'the *essence* of governance is its focus on governing mechanisms *which do not rest on recourse to the authority and sanctions of government*' (emphasis added).

Using the definitions supplied above, the growing popularity of NEPIs strongly suggests that environmental government has largely given way to environmental *governance*. In the remainder of this chapter, we subject this widely shared assumption to two forms of empirical testing. We begin by unpacking the term 'NEPI' to see what role the state plays in relation to each subtype, paying particular attention to who or what 'steers' and 'rows' society. Then we assess the spatial and temporal distribution of NEPIs across the nine cases. If the overall uptake of NEPIs has been sudden and very strong, then perhaps we are witnessing the dawn of environmental governance. But if regulation remains important or NEPIs are not being uniformly adopted, perhaps the shift is less pronounced.

Before moving on, it is worthwhile explaining why instrument use in Western European environmental systems constitutes such a good empirical test of the putative transition from government to governance. The main reason is that environmental policy is inherently *regulatory* in nature (Jordan, 2001: 4645), although regulation inevitably has distributive and redistributive consequences (Lowi, 1964). Because environmental damage normally has its origins in otherwise socially legitimate activities like energy and food production, the state has often stepped in to police the consumption of public goods by limiting the level of damage that one section of society can impose upon others. Regulation has been the preferred tool for doing this in all eight of our countries for many decades (Jordan *et al*., 2003b). This strong, histori-

cal legacy would make any consistent shift from traditional regulation to NEPIs in all or most of our nine cases, all the more significant.

What are 'new' environmental policy instruments?

Broadly speaking, policy instruments are the 'myriad techniques at the disposal of governments to implement their policy objectives' (Howlett, 1991: 2). Traditionally regulation has been the mainstay of environmental policy, but for a number of reasons (see Jordan, *et al*., 2003b), policy makers have started to explore, and in many cases adopt, 'new' tools of environmental policy. In the analysis that follows, we will show that 'new' is in fact a relative term; that is, 'new' instruments can only be categorically identified by looking at the political/policy context and time period in which they are used. Thus what is 'new' in one country may already be an established part of the taken for granted 'repertoire' of policy instruments in another (Anderson, 1971: 122; Bennett, 1988: 439). In this chapter, we concentrate on three distinct subtypes of 'new' instrument, namely MBIs, VAs and ecolabels.

Market-based instruments

MBIs 'affect estimates of costs of alternative actions open to economic agents' (OECD, 1994: 17). The total number of MBIs used in OECD countries has grown steadily since the early 1970s, as has the range, which now extends from subsidies through to emission charges and tradable permits (OECD 1998). The OECD distinguishes between four main types of MBI: ecotaxes (including charges and levies), tradable permits, subsidies and deposit-refund schemes. Because of space constraints, we only focus on ecotaxes and tradable permits.

Voluntary agreements

The first VAs appeared in Japan in the 1960s, but there is still no commonly agreed definition of what they actually are. The European Commission has adopted the following broad definition: 'agreements between industry and public authorities on the achievement of environmental objectives' (CEC, 1996: 5). Because this does not sufficiently differentiate between the main subtypes, we shall use the following typology, produced by Börkey and Lévèque (1998) for the OECD. This distinguishes between unilateral commitments, public voluntary schemes and negotiated agreements. *Unilateral commitments* consist of self-declaratory environmental improvement statements and/or programmes instigated by individual companies or industry associations, and communicated to their stakeholders. At their simplest, these may consist of a promise to phase out voluntarily a certain chemical substance (for example, chlorofluorocarbons). More sophisticated examples would include the corporate social responsibility (CSR) activities promoted by

multinational companies like Shell. *Public voluntary schemes* (PVS) are established by public bodies, which define certain performance criteria and other conditions of membership. Individual companies are free to decide whether or not to join, although the membership criteria are normally agreed in advance, often through a business association or standard setting authority (for example, the International Organization for Standardization (ISO)). Finally *negotiated agreements* are more formal agreements between industry and public authorities. They aim at addressing particular environmental problems. Negotiated agreements may or may not take the form of legally binding contracts, but normally their content is published in the public domain.

Ecolabels

Ecolabels mainly rely on moral suasion by providing consumers with information about the environmental impact of products and services (Jordan *et al*., 2004). By providing information to consumers in a standardized manner, they seek to facilitate more informed purchasing decisions. The OECD differentiates between three subtypes: externally verified, multi-issue schemes (Type I); unverified self-declaratory schemes (Type II); and single issue schemes (Type III).

A typology of instrument types

Table 13.1 provides a typology of the main instrument types delineated according to who determines the ends and means of policy. This typology usefully reveals the overlap between the different instrument types. For instance, forms of regulation are found in three of the four cells. Subsidies, which are another 'old' policy instrument, can be placed in all four cells, but they fit best into the two on the left. Similarly, both VAs and MBIs can be found in the bottom left and right-hand cells. The obvious implication is that government and governance (as we have defined them) are actually much more entwined than is commonly assumed.

In fact, the extent of the blurring between the two is even more substantial than that implied by Table 13.1. At its heart, the governance debate is really about where society is steered from. Table 13.2 recasts the contents of Table 13.1 into the language of governance. Under a 'government' approach, society is steered by the state, but in a 'governance' model, 'society actually does more self steering rather than depending upon guidance from government' (Peters, 2000: 36). Both tables identify two important functions: the determination of the *means* of policy ('rowing') and the determination of the *ends* to be achieved ('steering'). In general, 'government' is found in the top left cell of Table 13.2 and the closer we travel to the bottom right cell, the more important societal steering (that is, governance) becomes. Many scholars of governance assume that society is indeed undergoing such a shift as

Table 13.1 A simple typology of instrument types

	Regulator specifies the goal to be achieved	Regulator does not specify the goal to be achieved
Regulator specifies how the goal is to be achieved	Command and control (regulation); subsidies	Technology-based regulatory standards
Regulator does not specify how the goal is to be achieved	Most negotiated VAs; some MBIs (e.g. tradable permits); some regulation (for example, environmental quality objectives); subsidies	Most MBIs (e.g. eco-taxes); some VAs; informational devices (e.g. some types of eco-label)

Source: Russell and Powell (1996).

Table 13.2 A simple typology of governance types

	Government 'steers'	Society 'steers'
Government 'rows'	GOVERNMENT: hierarchical steering	HYBRID TYPES
Society 'rows'	HYBRID TYPES	GOVERNANCE: society 'self-organizes'

hierarchical government structures increasingly give way to public–private partnerships and various forms of 'ecological self organization' (for example, Teubner *et al*., 1994).

On closer inspection, government plays an important role in all four of the cells. To take VAs as an example, only unilateral commitments are instruments of 'self-organizing' governance because they offer businesses an entirely voluntary means of communicating with their stakeholders. Most public voluntary schemes would also primarily qualify as an instrument of governance, although they still entail a great deal of government involvement in their design, adoption and monitoring (OECD, 2003). Finally negotiated agreements actually sit closer to the government end of the government to governance continuum. Ecolabels are commonly regarded as very nonintrusive policy instruments. However, in fact, only Type II schemes constitute

'self-organizing' governance. The other two involve the state supporting, verifying or refereeing the labelling system (Jordan *et al.*, 2004). Finally neither ecotaxes nor tradable permits are free of government involvement. That is, they are also not self-organizing.

Although we return to this point in the final section, it should already be clear to the reader that the empirical distinction between governance and government is a lot more blurred than is suggested by some of the more theoretical accounts of governance. In the next section, we offer a more detailed assessment of the temporal and spatial patterns of NEPIs in the nine cases.

Environmental policy instruments: patterns of use

Table 13.3 offers a summary of the distribution of NEPIs across the eight countries and the EU. Rather than populate the cells with numbers,[2] we have decided instead to offer a qualitative weighting. Please note that the descriptors indicate how well used a particular instrument is in a particular jurisdiction relative to the other eight jurisdictions, rather than to some absolute baseline. In other words, comparisons should be made between jurisdictions within a particular column, rather than the other way round.

Table 13.3 The distribution of NEPIs by jurisdiction, c.2000

	Eco-taxes	Tradable permits	Voluntary agreements	Eco-labels
Australia	Low	Low	Low	Low
Austria	Medium	Low	Medium	Medium
Finland	High	Low	Medium	High
France	Medium	Low	Low	High
Germany	Medium	Low	High	High
Ireland	Low	Low	Low	Low
Netherlands	High	Medium	High	Low
UK	Medium	High	Low	Low
EU	Low	Medium/High	Low/Medium	Medium

Two things are immediately apparent. The first is that all nine jurisdictions have adopted at least one form of NEPI. To that extent, the diversity of instruments used has grown significantly since the 1970s. Three decades ago, only a small number of countries had adopted what are now classified as NEPIs, while the majority relied upon regulation. Today even the least innovative and environmentally ambitious countries (in our sample, Ireland and

Australia) have a number of fully functioning NEPIs in place, although regulation remains important in all nine cases. Second, although NEPIs in general are more popular and much more widely used, they are much more popular in some countries (for example, the Netherlands, Germany and Finland) than others (for example, Australia and Ireland). There are, as we shall see, also important cross-sectoral variations. Significantly, even the most enthusiastic users of some NEPIs have so far chosen to shun other subtypes (for example, tradable permits in Germany and Finland; ecolabels in the Netherlands; ecotaxes in the EU). Some countries are enthusiastic about particular types of NEPI (for example, tradable permits in the UK), but ambivalent about the rest. In short, just as there were enduring differences in the way regulation was applied in the past (for example, Vogel, 1986), there are differences in the way NEPIs are utilized today. If NEPIs are symptomatic of governance, then clearly there has been no wholesale or uniform shift from government to governance across our nine cases. In the next section, we analyse each instrument in turn to see if that sheds more light on the putative shift from government to governance.

Market-based instruments

Japan adopted one of the first MBIs (an environmental tax on sulphur dioxide emissions) in 1974. The Nordic countries, the Netherlands and France followed soon after, with charges on water and air pollution. Germany adopted a wastewater levy in the mid-1970s, but this was not fully implemented until the early 1980s. The UK did not initiate national environmental taxes until the early to mid-1990s (Jordan *et al*., 2003). More recently the UK has begun to pioneer the use of various, more innovative MBIs. Australia is a much more recent adopter of MBIs and in Ireland there are still virtually none.

In general, though, the 'followers' are now beginning to catch up with the initial 'pioneers' as MBIs are more widely applied (EEA, 2000). However the gap between the wealthier Northern and poorer Southern/peripheral European countries persists and, on some measures, may even be growing (CEC, 2000). Thus, the pioneers have now moved on to more sophisticated ecological tax reforms, whereas the followers have still not made much progress with first-generation MBIs such as simple effluent taxes and user charges.

The array of MBIs used has also evolved. In the 1970s, cost recovery charges dominated, but in the 1990s policy makers began to experiment with 'second-generation' approaches involving hypothecation (ibid.: 16). In our sample of eight countries, Austria (for example, its landfill taxes), Finland (for example, the oil waste levy), Germany (for example, duty on mineral oils) and the UK (for example, the landfill tax), formally 'earmark' the revenue from environmental taxes to environmental or other 'good' causes. Environmental tax reform is the most advanced form of ecotax currently

deployed among the eight countries. Here, again, there are clear leaders (the Netherlands, Finland, France, Germany and the UK all adopted significant programmes in the late 1990s) and followers (Australia, Austria and, especially, Ireland). Tradable permitting systems were first adopted in the USA in the 1980s, but they are still relatively uncommon in the EU. In our sample, only the UK will have successfully adopted a national greenhouse gas emission trading scheme before the EU tradable permit scheme comes on stream in 2005. The Netherlands has undertaken some national emission trading pilot schemes while member states such as Germany are only beginning to respond to the EU scheme (see below).

Finally the overall pattern is also highly differentiated across sectors. Some sectors, such as fuels, road transport and energy consumption, are relatively well covered by NEPIs. Other than in Finland and the Netherlands, the agricultural sector is hardly touched at all, although at one stage Austria did adopt a fertilizer tax (CEC, 2000: 12).

Voluntary agreements

The overall popularity of VAs has also grown significantly in all eight countries since the 1970s. Every EU state has adopted some form of VA, but the majority are to be found in the Netherlands and Germany. By 2002, these two had adopted more than 230 VAs. Most VAs are nonbinding and voluntary, but some states are now experimenting with more formal and binding subtypes (that is, negotiated agreements). The same pattern of leaders and followers is also apparent with respect to VAs: in this case, Germany, France and the Netherlands pioneered their use, with the rest following.

Rather interestingly the intrinsic nature of VAs also varies quite significantly across the nine cases countries. In the Netherlands, VAs supplement regulation rather than being an alternative to it; they are legal contracts or 'covenants' (Mol *et al*., 2000). In Germany, VAs are nonbinding, but they are often negotiated 'in the shadow of the law'; that is, put forward by industry as a means to pre-empt regulation. Austria has a lower number of VAs, all of which are nonbinding for constitutional reasons. In France and Ireland, roughly half of the VAs are binding. VAs are not very common in the UK, and those that do exist tend to be nonbinding and very flexible. Finally the sectoral focus of VAs is also very uneven. Most are to be found in the energy/climate change, chemicals and waste sectors (OECD, 1999: 15). They are much less common in the agricultural, transport and tourism sectors.

Ecolabels

Germany adopted the world's first national ecolabel scheme in 1978. Austria (1991), Australia (1992), France (1992) and the Netherlands (1992) subsequently adopted their own national schemes. Finland has been actively

participating in the Nordic Swan, which is a multinational ecolabel scheme that was adopted by the Nordic Council countries in 1989. Ireland and the UK are the only states that have opted to rely upon the EU ecolabel scheme despite considerable domestic demands for a national scheme. However the EU scheme has only a very low profile among producers and consumers. By 2000, only 41 EU ecolabels had been awarded across all 15 member states. In stark contrast, almost 4000 national ecolabels have been issued under Germany's Blue Angel scheme. The French, Dutch and, to a lesser degree, the Austrian schemes all suffer from a low take-up rate.

As with the other NEPIs, each ecolabel scheme has its own peculiar characteristics. Thus the Austrian, Dutch, French and the Nordic White Swan label put somewhat more emphasis on life cycle analysis than the German Blue Angel scheme. They even address different issues, depending on what is regarded as locally important. Thus Austria pioneered an ecolabel for tourism, the Netherlands was the first to award ecolabels to the food sector and flowers, Finland regards forest certification as an important issue and Australia emphasizes energy labelling.

Regulation

Amid all the discussion about NEPIs, it is all too easy to forget that regulation has not simply disappeared even in those states that have pushed the furthest ahead with certain types of NEPI. There has certainly been no wholesale switch to NEPIs or significant deregulation (see also Héritier, 2002a). There are a number of reasons for this. First, regulation often provides a supporting role for NEPIs. For example, regulations are often used to implement NEPIs, set the rules for their operation and penalize defectors. Second, there is still strong support for regulation in many countries (such as Austria, Finland and Germany) as a tool for dealing with point sources of pollution. Significantly, attempts made by France and the UK to introduce many NEPIs into their (generally) already very well regulated water pollution sectors have not amounted to much thus far.

Summary

Clearly the use of NEPIs is not 'limited' as some have claimed (Lafferty and Meadowcroft, 2000: 452). Far from it – the total number and diversity of NEPIs used in the eight countries and the EU has grown significantly, with environmental taxes, VAs and ecolabels proving especially popular. However, the overall pattern of change is surprisingly differentiated. Crucially no single type of NEPI is popular in all nine cases. In fact, some particular types of MBI (for example, tradable permits) have only recently been deployed, while some 'old' policy instruments (for example, subsidies) remain (though they are increasingly discredited as policy tools). In countries as diverse as the

UK, Finland, the Netherlands and (to a lesser degree) Germany, the adoption of NEPIs has been stunningly fast, to the extent that they are now the first port of call used by decision makers looking for implementing instruments. However there are also many countries in which NEPI use is either proceeding much more slowly (Australia and, until recently, Austria), or barely at all (Ireland). We explore the EU's role in more detail below but, at this stage, it is worth noting that, aside from some VAs, a modest ecolabel scheme and a very recent tradable permit scheme, it has struggled to adopt many NEPIs of its own.

New instruments: a clear case of governance … or government?

Conventional wisdom has it that NEPIs are somehow sweeping uniformly across different environmental protection systems. In our view, this claim does not stand up easily to empirical testing. In fact, not all NEPIs are actually that 'new': some of the 'new' instruments have been used in some countries for decades (for example, VAs in the Netherlands, Germany and France). Similarly some NEPIs are still not used in a number of countries and, in all nine cases, regulation continues to play a significant and/or dominant role. We close by reflecting upon what these patterns reveal about the putative shift from environmental government to governance.

The most obvious general point to make is that the growing popularity of NEPIs suggests that in a very general sense, governance by 'new' instruments *is* becoming increasingly common in the environmental sector, but government remains – and will probably continue to remain – dominant. Many recent accounts have suggested that the paucity of NEPIs can be partly explained by a number of factors, including political opposition, a lack of technical/economic expertise, fears of declining economic competitiveness and concerns about their distributional impacts (Golub, 1998; Jordan *et al*., 2003b). These obstacles notwithstanding, we still need to account for the surprising resilience of regulation across all nine of our cases. Regulation is often very hard to eliminate once it is in place. To borrow a historical institutional term, it becomes 'locked in' to societies as actors adjust their behaviour and expectations, for example by fitting expensive pollution abatement equipment, or setting aside certain types of land for environmental purposes (Pierson, 1993; Jordan, 1999). It is striking that, of the various deregulatory initiatives that were implemented in many of the nine cases in 1990s, none has significantly reduced the overall extent or reach of environmental regulation.

A second point is that regulation also plays a hugely important symbolic role, through its moral emphasis on penalizing polluters. Governments which are keen to be seen to tackle pressing and highly visible environmental threats still tend to rely heavily on regulation. By contrast, critics of NEPIs

have found it easy to condemn certain VAs and, until recently, tradable permits, as crude 'licences to pollute'. Consequently, we have found that NEPIs are more likely to be used to 'fill in' gaps in environmental protection systems, or as a means of responding to urgent new problems such as climate change, which have not been heavily regulated before.

Thirdly, regulation often provides an important support function for NEPIs. Among other things, it provides authority to the agency designing and implementing a NEPI, and establishes the rules governing its operation. With the dawning realization that there is no perfect instrument and that all instruments have their drawbacks, public authorities are now trying to design effective, efficient, but also highly complex, policy instrument packages that combine regulation with different types of NEPI (Rengeling and Hof, 2001).

A fourth and related point is that NEPI use is not 'self-organizing' as implied by a very strong definition of governance. One way or another, the state is likely to be drawn into the design, adoption and implementation of all environmental policy tools, however soft and supposedly unobtrusive. This can include straightforward administrative activities such as negotiating a VA or undertaking economic evaluations to set a pollution tax at the appropriate level, through to much more political tasks such as sharing out tradable permits among those wishing to trade them and then ensuring fair play, monitoring compliance and penalizing defectors. All these tasks in turn require huge amounts of bureaucratic time. The UK environment ministry recently devoted an incredible 17 person years to negotiating just 42 climate change VAs (Jordan *et al*., 2003b). Continuing monitoring and fine-tuning will, of course, demand additional bureaucratic resources.

Fifth, many environmental policy makers are, in Herbert Simon's apt phrase, as likely to be satisficers as utility maximizers. That is to say, while they recognize that regulation is imperfect, many still regard NEPIs as largely unproven. Their suspicions will doubtless have been confirmed by a recent OECD analysis (OECD, 2003) which concluded that the environmental effectiveness of VAs is often no different from what would have happened with business as usual.

Finally, given its reputation for innovation in environmental matters, the EU has been surprisingly passive in its promotion and adoption of NEPIs. In general, Table 13.3 suggests that EU membership is associated with NEPI use; that is, EU member states do appear to be more enthusiastic adopters than followers like Australia, which is a broadly comparable nonmember. However EU membership cannot be a strong force for innovation, because there are member states in our sample (for example, Ireland) with a low uptake similar to that of Australia.

On balance, the EU appears to have facilitated innovation at the member state level (Jordan *et al*., 2003a), without actually stimulating much innova-

tion itself. In fact, regulation remains the mainstay of EU environmental policy in spite of substantial NEPI use at the national level. Why is this? Apart from the many questions raised about their transparency and legitimacy, there are technical hurdles that have to be addressed before NEPIs can be adopted at a supranational level. For example, VAs are difficult to negotiate across borders, especially when well established large industry associations are absent (that is, it is significant that the first EU VAs concentrate on the chemical and car industries and not retailing). There are also political obstacles: several states (initially the UK, but more recently Ireland and Spain) have sought consistently to block the Commission's ability to innovate with environmental taxation, which, unlike most other aspects of EU environmental policy, still falls under the unanimity rule. Two recent political breakthroughs should nonetheless be mentioned: the 2003 agreement to set minimum rates of tax on certain fuel oils; and the EU's emissions trading regime, which is scheduled to commence in 2005.

These recent innovations notwithstanding, the Commission's reliance on regulation is so deep-seated that it even has to implement many of its NEPIs (such as the ecolabelling, emissions trading and environmental management and audit system (EMAS) schemes) using regulation. So, far from being a clear case of 'new' governance (Hix, 1998), the EU's experience with NEPIs demonstrates how strongly constrained it is by member state (that is, *government*) preferences.

Before we conclude that governance (as defined above) is weak while government remains strong in the environmental sector, it is worth bearing in mind three additional considerations. The first is that, although regulation remains important, it is nonetheless being used in new ways that allow the possibility of governance emerging *within* government. Thus, in Australia, regulation is much more 'light handed', whereas in Finland it serves a 'support function'. In the UK, the new integrated pollution control regulatory regime is more akin to a negotiated agreement than traditional regulation. And although it continues to generate much new regulation, the EU is now making greater use of framework Directives that leave greater scope for interpretation.

Secondly, it is worth questioning whether regulation is in fact the quintessence of government. There is a rich literature that argues that a number of the drivers of governance, namely privatization, marketization and new public management, actively require more, not less, regulation (for example, Majone, 1996). In other words, governance can generate a need for new forms of government. As Alberta Sbragia (2000) has shown, regulation is not a reliable touchstone of governance because member states have deliberately designed the EU to create or maintain new economic markets, to which regulation is ideally suited. The EU's role in delivering policy goals using

softer policy instruments (for example, the open method of coordination) in areas such as health and social policy is significantly more circumscribed precisely because that it is how the member governments would like it to operate. Héritier (2002a) argues the use of softer instruments in areas where the EU has little competence may well turn out to be the first step on the road to regulation. Either way, this line of debate breaks the strong association between governance and new instruments that we have chosen to rely upon.

Finally, government, as we have defined it above, may never have been as prominent or as novel as some Anglo-American writers have suggested. In some continental EU member states, governance may have been around for a good deal longer than is commonly supposed. Our analysis confirms that the less hierarchical exchange relationships between public and private actors that are typical of many VAs, have been a common feature of many national environmental policy systems (for example, the Netherlands, Germany and France) for decades. In other words, we should not assume that governance is 'new' or that it necessarily succeeds government.

To conclude, our overall finding is that environmental governance is at best supplementing, and most certainly not comprehensively supplanting, government by regulatory means. There have, of course, been some significant innovations, but many pre-existing elements of national policy practice have steadfastly endured, producing a rather more blurred picture of change than is sometimes assumed. Thus we have shown that governance can emerge within government, that governance can generate a need for new (or at least new forms of) government and that government in some countries may never have been that dominant anyway. Furthermore, the uptake of NEPIs has tended to be considerably stronger within member governments than at the supranational level in the EU. Also, the national uptake of NEPIs has tended to occur within pre-existing national 'repertoires' of policy instruments. By contrast, NEPI adoption in the EU's multi-level governance system has been comparatively weak, driven much more by national actors than by supranational bodies such as the European Commission. So, instead of looking for broad trends using simple labels (that is, government and governance), political scientists are likely to learn more when they formulate more specific research questions and subject them to detailed empirical testing. In this chapter, we have explored the governance transition through the prism of NEPI use in different national and supranational jurisdictions. We hope that the puzzling findings that we have unearthed will inspire others to engage in a more empirically informed debate about the causes and consequences of environmental governance.

Notes

1. The research underpinning this chapter was generously funded by the UK ESRC under grant number L216252013. We also draw upon material published in a recently edited book (Jordan *et al*., 2003b). Any errors we make in interpreting the material contained therein are entirely our own responsibility.
2. This is more difficult than one would expect, as countries collect data using different definitions of a particular instrument. Quantitative measures may therefore obscure more than they reveal (for example, with ecolabels, does one count the number of labels or the total number of products/service groups within a particular scheme?), hence our more qualitative approach.

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14 Environmental regulation, certification and corporate standards: a critique

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In 1992, representatives of 180 of the world's nations met in Rio de Janeiro at the Earth Summit. Among the documents they debated and considered was an Agreement on Forestry Principles. Carrying the unwieldy title 'Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests', the statement was the result of several years of sustained, intensive negotiation and controversy, a product of growing concern during the 1980s and early 1990s about the future of the world's remaining tropical forests.

That this meeting was taking place in Brazil was especially apposite for two reasons. On the one hand, the burning forests of Amazonia had, during the late 1980s, served to focus global attention on their survival as well as their role in the global environment, especially the carbon cycle. On the other hand, the Brazilian government was strongly opposed to any hint of internationalization of its sovereign resources and territory (for background, see, for example, Goodman and Hall, 1990; Schmink and Wood, 1992; Fogel, 2002: ch. 3). Opposition to the statement was much broader than support for it, and the Forestry Principles crashed and burned. During the intervening years, there have been repeated efforts to resurrect some version of the principles in the form of an International Forest Convention but, although a number of UN-sponsored panels, commissions and forums on forests have worked on preparing such a convention since 1995, these efforts have, so far, not been consummated (Lipschutz, 2005a; Dauvergne, 2005).

Although forestry management has been an 'internationalized' activity for more than 100 years (Scott, 1998; Lipschutz, 2001), it is only over the past two decades that serious international attention has been paid to the externalities generated by forestry practices. As defined in the 1993 Helsinki Declaration of the Ministerial Conference on the Protection of Forests in Europe, sustainable forest management is

> the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems. (International Trade Forum, 2002)

Despite the best efforts of concerned governments, some of which have called repeatedly for an international forestry convention (Canada has been among the most voluble in this regard; see Barron, 1997; Carette and MacCartney, 2000), one result of the apparent international impasse has been the growing privatization of global forestry regulation. There is nothing new about private law, either domestic or international (Cutler, 1998; Braithwaite and Drahos, 2000), but, whereas private law was historically constituted by contract among signatories, and usually legitimated through the legal structures of and enforcement by states, private forestry regulation rests on the hope for a form of 'social contract' between producers and consumers. Such a contract promises consumer loyalty in return for corporate good behaviour. Indeed, in the face of an international failure to establish a global forestry convention, such 'private' initiatives have proliferated, offering competing venues for those interested in fostering 'sustainable forestry' (Meidinger, 2002; Cashore *et al*., 2004).

Can such private regulation ensure sustainable forestry? This chapter attempts to answer the question. We begin with an examination of the reasons for privatization of forest regulation. Next, the chapter turns to a discussion of the many initiatives to implement semi-public or private forestry regulation, and the ways in which market-based methods lie at their core. Finally, we assess the fundamental flaws in such an approach, and argue that the sovereign consumer, when faced with contradictory messages about her purchases in the market, and possibly unmotivated by normative concerns, is not necessarily going to choose an environmentally friendlier product.

Why privatize regulation?

Public forests have long been viewed as a *national* resource, that is, the sovereign property of the state (Scott, 1998). In this role, the conservation of forests is tightly linked to the production of timber and other commodities that generate both capital and jobs, and the economies of large regions are almost wholly dependent on natural resource production from those forests (Magnusson and Shaw, 2003). Moreover, in the domestic scheme of things, timber producers can be politically influential and often get their way (although this is changing; see, for example, Lipschutz and Mayer, 1993; 1996: ch. 4; Dauvergne, 2001). One result of the struggle among competing interests has been the failure to negotiate a global forest convention. The resulting lacuna has generated a rash of efforts by both activists and business to find other means of regulating forest practices at the global level, and a struggle to establish the primacy of one set of standards over all others.

There are strong economic reasons for this struggle. While timber company brand names are hardly ubiquitous, the global demand for lumber is growing rapidly. 'Do-it-yourself' (DIY) remodelling has become ever more

Table 14.1 Initiatives in sustainable forestry regulation

	NGOs	States	Corp.	
Kyoto Protocol		✓		Establish terms and conditions to meet provisions of Kyoto Protocol regarding management of forests & their role as carbon sinks.
Intergovernmental Working Group on Global Forests (1993–4)		✓		Created to develop a scientifically-based framework of criteria and indicators for the conservation, management and sustainable development of boreal and temperate forests.
UN Intergovernmental Panel on Forests (IPF) (1995–7)		✓		Created by the UN Commission on Sustainable Development as an open-ended ad hoc group to pursue consensus and coordinate proposals to support the management, conservation and sustainable development of forests.
Intergovernmental Forum on Forests (IFF) (1997–2000)		✓		Follow up to the IPF created by ECOSOC to pursue further proposals for action to governments, international organizations, private sector entities and all other major groups on how further to develop, implement and coordinate national and international policies on sustainable forest management.
UN Forum on Forests (UNFF) (2000–present) (www.un.org/esa/forests/)		✓		Created as the permanent intergovernmental body responsible for overseeing the implementation of the IPF/IFF Proposals for Action and enhancing cooperation and international forest policy dialogue.
International Tropical Timber Organization (1985–present) (www.itto.or.jp)	observers	✓	observers	Created in 1985 to provide international reference document upon which more detailed national standards could be developed to guide sustainable management of natural tropical forests.
Center for International Forestry Research (CIFOR)	✓	✓		Established to improve the scientific basis for ensuring the balanced management of forests and forest lands; develop policies and technologies for sustainable use and management of forest goods and services.
International Organization for Standardization ISO 14001 (www.iso.ch)		✓	✓	ISO series provides a framework for an organization to identify and address the significant environmental aspects and related impacts of its activities, products and services.
World Commission on Forests and Sustainable Development (1996–9)	✓	✓	✓	Independent commission which held hearings to achieve policy reforms aimed at reconciling economic and environmental objectives for sustainable management of global forests.
Rainforest Action Network (www.ran.org)	✓			'Old Growth Campaign' promotes consumer boycotts of companies that log and sell products from old growth forests

Smart Wood (1989–present) (www.smartwood.org)	✓			Established by the Rainforest Alliance to provide certification to all types of operations in all types of forests. FSC accredited.
Forest Stewardship Council (FSC) (www.fscoax.org)	✓		✓	Created in 1993 to establish internationally recognized principles and criteria of forest management as a basis for accrediting regional certifiers.
Scientific Certification Systems (Oakland, CA) (www.scs1.com/forestry.shtml)			Private firm	'Forest Conservation Program' evaluates forest management against objective and regionally appropriate principles of sustainable forestry; FSC certified.
SGS Qualifor (Oxford, UK) (www.qualifor.com)			Private firm	'Carbon Offset Verification Service' assesses, surveys, monitors & certifies project development & management.
Pan-European Forest Certification (1999–present) (www.pefc.org)			✓	Created to provide certification of forests according to the Pan European Criteria as defined by the resolutions of the Helsinki and Lisbon Ministerial Conferences of 1993 and 1998 on the Protection of Forests in Europe.
Sustainable Forestry Initiative (1995–present) (www.aboutsfi.org)			✓	Established by American Forest and Paper Association to provide standard of environmental principles, objectives and performance measures that integrates growing and harvesting of trees with the protection of wildlife, plants, soil and water quality and other conservation goals for international application.
African Timber Organization		✓		Pan-African timber trade organization with 13 member countries developing standards for sustainable forest management that could form eventual basis for certification programme.
Malaysian National Timber Certification Council (www.mtcc.com.my)		✓		Quango established to administer voluntary third party certification of forests in Malaysia. Cooperates with FSC.
Lembaga Ekolabel Indonesia (1998–present) (www.lei.or.id)	✓			Certifying organization for Indonesian forests, works in cooperation with FSC.
International Forest Industry Roundtable		✓		Proposal for an international mutual recognition framework for national forest certification programmes is in the works.
The BMZ/GTZ Forest Certification Project (www.gtz.de/forest_certification)		✓		German government-owned corporation which provides training and support for information, capacity building, participation and networking for better communication and cooperation of those involved in certification processes.
Initiative zur Föderung nachhaltiger Waldbewirtschaftung (IFW)			✓	Dual process of certification whereby nationally accredited bodies within timber exporting nations would certify that producers have met high standards of forest management.

Sources: Evans (1996), CIFOR (no date), SGS (no date), IISD (no date), UN Forum on Forests (no date), and other forestry websites.

popular. Home improvement store sales in the United States alone are approaching $300 billion per year, a sizable fraction of which is lumber, and competition is fierce. Any path to more revenue will be eagerly seized, and the marketing of sustainably managed lumber provides one possible path.

Activists have interests other than monetary ones, but see potential in raising consumer awareness of forestry issues. Thus, they are putting pressure on retailers and DIY stores in Europe and North America, demanding that they sell only sustainably produced lumber and inform consumers that they are doing so. Demand from these retailers, it is hoped, will induce wholesalers and producers to seek sustainable timber for sale to contractors and do-it-yourselfers. But many timber companies and governments are reluctant to hop on activist bandwagons, regarding their standards as being too rigorous, and fearful that they could lead to internationally imposed rules. Consequently the business equivalents of such regulation are on offer as well.

Who regulates?

Private forestry regulation is booming, and associated projects fall into several different categories, including hybrid public–private ones (see Table 14.1). Many of the projects listed in the table seek to regulate through *certification*, that is, offering the producer a label testifying to 'good performance' in return for observing a specific set of standards. There are three types of product certification. First party labelling, the most common and simplest approach, entails producer claims about a product, such as 'recyclable', 'ozone-friendly', 'non-toxic' or 'biodegradable'. In the absence of a mechanism for verifying these claims, the only guarantee that the product performs accordingly is the producer's reputation.

Second party labelling is usually conducted by industry-related entities, such as trade associations, which establish guidelines or criteria for making claims about the product. Once the standards are met or the guidelines followed, an industry-approved label is placed on the product stating or verifying the product's environmentally friendly qualities. In this instance, corporate members of the certifying organization will seek to maintain the label's value, and to mandate how it is used, so that no single producer will have an advantage over any other.

Third party, or independent, labelling is performed by either a governmental agency, a nonprofit group, a for-profit company, or an organization representing some combination of these three. As with the second party type, third party labelling programmes set guidelines that products must meet in order to use their label. They may also conduct audits in order to ensure compliance with the guidelines. As the name implies, third party organizations are not affiliated with the products they label (Caldwell, 1998; Bass and Simula, 1999).

Timber certification comes in two forms. Forest management certification involves assessment of industry forestry practices by a company, community or other organization according to a set of predetermined standards. The focus of such certification may be an individual forest or a set of forests managed by a company, agency or other organization. It may also be conducted regionally or nationally, depending on the management structure of the forestry and timber sectors in a particular location or country. Wood product certification involves an inspection of the 'chain of custody' in the commodity chain through which harvested wood moves. This is done by auditing individual organizations at each step of the chain to determine whether or not they are using materials from certified sources (Oliver, 1996).

Finally the entity responsible for certification may be either independent (third party) or national. In the former case, standards are usually formulated by an organization, whether public, private or nonprofit, with no ties to the companies whose practices and products are subject to certification. The standard-setting organization then authorizes other independent entities to act as certifiers. Alternatively certification standards may be devised by associations whose members are owners of forests and producers or sellers of wood products. In the latter case, responsibility for certification often falls under the authority of the state itself, in the form of either a government agency or an 'independent' body established or chosen by the state.

In all cases, the company or individual seeking certification for a property pays the auditor to examine, assess and certify the forest. Once approved, certified timber companies, producers and products are permitted to display an eco-label intended to inform consumers that the prescribed standards have been met (ibid.). Clearly, however, the credibility of an eco-label is no easy thing for a consumer to assess.

Estimates of the total area of 'certified forests' worldwide range from 265 to almost 500 million acres (about 2 to 5 per cent of the world's forests; FAO, 2001: xii; CSFCC, 2002). Statistics about availability and sales of certified lumber and wood products do not appear to be available, although several large home-supply and DIY companies have, either under activist pressure or out of self-interest, agreed to carry certified wood. Among the best known of these is Home Depot in the United States.

Regulation and certification by activist groups and organizations

Of the various private nonprofit certification groups, the Forest Stewardship Council (FSC) is the best-known. The FSC was launched in 1993 in Washington, DC by environmental groups, the timber industry, foresters, indigenous peoples and community groups from 25 countries, with initial funding provided primarily by the World Wide Fund for Nature (since then renamed the WWF). Originally based in Oaxaca, Mexico, in 2002 the FSC moved its

central office to Bonn, Germany, where it is better positioned to compete with other standard-setting organizations.

The FSC is a membership organization comprising three equally weighted chambers (environmental, social and economic) and membership within each chamber is also equally weighted between North and South (FSC, 2002). Each chamber represents 33 per cent of the vote at annual meetings, and the board of directors has rotating members reflecting these interests. By 2001, the FSC was an internationally recognized organization with 448 members in 56 countries, 221 in the economic chamber, 86 in the social chamber and 174 in the environmental chamber (Meridian Institute, 2001: 20).

The FSC has developed and adopted global Principles and Criteria for Forest Management and it accredits certifying organizations that agree to abide by these Principles, Criteria and Standards. Purportedly, the FSC also monitors the operations and portfolios of such certifying groups on an annual basis. In cooperation with lumber retailers, the FSC creates buyers groups in consuming countries. Members of these groups are committed to selling only verified 'sustainably produced' timber in their stores (FSC, 2002). As of January 2003, the FSC had granted 466 'forest management certificates' in 56 countries, covering almost 77 million acres, and 2801 'chain of custody' certificates in 67 countries (FSCUS, 2003).

The actual ecological and social outcomes triggered by the FSC system are not yet clear, however, and have not yet been closely studied (but see Meridian Institute, 2001; Mater *et al*., 2002; Bass *et al*., 2001). There are signs that, in some locations, the system is not leading to ecological or social outcomes that exceed those already required by existing governmental policies. In other instances, FSC standards may not actually be implemented by producers, something that the organization's weak institutional base is unable to prevent. Funding and personnel to monitor implementation are scarce, and penalties for failing to observe the rules are few (for example, Freris and Laschefski, 2001).

An additional challenge to the FSC's success is the broader trend toward green labelling and competing standards that it has inspired. With international governmental processes in apparent stalemate, many have come to see FSC certification as the 'magic bullet', a 'market-driven mechanism' able to fill a critical niche, aimed at achieving sustainable forest management where governments cannot. But the large financial stakes involved in the control of the certification process have led forest products companies to become actively involved in standard setting and implementation activities in several countries, including Sweden, Canada, Malaysia and Indonesia. This appears to be leading to a 'consensus' rather than 'science-based' approach to standard setting in order to make the standards achievable, and thus to ensure that the large and growing market demand will indeed be met.

Regulation and certification by industry organizations and associations

A number of business organizations have developed certification programmes, some in conjunction with the International Organization for Standardization. These include the American Forest Products Association and the Canadian Pulp and Paper Association (for example, see Wood, 2000; CSA, 2002; Lipschutz, 2001). These industrial projects may reflect an effort to take away control of forest product certification processes, principles and discourse from the FSC and other activist groups (Hauselmann, 1997). Certainly any number of national timber and standard-setting organizations are loath to see international activists dominate the arena. The International Organization for Standarization (ISO) offers an overarching framework for environmental regulation and standard setting (see Cascio *et al*., 1996; Clapp, 2005). With an annual operating budget of $125 million provided by governments and corporate members, the ISO is far larger than the FSC and other comparable certifying organizations.

Historically the ISO has neither worked on nor developed competency in either environmental or forestry issues. Until the early 1980s, it limited itself to purely technical standards, such as the size of nuts and bolts (Hauselmann, 1997). The demand for environmental standards grew out of a concern that these might be imposed 'from above' as a result of inter-state agreements and conventions. Growing public agitation over the absence of any environmental considerations in the GATT and, later, the WTO also contributed to the ISO's entry into the environmental standards business (Lally, 1998: 4).

But the ISO provides only the context within which standards can be negotiated and promulgated, using an 'Environmental Management Systems' (EMS) approach. This differs from the FSC's Principles, Criteria and Standards in that EMS prescribe only internal management systems for companies that wish to improve continuously upon an environmental performance level which they themselves define. The ISO does not engage in policing corporate behaviour, enforcing standards or penalizing violators, and has no adequate mechanism to either ensure corporations' compliance with or the effectiveness of their individual action plans, or to control the use (or misuse) of logos and certification marks (Clapp, 2005). Companies can hire outside auditors to check on their performance but, because companies set the standards, ISO 14000 is, in effect, a system of first-party certification.

Nevertheless forest industry members and supporters of the ISO 14000 series are using the discourse developed by the FSC and environmental groups to describe their systems approach in terms uncannily similar to those adopted by the FSC. For example, a 1997 press release issued by the Canadian Sustainable Forestry Certification Coalition (an industry group) (CSFCC, 1997), promoting ISO forest certification, claimed:

> we have identified the background information that forestry organizations will find useful as they implement and progressively improve upon their environmental management system. This major step forward in relating the key elements of the ISO standard in the context of a range of international forest management measures will further the UN Agenda 21 goal of promoting sustainable development.

Some ISO members continue as well actively to push forward the development of international ISO forest management system standards. Others are concerned that certification might obstruct free trade and are active at the WTO Environment Committee to limit the definition and mutual recognition of eco-labels by GATT country signatories. Consequently, although timber products may carry ISO certification, what lies behind the label is none too clear.

The growing number of forestry certification programmes has been particularly frustrating to national timber industry associations, who see fragmented privatization as disadvantageous to their members. Something of a backlash has developed among the national associations, in particular, who would prefer to retain their own certifications systems but have them recognized by other national associations. Because the likelihood of formulating a global forest convention, much less ratifying one, is so low, the industry strategy has been to seek 'mutual recognition' of competing standards. As the 'Canadian Sustainable Forestry Certification Coalition', composed of national, provincial and sectoral associations, has put the case for mutual recognition:

> Although nice in concept, it is unlikely that one standard could ever speak to the diversity of forest types and ecosystems across North America, to the diversity of tenure systems, to public ownership, to private ownership, to the different needs and operating systems within a business, including their varied sources of wood supply, or to the different needs and priorities of the users of wood products. While one standard could run the risk of not speaking to the forest management realities of many operations, many standards will likely result in more widespread application, and in the end, more improvements in forest management. (CSFCC, 2002)

One such transnational harmonization scheme is the International Forest Industry Roundtable (IFIR)'s mutual recognition project. IFIR is a self-described 'independent network of industry associations', with members from Argentina, Australia, Brazil, Canada, Chile, Finland, France, Malaysia, Mexico, Norway, New Zealand, South Africa, Sweden, the United Kingdom and the United States. In 1999, it established a working group to develop an 'International Mutual Recognition Framework' for national forestry certification standards (FIDC, 2003). The objective of this initiative is to

> provide a critical mass of credibly certified wood products by recognizing that different certification systems can provide substantively equivalent standards of sustainable forest management. Mutual recognition would set a high threshold for entry for participating standards, while enabling the use of standards that accommodate local and regional circumstances. By providing a process to differentiate *credible from non-credible* certification standards, mutual recognition would use market forces to provide a range of certification standards that will assure customers that their wood product purchases contribute to sustainable forest management. (Griffiths, 2001: 3; underlines and emphases in original)

Although it is not stated outright, mutual recognition of national standards may be aimed against the Forest Stewardship Council, which is beginning to look like a default global standard setter, if only because of its broad membership and environmentalist credentials (ibid.: 8). There is also fear of the 'potential imposition of "mandatory" solutions via government regulation at the national or international level' (ibid., emphasis in original) if the industry is unable to self-regulate. As of this writing, the members of IFIR continue to meet and negotiate.

Does private regulation work?

Does private forestry regulation provide an adequate substitute for public oversight and enforcement? For the most part, the jury is still out on this question. According to IFIR, global sales in the forest products business amount to about $500 billion per year, of which some 30 per cent enters international trade (Griffiths, 2001: 5). The market for certified timber is, as yet, only a small fraction of this. It is difficult to find hard data on the impacts and effectiveness of such certification on the health of those forests that have been certified by the various programmes.

The vast majority of certified forests are in industrialized countries, and it appears that most of those forests were already being managed close to certifier standards. Furthermore the long-term consequences of certification, especially for natural forests (whether old-growth or new-growth) cannot be assessed until a significant fraction of a harvesting cycle has passed. Consequently, for the time being, there appears to be no way to determine whether certification, as a policy instrument, offers a viable long-term means of protecting the environment (Bass *et al*., 2001).

In the longer run, the cost of private forestry regulation will play a major role in its broad acceptance. In principle, competition among the various programmes ought to result in a lowering of certification costs, as well as elimination of deadweight costs associated with state-based regulation. But, until now, the demand for certified lumber and wood products has outstripped supply, and this has made it possible to sell certified goods at a premium. As this form of certification becomes more widespread, the premium will decline

and, at the margin, will provide little or no extra profit to the producers, wholesalers and retailers in the timber commodity chain. At that point, all else being equal, the benefits of sustainable forestry will have been internalized and socialized, with the global public and environment as the beneficiaries. But, if sustainable forestry is only voluntary and coverage does not extend to all forests, both North and South, there will be strong incentives by non-certified producers to free-ride on the global trade system.

The consumer trap

Private regulation of forestry practices through certification is based on markets and market-based strategies as mechanisms to foster compliance (Lipschutz, 2005b). As progress in the formulation of conventions and protocols has slowed, especially in the environmental issue area, the demand for such private regulation has grown (although the size of the market remains small and its future uncertain), a demand that is driven in no small part by globalization and the consumerism that it fosters (Lipschutz, 2000; Lipschutz, 2005b). The area of certified forests and the volume of certified wood products have certainly grown over the past decade, from virtually nothing to a few per cent of stock and production. Both social activists and the timber industry have an interest in the institutionalization of such certification, although for quite different reasons. Activists wish to see forests conserved, if not preserved; industry wants to ensure that restrictions on the cut remain as limited as possible. Reconciliation seems improbable (Magnusson and Shaw, 2003).

At the same time, however, corporations engaged in the production of material goods have no inherent interest in environmental protection, with two exceptions. First, a failure to reduce externalities may increase variable costs from fines, state intervention and lost business, all of which require the kind of policing that ISO 14000 does not address and that many corporations are loath to accept. Second, having a 'green' reputation could increase corporate profits. A producer who voluntarily controls externalities, and engages in virtuous behaviour, can advertise such practices and, with luck, grab a little extra market share. It might even be possible to charge a premium for green certification, for which high-income consumers will gladly pay. So there is available here both a moral and a market opportunity. Corporations can do well by doing good, while certifiers can do good by doing well.

But the ultimate question remains unanswered: can action through the market provide the incentives for the maintenance and enforcement of the kind of private self-regulation described here? Producers will only be attracted to such approaches if environmentally conscious consumers choose their environmentally friendly certified products. But setting the premium for such products at the 'correct' level is no easy task. Moreover it is one thing to

tack a 10 per cent green surcharge on a piece of furniture that may cost between $100 and $1000; it is quite another to charge an extra 10 per cent on a $20 000 remodelling job or a $300 000 house.

There is, moreover, an unrecognized trap hiding in this privatized, market-based approach to forestry regulation. Markets are particularly weak arenas in which to seek political goals. While some argue that there is such a thing as 'private' political power, which can be accumulated and exercised through the market (Levy and Newell, 2005), this seems a somewhat oxymoronic concept. Politics is, by definition, a public, collective endeavour, while markets involve private exchange between individuals. Politics is based on the visible aggregation of power, which markets eschew. Politics through market-based methods, which is what private regulation and certification amounts to, rests primarily on attempts to alter the preferences of large numbers of consumers in order to put pressure on producers.

Because consumer preferences are not political and are strongly influenced, if not determined, by the very system of production and consumption that motivates the social disruption and externalities of concern (Dawson, 2003), there is a certain tautological process at work here. If business and industry are able to acquire political power, this is more a form of displacement than an alternative: the 'corporate citizen' becomes, in a sense, a franchisee able to cast votes and influence political economy using its dollars (Lipschutz, 2005b).

Over the past 50 years, industrial societies have been built on the premise that lower prices enhance purchasing power, which maximizes individual satisfaction; it will not be so easy to convince people that they will be better off if they exercise environmental virtue in the marketplace. In any event, at the end of the day the trend toward privatization and market mechanisms appears to be gathering steam. If negotiations do begin, a global forestry agreement will take years to conclude even as nonpublic modes of regulation develop and grow. Meanwhile the cutting and burning will likely proceed without much let-up, and the scale and impacts of concomitant environmental damage will continue apace.

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15 Incentives affecting land use decisions of nonindustrial private forest landowners

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Forests throughout the world provide a wide range of ecosystem services, including carbon sequestration, biodiversity, water purification, soil retention and habitats for wildlife and people. Deforestation and fragmentation threaten the long-term viability of existing forest ecosystems and detrimentally affect people around the world. As growing populations compete for the use of shrinking forest resources, conflicts between individual and collective incentives are frequent, as many forest lands are owned and managed by individuals yet provide collective benefits. Forest-cover change is a global problem that requires analysis of the complex institutional incentives that affect the actions of those who control forest resources.

Diverse policies and governance arrangements have evolved throughout the world, establishing rights for extraction and use of forested lands. The preferred forest ownership regime typically reflects traditional property rights existing in each country. Indeed different ownership arrangements have experienced varying degrees of success depending on the setting. Ownership regimes include private property regimes, in which individuals or families control all rights to use of and extraction from a forest, government control of all or part of the rights to use of and harvest from a forest, and communal arrangements, in which individual bundles of rights are distributed differentially within the community, all with varying degrees of success (Ascher, 1995).

In Europe, governments and local community organizations have preserved forest lands since 1000AD to provide kings and other magnates with protected areas to keep deer and to kill and eat them (Rackham, 1989). In other areas of the world, forests have been protected communally, often merely by social norms that restrict access or limit harvests (Dorm-Adzobu and Veit, 1991; Gibson *et al.*, 2000).

Debate has surrounded the choice of policy tools for long-term health of forest ecosystems, with some proponents proclaiming that a tax, cost-share, certification or easement programme is better than others (Ascher, 1995). Much of the research has focused on the governance arrangement without considering the forest ecosystem, or demographic and economic conditions.

Furthermore it is not possible to truly evaluate the effectiveness of any type of governance without first understanding the resulting complex interactions between rules, incentives and behavioural outcomes of resource users.

In this chapter, we focus on a variety of policy tools that may or may not affect nonindustrial private forest (NIPF) owners' behaviour. These tools include tax policies and cost sharing, certification and easement programmes. We address whether these programmes actually affect the land use decisions of a private landowner. Specifically we are concerned about the potential disconnection between a landowner's participation and decision making and between participants and programme managers. We focus our review on programmes in the USA, where there is mixed evidence regarding the impact of various programmes on reforestation rates (Newman *et al*., 2000; Zhang and Flick, 2001). Furthermore many of the programmes we evaluated were developed years or decades ago and may not match current motivations of landowners, especially given changing landowner attitudes (Kauneckis and Novac, 2000; Erickson *et al*., 2002).

First, we briefly outline the importance of NIPFs in the USA and throughout the world. Then we outline a general socioecological framework of a forest ecosystem's interrelationship with government agencies and resource users. Using this general framework, we evaluate the different types of policies that affect NIPF landowners. Next, we briefly explore future directions for research using the socioecological system to investigate government regulations and cooperative management between landowners. We conclude with a discussion of the challenges for NIPF governance.

Nonindustrial private forests (NIPFs) and forest management in the USA

Nonindustrial private forest lands make up a significant portion of the forests throughout the world, and NIPFs in the USA constitute over 474 million acres, almost two-thirds of the country's forest land (Hibbard *et al*., 2003). In some regions of the country, NIPFs are the primary source of wood products such as pulp, lumber and plywood (Rickenbach, 2002). NIPFs fall into a broad system of private property rights where landowners are assigned almost all rights to manage their lands (Clawson, 1964). In the 1800s, this private property system led to large-scale removal of forests for conversion to more 'productive' uses, typically agriculture. The denuded land created a crisis of degradation of water resources that led to efforts by the federal government to conserve forest lands. National forestry policy was formalized around the turn of the 20th century, when Gifford Pinchot was selected to be the Department of Agriculture's first head of the US Forest Service (USFS) (Miller, 2002). The USFS's mission was based on the premise that the best way to reforest and maintain healthy forest lands was to buy back land from

private owners and put it into the hands of the newly created government land manager. Much of the US forest lands remained in private hands with management under private control. Some state tax programmes that affected private lands were developed at the same time and mirrored USFS goals of maintaining and expanding forest lands, but these programmes worked through economic incentives for private landowners. One such programme is Indiana's Classified Forest Program, established in 1899, which reduced participants' property taxes (Nelson, 1998).

Tax, cost-share, certification and easement programmes were developed to deal with issues salient at the time of their creation. During the 1940s, NIPF state 'seed tree' laws were created that focused on reforestation of cut-over forest lands (Ellefson *et al*., 1997). Since the mid-1980s, forest policy has incorporated concern for long-term, broad effects of forest practices on sustainability, productivity and biodiversity. Of course the emphasis varies among the states (ibid.). In many areas of the USA there has been an increase in the extent and age of the forests. A key question that needs to be addressed is whether this reforestation on private lands is due to programmes affecting landowner decision making or due to something else, for example the socio-economic shift from an agricultural economy to an industrial one (Birch, 1996). One of the main questions we put forth is whether the decades-old programmes are still addressing important concerns, or whether they are maintained because of rent seeking (wasteful attempts to increase budget, benefits or influence (Mueller, 1997) on the part of programme officials and programme participants.

Are these programmes equipped to deal with the ever-increasing urban pressure influencing forest landowners who may receive large economic gains through urban development? Within society, the central conflict between benefits from private and public forests has focused on the increasing fragmentation of forest lands surrounding urbanizing regions (Best, 2002). One solution to this conflict has been to provide incentives, or private benefits, to landowners who act in ways that result in the preservation of public forest benefits. The impacts of these programmes are dependent on the interrelationships between the programme, programme officials, forest ecosystems and NIPF landowners, which will be explored in the following section. Then we will investigate the impact of the general forest policies on NIPFs through an institutional model that maps out these interrelationships.

General framework of policy tool impacts

Individuals who live near a forest as well as individual resource users and people who live at some distance all benefit from the 'public good' of protecting forested land owned by private nonindustrial owners. Without some form of government or nongovernment intervention, society faces the classic

problem of the underprovision of a public good (Ostrom and Ostrom, 1999). Government interventions may come in the form of direct provision and production through creation of national and state forests and parks. Nongovernment organizations (NGOs) also may acquire land directly for preservation purposes through establishment of land trusts with rights to simple land or conservation easements. Government and NGOs also may try to provide more forest lands for society through financial assistance, regulation and technical assistance to private landowners. These programmes offer various incentives and assistance, but they are dependent on the landowners to actually maintain forest lands. Thus what actually happens on forested land depends on a set of interrelations among actors.

Anderies *et al*. (2004) provide a general framework of socioecological systems that we adapt here for the case in which a forest is owned by a private landowner and government and nongovernmental programmes try to affect the decisions made by that owner (see Figure 15.1). This general framework is expected to be applicable for situations in developed and developing countries. To understand why forested land grows in extent and quality, or remains the same over time, or disappears, one cannot simply examine a single entity, by itself, of those shown in Figure 15.1 (forest, forest owners, programme officers or the programmes in effect in a locality). One must also study the flows between the entities and the type of disturbances that may affect the entities and these flows.

In this chapter, we consider a forest that is owned by a NIPF landowner. This owner may use the forest in various ways (see flow 1 in Figure 15.1).

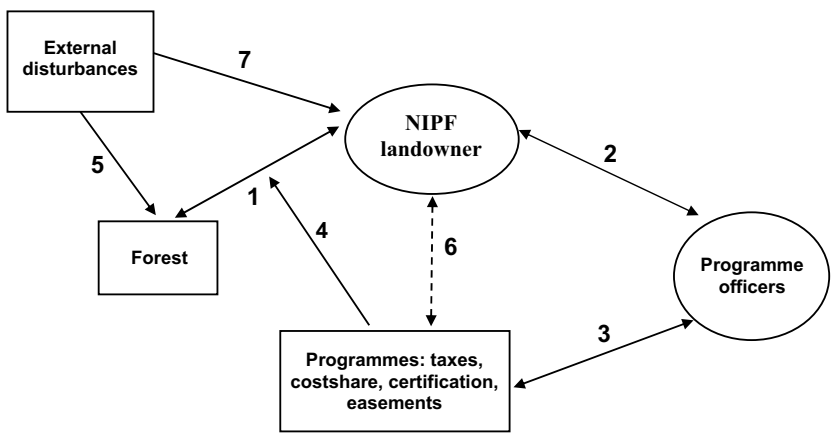

Figure 15.1 Conceptual framework of a socioecological system of forest management of NIPF

The landowner may or may not harvest nontimber products, engage in recreational activities or undertake commercial timber production and various other forest management practices. Thus what the forest owner does influences the condition of the forest and the forest condition may influence the NIPF landowners' decisions about forest use.

Governmental and nongovernmental programmes exist that aim to affect the actions of the NIPF landowner (flow 4). The programmes may provide training and education, tax benefits, protection of specific rights to the property, and so on. Programme officers, who manage the programmes, might be NIPF landowners themselves or might have ties with other interest groups, like extractive foresters or preservationists. NIPF landowners express their demands for particular services via flow 2. Anderies *et al*. (2004) mention tax payments, voting, lobbying, participating in councils and even bribing programme officers as possible actions. Communities will vary in regard to the number and strength of the means by which NIPF landowners can engage in expressing demands related to this land. In some communities, NIPF landowners can express themselves actively through elections as well as representing their views in a variety of hearings and through their support of diverse NGOs. In other communities, NIPF landowners have few avenues to express demands.

Programme officers also design the programmes (flow 3). Cultural backgrounds or political constraints may influence the type of programme the officers design. The NIPF landowners' demand for particular programmes is mediated through the programme officers. Some NIPF landowners' preferences for wildlife habitat or preservation may be in opposition to a cultural bias of foresters trained to harvest timber from forest lands. NIPF landowners may participate as co-producers of programmes when sharing experiences and expertise in order to educate other landowners through field days or presentations (flow 6). Programmes may provide education that can affect the mental model of NIPF landowners (Carlson *et al*., 2003).

External disturbances, such as fire, pests and construction of highways, might affect the NIPF (flow 5). Similarly economic development or changes in other governmental regulations, for example the Endangered Species Act, may influence both the landowners and the programme officers. Changes in the political environment, such as a shift in party leadership in charge of programme budget changes or a change in officer leadership, will affect the socioeconomic system, especially when programme officers are faced with job security concerns.

Anderies *et al*. (2004) mention the importance of the connections between resource users (NIPF landowners) and public infrastructure providers (programme officers). A distant relationship might lead to a decline in taking the demands of resource users into account and create incentives for rent seeking

and corruption by programme officers. With respect to our review, the distance between NIPF landowners and programme officers may explain why some current programmes are not able to meet their goals and the goals of the NIPF landowners.

NIPF landowners

Landowners make decisions about their land while considering some, although probably not all, government regulations and programmes that may affect them. Owner preferences for forest preservation and use are also changing, with increased emphasis on aesthetics and recreation. The changing preferences of forest owners may or may not be reflected in changing forest policies. Some programme participants, such as farmers (Erickson *et al*., 2002), may evaluate their forest in economic terms, so economic incentives may have more influence on them. The heterogeneity of NIPF landowners further frustrates long-term attempts to increase forest extent and health because programmes must serve both resource-dependent owners and recreational or residential owners. Government agencies and NGOs have attempted to alleviate this problem by creating a variety of programmes to serve different landowner needs (Klosowski *et al*., 2001; Erickson *et al*., 2002). This emerging plethora of programmes may serve different types of landowners, but it is still unclear whether these programmes actually influence their decision making.

Landowners' decisions are typically linked to the condition of their forest, as decisions may be made whether to cut older or larger trees (Keefer *et al*., 2002). The basic condition of the forest and the land quality restricts the landowner's decisions. For example, a landowner may wish to grow valuable tree species such as black walnut, but the ecological conditions may not be satisfied. On the other hand, some landowners may make decisions to cut on the basis of financial concerns, with less regard for the forest condition. The forest–landowner relationship is characterized in the model shown in Figure 15.1 as flow 1.

Landowners' decisions may also be influenced by forest policies, which are shaped in part by landowners' concerns expressed through elections for government officials who appoint programme officials, control budgets or create programmes. Some landowners may have a direct connection to forest officials through past history with the programme or relationships formed while in forestry councils or organizations (Rickenbach, 2002).

Forest policies

Policy makers use a variety of policies that are intended to encourage reforestation and good forestry management, including tax incentives, cost-sharing, certification and easement programmes. Each of these types of programmes

affects the landowners' incentives in different ways. Landowners may choose one programme over another according to the incentives and restrictions associated with them. Or they may ignore them entirely.

Tax incentives

Tax programmes include property, income and inheritance taxes. Property taxes affecting forest land include both assessment on the timber stand value (an inventory value) and the value of the property, although most states evaluate the timber stand separately from the land. Many states offer reduced assessment rates for forest land, which may encourage investment in forestry. In comparison, inheritance taxes based on the market value of the land, or including the timber stand value, may induce the recipients to cut the timber in order to make the payments (Wear and Greis, 2002).

We focus on state property tax programmes that are common in the USA: ad valorem, current use, flat rate and exemptions. In 2000, there were 66 state property tax programmes affecting forest land. Every state had at least one programme (Hibbard *et al*., 2003). Forest-specific property tax programmes are well established in many states. Indiana's programme was established in 1899, whereas other states (such as Georgia) just recently created forest-specific programmes (Newman *et al*., 2000).

Ad valorem taxes assess land according to its fair market value, full value or partial value (Hibbard *et al*., 2003). These programmes tax the land on the basis of its highest and best use, regardless of the current use of the land. There are currently 15 states with ad valorem tax programmes. The preservation incentive of this type of programme is fairly limited. If the fair market value of the land for development is greater than the market value for forest land, the land will be taxed at the rate for developable land even if the land remains forested. As can be seen, there are tax disincentives to keep land forested unless forest use is the most profitable.

The most common state tax programme is based on the current use that a landowner makes of his or her land (ibid.). Forest land typically is taxed at a lower rate than if under a straight ad valorem tax, where the assessed value would include its potential salable value for development. Most of the current-use programmes are based on income capitalization, where land is valued through its ability to produce timber via a soil or land productivity class. Residents with 'better' land face a higher tax rate. This taxing system may increase the conversion of marginal lands to forest, whereas there is less incentive for highly productive lands to be put to forest. In comparison to ad valorem taxes, current-use taxes are thought to increase the incentives for maintaining forested land in the face of development pressure on the urban fringe.

Georgia's Conservation Use Valuation programme is a current-use tax programme that requires landowners to sign a ten-year covenant with restricted

uses in order to receive a reduced tax assessment (Newman *et al*., 2000). Owners who violate their agreement owe twice the ad valorem tax amount plus interest, which may lead to relatively high compliance. Newman *et al*. note that, in some locations, especially near Atlanta, owners have experienced a tax reduction of 90 per cent with the current-use tax, which has led to a concentration of participation around urban and coastal areas (ibid.). These participation concentrations may reflect differences in landowner preferences in areas closer to cities, or perhaps the magnitude of the reduction in property tax assessment.

Nine states have flat-tax programmes with a fixed annual tax per forest acre (Hibbard *et al*., 2003). These programmes do not differentiate between marginal and highly productive lands. They levy a fixed, predetermined tax rate that varies from state to state, ranging from $0.50 to $3 per acre per year and averaging $1.16 per acre (ibid.). Three exemption programmes have been established in states where eligible forest landowners do not pay any property taxes (ibid.). Alaska exempts most private forest land indefinitely. Iowa has an exemption for certain forests for eight years. Delaware exempts certain forests indefinitely from taxation, and commercial forest plantations for 30 years.

Hibbard *et al*. (2003) note several problems with current tax programmes, especially that forest property tax programmes are sometimes written prior to the development of a clear set of forest management goals. Tax policy should be evaluated in combination with other policy instruments. Frequently there are many overlapping private forestry programmes, and it is possible that uncoordinated programmes may work against each other rather than support each other. Analysts have recommended that polices should perhaps increase the official commitment period for participation to reflect the long-term commitment to forest land retention. There also may be a need to reduce the number of procedures required for admission and administration. Perhaps funding should be increased with longer-term commitments to the programme agencies, as landowners may not be willing to make a long-term commitment to preservation with the uncertainty of possible tax policy change in the near future.

Eligibility requirements for special tax programmes may include size and condition requirements, public access, specific management practices, compliance with state forest laws or evidence of previous harvesting (ibid.). Landowners may decide not to participate in these programmes because of an aversion to the typically complicated application process for many forest tax programmes. Landowners must weigh the benefits of participation against the costs (flow 6 in the model). In states with relatively low property taxes in general, a tax reduction may be insignificant in contrast to the time and effort involved in applying for the programme or for direct expenses such as

application fees, surveys or government inspections. Threat of penalty for withdrawal from a programme may decrease participation by landowners who anticipate clearing their forest land in the future, or perceive a chance of changing land use.

Differences in the structure of the tax programmes may be critical to the impact on NIPFs. Current-use programmes without a penalty for removal of forested land may not significantly influence long-term land use decisions, as the tax discount may merely be a saving while the landowner waits to develop the land. In comparison, if there is a penalty for removal of forest land, the ability of landowners simply to use the tax abatement for rent while waiting for development is reduced.

Tax programmes are government programmes, so NIPF landowners can indirectly influence programme design through diverse political processes at local, state and national levels. The impact of these programmes on actual landowner decisions to increase forested area has been mixed. Zhang and Flick (2001) show, in a case study in North Carolina and South Carolina, that tax incentives stimulated reforestation investments, which was in line with predictions of their theoretical model. Nagubadi *et al*. (1996) found in a study of NIPF landowners in Indiana that participation in the Classified Forest Program (which provides a tax incentive) is positively related to larger size of the property, commercial reasons for acquiring property (land investment, timber sale), desire for assistance in managing land and membership of forestry organizations. Overall, property tax programmes are not necessarily beneficial and can create incentives to maintain or cut forest land through flow 6.

Cost-share programmes

Forest cost-share programmes are designed to reduce the amount of resources that landowners spend on forest management (flow 6). Typically landowners face substantial opportunity costs when enrolling in cost-share programmes, especially extensive paperwork and required inspections. Many landowners may not have the time and expertise to invest in the application process, whereas others with time and expertise may receive substantial monetary gains from participation. There is some evidence that landowners substitute government cost-share money for their own funds while undertaking activities that the landowner already planned and intended to perform with or without government assistance (Baughman, 2002). Cost-share programmes reduce the amount that landowners pay through flow 1 and potentially influence the actual decisions regarding the NIPF land (flow 4). Zhang and Flick (2001) show in their case study in North Carolina and South Carolina that cost-sharing programmes reduce reforestation investments. The reason for this negative effect of cost-sharing is a substitution effect. Public funds are

used for private investments, which leads to the incentive to invest somewhat less and consume more of their own resources.

The Nagubadi *et al*. (1996) study of NIPF landowners in Indiana shows that participation in the Forest Incentives Program (a cost-share programme) is positively related to owners with commercial reasons for acquiring property. Programme participation is mostly limited to landowners for whom economic motivations are important. Since these economic motivations are only important for a minority of the population of NIPF landowners (Birch, 1996), we may question whether these types of programmes provide the right incentives to affect decision making of NIPF landowners.

Certification

In comparison to cost-share and tax programmes, certification has been widely heralded as a new way to promote sustainable forestry (Rickenbach, 2002; Rametsteiner and Simula, 2003). Currently most certification programmes are affiliated with NGOs, so they provide one way to bypass the electoral process in the socioecological framework. The concept of certification covers several types of policies that promote a wide range of objectives, such as management for harvest or promotion of the ecosystem. Forest certification has been used throughout the world, with about 3.2 per cent of all forests certified (Rametsteiner and Simula, 2003). In the USA, the two most prominent certification programmes are the Tree Farm System and the Forest Stewardship Council.

Certification programmes are based on a professional forester's assessment of the landowner's forest management practices. These programmes often serve as recognition programmes for individuals already knowledgable about forestry. Landowners may gain assurance that their forestry management practices are ecologically sound or the best management practice (Rickenbach, 2002).

Landowners need forest management plans to become certified, but only about 5 per cent of NIPF landowners have official plans (Birch, 1996). Certification also requires that the landowners consult foresters before harvesting. Overall certification systems are relatively complicated, with management and paperwork requirements (Rickenbach, 2002). Many landowners are unaware of recent forest certification developments, such as the new Green Tag Forestry programme. This programme was designed for NIPF landowners, but has not made much of an impact yet, with only approximately 50 000 acres certified, whereas the Tree Farm System has 26 million acres and the Forest Stewardship Council has 8.4 million acres (ibid.). Many of the newer programmes were created to promote different ecosystem-oriented objectives, in comparison to the traditional industry base of the Tree Farm System. The Forest Stewardship Council, for example, is supported by

many environmental groups, including both the Sierra Club and Rainforest Action Network (ibid.).

Rickenbach (2002, p. 43) notes that, while 'members of landowner associations may learn of certification by reading organizational literature or attending landowner events, most landowners have no such exposure'. Participating landowners may serve a vital co-producing role in these events (flow 6), which may increase the amount of information NIPF landowners obtain about other programmes, for example Tree Farm System certification.

The Forest Stewardship Council has gained contracts and success with Home Depot, Centex and European buyers' groups, which have expanded demand from large producers. Rickenbach (ibid., p. 45) expects that small NIPFs will not benefit financially from the Forest Stewardship Council 'without significantly more FSC-certified acres and chain-of-custody certified mill capacity'. The Council may be cost-prohibitive for most landowners because of the $200 application materials fee and $1000 application fee (Wenban-Smith *et al*., 2002).

Rickenbach (2002) argues that landowners may be unaware of the available certification programmes and that these programmes may not match their preferences for forest use. This preference problem mirrors a similar issue associated with cost-share and tax programmes that are aimed at economic-minded landowners. The Tree Farm System and Forestry Stewardship Council are not government programmes, so NIPF landowners cannot influence them through voting. These NGOs need funding through either industry or citizenry to survive, so NIPF may have a small impact through funding. Overall the connection between NIPF landowners and programme development is rather weak because of its private nature. We may expect a mismatch between the programmes and the NIPF preferences.

Easement programmes

Government and NGOs created easement programmes, which provide long-term public benefit via preservation of forest lands in perpetuity (Society of American Foresters, 2002). Easements often have financial benefits for the landowner when they are bought by government agencies or land trusts. Other easement programmes are based primarily on donations, so do not have a direct payment to the landowner (ibid.). Land under a conservation easement incurs a tax reduction because the easement restricts use. The magnitude of this tax benefit varies from state to state, depending on the respective tax laws. As discussed earlier, if a state has an ad valorem tax, a tax based on the highest and best use, the property tax savings due to a conservation easement are greater than the reduction for landowners in states with a flat forestry tax. Landowners typically gain an indirect benefit through tax reductions.

The 1985 Dedicated Nature Preserve Act, an easement programme in North Carolina, promotes forest conservation and conservation in other types of habitats through property and income tax benefits to protect their property in perpetuity (Cassingham *et al*., 2002). Participation in the programme is limited by funding, so preference is given to ecologically at-risk regions. As might be expected, protection is also concentrated on marginal production agricultural land (ibid.), as landowners with productive land can require higher payments for easements. Some landowners may actually receive substantial economic benefits for the sale of conservation easements. Under the Federal Forest Legacy Programme, landowners cannot receive more than fair market value for their property, but under other programmes landowners may receive a substantial payment for highly prized forest areas (Society of American Foresters, 2002).

For an easement programme to be effective, significant monitoring is necessary to ensure that the landowner is not violating the agreement. Many organizations struggle with limited resources in efforts to monitor their conservation easements (ibid.), although state and federal agencies have worked in cooperation with land trusts in some states to monitor the easements effectively (Sader *et al*., 2002).

Easement programmes allow individual landowners to come to private, individual agreements with the implementing NGO or government office regarding allowable land use (flow 2). The government programmes offer less flexibility than the NGOs, but the agreements are individualized to particular properties through both types. The connection between the programme (easement) and the NIPF landowner is much stronger than with tax or cost-share programmes. We also might expect to see a stronger connection between the programme and the impact on the forest.

Regulations and cooperatives

In our review of programme impacts on the socioecological system of nonindustrial private forests, we did not explore two important programmes in US forest policy: regulations and cooperatives. For example, regulations may force landowners to refrain from harvesting particular tree species or specific forest lands if the forest is designated critical habitat under the Endangered Species Act (Nagle and Ruhl, 2002). States and local governments also may have harvesting rules that apply within watersheds to prevent erosion. Furthermore many contend that regulatory power has not been used much to protect US forests. These laws and programmes will be evaluated in future studies, but were not included at this time because the policies seem fundamentally different from the voluntary types discussed above.

Cooperative management plans also were excluded in this study. These projects frequently bring private landowners together to manage conjoint

forests cooperatively or to decrease the costs of harvesting on small acreages. Cooperative management has emerged as one way to mitigate the problems associated with fragmentation of forest lands through parcelization. Cooperative management of private lands is challenging for individuals because there are great costs associated with bringing people together for meetings.

In order to model cooperative management with the socioecological model we would include several interconnected NIPFs and cooperating landowners. This complicated governance arrangement, although frequently worthwhile, is quite different from a single landowner working with an NGO or government entity. Similarly regulation is another type of policy tool that may be used in the future, but is fundamentally different because it is not voluntary. We focus on voluntary programmes, which may alter the individual's incentives through NGO and government programmes. These two policy tools warrant further study, perhaps with a modified framework of the socioecological system.

Discussion

Considerable variation exists in the types of forestry programmes used to preserve US NIPF lands. We individually have focused on four types of programmes. Many of these programmes, however, concurrently affect the same forests and landowners, and some programmes may be incompatible with one another. Existing studies on forest programmatic impact were not designed to address the mismatch between NGO and government programmes and NIPF preferences, but there is growing evidence that there may be problems due to the weak links in the socioecological system.

In our discussion of the programmes we have not dealt with the governance issues associated with their development and implementation. Future research will investigate the strengths and weaknesses associated with the complex hierarchies between federal, state and local agencies and departments that affect NIPF management. Preliminary evidence indicates that there are challenges in coordination of multiple programmes with conflicting incentives (Ellefson *et al*., 2002). Currently attempts are under way to merge agencies affecting forestry into coordinated units instead of focusing on one medium, such as air, water, land or biota (ibid.), but this raises questions about the inflexibility of a single state agency managing the forest lands.

One of the key problems in the governance of forests is the distance between the NIPF landowners and the programme officers. NIPF landowners can only indirectly express their demand for programme incentives. NGO programmes can have a more direct interaction with the NIPF landowners when conservation easement contracts are adapted to the individual situation. The larger distance between NIPF landowners and programme officials in governmental programmes is partly caused by the federal budgets allocated

to the state governments, where programme officers are supposed to spend these resources on programmes with limited resources for monitoring. As a consequence, the programmes are not evaluated on the way in which they have affected the activities of the NIPF landowners.

The need for a better understanding of the relationship between programmes, officials and landowners is not only of interest for the governance of forest resources in the USA. One of the main reasons for poor forest management in developing countries is the distance between the direct forest resource users and governmental officials that provides incentives for rent seeking and corruption (Ross, 2001; Curran *et al*., 2004). Evidently more research is required into what might be robust institutional arrangements that tighten the relation between users of the forests and organizations whose goals are to protect and preserve viable forest resources (Hartig and Vallentyne, 1989).

This chapter presents a framework that allows us to investigate programmatic impacts on the socioecological system for NIPFs. Future research should investigate the viability of different policy tools with the understanding that NIPF landowner decision making is fundamentally connected to both the social world of politics and the ecological world. Emerging policy tools such as conservation easements and certification programmes may reflect the changing demographics of NIPF landowners. This trend also may reflect dissatisfaction with traditional forestry programmes and their typically economic focus. The socioecological system for NIPFs highlights the important and frequently overlooked connections in policy making. In order for society to increase reforestation in the USA and throughout the world, we must understand a programme's impact on all links in the system.

Acknowledgments

We thank Joanna Broderick, Laura Carlson and William Hoover for their fruitful comments on an earlier version of the chapter. We gratefully acknowledge support from the Center for the Study of Institutions, Population, and Environmental Change at Indiana University through National Science Foundation grants SBR9521918 and SES0083511.

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16 Green political economy and the promise of the social economy

John Barry and Graham Smith

Green political economy is a relatively new area of study, arising as it has over the last two decades in response to increasing levels of global and local environmental degradation, and other social and economic consequences of a 'neoliberal' economic agenda (both within the academy and politics and policy making).[1] While much of green political economy thinking has been focused on developing critiques of this neoliberal agenda as an explicit ideological project (Barry, 1999a; Jacobs, 1999; Mulberg, 1992), usually as part of a broader green political critique, this (necessary) critical focus has not been balanced by a positive and reconstructive programme. The aim of this chapter is primarily reconstructive, in that we concentrate on the positive and transformative potential of green political economy both in theory and in practice. The overarching objective of the chapter is to outline some of the key political, economic and normative features of green political economy, which makes this body of critical knowledge distinctive and politically radical in comparison to the orthodox economic models which currently dominate both the discipline of economics and economic policy making, including environmental policy making (Barry, 1999a).

The chapter begins with a discussion of the current state of green political economy, arguing that much of the debate about the putative 'greening of the economy' revolves around the defence and critique of ecological modernization. Although this is the site of much significant analysis, it is our belief that the almost hegemonic position of ecological modernization means that debates within green political economy continue to be dominated by discussions of neoliberal economic theories and approaches. Although a sustained and appealing critique of ecological modernization has emerged, elements of a reconstructive approach to green political economy are sadly lacking. Much of this chapter offers one possible avenue for a reconstructive turn by focusing on the potential of the social economy to contribute to the achievement of sustainable development. It is our contention that the different forms of organization found within the social economy can contribute to central concerns within green politics, in particular environmental protection, social justice (including poverty alleviation/reduction in socioeconomic inequality), the reconceptualization of work and democratic participation.

Where is green political economy now? The dominance of ecological modernization

The study of green political economy is currently in an interesting stage of its development. Aspects of the green critique have been widely accepted and concepts such as 'sustainable development' have become mainstays of political discourse (at least rhetorically). In the guise of ecological modernization, environmental considerations have been accommodated within a broadly liberal–democratic–capitalist framework. As Maarten Hajer (1995: 25) states:

> ecological modernisation can be defined as the discourse that recognises the structural character of the environmental problematique but none the less assumes that existing political, economic, and social institutions can internalise the care for the environment.

By increasing the 'eco-efficiency' of the economy, both at the macro level through fiscal policy and at the micro level through clean technologies and technological innovation, ecological modernization offers a development path that potentially appeals to states, corporations and mainstream environmental organizations. Economic growth is decoupled from environmental damage and the antagonism between capital and environment is overcome (Gouldson and Murphy, 1997).

Ecological modernization has itself become a site of contestation: within green political economy there has been an intensive debate about the nature and promise of the discourse (Barry, 2003a). Criticisms are wide ranging. For example, critics challenge the significance of decoupling. Many apparent examples of decoupling have only been achieved through a displacement of high energy-consuming and polluting industries to less industrialized countries: quite simply, environmental damage has been exported. Furthermore increased efficiency of resource use makes no practical difference if consumption of goods increases and the economy continues to grow. Equally the scale of technological efficiency required to move the economy in a more sustainable direction is huge. Following Michael Jacobs (1996:27), we can understand the relationship between environmental impact and human activity in terms of the 'sustainability equation':

I = Environmental Impact
P = Population
C = Consumption per person
T = Environmental impact per unit of consumption (a measure of how efficiently the economy is using environmental resources and producing wastes).

$$I = P \times C \times T.$$

To decrease I, either P has to fall, C has to fall or T has to fall (implying an increase in environmental efficiency). T is thus a measure of the 'environmental efficiency of production'. This means, for example, that to decrease I (total environmental impact) by 50 per cent over the next 50 years while the world economy grows by 2–3 per cent per annum (implying a fourfold increase in consumption and a doubling of world population), T would have to be one-sixteenth its present level by 2050. That is, technologies and living patterns would have to be *91 per cent* more environmentally efficient than they are now.

Beyond such technical questions, ecological modernization has nothing to say about social and political issues such as social justice, green citizenship and democratic participation. The theory and practice of ecological modernization is charged with a failure to address pressing issues of social justice on two fronts: both *within* industrialized nations and *between* highly industrialized and Third World nations (Hajer, 1995: 32). Ecological modernization theory is silent on the question of the distribution of environmental goods and bads, focusing primarily on the overall domestic environmental impact of national economies in the industrialized part of the world. Environmental justice campaigners within industrialized nations highlight the unequal distribution of environmental risks; for example, the siting of toxic waste disposal facilities close to lower socioeconomic neighbourhoods (Schlosberg, 1999). On a more global level, we have already noted that the ecological modernization of national economies may only be achievable through the export of polluting industries and the degradation of environmental resources in less industrialized nations. Indeed for many this 'race to the bottom' is a direct consequence of neoliberal-led economic globalization. For writers such as Martin Khor (1992: 38), we must not lose sight of the role that capitalism plays in the continuation of poverty and environmental degradation. As he puts it,

> This is the ultimate environmental and social tragedy of our age: the scientific knowledge that could be properly used to provide for every human being's physical needs is being applied instead through industrial technology to take away resources from the Third World largely for the production of superfluous goods. Meanwhile, the majority of Third World peoples sink deeper into the margins of survival.

Within the discourse of ecological modernization, questions of Third World development appear to be neglected: ecological modernization is a discourse of (and for) highly industrialized nations.

Ecological modernization also fails to speak effectively to other green concerns such as citizenship and participation. By working within the existing liberal–democratic–capitalist framework, dominant accounts of ecological

modernization ignore the role and practices of citizens, beyond providing a fiscal environment in which consumption choices internalize environmental costs (Smith, 2004: 142). Equally ecological modernization has little or nothing to say about democratic renewal: it remains a technical discourse in which elites (whether government, business or mainstream environmental groups) cooperate to establish suitable regulatory and fiscal policies. It is no wonder then that many greens perceive ecological modernization as an effective strategy through which the state and corporate interests can coopt and thus 'domesticate' and 'normalize' the environmental critique and movement (Wissenburg and Levy, 2004).

The critique of both ecological modernization and the broader discipline of neoliberal environmental economics is now well established and highlights the growing sophistication of a political economy perspective within green political theory that systematically analyses the causes and dynamics of environmental degradation and social disruption. However what is obviously lacking within current green thought is systematic work on 'reconstructive' green political economy: the articulation of coherent, attractive and realizable alternatives to dominant discourses such as ecological modernization. Alternative and more radical visions of ecological modernization have been offered (Christoff, 1996; Hajer, 1995), but these accounts fail to challenge systematically the structure of economic and public institutions. There has been much recent attention paid to the restructuring of political institutions, particularly influenced by the insights of deliberative democracy (Smith, 2003), but it is our contention that one of the main failings of green political economy has been the lack of attention paid to alternative forms of economic organization. The rest of the chapter focuses on the potential contribution of one group of institutions, collectively defined as the social economy, to the transformative project of green political economy.

What is the social economy?[2]

The social economy refers to a broad category (or categories) of organizations: cooperatives, mutuals and voluntary organizations, associations and foundations that engage in economic activity (traded or nontraded) with a social remit. Given the range of organizations, the social economy cannot be defined in traditional legal terms. The term 'social economy' is French in origin (*économie sociale*) and it aims to distinguish this group of organizations from public authorities and private enterprises with an exclusively profit-making objective. The social economy includes, for example, building societies, charity trading arms, consumer retail societies, community businesses, credit unions, fair trade companies, housing associations, intermediate labour market companies, local exchange trading schemes, marketing cooperatives, mutual cooperative companies, social businesses, social firms, time

banks, voluntary enterprises, workers' cooperatives, and so on (Pearce, 2003: 29). We are thus dealing with a broad range of organizations with different size and structure, engaged in varying types of economic activity at different geographical levels. The nature of the economic goods and services produced is not the key defining feature of the social economy, rather 'such enterprises belong to the *Économie Sociale* sector because of their purposes and the way they organize and manage their productive activity' (Molloy *et al*., 1999: 8). The broad range of organizational forms means that across the social economy we will find a variety of different relationships between stakeholders, such as paid workers, volunteers, trustees, members, users, customers, funders, contractors and the wider community. For example, a workers' cooperative will engage a different group of stakeholders in different ways than voluntary enterprises and community businesses.

The social economy is apparently the fastest growing sector in Europe (ibid.: 11). The two areas where there appears to be the most growth are economic integration (in particular training) and provision of social and health care services. Other new niches such as environmental improvement are also playing a larger role in the activities of the sector. Simply from an employment perspective, social economy organizations make a significant contribution to the national economy. Using figures from the late 1990s, the International Center of Research and Information on Public and Cooperative Economy (CIRIEC) estimates that there are just under 8.9 million full-time equivalent jobs in the social economy in the European Union, which equates to 6.57 per cent of full-time civil employment (CIRIEC, 2000: 18).[3]

CIRIEC defines the social economy according to four criteria: (a) the object of providing services to members (common or mutual interest) or the community (general interest), (b) the primacy of people over capital, (c) democratic functioning, and (d) a management system which is independent of the public authorities (ibid.: 11).

Broadly the social economy can be distinguished from other spheres of activity by two institutional characteristics: ethos and structure. The ethos of the social economy orientates organizations towards mutual, communal or general interests. The shared primary aim is to meet social needs rather than generating profit – a stark contrast with capitalist firms. Any profit and surplus is distributed according to different principles than shareholding. At this general level, all social economy organizations share the same ethos. However there will be different ways in which this ethos is put into practice since there are a range of values, norms and motivations expressed through different organizational forms. For example, organizations might be driven by motivations as different as beneficence, reciprocity or solidarity (Kendall and Knapp, 1995; Ware, 1989). While these are all different elements of a broad ethos orientating actors beyond self-interest, philanthropic activity

can take a quite different form from that of community self-help. The social commitment of some organizations will be relatively limited; that is, training of the socially excluded to facilitate participation in the 'mainstream' economy. For others, their ethos is oppositional, challenging cultural norms, with more experimentation in, for example, empowerment and democratic participation.[4]

The structure of social economy organizations is democratic in nature, leading to unusual patterns of the political division of labour and in the relationship between power and authority. These patterns vary according to the type of organization we are considering – cooperative, mutual or voluntary association – and the size of the organization. So, for example, both the participants and the expression of the democratic principle in small-scale workers' cooperatives are obvious (one member, one vote) when compared to community enterprises that may offer different forms of participation rights to different categories of stakeholders including trustees, paid workers, volunteers, members, users, funders, the wider community, and so on. The form of participation will also be dependent on the size of the organization. Whereas smaller organizations may facilitate direct participation by all stakeholders, larger organizations will have a different division of labour that is likely to be based on the representative principle, or where direct participation may be limited to annual votes for trustees or directors.

In some ways it is easiest to define the social economy in comparison to more familiar organizational types: capitalist corporations, public authorities, voluntary organizations and the informal economy. The most common criterion used to define the social economy is the limits placed on the role of investors on the private acquisition of profits (CIRIEC, 2000: 102); thus perhaps the most significant comparison is with for-profit or capitalist firms. Within the social economy the primary objective of organizations is not profit or capital accumulation and the primary beneficiary group is not investors. As Ash Amin and his colleagues (2002: 1) state:

> While organisations may be run as efficient businesses, their prime interest does not lie in profit-maximisation, but in building social capacity (e.g. through employing or training socially disadvantaged groups) and responding to under-met needs (e.g. environmental improvement, free or affordable child-care or housing for low-income families) – and in the process creating new forms of work. The social economy thus marks economic activity (traded and untraded) with a social remit.

Thus, by disrupting and/or being organized along lines different to solely profit maximization, the social economy can act as an alternative to, or brake on, the 'growth imperative' which drives the mainstream, capitalist economy, which of course has been a long-standing green policy objective.

A second contrast with the social economy is the public sector. Although the state may often be a significant source of income (whether through contracts or grants), organizations in the social economy are managed independently from the state. This means that not-for-profit companies established by the state to deliver public services (for example, Network Rail and foundation hospitals in the United Kingdom) would fail the independence test and would be situated just outside the boundary of the social economy.

If the social economy can be contrasted with the for-private-profit economy and the public sector, then what of its relationship with the organizations primarily associated with civil society, voluntary associations? It would be a mistake to assume that the social economy is simply another term for the voluntary sector (or civil society). Although many voluntary associations are part of the social economy, the 'non-distribution constraint' often used by analysts to distinguish the voluntary or nonprofit sector (Salamon and Anheier, 1997) excludes cooperatives, mutual aid societies and newer social enterprises that generate and distribute profits.[5]

Finally the most porous boundary, and one that raises many contentions, is with the informal economy, itself much celebrated with green politics (although often confused with the social economy). Jacques Defourny (1992: 28) – a prominent writer on the social economy – argues that the social economy 'does not include those activities which are not taken into account by national accounting systems'. This is an unnecessary limiting of the idea of the social economy, one that uses a neoclassical economic logic to distinguish what is and what is not productive activity: simply because something is not valued within national income accounting does not entail that it is not productive. Such a categorization of the social economy would remove a range of alternative forms of economic organization, for example local exchange trading systems (Barry and Proops, 2000) and other more informal self-help organizations, which may expand the range and potential of the social economy and its contribution to the achievement of the environmental, social and political aims of sustainable development.

The social economy and sustainable development

The social economy is a sphere of socioeconomic activities, organizational principles and motivations that is attuned to principles of sustainable development: to considerations such as environmental protection, socioeconomic equality, poverty reduction and encouraging democratic citizenship (Jacobs, 1999). This is clearly a bold statement, but it is our contention that the very ethos and structure of social economy organizations promotes sustainable forms of development. Ecological modernization and the broader discourse of environmental economics recognize that profit-maximizing corporations are not inclined to internalize social and environmental considerations and

that their activities need to be directed through detailed regulatory and fiscal policy if sustainable development is to be achieved. Our argument is that the organizations within the social economy – cooperatives, mutuals and associations – have an advantage over other institutional forms in that their ethos and structure already reflect principles implicit within sustainable development. This is not to say that there is no role for the state in regulating the social economy (see later), rather that a focus on the social economy as a key part of a sustainable development strategy signals a (potentially) more radical and transformative project than that of ecological modernization: whereas the latter aims to ensure the resource efficiency of the current economic system, the former project seeks its transformation.

Productive/economic activity in the social economy is associated with a plurality of goods fundamental to the achievement of a vision of sustainable development qualitatively different from ecological modernization. Our argument is not that each and every organization in the social economy displays all of these goods to the same extent, rather that collectively the social economy promotes (among others) the objectives we now address.

Social justice

One of the key distinguishing features of the social economy in comparison with the for-private-profit sector is the explicit social aims of production. Social economy organizations orient themselves towards common, mutual or general interests, often directly tackling socioeconomic injustices and poverty alleviation. In many cases the social economy is active in areas of deprivation where capital has fled and employment opportunities are few. The largest fields of operation in the social economy are social welfare and training, typically engaging socially excluded individuals and communities.

For many organizations, their social aims are tied to a commitment to the empowerment of individuals and communities, not simply the provision of services, but also forms of engagement that build self-confidence and social solidarity through co-production. Social economy organizations are likely to offer a mode of empowerment and capacity building not found in capitalist corporations or public bureaucracies. As Jacobs (1996: 100) argues:

> Community-based organisations tangibly raise levels of hope and self-confidence and a sense of social participation. By enabling people to work together for one another, they give expression to feelings of altruism and mutuality, and thereby help to regenerate a sense of community.

At the same time, the very structure of social economy organizations can be seen as promoting social justice, in that the influence of capital is reduced. For most social economy organizations the connection between capital and control of the enterprise is broken. Within the capitalist economy the ownership

and control of corporations create enormous inequalities among citizens in terms of their capacities and opportunities to influence decision making within the organization, but also more generally within the broader political realm (Dahl, 1985).

Environmental protection

The most obvious connection between the social economy and sustainable development is that group of organizations whose social aims are explicitly environmental. Environmental organizations are a growing sector of the social economy and range from countercultural cooperatives through to more mainstream wildlife conservation projects and community recycling initiatives (Young, 1997). The range of explicitly green economic enterprises within the social economy is impressive and has long been part (though often underemphasized) of the 'project' of green (and other) new social movements.

However our interest is not simply with explicitly green social economy organizations: environmental protection is but one aspect of sustainable development. The orientation towards common, mutual or general interests is surely fertile ground for the recognition of environmental impacts by all social economy organizations. As the prominent social economy writer John Pearce (2003: 43) argues: 'It should be axiomatic that an enterprise which has a social purpose will have a clear positive environmental policy, for to be environmentally irresponsible is to be socially irresponsible.' However the record of social economy organizations in adopting environmental policies and practices has been patchy at best; often working with limited resources and poor information, environmental considerations have been secondary to what many organizations perceive to be their primary social purpose. Awareness of the broader ecological context of social aims is emerging: for example, the International Statement on Cooperative Identity includes the principle that cooperatives should 'work for the sustainable development of their communities' (International Cooperative Alliance, 1996). Pearce (2003: 43) has suggested that all social economy organizations should 'report on their environmental policies and impact regularly as part of their social accounts'.[6]

Democratic participation and green citizenship

One of the defining features of the social economy offered by CIRIEC (2000: 11) is 'democratic functioning'. Social economy organizations have a diverse range of democratic governance structures, often providing avenues for a range of stakeholders – including varying combinations of paid workers, trustees, users, customers, volunteers, the local community, and so on – to shape policy and practices.

The combination of the structure and ethos of social economy organizations provides an attractive context in which green citizenship might be

cultivated and expressed. There is widespread agreement among green theorists that sustainability requires a cultural change in citizenship practice, but little indication of the institutional environments in which such practices can be cultivated and expressed (Smith, 2005). We have already argued that the social economy often generates a sense of empowerment and self-belief which is itself a precondition to active citizenship. The ethos of the social economy orients stakeholders away from narrow self-interest and the structure provides opportunities to engage with differently situated others. In this way social economy organizations provide an environment within which to cultivate political and critical skills, particularly where there are highly developed participatory structures. The ethos and structure also combine to contribute to the 'disposition of cooperation': the generation of 'pre-civic (or civil) virtues' of reciprocity, trust and recognition (Warren, 2001: 75). The way in which many organizations integrate different social groups in and through their work is promising ground on which civility is born. Amin and his colleagues offer a number of examples of social economy organizations breaking down barriers of prejudice and discrimination. One is the Gabalfa Community Workshop in Cardiff: 'By bringing disabled and non-disabled people together in everyday commercial transactions the project has successfully broken down barriers of fear and prejudice on both sides by "normalising" the presence of disabled in the community' (Amin *et al*., 2002: 48). Such a disposition of cooperation orients citizens away from narrow self-interests and is the ground upon which deeper civic virtues that are fundamental to green citizenship can be cultivated and expressed (Barry, 1999a).

Given current concerns about the debilitating effect of the culture of individualism, self-interest and excessive consumption on political and social life, this brief analysis of the developmental effects of social economy organizations suggests that the sector is a promising location for the cultivation of citizenship in the service of the achievement of green political goals as articulated by the idea of sustainable development – the cultivation of green citizenship in other words, or at least the 'greening' of citizenship. But the social economy can also be seen as a context within which citizenship is not just cultivated, but also practised and expressed.

There are a number of ways that we can think of the expression of citizenship in the social economy. One obvious way is thinking about the motivations of different actors involved in the social economy. Many individuals active in the sector are volunteers, driven by the express desire to contribute to the common good. Second, many paid workers are willing to accept the financial cost (wages are typically lower in the social economy) because they wish to be engaged in socially useful production rather than profit maximization in the mainstream economy. Third, consumers may also make similar types of judgment when deciding to purchase goods and services from the social

economy (ethical consumption). It would be strange indeed not to view the activities of such workers, volunteers and consumers (as well as other actors within the social economy) under the rubric of citizenship. Their choices and actions are guided not simply by self-interest, but also by a broader concern with the public or common good.

More radically we can think of citizen participation in the decision making processes of the social economy as fulfilling the green principle of democratizing the economy. There is a tendency within political thought to limit the process of democratization to the state. However such a conceptualization of democratic practice neglects the complex modes of governance that govern citizens' lives. Citizens are subject to a broad range of regimes of governance that involve a myriad web of state and nonstate agencies. With any given form of governance, it is valid to investigate the extent to which citizens are able to affect the regime to which they are subject. If we think in these terms, the social economy is part of the process of social and economic governance and we can thus legitimately analyse the extent to which it promotes the expression of citizenship, and the greening of citizenship. As with the earlier argument about the cultivation of citizenship, the particular blend of ethos and participative structure of these organizational forms promises meaningful opportunities for active citizenship in relation to forms of authority. This is particularly the case when we compare the social economy with other forms of governance, for example large-scale public bureaucracies and capitalist corporations which are more hierarchical in nature and offer few opportunities for meaningful participation. Too often the exercise of citizenship is a formal and passive affair: the social economy may offer a more human scale for the exercise of active forms of citizenship. Just as early pioneers of green political economy such as Schumacher (1973) called for 'human scale' economics and modes of economic thinking and acting 'as if people mattered', the social economy offers another way for those long-standing green values and ideas of citizenship and well-being to be achieved. Here also the emancipatory character and promise of green politics finds practical expression (Eckersley, 1992).

Reconceptualization of work, production and reproduction

One of the many issues that theorists of ecological modernization ignore is the green commitment to rethinking the nature of work. In modern society, work typically equates to paid employment and the significance and social status of the work done is directly related to the level of financial remuneration. The productive process in many social economy organizations points towards a different conceptualization of work: often work is done by a range of different actors including paid workers, but also by volunteers and users. Many social economy organizations do not have paid workers at all. One of

the interesting and radical potentials of the social economy is to disrupt the automatic identification of 'work' with 'employment'; that is, that one can do useful and socially valuable work outside the formal employment sphere. Thus practices within the social economy complement one of the central themes within green political economy, the separation of 'employment' (in the 'mainstream' or 'capitalist' economy) from 'work' (which may or may not receive formal payment).

The separation of employment and work is significant since, as Tony Fitzpatrick (1998: 13) argues, 'The employment ethic dominates, to an overwhelming extent, the political and economic debates dealing with social policy. This ethic refers to the fact that wage-earning activity in the formal labour market tends to be valued over all other forms of human activity'. Fitzpatrick has argued strongly for the need for a new 'green' model of welfare and social policy that separates work from employment and for green welfare/well-being arguments to be firmly represented within a 'post-employment' framework. The distinction between employment and work then becomes a central part of green arguments against the 'growth economy' and part of the political economy of a more sustainable economy. The social economy can be viewed as one institutional mechanism for providing welfare and well-being which is not necessarily associated with the growth economy and its fixation on quantitative measures such as private disposable income or national levels of GDP.

This disruption of work/employment also fits long-standing feminist and eco-feminist arguments for the recognition of the work done in the reproductive sphere, which often is 'invisible' since it does not command a wage or other monetary value which would be included in standard national accounts (Salleh, 1997; Mellor, 1997). In this way, a shift to the social economy is a way of reconnecting production and reproduction.

Finally the social economy offers an economic context within which the reconnection between 'production' and 'consumption' can be achieved (Barry, 1999a). This can be expressed either through making these production and consumption relations more transparent, as in 'fair' and 'ethically' traded commodities, or by making the connection between production and consumption more personal and localized. The social economy provides a number of organizational forms through which the systematic decentralization and localization of production and consumption can occur.

Associative reforms to the welfare state

If the social economy offers a productive sphere in which the goals of sustainable development are promoted, the question that follows is how the activities of the sector might be further enhanced. The social economy has always responded to social needs that are inadequately met (or ignored) by

either the state or the market. For some of these activities, organizations in the social economy have received funding from public authorities in the form of grants or contracts. In a number of liberal democratic societies the role of the social economy in the provision of welfare has increased as the state has 'rolled back' its activities. The UK is a good example of the case where the state often uses social economy organizations (and private for-profit firms) to provide services that were once delivered directly by public bureaucracies. More recently the public procurement process has given preference to social economy organizations in certain areas of social policy, typically in recognition of the wider positive benefits (soft outputs) of their activities – the kinds of benefits we discussed above.[7] Some of New Labour's key programmes rely in part on the social economy. For example, the New Deal (a 'workfare programme for the unemployed') includes an option of working in the voluntary sector and many social economy organizations provide training opportunities in conservation and other environmental improvement projects; the New Deal for Communities (a regeneration program) explicitly recommends the development of the social economy in the regeneration of socially excluded communities.

One way of reading these reforms is as evidence of a worrying roll-back of the welfare state driven by the logic of economic liberalism: 'a subtle abandoning of the universal welfare state under the guise of partnership, efficiency of service delivery, and local targeting' (Amin *et al*., 2002: 123). However we could also read the recent growth in interest in the social economy as a move towards a new form of welfare governance which would recast the relationship between the state, the social economy and citizenship. The extension of the social economy certainly resonates with the arguments of Paul Hirst (1994, 2002) for the renewal of modern democracies through associationalism and more recent work within green social policy on 'welfare associationalism' (Fitzpatrick, 1998).

For Hirst, the provision of services by large-scale hierarchical bureaucracies – or worse by quasi-public bureaucratic agencies or hierarchically managed business corporations (following privatization and deregulation) – has led to a low level of accountability to citizens: 'Top-down administration appropriates the service from those for whom it is provided, and they have little capacity to redirect a failing bureaucracy toward meeting their needs' (Hirst, 1994: 6). There is little or no room for citizens to shape the services they receive: 'however good or bad the service delivery personnel are, citizens have little access to these institutions other than in the capacity of clients, as objects of administration' (ibid.: 166). Hirst argues for an alternative pattern for the governance of welfare – provision by a plurality of self-governing and democratic associations – or, in the language of this chapter, social economy organizations. A plurality of associations would accommodate the plural communities (with different values and demands) that we find in modern

democracies; citizens would have a choice of different service providers. The state would still play a significant role as regulator of provision of services, ensuring standards of services (including social and environmental reporting) and democratic functioning within social economy organizations. Importantly, though, it would no longer be 'in the contradictory position of providing services through its bureaucratic agencies and also acting as the guarantor of the standard of those services' (ibid.: 168–9). Unlike visions of economic liberalism, Hirst's proposals do not seek to reduce welfare provision, but rather to change its form of governance in a more emancipatory and sustainable direction.

From a green social policy perspective, Fitzpatrick's work on 'welfare associationalism' resonates with the ideas of Hirst. According to Fitzpatrick (1998: 18):

> welfare associationalists insist that the dominance of the state and market sectors in social policy making is now detrimental to personal, social and ecological well-being … According to welfare associationalism … (dis)integrative formalism must be supplanted by a 're-integrative informalism' of non-market decentralization and social participation, where individuals and groups either produce the welfare services which they consume, or, where this is unrealistic, have the greatest practicable control over their design and delivery.

It is clear that the social economy can be regarded as a part of the shift to what Fitzpatrick calls 're-integrative informalism', aimed at enabling communities and groups to provide for their own welfare independent from state or for-private-profit bodies. Providing innovative mechanisms and ways of promoting 'quality of life' is at the heart of both green political economy and sustainable development.

Democratizing the economy

The most common way of defining the social economy is in contrast to the for-private-profit, capitalist economy. The social economy offers alternative modes of production that do not prioritize profit maximization. As we argued in the introductory remarks on ecological modernization, one of the defining features of much current green political economy is the fact that the capitalist corporation is taken as given. It may be the object of much critique, but practical suggestions for reform focus on the regulatory and fiscal environment as the mechanism for reorienting corporate practices.

Within the green movement, the various campaigns on corporate social responsibility are increasing their influence and appeal, putting pressure on states and international organizations to develop legislation to force corporations to comply legally with environmental, equality and social principles, as well as opening up the possibility that the 'fiduciary duty' of corporate office

holders be supplemented with other legally binding obligations other than maximizing profits for shareholders. On the back of corporate scandals and corruption from Worldcom and Enron to Parmalat, this movement has gained momentum and added to public pressure for the internal reform and external regulation of corporations. However the fiduciary duty of the management board to maximize profits for shareholders remains a major stumbling-block for the greening of corporations: noneconomic concerns of environmental protection, social concerns and so on cannot legally be placed on an equal footing with the need to maximize profits. While useful as a form of reformist and oppositional political strategy, the corporate social responsibility movement is based on taking the corporation as 'given' and finding political means of reforming it, rather than seeking to create, in the title of a book by David Korten, *The Post-Corporate World* (2000). The social economy may offer a model on which we might begin to think beyond the political economy of capitalist corporations and towards the democratization of the economy.

Here again it is worth returning to Hirst's work on associative democracy. Although it is his ideas on welfare governance that are most well known and debated, he also argues that the capitalist corporation is not the inevitable form of organization of economic activity: 'Associative democracy … promotes the democratic governance of corporate bodies in both the public and *private spheres*, aiming to restrict the scope of hierarchical management and offering a new model of organisational efficiency' (Hirst, 1994: 74, emphasis added). By drawing on the work of Hirst and other writers on economic democracy, such as Robert Dahl (1985), the social economy emerges as the basis of an economy where the ownership of capital does not directly determine the control of enterprises and the principle of democracy is applied to economic governance.

Dahl in particular has argued that the existing governance of corporations has profound effects on the ability of citizens and communities to influence the decisions that affect their lives and environment. Ownership and control of capitalist enterprises allows business interests to convert their economic position into a privileged position in the political system, undermining the democratic process and having profound impacts on wider society and the environment. Just as the modern pattern of corporate ownership undermines the democratic nature of the political process, it also undermines any possibility of meaningful democracy and participation within the corporation itself (ibid.: 54–5). For Dahl, a system of self-governing enterprises would have a double dividend: the connection between capital and influence/control would be broken at the level of the political system and at the level of the individual economic enterprise.

Dahl's preferred form of self-governing economic enterprise is the workers' cooperative. He is obviously attracted to the one member, one vote

principle. Workers' cooperatives have also long been the preferred form of economic organization within green politics (Carter, 1996; Green Party, 2003). However, given our preceding discussion of the plethora of organizational forms within the social economy, it is not at all clear why we should be interested in workers' cooperatives alone. In fact, compared to other forms of organization within the social economy, workers' cooperatives often have no lines of accountability to the local communities in which they operate. As Hirst (1994: 142) argues, participation in economic enterprises should not be limited by a single category of stakeholder, that is, paid workers:

> the demand for economic democracy has been prised loose from the exclusive grip of advocates of 'workers' control'. It is now clear that there are more stakeholders in industry than just the immediate producers, and that corporate governance must reflect this … it concerns the relationship of the firm to the wider community.

Hirst argues that self-governing economic enterprises must be accountable and democratic, but the specific structure of accountability and democracy is likely to be plural and diverse. Although he does not go into much detail, the plethora of institutional forms within the social economy appears to offer empirical examples of what he has in mind.

A transition to economic democracy is highly unlikely in the foreseeable future and is unlikely to happen organically since social economy organizations are at a disadvantage under current market conditions. As David Miller (1981: 324) states: 'Rather than being a neutral device, [the market] discriminates against certain preferences, such as those for cooperative modes of organisation.' There is a systematic bias within free markets in favour of organizational forms that satisfy only 'private desires' such as income maximization: that is, capitalist firms. Organizations from the social economy that also (or primarily) promote 'group-oriented desires' (such as equality at work, participation and environmental protection), find themselves disadvantaged under market conditions: 'The market discriminates in favour of those who prefer the authority structure of the capitalist firm' (ibid.: 327-8). Current market rules and disciplines undermine the pursuit of sustainable development and other green economic and political goals which run counter to the logic of capitalism.

However this does not point to a rejection of the market understood as a system of free exchange and opportunity for entrepreneurial and innovative economic activity. It does not follow that the default position to the capitalist economy is either state socialism or an unrealistic, autarkic vision of closed, small-scale, decentralized socioeconomic and political systems popular in much radical green political theory (Barry, 1999a). Green political economy can be 'anti-capitalist' and at the same time 'pro-market'. What this requires,

though, is that the state play an activist role in shaping a sympathetic environment for economic democracy. As Hirst (1994: 146) argues, to move beyond the 'republic of shareholders', 'companies need to be encouraged by public policy to evolve into self-governing associations that are sufficiently representative of their stakeholders to continue to enjoy the privileges of corporate status'. Similarly, Miller (1981: 328) recognizes that it is the state that must 'facilitate alternative modes of association, or change the financial terms on which different institutions compete in the market'. A green and democratic (social) economy inhabited by green and democratic economic enterprises will, in part, be the product of an active green state.

Conclusion

A number of themes emerge from this brief overview of the social economy and green politics. Two in particular are worth highlighting. The first is that the social economy is an excellent vehicle for sustainable development, embracing as it does the economic, social and environmental 'bottom lines' of sustainable development. Equally, and related to this, the social economy is also an excellent vehicle for the achievement of green political aims of challenging the growth imperative and the employment ethic, encouraging active citizenship, promoting egalitarianism and, above all, providing a sphere and set of oppositional practices which can help in green strategies for the transition towards a more sustainable, just and democratic society.

The second is that, if the role and scope of the social economy are to be expanded it must be done by an active state; there is only so much that can be done through countercultural networks. The green social economy will not (sadly) emerge 'naturally' but will require state support. In other words, if, as we suggest, there are both principled and strategic reasons why greens should seek to increase the social economy at the expense of the formal/capitalist economy, then it follows that greens should support state activities which can help bolster the social economy (and of course challenge and oppose state policies which threaten or undermine the social economy). In keeping with recent work in green politics on issues of strategy and the (green) state (Dryzek *et al*., 2003; Eckersley, 2004; Barry, 2003b), a focus on the social economy enables greens to move beyond (abstract) critique to providing viable and practical alternatives that are living examples of sustainability in practice.

Notes

1. The roots and composition of 'green political economy' are many. For our purposes in this chapter we would regard the work of radical economists such as Nicholas Georgescu-Roegan (1971, 1976), Ezra Mishan (1967), Herman Daly (1973, 1985), Herman Daly *et al*. (1990, 1993), Fritz Schumacher (1973) and James Robertson (1983, 1985) as forerunners of key aspects of green political economy in the 1960s and 1970s. Moving to the 1980s and

1990s, 'green economics' associated with writers such as Michael Jacobs (1991), Richard Douthwaite (1993, 2000) and the economic policies associated with Green parties worldwide and progressive think-tanks and organizations such as the New Economics Foundation in the UK are also key milestones. Today green political economy includes 'ecological economics' (Faber *et al*., 1996), and the work in the journal *Ecological Economics*, as opposed to 'environmental economics' (Barry, 1999b), the work of ecofeminists such as Mary Mellor (1992, 1995, 1997) and Ariel Salleh (1995, 1997), ecosocialists such as Ted Benton, Andre Gorz and others such as Joan Martinez-Alier and his 'environmentalism of the poor' (Martinez-Alier, 2002). An important part of green political economy thinking concerns the implications of sustainable development for the welfare state as found in the work of writers on the 'greening' of social policy (Fitzpatrick, 1998). A moot point here is whether works and authors such as *Factor Four* (von Weizacker *et al*., 1998), *Natural Capitalism* (Hawken *et al*., 2000) and associated developments (especially from 'think-tanks') should be included as part of green political economy. Drawing on the Marxian roots of 'political economy' analysis, 'green political economy', as we understand it, is also concerned about power relations and social change. Given that the transformative potential or stated aims of many works in green political economy range from the complete overthrow of the existing economic order to more reformist approaches to the 'greening' of capitalism, a firm 'cut off' cannot be established and indeed, in our view, is counterproductive. Having multiple sources (not all of which will be compatible) to draw upon is a strength, not a weakness, that at the very least needs to be acknowledged, rather than attempting to dragoon all potential approaches into toeing a particular 'party line' (even if the party is the Green Party).

2. For reasons of space, our focus in this chapter is on the social economy in Western, capitalist societies. The social economy in the developing world is more prominent in terms of size and meeting people's needs in comparison to the state or private economic sector and contains a wide variety of organizational modes from which the West could learn. For an account of the social economy in the developing world, see Latouche (1993).
3. This figure is equivalent to 7.92 per cent of full-time salaried civil employment.
4. While there has always been an economic aspect to oppositional green political activism and green politics, it is often underemphasized and undertheorized as an essential aspect of green political strategy. For a discussion of the role of alternative economic practices and modes of organization within green political strategy, see Begg (2000), Barry and Proops (2000), Doherty (2001), Seel *et al*. (2000).
5. Much research on the voluntary sector is dominated by the US Johns Hopkins Comparative Nonprofit Sector Project.
6. This would realize the idea of triple bottom-line accounting, providing information on the social, environmental and financial impacts of an organization and how they interrelate.
7. While such soft outputs are recognized, support is typically rhetorical; service contracts rarely take these additional benefits into account, preferring instead to focus on quantifiable (hard) outputs.

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17 Moving the earth: cars and the dynamics of environmental politics

Matthew Paterson[1]

Material practices and environmental politics

When Western academics, especially in the discipline of politics,[2] think about environmental politics, they tend to start with the environmental issues through which we come to understand the physical world around us as in some sense or other 'endangered' and thus 'the environment' becomes something of political interest. So we analyse climate change, toxic waste, species extinction, genetic modification, and so on. We look at the processes through which such issues are defined, articulated politically, the different institutions which come to deal with them, and attempt to explain how such institutions respond to such problems, often with a sense of purpose about how they might respond 'better'. At times we look across issues at similarities in the way they are treated, such as the roles of different actors (business, environmental NGOs, international institutions) in shaping such responses, or at specific political discourses (environmental security, liberalism, ecological modernization) through which such responses are understood.

What happens when we do this of course is that the environmental issues themselves tend to be both reified and treated uncritically, and at the same time any sense of an overarching 'environmental crisis' is lost or at least attenuated, as the world is split up into a host of seemingly discrete 'issues'. The interconnections between different such issues, such as the knock-on effects of particular ways of dealing with one on another, get missed.[3]

I do not propose that we should discontinue studying such issues and responses to them, but rather that we also need to take a general look at the politics of the range of material practices which generate environmental degradation. This enables a more systemic analysis by looking at the way the practices which generate degradation are bound up with the operations of modern political, social and economic systems. It avoids the tendency to privilege technofixes which is one outcome of the 'issues' focus (as such a focus means we tend not to look at the consequences across such issues). Perhaps most fundamentally, it enables us to answer the question of why environmental degradation occurs, not only how political institutions respond to them.

Many such practices could be chosen to develop this way of thinking about environmental politics. We could look (for example) at construction, comput-

ers, food, telecommunications, housework, education, aviation, the military, paper, electricity, keeping warm and cool. In each case we should avoid reducing it to a focus on business practices (hence the above list does not start, 'the construction industry') which tends to oversimplify the situation and its politics by enabling us to point the finger at corporations too easily.

For me, cars are a particularly good example. They certainly count as what Julian Saurin calls a 'globalised reiterated practice' (Saurin, 1996), omnipresent features of modern life across the planet (even if very differentially so), which are associated with generating many aspects of environmental degradation. These impacts range from local air pollution, with its widespread health impacts, to regional and global air pollution impacts (acid rain, climate change), to intensive resource use and depletion, to the impacts of oil extraction (principally to power cars) and many others.[4] So cars and mass car use (700 million and counting, see, for example, Shove, 1998) are clearly important in terms of the generation of environmental degradation.

But they are also important politically, and thus useful for examining the depth of the political challenges thrown up by environmental change. First, they are associated with some of the biggest corporations in the world, one of the most globally integrated manufacturing industries, facts which help us therefore to focus on the structural power of business. They are frequently associated strongly with accelerating economic growth during the 20th century, and as a consequence have been promoted by states over rival forms of transport. Second, they are highly culturally valorized. They themselves are fetishized as highly desirable commodities around which status competition and identity formation (class-based, nationalist, gendered, radicalized, and so on) are often mobilized. But they also are seen to embody many of the symbols through which modernity is itself understood as 'good': mobility, independence and progress, in particular. Thus the practices of accumulation are deeply embedded in individual and collective identities. Third, they can widen the focus usefully, avoiding looking simply at an industry, but at a whole social complex of production, consumption, regulation, and so on, that we could call a regime of 'automobility' (Rajan, 1996; Urry, 1999; Shove, 1998; Bohm *et al*., forthcoming). Finally cars and their associated practices of road building and oil extraction and shipping, have been in many places an object of resistance, and thus help focus on the contested nature of global environmental politics (GEP), to see it not just as a technical attempt to find an optimal solution to particular problems, but as a fundamental contest over values, worldviews, interests and authority.

International political economies of cars and the environment

An appropriate place to start examining the global environmental politics of cars is perhaps with international political economy (IPE). Conventional IPE

indeed contains a significant amount of writing on the car industry, including some work on environmental politics in relation to this.[5] The predominant focus in this work is on the location of manufacturing plants, revealing the frame's nationalist orientation; the question for such writers is normally 'how can [country X] best pursue the benefits of having car manufacturers locate on their soil?' (for example, Reich, 1989; Kawahara, 1997; Molot, 1993). A subfocus here is on regional integration schemes which often generate specific contexts for such inter-state competition for locational advantage and also as consequences rules, mostly involving harmonization of standards, designed to level competitive playing fields (most work here is on NAFTA and the EU, see Weintraub and Sands, 1998; Freyssenet *et al*., 2003). In this context, the environmental features of such integration schemes are prominent and are often where environment/economy conflicts become prominent, often specifically regarding cars (for example, Kirton, 1998; Arp, 1993). In relation to NAFTA, the MMT case, where the US company Ethyl Corporation successfully sued the Canadian government in 1998 under the provisions of chapter 11 of NAFTA for the latter's ban on the former's gasoline additive on grounds of health and environmental impacts, gaining compensatory payments and an overturn of the ban, is a paradigm example (Kirton, 1998). The debate in the EU over catalytic converters in the late 1980s and early 1990s was similarly paradigmatic, with the choices of which technology to adopt to improve the environmental performance of cars clearly having as much to do with the strategic interests of car manufacturers in different member states as the benefits of one technology over another (Arp, 1993). This lens can be useful, especially in the latter context, in terms of how it enables us to focus on corporate lobbying over environmental questions. But this remains a fairly limited lens for environmental purposes. Specifically, as it asks a question about the locational politics of car manufacturing, it both misses the broader ecologically important question of why all states favour cars over their rival transport modes and (relatedly) narrows the focus to the car industry, rather than focusing on automobility in all of its complexities.

A broader IPE rooted in political economy more generally, which comes usually (although not necessarily) out of Marxian traditions, can take us significantly further in understanding the environmental politics of cars. Such frameworks generate three highly salient foci. First, they focus on the overall material organization of the economy. The debates about Fordism and beyond show the historical and continuing importance of the car industry and of car consumption to the organization of the core capitalist economies (and increasingly to all economies) (Amin, 1994; Lash and Urry, 1987; Lipietz, 1985; Rupert, 1995). Second, and following from the former, many studies illustrate the important relationship between cars and growth. Car industries have been at the forefront in innovation in production techniques and labour

organization from Ford's assembly line onwards, and have generated accelerated growth. But the connection is deeper than this, which might be an historical accident. Car industries are widely recognized to have particularly high levels, and complex forms, of forward and backward linkages. From oil extraction and metals production, to parts manufacture, to assembly, to distribution and sales, to insurance, to maintenance, and so on, investment in the car industry has particularly widespread impacts across the economy (Overy, 1990).[6] Furthermore cars (and trucks, their counterpart) in their consumption increased the mobility and flexibility of the circulation of goods and thus made a whole range of other producer and consumer practices possible, accelerating overall accumulation in the process.

Third, such lenses start with the proposition that, in capitalist societies, there is a structural imperative for growth and for states to promote growth. In capitalist society, recession (lack of growth) is the definition of economic crisis. The imperative for capitalist firms to aim to maximize profits has the expansion of the system as a whole as a systemic imperative. But capitalist societies are also unstable, as a result of class conflicts and the contradictions between the interests of individual capitals and capital collectively in particular (for example, Jessop, 1990). This thus generates a systemic explanation of the favouring of cars over their competitors (rather than just among different sites of car manufacturing). This then gives us a sense that the dynamics of environmental degradation are rooted in specific patterns of accumulation and in the imperative of accumulation in general.

Cars, cultural politics and the nature of environmental politics

But this sort of political economy is also limited in explaining the extraordinary growth in car production and consumption, and the dynamics underlying the regime of automobility. Specifically it misses the cultural dynamics of cars, or has a crude explanation of such cultural politics. Cars are not only promoted for their accumulation benefits, but also because of their cultural articulation with dominant modernist themes: freedom, individualism, status competition, movement and progress. These all of course intersect with accumulation imperatives, but cannot be reduced to them. These cultural dynamics appear, not only in the advertising images through which cars are promoted or in the everyday discourse through which people understand their cars (or the aspirations for cars of those who do not own one), but also in the symbols through which resistance to cars, road building and so on are articulated.

For me, the most fundamental of these is the specific combination of particular conceptions of freedom and the valorization of movement in modern societies. These of course come together in the phrase 'automobility', so that cars not only symbolize such values, they almost by definition come to be seen as the condition of possibility of the realization of such values. Thus

an 'automobilist', a common early 20th century term for car driver (Toad of Toad Hall is an 'automobilist' in the well-known early anti-car tract *Wind in the Willows*) is someone who is specifically *autonomously mobile*.[7]

Cars are thus widely understood in normative terms through their ability to enable people to realize these values. At the level of discourses of everyday life, one of the most widely referred to advantages of cars over other modes of transport is their ability to get one from A to B by a route of the driver's choosing, at a time of their choosing, and so on, by contrast with the schedules and fixed stops of most public transport systems. Freedom is highly emphasized in car advertising (more in North America than in Europe), the connection made through images of the open road, where the freedom is expressed and understood to be specifically connected to the possibilities of unconstrained movement. And, of course, 'freedom of movement' is one of the standard elements in both Anglo-American liberal thought and in French Revolution-derived traditions regarding the meanings of liberty.

The conception of freedom here is essentially libertarian (as opposed to liberal). It is, as car critic James Howard Kunstler (1996: 60–61) has stated, the 'freedom of the fourteen-year-old child', the freedom which recognizes no responsibility to those around, no sense of having consciously to decide on a course of action, simply of being able to act on temporary whims without external constraint. It hypervalues individuals and has no conception, as do liberal conceptions of freedom proper, of the boundaries of freedom created by the obligation not to impinge on someone else's freedom.

But it is the way it is connected to movement which is particularly interesting and important politically. Freedom of movement was a rallying cry in the French Revolution, as the *ancien régime* had radically restricted movement to control populations (as had many other European states). However the 'freedom of movement' attained early on in the French Revolution quickly became the 'dictatorship of movement' (Virilio, 1986: 30, as in Douglas, 1999: 145). Mobility, then, became 'simultaneously the *means to liberation* and the *means to domination*' (Douglas, 1999: 147). This tension is still present. On the one hand, modern societies legitimize themselves in terms of values such as freedom, mobility, equality, democracy, and so on. On the other, modern societies require people to be increasingly mobile and flexible to act as modern subjects in the workplace, the army, the home, the shopping centre/mall. So people are exhorted to move constantly to find work, as part of their work, to seek out new sites of consumption, to travel to new places on holiday, and so on.

At the same time, the consequences of modern forms of movement, in particular automobility and air travel, mean that such movement is increasingly regulated.[8] The pathologies of automobile use, in terms of danger to car drivers and others who may get in their way, of pollution, of urban spatial

reorganization and, most banally (but at a day-to-day level most importantly), of congestion, mean that car use becomes increasingly regulated. There were riots when city governments put in place the first parking restrictions and traffic lights, and each new technological development is often seen by drivers as a new intrusion on their freedom. At present in the UK there is an illegal campaign to destroy speed cameras, for example, and the planned introduction of compulsory global positioning systems (GPS) is similarly regarded with hostility in many quarters. But the vision of unconstrained mobility lives on despite the increasingly intrusive regulation. As Rajan (1996) points out in his discussion of the regulation of cars regarding air pollution in California, it is precisely the uncontested attachment to automobiles which renders such regulation necessary to offset the side-effects of mass automobile use.

This cultural attachment to cars could perhaps be regarded as simply the ideological extension of the political economy of the car. In order to promote accumulation via accelerating mobility and consumption, corporate and state elites have had to foster car use and, in order to legitimize the resources and time people have to devote to their cars and the other social changes entailed in mass automobile use (suburban sprawl, and so on), have developed ideological images of cars as representatives of freedom. The car thus becomes an ideological mask to obscure the 'unfreedom' in labour relations. As Gorz (1980) neatly puts it, the car is the 'expression of bourgeois ideology at the level of everyday life', with its associations of individualism, consumption, status consumption and exclusion.

The way this is embedded in those identities seems to me, however, not best expressed in Gorz's terms. For Gorz (1980) ideology is used in the sense of something which *masks* reality. All that is required is to unmask this ideological cloak and social change becomes possible. Similarly Wolf (1996) and Gartman (1994) both treat the way that cars are embedded in identities as primarily a psychological reaction to alienation in the capitalist labour process, a means by which capitalism displaces the alienation it inevitably produces. The car for Wolf (1996: 192) is then a 'substitute satisfaction', or for Gartman (1994: 12), an 'ersatz satisfaction' for the degradation of work under Fordist mass production. But the notion of false consciousness which underlies these interpretations is deeply problematic. While not wishing to dispute the 'facts' they present (Gorz's argument about the impossibility of everyone owning a car, Wolf's concerning the myth of speed, both drawing on Illich, 1974), it seems to me more useful to take seriously the reality and depth of the identities produced around the car. They should not be dismissed as false consciousness, but should be understood as deeply embedded. As Gartman argues, 'rather than see the needs appealed to by consumer goods as false needs engineered by the culture industry, my formulation conceptualizes

them as true needs for self-determining activity channelled by class conflict into the only path compatible with capitalism – commodity consumption' (1994: 11). However Gartman still relies on viewing mass consumption, notably of the car, as a displacement from the alienation produced by capitalist mass production.

Berman (1982: 313) again seems to me to understand the relationship and contradiction here better: 'This strategy [of the promoters of the 'expressway world'] was effective because, in fact, the vast majority of modern men and women do not want to resist modernity: they feel its excitement and believe in its promise, even when they find themselves in its way.' As Berman (1982: 291) quotes Allen Ginsberg, the forms of identity produced in this process are not false, imposed purely to meet someone else's interests; they are more like 'Moloch, who entered my soul early'. The car is partly constitutive of who it is to be us, not something externally imposed on us through deceit. Understanding the relationship in terms of notions of the cyborg developed in general by Haraway (1991), and invoked in relation to the car for example by Thrift (1996) or Luke (1996), gets closer to the complexities of the relationship between human identities and the machines through which such identities are shaped. The transformation of those identities cannot be achieved by simply showing their 'false' nature.

Resistance to the earth movers

Focusing on the political economy and cultural politics of the car gives us a powerful explanation of how, politically, global environmental degradation has come about. It suggests that many of the daily practices which collectively engender such degradation are systemically bound up with the reproduction of capitalist society, with its requirements for accumulation, and at the same time are integral to many of the symbols and identities through which modern societies understand themselves and are reproduced culturally. But at the same time the danger is of course that this gives too much of a sense of closure, and that there is no alternative to the current mode of automobility with all of its ecological consequences. But of course automobility contains many contradictions, and has also been widely resisted since its inception.

Automobility's contradictions

There is the possibility that cars could be transformed through some strategy of ecological modernization, so that their various pathologies are overcome. The fuel sources can be changed to being environmentally benign, the fuel efficiencies can be increased dramatically, safety measures can be significantly enhanced, 'smart' cars and traffic systems can be introduced to mitigate congestion, and so on.[9] For most observers, the technologies already exist to

transform the automobile system in these ways, and all that is required is their aggressive adoption through state policies designed to shape corporate and individual practices. In this sense, automobility can be thought of in systems-theoretic terms (Urry, 1999), where it grows as an autopoietic system, but which contains dynamics which eventually lead to the development of different systems or significant modifications of the system itself. Some of these developments are internal to the systems' own logic, others are introduced by external constraints such as worries about pollution or the exhaustion of oil supplies.

For others (Bohm *et al*., forthcoming), this systems-theoretic account is highly problematic. In particular, in presenting automobility as autopoietic, it obscures the sites of human agency where the regime of automobility was set in train, and through which it might be transformed or overcome. There is thus no politics except perhaps an elitist, technocratic one, in the systems account. Normatively it leads to the sort of focus on technical fixes which are advocated by ecological modernization approaches to cars and environmental policy in general. A significantly more critical eye should be cast over the potential of such technofixes than those cast by boosters like Amory Lovins (Hawken *et al*., 1999). In narrow environmental terms, there is the danger that the successor technologies to the internal combustion engine have more significant implications than are often assumed. For example, with fuel cells, widely regarded as the most likely long-term successor to the internal combustion engine, the question remains as to where the electricity comes from to create the hydrogen from water, and it requires enormous optimism about the take-up of renewables to assume the electricity for such purposes can all be generated from such sources.

But, more importantly, such a strategy misses the internal contradictions contained within automobility itself. One such strategy to deal with congestion is the introduction of telematics, or 'smart' motoring, the development of onboard communications systems to inform drivers (increasingly needing to be hybridized in this manner; see, for example, Sheller and Urry, 2000) about sites of congestion, alternative routes, and ultimately leading to the development of automated driving systems, so that the driver (on 'smart' roads at least) does nothing other than tell the car where she or he wants to go, and the car, interacting with the road, does the driving. This is of course frequently talked about in terms which suggest that the driver could now concentrate on other ways of being mobile. They are now enabled to use their phones, their computers, the Internet. This is in many ways an extension of the transport technology in the car itself, where technological development has been focused on reducing human movement and effort (from hand-cranked starters to electric automated doors), while maximizing physical movement of the car, a progressive virtualization of human movement consistent with new

telecommunications technologies. Of course, what this does at the same time is attenuate the sense in which the driver is 'autonomously' moving: their autonomy becomes more and more reduced to a sense of a decision in their brain about where and when to go, and less and less about 'mastery' of the car as a machine. Thus the technocratic impulses of ecological modernization and the 'smart car, smart highway' developments run up against the cultural imperatives of cars as embodiments of freedom.

Automobility should thus be conceived of as containing fundamental contradictions which cannot be overcome within a cultural and political–economic framework emphasizing the conflation of autonomy with mobility. The most immediate one here is the sense in which the insistence on car-based mobility increasingly hits the limits to do with the presence of other cars on the road and of road construction. Thus, to maintain movement in scarce urban (and interurban) spaces, autonomy has to be sacrificed through telematics and automated driving. Similarly, in Rajan's (1996) example, to keep the air tolerably breathable, while keeping car use unconstrained, requires a progressively more intrusive set of regulations, on car manufacturers, on firms maintaining cars, on owners of cars regarding maintenance and inspection of cars, and so on.

Perhaps more deeply, automobility is internally contradictory, in the sense that that which is presented discursively as autonomous is in fact never so. Akin to feminist arguments about the obscured dependencies of 'rational economic man' (on women's labour, and often on 'nature': Pateman, 1988; Plumwood, 1993), the presentation of car driving as autonomous obscures the dependence on, among other things, displacement of a range of environmental costs (climate change, forests, acid rain, and so on); military spending to secure access to oil; state expenditure for infrastructure development; health care costs from accidents, air pollution-related ill-health and disease because of lack of exercise; and legal and policing arrangements to ensure the smooth running of the system. All of these are required to occur in order that the driver can be presented as 'autonomously moving'.

The immediate point perhaps in terms of environmental politics is that many of these dependencies are ones which are creating strains which cannot be sustained. Students of environmental politics will be familiar with these, and they need little expanding on here. But the more important point in the context of this chapter is that, to understand the politics of the immediate problems of sustainability embedded in automobility, we need to understand the deeper internal dynamics of tensions within automobility. For it is these which will determine the possibilities of either mitigating its effects or transforming it as a system.

Resistance politics

The other aspect here is that cars, and the regime of automobility of which they are the principal artefact, are resisted in a way which is often overlooked in the taken-for-granted character of cars in modern life. Such resistances are varied in form, and vary in different culturally specific settings, but are nevertheless widespread. They take the forms of, for example, populist tracts against car-dominated societies (Zielinski and Laird, 1995; Kay, 1997; Gorz, 1980; Wolf, 1996; Kunstler, 1996; Sachs, 1992; Alvord, 2000; Aird, 1972; Bendixson, 1977; Flink, 1972; Tyme, 1978); a range of alternative transport and urban policy practices promoting public transport, traffic calming, 'safe routes to school', 'street reclaiming' and so on (Victoria Transport Policy Institute, no date; Newman and Kenworthy, 1999; Engwicht, 1999); direct action against road building, to 'Reclaim the Streets' (RTS) for nontransport uses such as parties and community events, to promote cycling (through Critical Mass actions); occasional destructive actions such as the torching of Hummers at a sales lot in California (Seel *et al*., 2000; McKay, 1996; Wall, 1999; RTS, no date; on the torching of Hummers, see Madigan, 2003); countercultural actions such as those associated with *Adbusters*; and specific anti-car activities such as the current moral panics around sports utility vehicles (SUVs).

My point here is not necessarily to assess the impacts of these various resistances. It is perhaps to suggest that they are more widespread than we often think, and that the objections of activists to many of the consequences of automobility have resonances for large numbers of people beyond activist communities (the current widespread scorn for SUVs is a good, if superficial, example of this). But the more important point for the present purposes is that such resistances tend towards the systemic and the cultural.[10] They tend toward articulating 'the problem' as one which is simultaneously about the political economy of accumulation and about the ideological privileging of (a libertarian conception of) autonomy, mobility and the way these two conceptions are conjoined in 'auto-mobile' ideology. Thus many of the resistances end up specifically rejecting individualist ideologies in favour of community-based politics (in different ways, see Kunstler, 1996; RTS, no date; Engwicht, 1999; Gorz, 1980), rejecting speed and movement in favour of 'slowness' (Sachs, 1992) or alternative uses of public space (RTS, no date), and rejecting the imperative of accumulation embedded in capitalist societies (RTS, no date; Gorz, 1980; Wolf, 1996). The trajectory of RTS as an 'organization' is the archetypal journey here. RTS actions started as part of the anti-road building movement in the UK in the early 1990s, in the specifically urban context of the M11 link road construction in north-east London. They moved from an opposition to road building (principally because of the destruction of urban communities, unlike the countryside/wildlife/amenity/heritage focus of

many other such protests), to an opposition to the dominance of car culture in cities (through organizing parties in city streets which involved illegally closing streets down, to provide an image of alternative forms of urban life), to identifying cars as a symptom of a wider malaise in capitalist society, to organizing anti-capitalist protests (the first large anti-multilateral economic organization direct action being the 'Reclaim the Summit' at the G7 in Birmingham in 1998). Such a trajectory follows a logic of thinking through carefully the implications of problematizing cars because of their environmental and social consequences.

Conclusions

This chapter has given a necessarily brief overview of some arguments for the way we might think about global environmental politics critically. We can still of course engage with fairly 'conventional' debates; for example, one extension of the work here could be to explore the political power of car manufacturers in, say, the climate change regime. But this should also be accompanied by a political–economic and a cultural analysis of the conditions of possibility of such corporate power. One of the key advertising campaigns in the USA, in the run-up to Kyoto, for example, was that by the corporate-funded National Consumers Council, with the well-known advert with the 'soccer mom' complaining about Kyoto, saying that 'the government wants to take away my SUV' (Schneider, 2002). The embeddedness of such corporate power in specific forms of everyday life, the meanings of motherhood and family responsibility, and so on, should not be underestimated, if we are serious that the purpose of studying GEP is to think carefully about the conditions of possibility of moving towards a sustainable global polity.

Notes

1. This chapter draws on earlier work on the themes developed here, where fuller versions of some of the arguments can be found. See in particular Paterson (2000a, 2000b). A book-length treatment is currently being prepared.
2. I take this to include International Relations, regarding the alleged distinction between the two to be of dubious intellectual value.
3. The tall stacks means of dealing with local air pollution on acid rain is the most well known, but myriads of other examples can be found: the legacy of the treatment of hydrochlorofluorocarbons (HCFCs) in the Montreal Protocol for the climate change regime is another good example.
4. For various accounts of the environmental impacts of cars, see, for example, Freund and Martin (1993: 29–33), IEA (1993), Transnet (1990), Gordon (1991).
5. By 'conventional' here I mean the dominant North American conception which combines a realist account of international politics with a neoclassical economic account of how economies work. Gilpin (1987, 2001) is perhaps the best known proponent. In work on the car arising out of this lens, there is much in common with work in economic geography on cars (for example, Dicken, 1998: 316–52), where the focus is similarly on the politics of the location of manufacturing plants and thus the international distributive politics of the benefits of car production.

6. Even in an age where cars are now assumed to be an 'old' industry, the standard figure given in North America is that one in seven jobs depends in some way or other on the continuing success of the car industry.
7. There is an inherent ambiguity in the phrase 'automobile', in that it is unclear who is the subject of the autonomy – the person or the machine. The machine is called the automobile, but the person is referred to as 'auto-mobile' through their use of the machine. This of course has helped engender many analyses of cars in terms of cyborgs (Lupton, 1999; Luke, 1996), and is useful in deconstructing the ideologies underpinning the valorization of cars, but is tangential to my purpose here.
8. The dynamics of air travel and automobility are quite different here, in part because of their different technological requirements, and precisely because air travel does not entail 'autonomous mobility'. The governance of air travel is principally one of control of passengers to meet safety requirements, and of course increasingly overlaid with a combination of control mechanisms and disciplinary/surveillance mechanisms to meet the demands of 'security'.
9. On ecological modernization and cars, see Paterson (2003).
10. I should emphasize the word 'tend' here. Clearly not all of those who articulate an opposition to one or more of the consequences of automobility end up thinking this way. But I would defend the argument that thinking clearly about specific problems, whether they be climate change, urban health problems, congestion or any of the other specific car-related problems, tends towards thinking in such systemic and cultural terms.

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18 Transnational corporations and global environmental governance

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In the current era of economic globalization there has been remarkable growth in both the number of transnational corporations (TNCs) and the amount of foreign direct investment (FDI). The number of TNCs has grown from 7000 TNC parent firms in 1970 to over 65 000 in 2002. By 2002 there were also over 850 000 foreign affiliates – that is, corporations associated with a TNC – operating around the world, making up one-tenth of world GDP and one-third of world exports (UNCTAD, 2001: 9; 2002: xv, 272). Flows of FDI have grown considerably in recent decades. In 1970, the level of FDI inflows stood at US$9.2 billion, and by 2001 it stood at US$735 billion (down from the record-breaking US$1.49 trillion in 2000) (UNCTAD, 2001: 1; World Bank, 2003).

Given this importance of transnational investment, it is clear that TNCs are very important global actors. They are especially important in environmental politics and policy because they tend to invest in environmentally sensitive sectors. This chapter will examine the role of business actors in global environmental governance. It argues that the visibility and power of TNCs in the formulation of global environmental governance has increased in the past decade. While this enhanced position has given TNCs a stronger voice in influencing global environmental policy outcomes, it has also led to a movement to impose external rules on these actors, in the form of a global corporate accountability agreement. In the face of growing momentum to discuss such a treaty at the global level through forums such as the 2002 World Summit on Sustainable Development (WSSD), TNCs have actively discouraged the idea. The battle over such a treaty is likely to loom large in the discourse over TNCs and global environmental governance over the next decade.

Channels of business influence in global environmental governance

Mechanisms of global environmental governance generally attempt to alter the behaviour of states in ways that promote environmental protection. This often means that states are asked to implement policy changes that have an impact on the way industry players, including TNCs, operate. With such rules coming into place in a variety of sectors, it is understandable that TNCs and corporate interests have attempted to be a part of the process of forming

global environmental governance. They do this via a number of overlapping channels, including direct lobbying, influence from their structural power in the economy, and the establishment of self-regulations.

Corporate lobbying

Lobbying domestic governments before they send delegations off to international environmental negotiations has traditionally been a key strategy for industry actors. In this way they are able to exert significant influence over governments' positions from behind the scenes (Susskind, 1992; Gleckman, 1995). Many corporations, both national and global, have pursued such a strategy on a wide range of global environmental issues, such as global warming, ozone depletion and toxic waste trade (see, for example Newell and Paterson, 1998; Levy, 1997; Clapp, 2001a). While this is still an important strategy, business players are increasingly lobbying at the international level as well.

Over the past decade, business advocacy groups as well as individual TNCs have begun to lobby intensively at the international level in an attempt to influence global environmental negotiations. They are able to participate as observers at these negotiations, much as NGOs do. International industry advocacy groups promote business interests at both the domestic and international levels. Examples of such advocacy groups which regularly attend environmental treaty negotiations include organizations such as the International Chamber of Commerce (ICC) and the World Business Council for Sustainable Development (WBCSD), as well as more specific groups such as the Global Industry Coalition (GIC) on biotechnology or the Global Climate Coalition (GCC) on climate change.

Individual TNCs also involve themselves directly in global environmental negotiations which are directly relevant to their interests. Corporations such as Monsanto, Dupont and Syngenta, for example, attended many of the negotiation sessions which led to the Cartegena Protocol on Biosafety (Glover, 2003; Clapp, 2003). Corporations have also been well represented at the meetings of the Codex Alimentarius (the UN body responsible for setting international food safety standards which are recognized by the World Trade Organization for trade purposes). A study of the participation of corporate players in the Codex meetings in the early 1990s revealed that, in addition to the 104 governments represented, there were also over 100 TNCs in both the food and agrochemical industries represented. In terms of the number of representatives present at such meetings over a two-year period, there were 662 industry representatives compared to 26 representatives from public interest groups (cited in Lang, 1999: 178).

The presence of corporate actors at global negotiations over the past decade is now seen as normal. A quick glance at the attendance list of just about

any major environmental meeting or conference of the parties to any international environmental regime reveals the large presence of advocacy groups and corporate actors. As observers at such gatherings they cannot participate in voting, but they can and do make interventions at times and they actively use the occasion of the negotiation session to lobby governments on their positions. They may make fewer public interventions than environmental NGOs, but they are very active in the corridors, and in smaller working and technical groups. TNC and industry advocacy group representatives also often meet among themselves in daily strategy meetings at these negotiations.

This rise in industry participation in global environmental governance forums over the course of the 1990s was in part a response to the growing role of environmental NGOs in those forums at that time. Industry players, put simply, were keen not to be left out of the process, as rules might be influenced by environmental groups in ways that were disadvantageous to corporations. In the case of the Basel Convention, for example, environmental NGOs were extremely influential in the initial negotiation of the treaty in the late 1980s. By the early 1990s the direction of the convention shifted toward adoption of an amendment that would ban the trade in waste between rich and poor countries. Industry advocacy groups, including the International Council on Metals and the Environment, the Business Recycling Coalition and the Bureau of International Recycling, suddenly came on board in large numbers and attempted to lobby delegates at the conference of the parties (COP) meetings as openly as did NGOs, in an attempt to stem such action. They were, ultimately, unsuccessful in terms of stopping the Basel Ban Amendment from being adopted. But thus far they have been successful in convincing key governments not to ratify it (see Clapp, 2001a).

Corporate actors, including both individual corporations and advocacy groups, were in full force at both the Rio Earth Summit in 1992 and the WSSD in Johannesburg in 2002. While industry representatives only made a 15-minute intervention at the Stockholm Conference in 1972, these groups now put enormous efforts into large summits (Gleckman, 1995, 95). In 1990, some 48 TNCs established a lobby group, the Business Council for Sustainable Development (BCSD) which was active at Rio in promoting the business perspective. The BCSD, headed by Swiss industrialist Stephan Schmidheiny, had strong ties with the secretary general of the Rio Conference, Maurice Strong, and it was on Strong's recommendation that the group was formed (CEOa, no date). The ICC was also active at UNCED, and formed the World Industry Council on the Environment (WICE) in 1992 to provide industry follow-up on the Earth Summit. In 1995, the BCSD and WICE merged to form the World Business Council for Sustainable Development (WBCSD). At the WSSD, yet another new group was formed to present a common

international industry position, the Business Action for Sustainable Development (BASD). Comprising some 161 TNCs, this group was formed from a joining of efforts by the ICC and the WBCSD, and began meeting to form its strategy for the WSSD in 2001 (Rutherford, 2003: 14). The BASD is headed by Sir Mark Moody-Stuart, a former chief executive officer of Shell.

Structural power

A more diffuse, but no less important, way that TNCs influence global environmental governance is via their 'structural power' (Gill and Law, 1993). Structural power refers to their ability to influence the formation and functioning of governance, not so much by direct means, but by their dominant position in the global economy, which has an indirect yet powerful influence over mainstream ideology and state policy formation. While it is difficult to measure this type of corporate influence over states and global institutions, many scholars are stressing its importance for understanding global policy outcomes that promote globalization and a neoliberal economic agenda. Rooted in a historical materialist perspective, these scholars have drawn on the ideas of Gramsci to demonstrate the ways in which the dominant ideology and discourse on sustainable development has been influenced by an 'historical bloc' composed, not just of TNCs, but also of states and intellectuals, the latter having fallen under the hegemonic influence of capital (Sklair, 2001; Levy and Newell, 2002).

The structural power of TNCs has been exerted in the global environmental realm in several important ways. First is the role they have carved out for themselves in terms of influencing the language used in official documents regarding the concept of sustainable development and the role of industry. This 'discursive influence' is extremely important to the formation of global environmental governance (Levy and Egan, 1998). In the run up to Rio, for example, industry groups were active in defining the concept of 'sustainable development' and pressing for their interpretation of industry as promoters of sustainable development to be represented in the official documentation coming out of that conference (Chatterjee and Finger, 1994). Leslie Sklair (2001: 206–15) describes this effort of industry to put its stamp on the definition of these key concepts as a 'sustainable development historical bloc'.

By influencing the terminology in a way that enables them to maintain the goal of economic globalization and promote faith in industry efforts to protect the environment, TNCs have thus far been able to escape calls for direct regulation of their activities. Finger and Kilcoyne (1997) argue that, at Rio, industry ensured that the only references to TNCs in *Agenda 21* were in the context of industry as partners in sustainable development, or in the promotion of voluntary initiatives. In this way, no explicit obligations or regulations were placed on these actors in the follow-up to Rio. These themes were

carried over to the WSSD, and this was clear from the first strategy meetings of the BASD prior to the summit. The BASD was explicit that its strategy would be one of promoting examples of industry partnerships for sustainable development and voluntary initiatives, in order to avoid a negative focus on TNCs. Bjorn Stigson, president of the WBCSD, said at one of the BASD planning meetings prior to the WSSD that 'We want to ensure that the business voice is heard in a strong and cohesive manner, and that business has its proper place at the World Summit' (cited in Graymore and Bunn, 2002). NGOs were not all that surprised, then, that the Johannesburg Plan of Action stressed the partnership and voluntary roles for business, rather than the need to regulate them.

The structural power of TNCs is also evident in the way that states approach environmental regulation at both the national and global levels. The sheer economic weight of TNCs in the global economy gives them important influence. In an increasingly competitive global economy, many states have pursued domestic and international policy outcomes which would be acceptable to corporations in order to keep or attract investment in their country, even in the absence of direct lobbying (Newell and Paterson, 1998). States are increasingly being influenced by the threat, or indeed the mere potential threat, of relocation by TNCs in ways that prevent a strengthening of environmental regulations (Neumayer, 2001: 70–71). It does not matter whether firms act upon such threats. It is simply that the fear that firms will act, and the calculation of the effect that this could have on their economy, that influences the extent to which states impose environmental regulations (Porter, 1999: 136).

Industry-driven voluntary codes and standards

International corporate actors also influence global environmental governance by developing their own codes of conduct that are aimed at pre-empting state or international regulation. At both Rio and Johannesburg, industry players stressed the importance of voluntary environmental initiatives on the part of firms as opposed to specific external obligations imposed on TNCs. Industry argued that it was well aware of the need for corporate social and environmental responsibility, and would pursue voluntary initiatives to improve environmental performance (Chatterjee and Finger, 1994). Taking up this idea, TNCs have been involved in recent years in the establishment of private forms of global environmental governance such as voluntary codes of environmental conduct at both the national and international levels. These include participation in setting up voluntary industry codes of conduct, such as the International Organization for Standardization's ISO 14000 environmental management standards, the ICC's Business Charter for Sustainable Development, Responsible Care and the Coalition for Environmentally Responsible Economies (CERES) Principles (Nash and Ehrenfeld, 1996).

The ISO 14000 environmental management standards are perhaps the most widely recognized global-level voluntary initiative on the part of industry. These standards were developed in the early 1990s under the auspices of the ISO, directly following promises made by industry to establish voluntary initiatives at Rio. The ISO 14000 standards are management standards, meaning that they encourage firms to establish a management system that improves its awareness by setting its own goals for environmental improvement. In theory this should help to improve environmental performance. By 2001, some 49 000 firms in 118 countries had gained certification to the ISO 14001 standard, the only one of the series to which firms can become certified (ISO, 2003). With a growing number of firms in both developed and developing countries adopting these standards, it is increasingly considered that adherence to the standards will become a de facto condition for conducting business in the global marketplace.

While initiatives such as the ISO 14000 series of standards are popular with firms and governments, there is widespread concern in NGO circles as to whether these standards will really make a difference in terms of environmental performance (Krut and Gleckman, 1998; Clapp, 1998). Some have labelled such efforts as 'greenwash' (Greer and Bruno, 1997). None of the industry-based voluntary codes, for example, have specific environmental performance criteria, but rather rely upon firms setting their own environmental goals. The ISO 14001 standard, for example, stresses that TNCs should comply with all environmental laws in the country in which they operate. But this differs substantially from *Agenda 21*, which calls on TNCs to follow home country standards. In this way ISO 14001 allows for differences in standards between countries, but it may not do much to improve standards in developing countries.

While such codes may not have stringent standards in terms of performance, some businesses are attempting to use ISO 14000 and other voluntary industry codes as a deliberate attempt to head off more stringent regulation. Industries in a number of countries are pressing their governments for some form of regulatory relief, such as more lenience for ISO 14001 certified firms when monitoring environmental regulations (Clapp, 2001b). For example, the USA, Argentina, South Korea and Mexico have adopted measures which take ISO 14001 certification into account in the monitoring and enforcement of regulations (Speer, 1997: 227–8; Finger and Tamiotti, 1999).

Interpreting industry positions on environmental issues

A literature has emerged over the past decade to try to make sense of these channels of influence, to understand the motives and strategies of industry in global environmental governance. One might assume that business players generally oppose strong global environmental rules because they impose

costs on firms. But deciphering the business position on a particular environmental issue is not always so straightforward. In some cases corporate actors push for weak global environmental rules, but in other cases they are content to go along with strong rules pushed for by NGOs and states. How do we make sense of these varying responses by industry to global environmental regulations?

Industry positions on enviromental governance mechanisms are conditioned by specific factors in each issue area, including economic, political, cultural and firm-specific conditions. David Levy and Peter Newell (2000) argue that, as economic globalization continues apace, economic factors have come in recent years to be predominant in explaining industry positions on environmental issues. But while economic considerations are often a dominant factor, uncovering firm motivations is often complex. In the case of climate change, industry response has been varied among different firms in both the same and different sectors, indicating that individual firms have a variety of interests in this issue (Levy, 1997; Newell and Paterson, 1998; Rowlands, 2000; Skjærseth and Skodvin, 2001). In the cases of ozone-depleting substances and persistent organic pollutants (POPs), industry actors have largely been on side and in favour of strict rules calling for a ban on the production and trade of these harmful substances. This is largely because patents on those substances have expired, and these industries can gain economically from the sale of substitute chemicals (Levy, 1997; Clapp, 2003). But in the case of waste recycling and biosafety, the entrenched industries' chances of gaining from substitutes are slim, so they have a much stronger stake in opposing strong rules which they see as harming the very core of their industry (Clapp, 2001a).

There are other points of similarity that are fairly consistent in the formulation of industry positions in global environmental negotiations. First, industry actors generally tend to stick together in calling for voluntary initiatives and self-regulation, in an effort to avoid legally binding rules, especially those aimed specifically at TNCs. This was clear at both the Rio Earth Summit and the WSSD, and is also evident in industry interventions at negotiations of issue-specific environmental treaties. Second, industry has generally interpreted the use of the word 'precaution' to mean 'risk assessment', and specifically ties its use to Principle 15 of the Rio Declaration. This is because Principle 15's version of precaution implies that at least some scientific assessment must be conducted, and that precautionary measures in cases where full scientific certainty is lacking should be 'cost-effective'.[1] The ICC's statement interpreting precaution (ICC, 1997) appears to have guided much of industry's take on it in a variety of global environmental forums. This was seen clearly in the negotiations on hazardous waste trade, POPs and biosafety (Clapp, 2003). Third, industry actors are also fairly consistent in their positions on global environmental negotiations in calling for as few trade

restrictions as possible in international environmental agreements. They would ideally like environmental treaties to address these problems without having to turn to measures that would hamper global trade. When it is clear that such measures will be used, industry has argued to at least have the treaty in question clarify that WTO rules should prevail in cases of conflict. Again this position was consistent in industry interventions at the negotiations on the hazardous waste trade, POPs, climate change and biosafety.

Governing TNCs for corporate accountability

In addition to looking at the channels of influence of business over global environmental governance, it is also important to examine international efforts directed specifically at TNCs. The current global effort by NGOs to push for an international treaty to regulate TNCs is not an entirely new idea. In 1977, the UN Center for Transnational Corporations (UNCTC) launched negotiations on a globally applicable voluntary code of conduct for TNCs, which included provisions on environmental conduct and outlined rights and responsibilities of TNCs (FOE England, Wales and Northern Ireland, 1998). The UNCTC, which was set up in the early 1970s, was mandated to monitor the economic, social and environmental impact of TNCs, particularly those operating in developing countries. The Code of Conduct aimed to ensure that foreign direct investment did not have adverse consequences in these areas. Talks on this code continued from the late 1970s until the early 1990s, but it was never finalized or adopted. According to NGOs involved in the negotiation of this agreement, it was pressure from the USA and ICC which led to the dismantling of the UNCTC just prior to the Rio Earth Summit, its remaining activities being taken over by the United Nations Commission on Trade and Development (UNCTAD) (FOE, 1998; NGO Taskforce on Business and Industry (a), no date). Instead of the UNCTC code, UNCED promoted voluntary initiatives developed by corporate actors themselves, as discussed above.

Unconvinced that the voluntary, self-regulation approach has led to significant environmental improvements over the past decade, activist groups have recently revived the idea of a corporate code of conduct, and some are calling for such a code to be in the form of a legally binding international agreement. These groups stress that there is a difference between corporate responsibility and corporate accountability. Corporate responsibility refers to recognition by industry of their role in sustainable development, and the voluntary and self-regulatory efforts they adopt. Corporate accountability is a much stronger notion. It implies legal obligations by corporations to promote sustainable development and to provide compensation when these obligations are breached (NGO Taskforce on Business and Industry (b) (no date); Bruno and Karliner, 2002; FOEI, 2001).

Since Rio, many TNCs, including international industry lobby groups such as WBCSD, the ICC and the BASD, have stressed their voluntary adherence to principles of corporate social responsibility (CSR). They argue that principles of CSR ensure that corporations are acting in an environmentally and socially sound manner, and that adhering to these principles makes 'good business sense' (Holme and Watts, 2000). Groups such as the BASD highlight the Global Reporting Initiative (GRI) as the key governance structure for business with regard to corporate responsibility (Moody Stuart, 2002: 120). The GRI is an initially industry-driven, now independent, initiative on sustainability reporting for TNCs. The GRI is now a collaborating centre with the UN Environment Program (UNEP) and also cooperates with the UN on the Global Compact, discussed below (GRI website: www.globalreporting.org).

This CSR approach has been criticized by sceptical NGOs. According to a key study by UNCTAD which surveyed TNCs on their environmental policies, the most influential motivating factor for these firms to develop corporate environmental policies was government laws and regulations (UNCTAD, 1993: 38). Indeed firms that are in breach of the law are more likely to be fined or made legally liable for any environmental damage that they cause. Many have argued that states have an important role, not just individually, but also collectively, at the international level via international organizations, in promoting improved environmental performance of TNCs through externally imposed laws and regulations. Recent years have seen a number of developments along these lines, all of which are still voluntary, but which originated outside industry itself.

Global compact

The Global Compact (GC), a pact between the UN and global business, was launched in July 2000. It was proposed by UN Secretary General Kofi Annan in early 1999, as a challenge to global corporations to demonstrate their commitment to social and environmental goals. The GC asks corporations to promise to become responsible corporate citizens, and asks them to adhere to nine principles, covering social, environmental and human rights, and to incorporate these into their mission statements as well as their operations (UN Global Compact). The main objectives of the GC are to 'mainstream' environmental and social issues into operations of business, and to encourage business to take action in support of UN goals. In the area of the environment, corporations are asked to support the precautionary approach, to undertake initiatives to promote environmental responsibility, and to develop and diffuse environmentally friendly technologies (UN, no date).

The Global Compact has been widely criticized by NGOs as 'bluewash'. Similar to the greenwash concept, NGOs argue that TNCs are using the GC as a way to wrap themselves in the UN flag. While this may be great for the

public relations of these corporations, critics charge that in practice they are not doing much to improve their environmental and social practices. The principles outlined in the GC are only voluntary, and there is no monitoring of the corporations that have signed on, and thus, in the eyes of the critics, no real accountability on the part of the corporations (CEO(b), no date). Furthermore, many see the compact as representing 'a smuggling of a business agenda into the United Nations' (Bruno and Karliner, 2002: 1).

OECD Guidelines for Multinational Enterprises

The OECD Guidelines for Multinational Enterprises (MNEs) were first established in 1976 as a set of voluntary guidelines within OECD countries. The guidelines cover a wide range of issues such as information disclosure, taxation, labour relations and the environment. These guidelines have been revised periodically over the years. A chapter on environmental protection was added in 1991, and in 2000 further updates were made, which included extraterritorial application of the guidelines for MNEs operating in non-OECD countries (FOE Netherlands, 2002; FOE, 1998). With respect to the environment, the guidelines promote already existing environmental management standards, such as the ISO 14000. But they do go beyond the ISO standards in that they ask OECD members to encourage their TNCs to adopt 'measurable objectives, and where appropriate, targets for improved environmental performance'. The guidelines also call for more consultation with affected communities as well as improved access to information on the environmental activities of TNCs (OECD, 2000).

While the guidelines do make important steps toward promoting improved environmental performance rather than just improved management, some environmental groups have attacked the guidelines for being weak (FOE Netherlands, 2002). Because the OECD guidelines are voluntary, they do not impose any legal obligations on TNCs. They are merely guidelines for OECD member countries to encourage their TNCs to follow voluntarily. For this reason, environmental NGOs have been sceptical of the ability of the guidelines in their current form to engender true change in TNC environmental practices.

A binding corporate accountability treaty?

Recent years have seen a growing push among environmental and other NGOs for a legally binding global mechanism to regulate TNC activities to ensure good social and environmental performance. The idea of a global treaty on corporate accountability was floated in the run-up to the WSSD in 2002 by a number of groups, including Friends of the Earth International, the World Development Movement, Christian Aid and the Alliance for a Corporate-Free UN (CEO, 2001: 6).

Friends of the Earth International put forward a fairly detailed account of its ideas on what a legally binding international treaty on corporate accountability should, in its view, look like. This proposal stresses the legal rights of citizens to hold corporations accountable, rather than the present framework where corporations are only legally accountable to their shareholders. Specifically the FOEI proposal calls for duties on corporations to report fully their social and environmental impacts and for effective prior consultation with affected communities. It also calls for extension of corporations' liability to their directors when there is a breach of national environmental or social laws, and to directors and corporations for breaches of international laws or agreements. It further calls for rights of redress for citizens, community rights to control and access resources, and minimum environmental, social, labour and human rights standards. Those corporations that breach these new duties would be subject to sanctions (FOEI, 2001).

Greenpeace International also introduced its 'Bhopal Principles on Corporate Accountability' in 2002. Though initially introduced as a set of voluntary principles, it is clear that Greenpeace sees this initiative as the first step toward a legally binding international treaty. Not that dissimilar to the FOEI proposal, the Bhopal Principles include measures to ensure that corporations follow key principles of the Rio Declaration, including those on liability, double standards, the precautionary principle and the polluter pays principle (Greenpeace International, 2002).

Not surprisingly, industry is not at all keen on the idea of a legally binding treaty on corporate accountability, especially one that places a strong emphasis on the need to extend corporate liability for damages caused by their operations. Though the BASD endorses the idea of promoting corporate responsibility and to some extent accountability, it also stresses that 'This refers to existing agreements and is not a call for a new international regime' (BASD, 2002). Industry in fact prefers to stress that improved governance for business should be focused on enhancing local efforts, rather than implementing new global agreements geared toward TNCs. As Sir Mark Moody Stuart (2002: 121) states: 'Global business is far from perfect, but the standards applied by international companies are almost always higher than those of purely domestic companies. To address global governance without addressing national and local governance will lead to disappointment.'

Critics of the global business lobby have argued that groups such as BASD were formed primarily to lobby against the idea of a globally binding treaty at the WSSD. According to Corporate Europe Observatory (CEO, 2001), 'There can be little doubt that the desire to oppose binding international regulations for corporations is a key motive behind the industry campaign towards WSSD.' Indeed early drafts of the Johannesburg Plan of Implementation text prepared by the chair of the WSSD included a commitment to

'launch negotiations for a multilateral agreement on corporate accountability' (cited in Graymore and Bunn, 2002: 1). While there are some references to the need for corporate responsibility and accountability in the plan, the final text did not include the commitment to pursue a treaty, and instead focused on promoting voluntary agreements. Its removal was, according to NGOs, the result of intense pressure from BASD.

Conclusion

Corporate participation in the formation of global environmental governance has grown in both size and influence over the past decade. Since the Rio Earth Summit, TNCs have taken on a more visible lobbying role at environmental negotiations, have seen their structural power enhanced, and have established voluntary corporate initiatives as a way to promote self-regulation over externally imposed state or global regulation. The positions that industry actors take in global environmental negotiations are dependant on a variety of factors, but it can be said that in general economic factors weigh heavily in their negotiating stances. At the same time that industry's presence and influence at forums for negotiating global environmental governance have increased, there has been a growing movement toward externally imposed regulations directed specifically at improving TNCs' environmental and social performance. This movement is a reaction to disappointment on the part of NGOs with the results of voluntary self-regulations. A number of initiatives have been brought forward, including the call from several quarters for a binding international treaty on corporate accountability. Not surprisingly, industry has been extremely resistant to this idea. The battle over this idea was very evident at the World Summit on Sustainable Development in 2002. Industry was able at this forum to head off concrete intergovernmental action in this direction. However the battle between NGOs and industry over this issue is likely to characterize the discourse over TNCs and global environmental governance in the years to come.

Notes

* I would like to thank the Social Sciences and Humanities Research Council of Canada for funding in support of this work. I would also like to thank Sam Grey for research assistance.

1. Principle 15 of the Rio Declaration reads: 'In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation' (UN, 1992).

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19 Environmental policy and the environmental Kuznets curve: can developing countries escape the detrimental consequences of economic growth?

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Many have taken the policy implication of the so-called 'environmental Kuznets curve' (EKC) to be that poor countries can and perhaps should grow themselves out of environmental problems over time rather than tackling them with stricter regulation now. Many critics have argued, however, that the EKC suffers from severe methodological problems that cast doubt on the reliability of EKC results. In the face of such criticism, the aim of this chapter is to examine the implications of the EKC for pollution trends in less developed countries (LDCs). First, we consider the robustness of the EKC critique. Our review suggests that the EKC may be more robust than some studies have claimed. We then focus on one potentially more problematic criticism: the issue of whether compositional changes in developed countries (DCs) are responsible for emissions reductions and whether they at least partly result from the substitution of imports for pollution-intensive domestic production. If so, it is obviously doubtful whether today's LDCs can also expect to experience such compositional changes. Our results do suggest that the compositional reductions in pollution experienced by DCs stem, at least in part, from DC demand for pollution intensive output being increasingly satisfied by imports.[1] In other words, the now rich countries have become clean at least partly by exporting the dirty production of products to other, poorer countries. This implies that the current poor countries will not be able to replicate fully this experience.

The second part of the chapter therefore proceeds under the assumption that EKCs provide 'best case' scenarios. We take a number of the most widely cited EKC studies and consider their implications for pollution trends in developing countries. More specifically, taking the turning points estimated by these studies as given, we estimate how long it will take different regions in the developing world to reach these turning points using three economic growth scenarios.[2] Our results provide some unpleasant implications for many developing regions, particularly given that many of the criticisms of EKCs suggest that the estimated turning points are too low. Many aspects

of environmental quality are predicted to deteriorate for many years to come, even under our high economic growth scenario.

The implications of the EKC for developing countries have been widely neglected within the EKC literature. Studies have not explicitly considered whether LDCs can expect to follow an EKC or when LDCs can expect to experience an improvement in environmental quality. While some studies have predicted future global emission trajectories of some air pollutants (Selden and Song, 1994; Holtz-Eakin and Selden, 1995; Schmalensee *et al*., 1998), no analysis has been undertaken at the regional level. Furthermore none has considered such a range of pollutants or employed different growth scenarios. Given the enormous appeal that the results of the EKC literature have for policy makers in the developing world ('pollute first, clean up later'), we believe that the issues considered in this chapter are of great importance to the academic and policy debate on the growth–environment relationship. In addition we also discuss how environmental policy can help prevent becoming true some of the dire predictions following from the EKC results.

The remainder of the chapter is structured as follows. The first section outlines the basic EKC methodology and addresses some of the key criticisms that have been levelled at the EKC. The second section examines the composition effect experienced by DCs and asks whether this is a result of DCs effectively 'exporting' pollution. The third section provides our forecasts of pollution levels in LDCs and the fourth section concludes the chapter and considers the policy implications of our findings.

1 The EKC methodology and its critique

In the majority of studies, the basic EKC equation that is estimated is of the following form:

$$E_{it} = (\alpha + \beta_i F_i) + \delta Y_{it} + \phi(Y_{it})^2 + k_t + \varepsilon_{it} \qquad (19.1)$$

where E denotes the environmental indicator, either in per capita form or in the form of concentrations, Y denotes per capita income, F denotes country-specific effects, k refers to year specific dummies or a linear time trend and i and t refer to country and year, respectively. Note that some studies include an income cubed term to allow for the possibility of an upturn in pollution at high per capita income levels. In equation (19.1), if $\delta > 1$ and $\phi < 1$ then the estimated curve has a maximum turning point per capita income level, calculated as $Y^* = (-\delta/2\phi)$.[3]

However this simple methodology has been the subject of growing criticism in recent years (see, for example, Arrow *et al*., 1995; Stern *et al*., 1996; Ekins, 1997; Perman and Stern, 1999; Stern and Common, 2001). The following are perhaps the most significant of these criticisms:

Econometric issues

Stern and Common (2001) and Perman and Stern (1999) criticize the EKC on two grounds. First, they claim that studies that use only OECD data will tend to estimate turning points at lower per capita income levels than those using data for the world as a whole. This arises because the developing countries are typically experiencing increasing emissions of even local air pollutants. The implication of this criticism is that the many studies to have estimated EKCs using only OECD data will have provided overly optimistic turning points. Second, they argue that per capita income and emissions are likely to be nonstationary variables. As a result, standard estimation is likely to generate spurious results. Cole (2003) examines the robustness of the EKC, paying particular attention to these two criticisms. Cole (2003) firstly estimates a variety of functional forms for each of four different pollutants.[4] Across all of these models, little distinction is found between results estimated using only OECD data and those estimated using a larger sample containing both developed and developing countries. With regard to the second criticism, nonstationarity is found to be present for two of the four pollutants (for which a larger time series is available) and estimation is therefore undertaken in first differences to remove country-specific stochastic trends. An inverted-U relationship between income and emissions is still found for these two pollutants, with turning points in line with previous studies. The role played by nonstationary variables and OECD dominated samples may therefore be specific to the previously unused sulphur dioxide emissions data set that Stern and Common (2001) and Perman and Stern (1999) utilize.

Consistency of results

Ekins (1997) suggests that the EKC literature is overly optimistic in suggesting the existence of a systematic inverted-U relationship between income and pollution. He argues that estimated turning points are highly dependent on the choice of functional form (for example logs or levels) and the choice of data set and estimation method. In a similar vein, Harbaugh *et al*. (2000) find their EKC results to be highly sensitive to additional covariates and to changes in the nations, cities and years sampled. They are even unable to replicate Grossman and Krueger's (1995) results using the same covariates and the same sample, but using a revised version of the pollution concentrations data set that had been corrected for errors.[5] These studies would suggest that the reliability of the EKC is questionable, although it should be noted that Harbaugh *et al*. (2000) do appear to accept the existence of an inverted-U relationship between income and pollution and offer reasons why their results may not be capturing it. One reason offered is the fact that they are regressing *city-level* pollution concentrations against *national* explanatory variables

despite the fact that pollution around a given monitoring station is almost certainly related to local economic activity and local population density, neither of which they measure. In general, pollution concentrations data are very noisy and would ideally require the use of numerous dummy variables to control for site-specific pollution determinants, such as temperature, rainfall and so on. Such data are typically not available, however, perhaps suggesting why EKCs estimated using concentrations data appear somewhat fragile.

The results of Cole (2003) would certainly indicate that EKCs estimated using national per capita emissions are more robust. Cole (2003) finds the inverted U-relationship between income and emissions to be robust across the variety of functional forms estimated (fixed or random effects, levels or first differences). In all estimations, a statistically significant inverted-U relationship is found between income and emissions, with turning points that are insensitive to the chosen functional form. Furthermore the inclusion of additional covariates (trade variables, political economy variables) does very little to affect this relationship. Finally, as already mentioned, the results were not sensitive to the use of a full or an OECD-only data set.

The role of trade

A number of studies have suggested that the EKC inverted-U relationship may be a result of the changing trade patterns that appear to accompany economic development (Grossman and Krueger, 1995; Suri and Chapman, 1998; Heil and Selden, 2001). As a country develops, the emphasis of the economy shifts from heavy industry towards services. This suggests that the developed world may now be importing its pollution-intensive output from the developing world, rather than producing it for itself. This fact may therefore explain the reductions in local air pollution experienced in most developed countries in recent years.

While we believe the first two criticisms are less problematic than has been claimed, there remains the possibility that EKC results are overly optimistic. The third criticism implies that a factor responsible for reducing emissions in DCs (the composition effect, as defined below) may be absent from LDCs' attempts to reduce emissions. This would obviously suggest that LDCs would have to rely increasingly on other ways of reducing emissions, for example through the use of environmental regulations. Since this argument casts doubt on whether today's developing countries will be able to experience the same pollution–income path as today's developed countries, we now examine it in more depth.

2 Are developed countries substituting imports for domestic pollution-intensive production?

The EKC relationship has typically been explained in terms of the interaction of scale, composition and technique effects. *Ceteris paribus*, scale effects are likely to prove environmentally damaging and arise as a result of the increased scale of economic activity associated with economic growth. Composition effects refer to the fact that, as a country develops, its economy sees a changing emphasis from agriculture to pollution-intensive, heavy industry and then towards light manufacturing and services. In isolation, the composition effect for a developed economy is likely to reduce pollution, but can lead to increases in pollution for developing countries at the early stages of industrialization. Finally the technique effect refers to changing techniques of production that may accompany economic growth, often because of increased demand for environmental regulations. Again, in isolation, this effect is likely to reduce pollution. The EKC is therefore often explained in terms of the dominance of scale effects over composition and technique effects at early stages of development, with later stages of development associated with the dominance of composition and technique effects over scale effects.

But will today's LDCs be able to experience environmentally beneficial composition and technique effects? *In principle*, there is no reason why LDCs will not be able to experience changing techniques of production as a result of increased environmental regulations together with greater access to new technology. However, if the composition effect is a result of an increasing share of pollution-intensive consumption being met by imports, it is questionable whether the developing world can benefit from such changes.

Numerous studies have suggested that the EKC may be a statistical artefact that results from the developed world exporting its pollution abroad (Grossman and Krueger, 1995; Suri and Chapman, 1998; Heil and Selden, 2001).[6] If true, this implies that the LDCs will not be able to follow the same pollution–income path as the DCs since they will have no-one to whom they can pass their pollution-intensive industries. But is this accurate? The aim of this section is firstly to examine to what extent compositional changes within DCs have reduced pollution emissions and, secondly, to consider whether these changes are a result of DC demand for pollution-intensive output now being met by production from LDCs.

Isolating the effect of compositional changes on pollution

Using sectoral production data and sectoral pollution intensities from Hettige *et al*. (1994), it is possible to identify the composition effect, holding constant the scale and technique effects.

The first step is to calculate each sector's share of total production in 1970. If these percentage shares are then applied to 1996 sectoral production data,

we have effectively applied 1970's composition to 1996 production (for example, if ISIC sector 351 formed 10 per cent of total 1970 production, we scale the production of sector 351 in 1996 so that it forms 10 per cent of total 1996 production, and do the same for each sector). We then multiply 1996 sectoral production and 1996 counterfactual sectoral production (estimated using the composition of production in 1970) by the same set of sectoral pollution intensities and aggregate across sectors. The difference between the two 1996 aggregates tells us how much higher manufacturing emissions would have been in 1996 if the composition of production was the same as that in 1970. Table 19.1 expresses this quantity as a percentage of counterfactual 1996 emissions (that is, emissions calculated using 1970's composition of production), thereby indicating the percentage reduction in air pollution between 1970 and 1996 as a result of compositional changes alone. This is reported for four air pollutants and four developed countries.[7]

Table 19.1 The percentage change in air pollution from manufacturing as a result of compositional changes alone, 1970–96

	NO_2	SO_2	CO	SPM
USA	–4.9	–12.5	–12.0	–11.2
Canada	–3.2	–18.1	–10.8	–12.6
Japan	–31.7	–31.9	–36.1	–30.6
UK	–5.8	–18.1	–14.0	–11.3

Table 19.1 indicates, for example, that US SO_2 emissions from manufacturing in 1996 were 12.5 per cent lower than if the composition of production in 1996 was the same as that in 1970; that is, *the composition effect alone* has reduced manufacturing SO_2 emissions by 12.5 per cent, relative to 1970. Since we are comparing 1996 production and pollution data with 1996 data assuming 1970's composition, we are clearly removing any scale effect. The total scale of manufacturing production is the same in both cases. Similarly, since we are applying the same sectoral pollution intensities in each case, emissions are unaffected by any technique effect.

Table 19.1 suggests that composition changes have reduced air pollution emissions, particularly SO_2, CO (carbon monoxide) and SPM (suspended particulate matter), by a significant amount over the period of consideration. Japan appears to have experienced the greatest composition effects. To ascertain whether LDCs can experience similar compositional emissions reductions we need to know whether these reductions derive from DCs substituting pollution-intensive imports from LDCs for their own pollution-intensive production.

A number of studies have attempted to assess the extent to which changing trade patterns can explain the composition effect. Suri and Chapman (1998) include the ratio of manufactured imports to domestic manufacturing production, and the same ratio for exports, as determinants of energy use. They generally find that the import ratio has a negative relationship with energy use while the export ratio has a positive relationship, and therefore suggest that domestic production is being replaced by imports. Similarly Heil and Selden (2001: 46) find that increased trade intensity is associated with decreased carbon emissions in high-income countries and increased emissions in low- and middle-income countries. They suggest that 'the greater trade intensities of high-income countries may have helped those countries expand their economies without proportional increases in carbon emissions, perhaps in part by "exporting" their carbon emissions to lower income countries' (ibid.: 47). In a similar vein, Rock (1996) finds that those LDCs with outward-oriented trade policies have higher pollution intensities of GDP than those following inward-oriented policies. Finally both Antweiler *et al*. (2001) and Cole and Elliott (2003) find some evidence to suggest that relatively low levels of environmental regulations can be a source of comparative advantage.

In contrast, Jänicke *et al*. (1997) find that the OECD countries generally remain net exporters of many pollution-intensive products, with little evidence of net exports as a share of consumption falling. It should be pointed out, however, that this finding does not necessarily imply that the demand for pollution-intensive products in high-income countries is *not* increasingly being met via imports. It is possible for the share of imports in domestic consumption to rise even though net exports as a share of consumption are not falling.[8] As a result, we believe the most direct way to investigate this issue is simply to estimate the share of imports in consumption, for each dirty industry, over the period 1970–96, which is what we do now.

The share of imports in consumption and output

It is widely recognized that the most pollution intensive industries are ISIC 34 Paper and Paper Products, ISIC 35 Chemical Products, ISIC 36 Non-Metallic Mineral Products and ISIC 37 Basic Metals.[9] For each of these industries, we calculate domestic consumption and divide this by the imports from developing countries within that industry.[10] Figures 19.1 to 19.4 provide our results for the USA, Canada, Japan and the UK, respectively.

These four figures provide strong evidence to suggest that the share of developing country imports in pollution-intensive consumption has increased over the period 1978–96 (1976–96 for Japan). Thus it would appear that developed country demand for pollution-intensive output is increasingly being satisfied by imports from abroad, in line with the findings of Suri and Chapman (1998) and Heil and Selden (2001).[11]

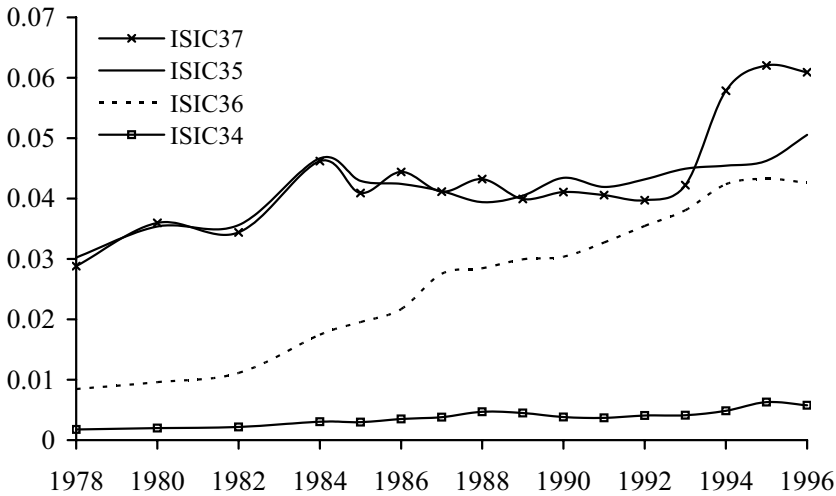

Figure 19.1 *The share of developing country imports in domestic consumption: USA, 1978–96, by pollution-intensive sector*

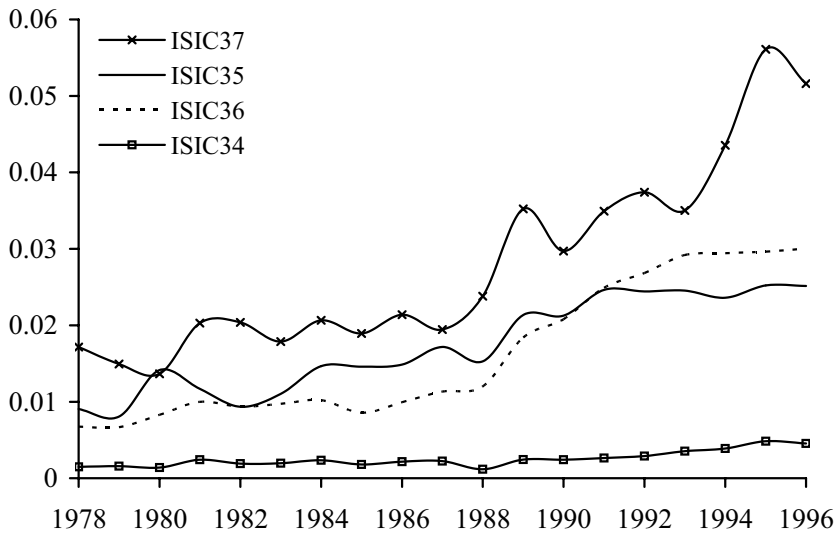

Figure 19.2 *The share of developing country imports in domestic consumption: Canada, 1978–96, by pollution-intensive sector*

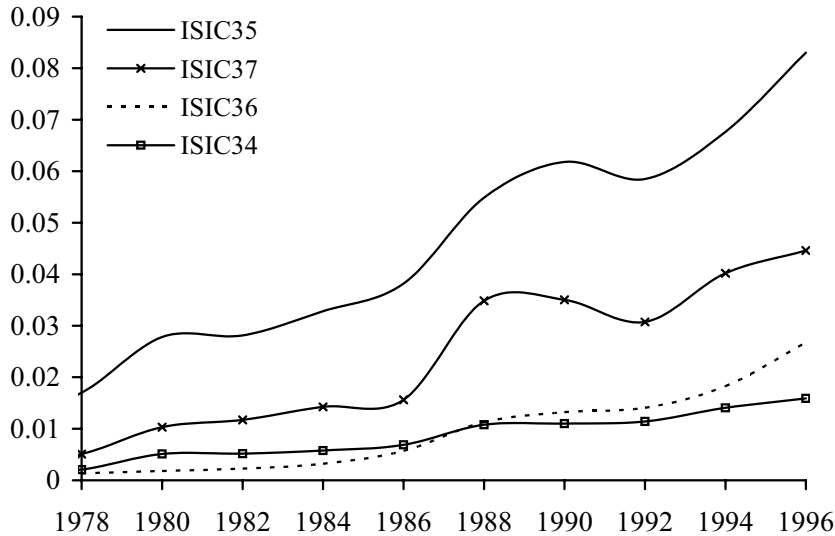

Figure 19.3 The share of developing country imports in domestic consumption: Japan, 1976–96, by pollution-intensive sector

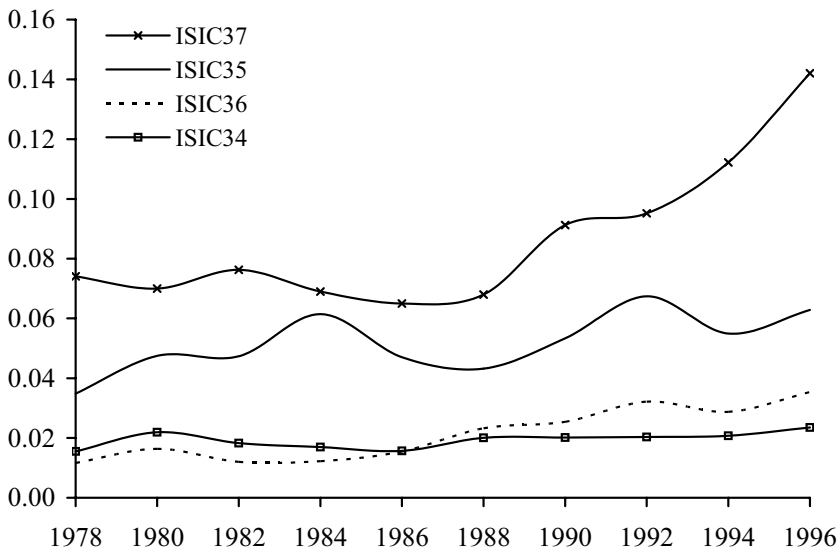

Figure 19.4 The share of developing country imports in domestic consumption: UK, 1978–96, by pollution-intensive sector

These findings raise doubts as to whether today's LDCs can experience compositional reductions in pollution comparable with those presented in Table 19.1. Emissions reductions in DCs have been attained through both compositional changes and increasingly stringent environmental regulations (the technique effect). If some of the emissions reductions due to the composition effect cannot be replicated by LDCs, it follows that the technique effect in LDCs must be stronger than was the case in DCs to bring about the same emissions reductions. Indeed, if the technique effect were unable to compensate for a possible reduced composition effect, it would appear likely that LDC emissions will peak at a higher level of per capita income than DC emissions. The turning points in the EKC literature may therefore be overly optimistic from the point of view of LDCs.

3 Forecasting pollution trends in LDCs

Our analysis therefore suggests that EKC results should be interpreted as 'best case scenarios'. The aim of this section is to show that, even if we accept these best case scenarios, and ignore the question marks that surround the EKC, we still find significant cause for concern. More specifically, we ask the following question. If LDCs will follow the same pollution–income path as DCs, and EKC studies have reliably estimated this path, when can we expect pollution levels to decline?

Forecasting methodology

All EKC studies considered here (and indeed practically all studies on the subject) employ gross domestic product (GDP) per capita in purchasing power parity in real US$1985 from the Penn World Tables (PWT) (Summers and Heston, 1991). Unfortunately, this data set does not contain all the countries in the world and currently extends to the late 1980s or early 1990s only, depending on the country. We take all countries in the data set for which GDP per capita figures were reported for 1988 or later. Countries were grouped into regions according to the classification contained in appendix A. Note that this classification follows EIA (2001), our source for regional growth projections. Regional GDP per capita is estimated as the population weighted average of all countries in a certain region for which the PWT provide estimates. Historical per capita growth rates taken from EIA (2001) are used to forecast these regional GDP per capita data to 1999.

Forecasts of economic growth over a long period of time are notoriously difficult. Few even try to forecast growth rates on a regionally disaggregated basis beyond a few years. Because of the close links between economic growth and energy consumption growth, the Energy Information Administration (EIA) has traditionally been interested in forecasting economic growth beyond the short term. EIA (2001) provides forecasts of economic growth

for our regions up to the year 2020, with different estimates according to a low reference and high growth scenario.[12] For the sake of argument we have extended these forecasts up to 2100 using the growth rates for 2015 to 2020 predicted by the EIA. Beyond the year 2100, we do not venture any forecasts.

Our forecasts beyond 2020 are mainly for the sake of argument and we fully acknowledge the enormous uncertainties involved in predicting income levels over such a long time period. We also note that the high growth scenario is bound to be impossible to sustain for certain regions as it would imply absurdly high income levels in the latter part of the 21st century. Having said this, the fact that we employ three different growth scenarios makes us confident that the growth rate actually realized in the not too distant future has a high probability of being close to one of the three different scenarios. Of course, given past experience, there is reason to expect that different regions will follow different scenarios, but we do not predict which scenario is most likely for each region.

Forecasting results

Table 19.2 provides an overview of predicted per capita GDP for the developing country regions to 2100, contingent on the scenario employed. Note that all GDP data are in real US$1985. To provide a better understanding of the differences between the three scenarios, the last column in Table 19.2 also lists the average annual growth rate between 2001 and 2030.

Table 19.3 lists the pollutants of interest, together with the source of the study and the estimated turning point. Shafik (1994), Selden and Song (1994), Grossman and Krueger (1995) and Cole *et al*. (1997) are four of the most widely cited studies.[13] The estimates by Cole (2003) and Stern and Common (2001) use data sets containing a reasonable number of developing countries and address the issue of nonstationarity. The potential importance of these features is discussed in the previous section and suggests that the estimated turning points from these studies are arguably more reliable than those from other studies. Information from Tables 19.2 and 19.3 is combined in Tables 19.4 and 19.5, which estimate the time period in which, or after which, the relevant turning point is estimated to be reached, depending on the pollutant considered and the growth scenario employed.

Looking at the results in Tables 19.4 and 19.5, one might distinguish between three groups of regions. The first group consists of Africa and India. It is clear that Africa is the region for which the EKC studies provide least hope for the future. For virtually all pollutants and all growth scenarios, pollution is predicted to rise for the most part of this century and frequently beyond the year 2100. Similarly bleak is the situation for India, for which only a few pollutants are estimated to improve before the year 2030. Even

Table 19.2 Predicted income levels in developing country regions

		2001	2010	2020	2030	2050	2075	2100	*g* (2001–30)
Africa	Low	1 216	1 293	1 319	1 341	1 387	1 446	1 508	0.34
	Ref.	1 253	1 520	1 800	2 125	2 962	4 486	6 793	1.82
	High	1 290	1 784	2 446	3 337	6 210	13 500	29 348	3.28
Central & South America	Low	4 266	4 945	5 777	6 762	9 263	13 727	20 342	1.59
	Ref.	4 394	5 811	7 860	10 658	19 598	41 960	89 841	3.06
	High	4 522	6 809	10 645	16 669	40 870	125 393	384 720	4.50
China	Low	2 925	4 053	5 372	7 078	12 290	24 493	48 814	3.05
	Ref.	3 097	5 546	9 799	17 211	53 098	217 103	887 676	5.91
	High	3 185	6 469	13 151	26 591	108 718	632 051	3 674 542	7.32
Other developing Asia	Low	2 821	3 479	4 256	5 142	7 506	12 046	19 331	2.07
	Ref.	2 904	4 081	5 779	8 084	15 823	36 631	84 800	3.53
	High	2 989	4 779	7 812	12 615	32 895	108 998	361 166	4.97
Eastern Europe & FSU	Low	4 021	5 060	6 815	8 727	14 310	26 554	49 272	2.67
	Ref.	4 140	5 936	9 240	13 685	30 019	80 137	213 929	4.12
	High	4 381	8 113	16 758	32 975	127 675	693 446	3 766 330	6.96
India	Low	1 824	2 376	3 192	4 270	7 642	15 817	32 739	2.93
	Ref.	1 877	2 786	4 324	6 685	15 977	47 475	141 075	4.38
	High	1 931	3 259	5 833	10 401	33 065	140 365	595 861	5.81
Middle East	Low	4 673	5 109	6 059	7 307	10 625	16 968	27 097	1.51
	Ref.	4 814	6 015	8 251	11 511	22 404	51 506	118 412	3.01
	High	4 956	7 057	11 186	18 017	46 744	153 916	506 806	4.45
South Korea	Low	10 326	13 254	17 822	23 788	42 378	87 220	179 511	2.88
	Ref.	10 633	15 540	24 145	37 143	87 904	258 031	757 411	4.31
	High	10 944	18 203	32 588	57 892	182 703	768 520	3 232 705	5.74
Mexico	Low	6 767	8 324	11 087	14 876	26 781	55 847	116 458	2.72
	Ref.	6 900	9 259	13 593	20 061	43 695	115 623	305 954	3.68
	High	7 032	10 300	16 634	27 052	71 548	241 326	813 976	4.65

Note: *g* is average annual percentage growth rate between 2001 and 2030.

Table 19.3 Estimated turning points for various pollutants and studies

Arsenic (concentration)	Grossman and Krueger (1995): $4900
Biological oxygen demand	Grossman and Krueger (1995): $7623
Chemical oxygen demand	Grossman and Krueger (1995): $7853
CO (emissions)	Selden and Song (1994): $6241 Cole *et al*. (1997) $9900
Dissolved oxygen	Grossman and Krueger (1995): $2703
Faecal coliform	Grossman and Krueger (1995): $7955
Lead (concentration)	Grossman and Krueger (1995): $1887
Mercury (concentration)	Grossman and Krueger (1995): $5047
Nickel (concentration)	Grossman and Krueger (1995): $4113
Nitrates (concentration)	Grossman and Krueger (1995): $10524 Cole *et al*. (1997): $25000
NO_x (emissions)	Selden and Song (1994): $12041 Cole (2003): $14810
SPM (ambient concentration)	Shafik (1994): $3280 Grossman and Krueger (1995): $6151
SPM (emissions)	Selden and Song (1994): $9811 Cole *et al*. (1997): $7300
SO_2 (ambient concentration)	Shafik (1994): $3670 Grossman and Krueger (1995): $4053
SO_2 (emissions)	Selden and Song (1994): $8916 Cole (2003): $8691 Stern and Common (2001): $18039 (non-OECD only)
Total coliform	Grossman and Krueger (1995): $3043

then, in most cases pollution is predicted to rise for another 15 or 20 years or so, even in the high economic growth case.

The second group consists of Central and South America, China, Eastern Europe and the Former Soviet Union (FSU) as well as the Middle East. While China's starting level of income per capita is somewhat lower, higher predicted growth rates soon raise it to a level comparable with the other regions in this group. Even though this group has higher initial income levels and partly higher predicted growth rates than Africa and India, often pollution is still forecast to deteriorate for many years to come. Even with the high-growth scenario, most pollutants are not estimated to reach their peak before the next decade, and it will be even later for the lower-growth scenarios.

The third group consists of two countries, Mexico and South Korea, who have made it into the Organisation for Economic Co-operation and Develop-

ment (OECD). Their initial income levels are high enough to ensure that many pollutants are already falling or will start to decline within the present decade. Only emissions of a few pollutants are predicted to continue increasing beyond 2020.

If we consider the results from the perspective of individual pollutants rather than regions, one might distinguish between pollutants with an estimated turning point below or close to US$5000 and those with higher turning points. For the first group of pollutants, the situation is already improving or will soon start doing so, with the exception of India and, more drastically, Africa. For the second group of pollutants, however, it will take well into the next decade, if not beyond, before environmental quality improves in many developing regions.

4 Discussion and conclusions

It is important that our findings are not misinterpreted. We suggest that some of the weaknesses of the EKC methodology are less problematic than has been claimed (by, for example, Stern and Common, 2001; Ekins, 1997), so that the major results of the EKC literature still hold (Cole, 2003). However we find evidence to suggest that emission reductions from compositional changes in developed countries arise as a result of an increasing share of developing country imports in the consumption of pollution-intensive products. Question marks therefore still remain over the EKC. The estimated turning points may be overly optimistic and it may be questionable whether LDCs will be able to reduce emissions to the same extent as the DCs.

In the second part of this chapter we have therefore accepted that EKC results may be best case scenarios, but have nevertheless assessed their implications for developing countries. We find that, for many water and air pollutants, the situation is predicted to worsen for many years to come for most regions in the developing world (with the possible exception of Mexico and South Korea). This is true even if a high-growth scenario is employed which would yield the estimated turning point more rapidly. Taking the EKC results, which (to repeat) might be overly optimistic, at their face value therefore leads to some bleak conclusions for many developing country regions. These implications of the EKC results might not be so important if emissions in developing regions were growing from very low levels. However this is not the case, since existing emission levels are already high, with severe human health impacts (see, for example, World Bank, 1992: Mage *et al*., 1996; WRI, 1998). David Wheeler (2002: 4), from the World Bank's Development Research Group, suggests that air and water pollution kills and seriously affects so many people that 'numerous benefit–cost studies have indicated that air and water pollution control are competitive with other social investments, even in very poor countries that have pressing needs for basic education and health care'.

Table 19.4 Estimated time periods for water pollution to start declining

	Y*	Arsenic (conc.) G&K (1995) 4900	BOD G&K (1995) 7623	COD G&K (1995) 7853	Dissolved oxygen G&K (1995) 2703
Africa	Low	>2100	>2100	>2100	>2100
	Ref.	2080–85	>2100	>2100	2035–40
	High	2040–45	2055–60	2055–60	2020–25
Central & South America	Low	2005–10	2035–40	2035–40	↓
	Ref.	2001–05	2015–20	2015–20	↓
	High	2001–05	2010–15	2010–15	↓
China	Low	2015–20	2030–35	2030–35	↓
	Ref.	2005–10	2015–20	2015–20	↓
	High	2005–10	2010–15	2010–15	↓
Other developing Asia	Low	2025–30	2050–55	2050–55	↓
	Ref.	2015–20	2025–30	2025–30	↓
	High	2010–15	2015–20	2020–25	↓
Eastern Europe & FSU	Low	2005–10	2020–25	2025–30	↓
	Ref.	2005–10	2015–20	2015–20	↓
	High	2001–05	2005–10	2005–10	↓
India	Low	2035–40	2045–50	2050–55	2010–15
	Ref.	2020–25	2030–35	2030–35	2005–10
	High	2015–20	2020–25	2025–30	2005–10
Middle East	Low	2005–10	2030–35	2030–35	↓
	Ref.	2001–05	2015–20	2015–20	↓
	High	↓	2010–15	2010–15	↓
Mexico	Low	↓	2001–05	2005–10	↓
	Ref.	↓	2001–05	2001–05	↓
	High	↓	2001–05	2001–05	↓
South Korea	Low	↓	↓	↓	↓
	Ref.	↓	↓	↓	↓
	High	↓	↓	↓	↓

Note: BOD: biological oxygen demand; COD: chemical oxygen demand; G&K (1995): Grossman

Faecal coliform G&K (1995) 7955	Lead G&K (1995) 1887	Mercury G&K (1995) 5047	Nickel G&K (1995) 4113	Total coliform G&K (1995) 3043	Nitrates (Concentrations) G&K (1995) 10524	Nitrates (Concentrations) Cole *et al.* (1997) 25000
>2100	>2100	>2100	>2100	>2100	>2100	>2100
>2100	2020–25	2080–85	2065–70	2050–55	>2100	>2100
2055–60	2010–15	2040–45	2035–40	2025–30	2065–70	2090–95
2035–40	↓	2005–10	↓	↓	2060–65	>2100
2015–20	↓	2001–05	↓	↓	2030–35	2055–60
2010–15	↓	2001–05	↓	↓	2015–20	2035–40
2030–35	↓	2015–20	2005–10	2001–05	2045–50	2075–80
2015–20	↓	2005–10	2005–10	↓	2020–25	2035–40
2010–15	↓	2005–10	2001–05	↓	2015–20	2025–30
2050–55	↓	2025–30	2015–20	2001–05	2065–70	>2100
2025–30	↓	2015–20	2010–15	2001–05	2035–40	2060–65
2020–25	↓	2010–15	2005–10	2001–05	2025–30	2040–45
2025–30	↓	2005–10	↓	↓	2035–40	2070–75
2015–20	↓	2005–10	↓	↓	2020–25	2040–45
2005–10	↓	2001–05	↓	↓	2010–15	2025–30
2050–55	2001–05	2035–40	2025–30	2015–20	2060–65	2090–95
2030–35	2001–05	2020–25	2015–20	2010–15	2040–45	2060–65
2025–30	↓	2015–20	2010–15	2005–10	2030–35	2045–50
2030–35	↓	2005–10	↓	↓	2045–50	>2100
2015–20	↓	2001–05	↓	↓	2025–30	2055–55
2010–15	↓	↓	↓	↓	2015–20	2035–40
2005–10	↓	↓	↓	↓	2015–20	2045–50
2001–05	↓	↓	↓	↓	2010–15	2035–40
2001–05	↓	↓	↓	↓	2010–15	2025–30
↓	↓	↓	↓	↓	↓	2030–35
↓	↓	↓	↓	↓	↓	2020–25
↓	↓	↓	↓	↓	↓	2015–20

and Krueger (1995). Y* estimated turning point; ↓: estimated pollution levels already falling.

Table 19.5 Estimated time periods for air pollution to start declining

	Y*	CO (Emissions)		NO_x (Emissions)		SPM (Concentrations)	
		S&S (1994) 6241	Cole *et al.* (1997) 9900	S&S (1994) 12041	Cole (2003) 14810	Shafik (1994) 3280	G&K (1995) 6151
Africa	Low	>2100	>2100	>2100	>2100	>2100	>2100
	Ref.	>2100	>2100	>2100	>2100	2055–60	>2100
	High	2090–95	>2100	>2100	>2100	2025–30	2090–95
Central & South America	Low	2020–25	2050–55	2065–70	2070–75	↓	2020–25
	Ref.	2010–15	2020–25	2030–35	2035–40	↓	2010–15
	High	2005–10	2015–20	2020–25	2025–30	↓	2005–10
China	Low	2020–25	2040–45	2045–50	2050–55	2001–05	2020–25
	Ref.	2010–15	2020–25	2020–25	2025–30	↓	2010–15
	High	2005–10	2015–20	2015–20	2020–25	↓	2005–10
Other developing Asia	Low	2040–45	2060–65	2070–75	2080–85	2001–05	2040–45
	Ref.	2020–25	2035–40	2040–45	2045–50	2001–05	2020–25
	High	2015–20	2020–25	2025–30	2030–35	2001–05	2015–20
Eastern Europe & FSU	Low	2015–20	2035–40	2040–45	2045–50	↓	2015–20
	Ref.	2010–15	2020–25	2025–30	2025–30	↓	2010–15
	High	2005–10	2010–15	2015–20	2015–20	↓	2005–10
India	Low	2040–45	2055–60	2065–70	2065–70	2015–20	2040–45
	Ref.	2025–30	2035–40	2040–45	2045–50	2010–15	2025–30
	High	2020–25	2025–30	2030–35	2030–35	2005–10	2020–25
Middle East	Low	2020–25	2045–50	2055–60	2060–65	↓	2020–25
	Ref.	2010–15	2025–30	2030–35	2030–35	↓	2010–15
	High	2005–10	2015–20	2020–25	2020–25	↓	2005–10
Mexico	Low	↓	2010–15	2020–25	2025–30	↓	↓
	Ref.	↓	2010–15	2015–20	2015–20	↓	↓
	High	↓	2005–10	2010–15	2015–20	↓	↓
South Korea	Low	↓	↓	2001–05	2010–15	↓	↓
	Ref.	↓	↓	2001–05	2005–10	↓	↓
	High	↓	↓	2001–05	2005–10	↓	↓

Note: CO: carbon monoxide; NO_x: nitrogen oxides; SPM: suspended particulate matter; SO_2: sulphur dioxide. S&S (1994): Selden and Song (1994); G&K (1995): Grossman and Krueger

SPM (Emissions)		SO_2 (Concentrations)		SO_2 SO_2 (Emissions)		
S&S (1994) 9811	Cole *et al.* (1997) 7300	Shafik (1994) 3670	G&K (1995) 4053	S&C (2001) 18039	S&S (1994) 8916	Cole (2003) 8691
>2100	>2100	>2100	>2100	>2100	>2100	>2100
>2100	>2100	2060–65	2065–70	>2100	>2100	>2100
>2100	2055–60	2030–35	2035–40	>2100	>2100	>2100
2050–55	2030–35	↓	↓	2090–95	2045–50	2045–50
2020–25	2015–20	↓	↓	2045–50	2020–25	2020–25
2015–20	2010–15	↓	↓	2030–35	2015–20	2015–20
2040–45	2030–35	2005–10	2005–10	2060–65	2035–40	2035–40
2020–25	2010–15	2001–05	2005–10	2030–35	2015–20	2015–20
2015–20	2010–15	2001–05	2001–05	2020–25	2010–15	2010–15
2060–65	2045–50	2010–15	2015–20	↓	2055–60	2055–60
2035–40	2025–30	2005–10	2010–15	↓	2030–35	2030–35
2020–25	2015–20	2001–05	2005–10	↓	2020–25	2020–25
2035–40	2020–25	↓	↓	2055–60	2030–35	2030–35
2020–25	2015–20	↓	↓	2035–40	2015–20	2015–20
2010–15	2005–10	↓	↓	2020–25	2010–15	2010–15
2055–60	2045–50	2020–25	2025–30	2075–80	2055–60	2055–60
2035–40	2030–35	2015–20	2015–20	2050–55	2035–40	2035–40
2025–30	2020–25	2010–15	2010–15	2035–40	2025–30	2025–30
2045–50	2030–35	↓	↓	2075–80	2040–45	2040–45
2025–30	2015–20	↓	↓	2040–45	2020–25	2020–25
2015–20	2010–15	↓	↓	2030–35	2015–20	2015–20
2010–15	2001–05	↓	↓	2040–45	2010–15	2010–15
2010–15	2001–05	↓	↓	2025–30	2005–10	2005–10
2005–10	2001–05	↓	↓	2020–25	2005–10	2005–10
↓	↓	↓	↓	2020–25	↓	↓
↓	↓	↓	↓	2010–15	↓	↓
↓	↓	2005–10	↓	↓	↓	↓

(1995); S&C (2001): Stern and Common (2001); Y*: estimated turning point. ↓: Estimated pollution levels already falling.

It is here that environmental policy making could (and in our view should) intervene. As pointed out by Munasinghe (1999), if remedial, anticipative environmental policies are employed, then there is a real chance for LDCs to 'tunnel through' the EKC. This emphasizes the role of the so-called technique effect, that is, the pollution reduction brought about by technical progress and environmental regulation. Most studies agree that this effect has played an important role in reducing pollution in developed countries. LDCs should also be able to benefit from this effect, as long as a mechanism exists through which preferences can be translated into policy. It could even be argued that LDCs should benefit more than DCs from the technique effect, since pollution abatement technology is now more advanced and is improving faster than it has in the past. Therefore, a combination of strong and sophisticated environmental policies, together with progress in pollution abatement technology, provide the opportunity for developing countries to escape the pattern of the EKC. Economic growth could therefore be achieved with less environmental degradation than has been the case in developed countries.

Although many authors have criticized the EKC literature and its often implicit policy implications, we suggest that these criticisms do not necessarily invalidate the EKC's major findings. Our critique of the EKC literature therefore has a different thrust. We show that the implications of taking the EKC results at face value are bleak for many developing countries, even under the high-growth scenario. We therefore hope to have shown that, even if the supposedly optimistic EKC relationship is accepted, an environmental policy that followed the 'pollute first, clean up later' ideology would have very unpleasant implications for LDCs.

Notes

* Eric Neumayer acknowledges financial assistance from the Leverhulme Trust.

1. Declining pollution emissions in DCs have also arisen as a result of changing techniques of production, often the outcome of increased environmental regulations. In principle, LDCs can also experience an increased demand for such regulations as their income levels increase, although this should not be taken for granted. A mechanism is needed through which society's preferences can be translated into policy making. Inequality of power within LDCs, or a general lack of democracy, could prevent such a mechanism from operating (Torras and Boyce, 1998).
2. We do not address developed country regions (North America, Western Europe and Developed Asia) since, for the pollutants looked at here and the estimated turning points, pollution is estimated to decrease in these regions already.
3. Table 19.3 provides the estimated turning points from a large number of EKC studies.
4. Three air pollutants are considered, nitrogen oxides, sulphur dioxide and carbon dioxide, together with a measure of water pollution, biological oxygen demand.
5. Harbaugh et al. (2000) were unable to include all of the control dummies that Grossman and Krueger used (for example, the type of monitoring device) since these were not reported in the revised data set. This may, at least in part, explain the different results.
6. For a comprehensive overview of the so-called 'pollution haven' debate more generally, see Neumayer (2001a, 2001b).
7. By applying US intensities to Canada, Japan and the UK, we are assuming that the

relative pollution intensity of US industries is the same as that for Canadian, Japanese and UK industries.

8. For example, imagine that an industry in a particular country in one time period has production (P) = 50, imports (M) = 10 and exports (X) = 20. Consumption (C) would therefore = 40. M as a share of C = 0.25 and net exports as a share of C = 0.25. In the next time period, imagine P = 45, M = 10 and X = 22. Now C = 33, M as a share of C = 0.3 and net exports as a share of C = 0.36. In this scenario, net exports as a share of consumption have actually risen despite the fact that an increasing proportion of consumption is being met by imports, which has allowed production, and hence pollution, to contract within the industry. Thus, for the purposes of this chapter, imports, rather than net exports, as a share of consumption is the appropriate variable to examine.
9. See, for example, Hettige *et al*. (1994).
10. Domestic consumption within a sector is calculated as production plus imports minus exports. All data have been converted to 1985 US dollars and are from the OECD STAN database (OECD, 1998), with developing country imports provided by the World Bank's bilateral trade database.
11. We find similar trends to those in Figures 19.1–19.4 for *total* imports as a share of consumption and for imports (total or LDC) as a share of domestic production.
12. We do not employ different scenarios for population growth. This is because scenarios for economic growth exhibit much more variability than scenarios for population growth. EIA (2001) employs the United Nations reference scenario for its underlying population growth projections. Using different scenarios or a different source for projections of population growth would change the forecasted per capita economic growth rates only slightly.
13. We do not consider the second turning point in the relatively few estimations in the EKC literature that have included an income cubed term. This is consistent with our interpretation of EKCs as best case scenarios.

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20 Trade liberalization and global environmental governance: the potential for conflict

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This chapter assesses different arguments for the potential for conflict between the rules and treaties embodied in the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) and those embodied in multilateral environmental agreements (MEAs). Its analysis underscores the importance of research into the way global governance orders interact, an area understudied in international environmental politics to date.[1]

The advent of the WTO has added several new twists to long-running debates on the trade–environment conflict. Daniel Esty (2000) has recently argued that the WTO needs to address trade–environment linkages for reasons of both economic efficiency and political legitimacy. Ken Conca (2000: 494) argues more strongly:

> The WTO has proven to be profoundly anti-environmental, handing down environmentally damaging decisions whenever it has had the chance to do so. Fears of a race to a dirty bottom are proving prescient, and optimism that trade rules can be greened from within has waned appreciably.

These fears have underscored recent transnational protest against the WTO and its sister organizations. Activists argue that, to date, the WTO's dispute resolution panels have had a reasonably consistent record in striking down domestic environmental legislation that uses trade sanctions to ensure enforcement. They further contend that this could ultimately threaten MEAs that rely on similar trade sanctions to ensure their enforceability (Charnovitz, 2002). On the other hand, some analysts argue that more recent developments in these cases indicate a move towards greater accommodation between the notions of free trade and environmental protection (DeSombre and Barkin, 2002).

Approximately 20 of the estimated 200 MEAs contain trade-related compliance measures (Stokke, 2003: 1). Some of these regimes seek to limit international trade flows as an objective in itself. Prime examples of MEAs in this category include the 1989 Basel Convention on Transboundary Shipment of Hazardous Waste, the 1973 Convention on International Trade in Endangered Species (CITES), and the Montreal Protocol on Substances that Deplete the Ozone Layer (1987).

In other cases, trade measures may have a role in implementing or enforcing MEAs. For example, the Kyoto Protocol (1997) to the United Nations Framework Convention on Climate Change sets limits on greenhouse gas emissions by industrialized (Annex 1) countries, and contains provisions for emissions trading among states to achieve its goals at the lowest cost. However, depending on how such schemes are set up domestically, they could be challenged: for instance, if emissions trading schemes under Kyoto gave some countries a competitive edge in generating cheaper energy (Jinnah, 2003). Finally the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000) restricts imports of genetically modified organisms to Southern countries.

If a WTO tribunal strikes down these rules, this in turn could undermine the legitimacy and political standing of the framework MEA. Such actions could have a further 'chilling effect' (Conca, 2000) on present and future international negotiations, as well as further undermining the political and social legitimacy of the WTO and of the multilateral model of international environmental problem solving. So, despite the fact no such challenge has yet been brought by any state, members of both the WTO and environmental communities are starting to assess the likelihood of this happening, and what the effects could be.[2] It is hard to assess an as yet hypothetical event, and indeed one could argue that it is unusual that such a challenge has not been issued sooner.

When this subject is raised, several questions arise. First, does inter-state conflict over trade not make such conflict likely? Is the WTO not much more powerful than MEAs, and therefore will the proponents of free trade not prevail over those who seek to enforce environmental treaties? Have we not seen this already domestically? Finally, is conflict not inevitable, given the conflicting tenets upon which the trade and environmental regimes are premised? This chapter assesses each of these questions in turn. First, given the potential for friction between MEAs and the WTO, states initiate disputes in the WTO framework, and are most likely to trigger a challenge to an MEA within the WTO. Second, the chapter assesses the institutionalist argument that the WTO has a superior legal and organizational capacity to the various MEAs. Third, some argue that legal precedent and the articles of the treaties concerned point towards conflict. This section examines how domestic disputes have really played out over time, and the role of the Vienna Convention on the Law of Treaties could play in WTO–MEA conflict. Fourth, many, particularly societal actors, see the basic norms and principles on which the GATT/WTO was founded as fundamentally antithetical to norms of environmental protection. As these norms are given support and legitimacy by elite actors in the international system, and also have the support of global capital, it is more likely that environmental provisions will be struck down as

protectionist measures. On the other hand, the chapter sketches an apparent normative convergence between trade and environmental regimes over the past decades, and the reasons that may underpin this convergence.

1 The 'trigger' for disputes: inter-state conflicts over trade measures

Basically disputes are brought before WTO panels by parties to the agreement: states who believe that a provision in domestic legislation or a multilateral agreement aimed at protecting the environment or social welfare is, in effect, a protectionist measure that contravenes provisions of the General Agreement on Tariffs and Trade (GATT). This approach has frequently been used to target domestic environmental laws (see discussion below) and is, in fact, the only way through which conflicts between the WTO and MEA would be triggered. Such a complaint might be brought by a state that is not a party to an MEA or that is discriminated against under the terms of an MEA, acting either in its own interests or on behalf of powerful domestic constituencies.

There are several provisions of the GATT that may give rise to a challenge to a trade provision in national legislation or an MEA. Article I of the GATT, for instance, sets out the 'most-favoured nation' principle, which forbids trade discrimination against 'like products', regardless of the country of origin. With some limited exceptions, Article XI of the GATT provides a general ban on quantitative restrictions on the import and export of products, a provision that could call into question the legality of trade bans on hazardous wastes, endangered wildlife or genetically modified organisms. Article XIII forbids discriminatory application of quantitative restrictions; that is, if a trade restriction is applied to one country, it must be applied to all.

The Ban Amendment of the Basel Convention is considered especially vulnerable to challenge under the GATT provisions outlined above, either by nonmembers or members excluded from Annex VII (Krueger, 1999; Wirth, 1998). By its terms, the Ban Amendment provides that only Basel Convention Parties listed in Annex VII of the Convention (OECD members plus Liechtenstein) may import hazardous wastes for recycling purposes. Several governments, including India, Israel and Monaco, have already voiced objections to Annex VII, particularly on the grounds that it is a fixed list. They argue that there are no sound environmental reasons why they should not be allowed to continue to recycle waste materials, thus benefiting economically in the process. While provisions to enlarge membership of Annex VII may be put in place once the Ban Amendment is ratified, this process is likely to take a while, and, in the meantime, the Basel Convention remains vulnerable to such a challenge: currently, because the European Union (EU) has ratified and is implementing the Basel Ban, and also in the period following the Ban's entry into force.

Conflicts over trade are a common feature of the international landscape, and the WTO has become the arena in which trade–environment conflicts are fought. Given the legal vulnerabilities of several leading MEAs, it is in fact surprising that no MEA-related dispute has yet been brought in front of a WTO panel. In assessing further arguments posited either for conflict or for WTO strength the following sections provide some clues as to why this is the case.

2 The institutionalist argument: legal and organizational capacities

If an MEA-related dispute were brought in front of a WTO panel, what would an institutionalist approach predict about the likely outcome? This section assesses the institutional capacities of the trade and environment orders, and rules governing legal disputes within each sector. It focuses on three dimensions of institutional capacity: the legal powers of the WTO versus MEAs, their respective organizational capacities and the conflict within the WTO between its intergovernmental aspect and its organizational autonomy. In some ways, this is a numbers game. Indicators of capacity include membership, staff sizes and budget. However they also include a procedural aspect. How well are the orders integrated? How are decisions made and disputes resolved? This assessment yields some interesting results. While the WTO certainly has greater legal capacity, shortcomings in its organizational capacity raise questions as to its ability to deal effectively with, for example, MEA-related disputes.

In very basic legal terms, the WTO is much stronger organizationally than the collectivity of MEAs. It has, for instance, stronger and more enforceable compliance mechanisms and a dispute settlement procedure that virtually ensures real behavioural change by the states brought before it.[3] The package of rules and measures states sign up to when they join the WTO impose quite deep structural changes in national economic policies, and cover a broader scope of activities (covering services, intellectual property rights and agriculture) than did the GATT. An argument based on legal capacity would highlight these relative strengths of the WTO over environmental agreements, and hypothesize that, in the event of conflict between the two, the trading order would defeat the environmental (Samford, 2002). For example, the WTO brings a multitude of treaties and agreements firmly together in one bundle, and under the auspices of a single organization. The environmental order, by contrast, is much more piecemeal. Rather than grouping disparate issues together, negotiations are carried out on a per-issue basis, not always under the direct management of the most plausible 'umbrella' institution for international environmental issues, the United Nations Environment Programme (UNEP). Third, decision making procedures in the WTO are far more streamlined. It is a 'self-adjusting' organization, with delegations in Geneva able to

make decisions, as well as its own system of panels and appeals in the case of disputes. Environmental treaties do not contain the same decision making mechanisms, and rely on periodic conferences of the parties to make changes in treaty structure or obligations. Finally, WTO tribunals are usually made up of trade law experts rather than experts in environmental law. This potentially strengthens the hand of the trade side of the conflicts, and has been the object of many proposals for institutional reform (see the Conclusion).

In terms of indicators of organizational capacity, the difference between the two is less stark. For one, the WTO and UNEP as organizations have roughly commensurate numbers of personnel and budgets, although the tasks assigned to the WTO are more demanding in many ways.[4] This in turn has led to concerns that the WTO is overstretched in terms of matching tasks to available personnel and resources (Blackhurst, 1998). Second, in terms of membership numbers, the membership of the WTO is actually smaller than that of many MEAs. As of April 2003, the WTO had 146 members, the most notable recent accession being China. The Basel Convention has 158 members, CITES has 164, the Convention on Biodiversity has 187 and the United Nations Framework Convention on Climate Change, 194. The breadth of membership of MEAs is an important component of the legal argument against WTO–MEA conflict (see below). On the other hand, these Conventions in their original forms impose relatively undemanding obligations on their respective Parties. The more controversial amendments and protocols, which have the most impact on trade, have been ratified by a much smaller number of states. For example, the 1995 Basel Ban amendment has only 37 ratifications to date and needs 62 to come into force. The 1999 Cartagena Protocol of the Convention on Biological Diversity (CBD), which regulates trade in genetically modified organisms (GMOs), came into force in September 2003 with 50 signatories and now has 65 Parties.

Third, how does each order deal with internal conflicts among its members? Both orders are essentially governmentally driven: national delegates or representatives are responsible for treaty approval and implementation, and actual voting and formal decision making powers are restricted to states (or regional economic organizations) and their representatives. Typically, however, MEAs tend to be more open, at least in informal ways, to participation and input from a wider range of non-state actors. Deliberations are public and transcripts and reports are much more readily available. Both kinds of regimes also have particular dimensions of support among members, which often weaken their relative capacity to command consensus and their ability to carry out their respective mandates. These disputes have been far more marked in the WTO, highlighting the clash between its role as an *intergovernmental* organization and its institutional autonomy. Splits between Northern and Southern countries over trade issues and environment issues are very

common, as well as transatlantic divides, between the USA and the EU, in particular. The WTO is redolent with conflict at this point, dealing both with the USA–EU dispute over genetically modified organisms, and with the fissures leading up to, during, and following the 1999 Ministerial Meeting in Seattle. In 2003, the Ministerial Meeting held in Cancun, Mexico, broke up over the question of agricultural subsidies.

Thus it is hard in practice to maintain the distinction between a monolithic and powerful WTO and a piecemeal, relatively toothless environmental governance order, even on purely institutional terms. In many ways, the WTO is fighting for its legitimacy, not only in the face of transnational protest, but also in the eyes of many of its members. Its organizational capacity is also overstretched, despite its wider legal powers. On the other hand, MEAs face far less external opposition and, by operating in a more transparent, participatory fashion, potentially command more legitimacy than one might expect. These arguments underlie the vehement opposition on the part of the WTO secretariat to the possibility of a WTO–MEA conflict, discussed in Section 4.

3 Legal conflicts between trade and environment: from *Tuna–Dolphin* to MEAs

The impact of free trade regimes on the environment has long been a topic of debate in economics, political science and legal studies (Williams, 2001; Thompson and Strohm, 1996; Esty, 1994). In recent years, the environmental community has come to fear that a pattern of anti-environment rulings at the domestic level will be replicated in the international arena. GATT and WTO dispute resolution bodies have often struck down environmental trade measures (ETMs) where WTO members have challenged them, deciding that these mechanisms violated GATT provisions. Some commentators have argued that this bodes badly for the future of multilateral environmental agreements that utilize ETMs to enforce their mandates.[5]

This section examines the treatment of ETMs by GATT/WTO dispute resolution panels over the past decade. It argues that, while dispute resolution panels have demonstrated a clear antipathy to the imposition of unilateral trade restrictions by countries in the name of environmental protection, the international community has remained open to more creative solutions of the problems. Furthermore a different set of legal principles applies to cases where two treaties collide, as opposed to when national laws come up against international agreements: here we examine the possible interpretations of the Vienna Convention on the Law of Treaties.

Dolphins and turtles: Article XX and unilateral precedents?

The most important, and contentious, article of the GATT with respect to the use of ETMs is Article XX. This article (in ten clauses) covers a list of

'general exceptions' to GATT provisions, including in the context of prison labour, intellectual property rights, public morals and national treasures. Two in particular (XX(b) and XX(g)) relate to environmental protection. They are reproduced here along with the chapeau, or introductory provision, of the article:

> Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:
>
> (b) necessary to protect human, animal or plant life or health
>
> (g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.

Two examples, the *Tuna–Dolphin* and *Shrimp–Turtle* cases, both brought by other countries against US environmental regulations in the 1990s, demonstrate that GATT/WTO panels have tended to interpret the chapeau and articles XX(b) and XX(g) extremely narrowly.[6] In both these cases, the GATT/WTO struck down the national regulation, at least initially. In its first ruling in the *Tuna–Dolphin* case (1991), brought by Mexico against the US ban on its tuna exports, the GATT Dispute Resolution Panel ruled first that GATT parties could not impose restrictions on 'like products', under Articles I or III of GATT on the basis of the methods in which those products are processed or produced (in this case, the USA objected to setting nets on dolphins to obtain tuna), nor did Article XX(b) allow the USA to protect the life or health of animals found outside its jurisdiction.[7] In finding that the unilateral measures imposed by the USA to protect dolphin were not 'necessary', the Panel interpreted the term very narrowly, holding that the burden was on the USA to demonstrate that it has 'exhausted all options reasonably available to it to pursue its dolphin protection objectives'.[8]

In the *Shrimp–Turtle* case, incidental capture and death of sea turtles in shrimp trawl nets in the Indian Ocean prompted the USA, under the Endangered Species Act, to ban shrimp imports from countries not using 'turtle excluder devices' on all vessels. In 1997, a WTO dispute Settlement Panel was convened to rule on a challenge brought by four Asian countries. The panel held against the USA on the grounds that it had violated its obligations under Article XI of GATT and had not met the requirement for nondiscrimination under Article XX because it mandated that all foreign countries adopt essentially the same policies and practices as the United States.[9]

These decisions underpin the fear of many members of the environmental community that MEA trade-related enforcement provisions would be struck

down by WTO panels in the future. On the other hand, recent developments in WTO jurisprudence provide some grounds for reconciliation. For one, the *Tuna–Dolphin* ruling has never been enforced, and is considered to have opened the door for the acceptance of voluntary labelling practices by the WTO. Second, in 1998 and 2001, in what the environmental community regards as a highly positive development, the USA was allowed by a WTO Appellate Body in the *Shrimp–Turtle* dispute to maintain its import embargo on shrimp, provided that it continues to make a good faith effort to work towards an international agreement on sea turtle conservation.[10] In so doing, the Appellate Body acknowledged that 'trade liberalization' was not the only 'objective and purpose' of the WTO and that it was incumbent upon it to ensure protection of the environment, conservation of natural resources and achievement of sustainable development (de La Fayette, 2002: 689).

Conflict between the WTO and MEAs and the Vienna Convention on the Law of Treaties

As the previous section suggests, the fact that challenges to ETMs to date have tended to be successful may bode badly for MEAs that rely on trade measures for enforcement.[11] Pivotal to any analysis of possible outcomes of a legal conflict is application of Article 30 of the Vienna Convention on the Law of Treaties (VCLT).[12] While the VCLT has only been ratified by 34 countries to date, its provisions are generally recognized as a codification of customary international law[13] and WTO dispute resolution panels have consistently held that the treaty should guide interpretation of GATT provisions (Hudec, 1999). Article 30 provides that, where states are parties to successive treaties related to the same subject matter, the later treaty prevails in the case of conflicting provisions unless the later treaty specifies that the earlier agreement will do so, the principle of *lex posterior derogate legi priori* (more colloquially, *lex posterior*). As one legal scholar argues, 'the strict application of this rule could lead to problems, in that it could arguably invalidate MEAs (or parts of them) that became binding before 1994 [the year the WTO was brought into being under GATT]'.[14] This would include both CITES and Basle (which came into effect in 1974 and 1992, respectively).

There are, however, large grey areas in this analysis. First, MEAs' case may be strengthened by another rule of treaty interpretation, *lex specialis* (*generalia specialibus non derogant*), the principle that treaties with more specific terms as to the subject matter at hand take precedent over more general ones (Sinclair, 1984; Dowrick, 1982). While not expressly set forth in Article 30 of the Vienna Convention, the principle is widely applied by domestic and international courts and is considered to constitute customary international law.[15] For example, it could be argued that the provisions of CITES or of Basle should prevail over the GATT because the former

specifically addresses the trade of endangered species and waste, respectively, whereas the latter encompasses trade issues more generally.

Second, it is not clear which rules apply when conflicting parties are not parties to both agreements, although the more universal one is likely to prevail: as argued above, many MEAs in fact have wider membership than the WTO. Legal theorists also point to the extremely narrow interpretations of Article XX of the GATT handed down by dispute panels in *Tuna–Dolphin* and *Shrimp–Turtle*, further noting that, while the appellate decisions in *Shrimp–Turtle* are encouraging, they could subsequently be reversed by a future panel or by future WTO legislation (de La Fayette, 2002: 690). At the same time, the fact that MEAs are, of course, multilateral, clearly negotiated and formally agreed to by signatories strengthens their legality.

Third, in several respects, MEAs could amend their texts to protect themselves against a legal challenge.[16] CITES, for example, could move to split-listing of species by country. Basle contains provisions under Article XI allowing bilateral waste trading agreements, although it is not clear as to the conditions that govern such agreements. The regime also needs to move towards more flexible provisions for parties to join Annex VII. Some of these moves towards more 'market-friendly' mechanisms are discussed below.

4 Normative conflict: environment versus development?

It is possible to argue that conflict between MEAs and the WTO is inevitable simply because of fundamental conflict between their underlying norms, or sets of ideas, upon which each was founded. Both sets of ideas have traditionally been espoused by different constituencies: international organizations, nonstate actors and, within governments, different agencies. Hence (until recently), they have evolved relatively autonomously.

The trading order was founded on the belief that trade liberalization is the key to world prosperity. The participation and full exposure of less developed countries to the world market is their best route out of underdevelopment, a view held not only by international organizations but also by many Southern governments. The environmental order was founded on the idea that coordinated, collective action among states is necessary to preserve the global environment, both for current and future human generations and for nature's own sake.[17] Policy is reinforced by scientific consensus (or at least majority opinion), rather than economic efficiency, and relies on compliance by national governments with stated and agreed upon international targets. Many argue that the goal of unfettered market liberalism inherently conflicts with, and undermines, the goals of environmental protection and sustainable development (Cavanagh *et al*., 2002). Conflict between the two orders is inevitable, especially as neoliberal beliefs are espoused by elite actors, thus commanding more legitimacy in powerful policy-making circles.

On the other hand, some commentators sketch a substantive, albeit still limited and dynamic, normative shift on the part of both orders in the past decade (O'Neill and Burns, 2001). In essence, it can be argued that trade and environmental regimes are converging on a new, shared norm of sustainable development, accompanied by a form of free market environmentalism. In their Ministerial Declaration in 2001, the ministers to the WTO affirmed their commitment to the objective of sustainable development and the right of nations to implement measures to protect the environment. Furthermore the ministers called for procedures for regular information exchange between the WTO and MEA Secretariats, and possible reductions or elimination of tariff and non-tariff barriers to environmental goods and services. The declaration called upon the WTO's Committee on Trade and Environment to give particular attention to the effect of environmental measures on trade access, labelling requirements for environmental purposes and relevant provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights. Finally perhaps the most important provision calls for negotiations on 'the relationship between existing WTO rules and specific trade obligations set out in multilateral environmental agreements (MEAs)'.[18]

However the extent of the WTO's commitment to levelling the playing field between trade and environmental considerations must remain open to question. The Doha Ministerial Declaration calls only for examining the relationship of WTO rules and trade-related measures in MEAs when disputes arise between *parties* to MEAs, explicitly stating that 'the negotiations shall not prejudice the WTO rights of any Member that is not a party to the MEA in question'.[19] As Charnovitz (2003) concludes, 'even if the narrow Doha Agenda negotiations succeeded, however, the intellectually difficult issues would still be off the table. That is, what should the WTO do about the specific trade obligations in MEAs against *non-parties* to the MEA?' Indeed many of the potential disputes that we described earlier in this chapter fall squarely within this category. However there is also other evidence that the WTO could become a positive force for environmental protection in some contexts. For example, the Doha Ministerial Declaration calls for negotiations to clarify and strengthen WTO rules related to trade-distorting fisheries subsidies, a major contributory factor to devastating levels of overfishing throughout the world.

MEAs for their part are moving towards more free market mechanisms (such as emissions trading under the Kyoto Protocol and exploration of the development of individual transferable quota systems to combat overfishing), the involvement of private economic actors and integrating the development community with the environmental community. A very important part of this convergence has been the emergence and codification of the concept of sustainable development as a means of linking economic growth and environ-

mental protection (quite loosely) with social concerns, with trade liberalization seen as an integral tool for achieving these objectives.[20]

To take another example, the 10th Conference of the Parties of CITES, held in 1997, agreed to transfer the African elephant populations of Botswana, Namibia and Zimbabwe from Appendix I to Appendix II, opening the way for commercial trade.[21] This could be interpreted as an effort to support market-driven conservation programmes in these countries, such as Campfire in Zimbabwe. Several other proposals were advanced to transfer species from Appendix I to Appendix II at the 11th and 12th COPs. This concept, which implies a shift away from moratoria on resource use (based on their intrinsic value to the world's biodiversity) towards limited use based on their economic value, has also cropped up in US environmental policy discourse.

Finally, in the lead-up to the World Summit on Sustainable Development (WSSD) in 2002, trade issues have risen on the international environment–development agenda. UN Secretary General Kofi Annan and UNEP head Klaus Toepfer have both welcomed the Doha Declaration as a sign that the WTO is starting to take sustainable development and social concerns more seriously, and to favour the lifting of agricultural subsidies and other trade barriers that affect poorer nations' ability to compete on the world market.[22] It is clear they believe that cooperation, not confrontation, is the best way forward for both international governance orders.

Pressures for normative convergence – in particular to avoid conflict – are apparent from internal and external sources. Certainly elites in both orders have expressed an intention to cooperate in the future, and have publicly embraced the notion that sustainable development is best achieved through strong environmental institutions and a liberalized international trading order. The WTO Secretariat, under pressure from external opposition and internal splits, is concerned about its continued legitimacy, even existence, if it does not start taking social concerns into account. Finally business interests and domestic public opinion too have expressed a concern with maintaining effective international environmental regulation, even through private forms of regulation. More research is needed into the agents and processes of this normative convergence to establish to what extent, and why, it is occurring.

This convergence entails far from trivial changes in actor behaviour and in policy outcomes. Most importantly, in terms of the arguments put forward in this chapter, this convergence is likely to ameliorate real conflict between the two orders. On the other hand, it is not at all clear that these shifts will enhance environmental protection. Many environmentalists distrust, particularly for reasons of accountability and social welfare, the shift to more flexible measures in environmental regimes, and accuse the WTO of 'greenwash', seeing it as one of political expediency on the part of both

orders. However, ultimately, it could provide a powerful defence against states bringing complaints about MEAs to the WTO with the expectation that they will succeed.

Conclusion

In conclusion, arguments for conflict between the world trading and environment orders are, in fact, quite ambiguous. It is certainly possible that states could bring such a challenge in the expectation that the legal powers of the WTO would prevail. However several strong arguments militate against this outcome. These include the more pro-environmental position taken by the WTO in the *Shrimp–Turtle* appellate decisions, the possible influence of the Vienna Convention on the Law of Treaties on interpretation of the GATT and its nexus with MEAs, the organizational capacity of the WTO, the expressed intention of its leaders to work to avoid such conflict, and the increased incorporation of less explicitly trade-restrictive measures in MEAs. In the absence of an actual challenge, though, outcomes are hard to predict. The normative convergence scenario outlined above pulls together many of these threads, and might ultimately provide the best (and easiest) defence for MEAs (if not actually for the environment itself). However it needs more research to explain and understand what is going on, as well as the constraints on its occurrence and impact.

In the meantime, various international institutional reforms have been proposed to level the playing field between the two regimes, focusing especially on legal–institutional disparities. These include amending Article XX to provide explicitly a 'safe harbour' for certain MEAs, the approach taken in the North America Free Trade Agreement, or expanding the purview of dispute panels to include environmental law experts (Hudec, 1999). Creating a World Environment Organization (WEO) is an idea that has favour in many quarters, including the WTO. A WEO would have equivalent legal standing to the WTO, bringing the diverse set of MEAs under a single framework organization.[23] Proponents argue that this would help harmonize and level the playing field in the global governance arena (Biermann, 2001). Arguments against this proposal are fairly powerful, however, including the extent to which another large international bureaucracy, with its attendant inefficiencies and costs, would be desirable, and to what extent the political will exists to create one. In this case, if the normative convergence argument holds, this could contribute to political inertia around international institutional reform, providing a less deliberative alternative.

What is not in doubt, amid all the different arguments concerning the WTO and MEAs, is that, following Paterson (1999), international economic and environmental concerns are now inextricably linked in the study of global governance. It is becoming increasingly difficult to view either in a vacuum

from each other, and studying their interaction will be an important task for scholars of international relations for many years to come.

Notes

1. Although see Young (1996).
2. See Hyvarinen and Brack (2000), Conca (2000), Von Moltke (2001), Winter (2000), DeSombre and Barkin (2002). Several think-tanks and activist groups have projects on this topic: for example the Woodrow Wilson International Center has a Trade and Environment Forum, at wwics.si.edu/tef/index.htm. The journal *Bridges* runs regular articles on this subject, and UNEP and WTO officials have met to discuss synergies between the WTO and MEAs on several occasions. See UNEP press release, 'Trade rules and environment treaties can co-exist', October 2000.
3. In particular, the principle of automaticity applies to the WTO: a report from a settlement panel must be adopted unless rejected by a consensus of members, although a country ruled against may appeal to the Appellate Body.
4. The WTO had a budget of $94m and a staff of 513 in 1996; UNEP, by comparison, had a staff of 700 and a budget of $99m (Blackhurst, 1998: Table 1.1, p. 40).
5. See Conca (2000), von Moltke (2001).
6. These are the two most high-profile cases on which the GATT/WTO has ruled. Others include *Tuna–Dolphin II* (where the EU filed a complaint against the USA for trade restrictions on their exports of Mexican-origin Tuna) and *Reformulated Gasoline* (where Venezuela and Brazil filed suit against the USA over rules concerning gasoline composition).
7. Under the US Marine Mammal Protection Act, the USA required all tuna fishing fleets to use special nets to avoid incidental capture of dolphins, a key cause of dolphin mortality in the Pacific. See GATT Dispute Panel Report on the United States: Restrictions on Imports of Tuna, 30 ILM (1991), and Esty (1994).
8. *Dispute Settlement Panel Report on United States Restrictions on Imports of Tuna*, 16 August 1991, *reprinted in* 30 I.L.M. 1594 (1991). See also *Tuna/Dolphin II, Panel Report*, 33 I.L.M. (Tuna/Dolphin II was brought by the European Economic Community, which contended that secondary embargoes of its tuna products under US legislation violated the GATT.)
9. World Trade Organization, United States: Import Prohibitions of Certain Shrimp and Shrimp Products, Report of the Panel, WT/DS48/8, 8 May 1998. See also Dailey (2000).
10. Appellate Body Report, United States – Import Prohibition of Certain Shrimp and Shrimp Products, WT/DS58/AB/R (Oct. 12, 1998) (adopted, with modifications, Nov. 6, 1998); Appellate Body Report, United States – Import Prohibition of Certain Shrimp and Shrimp Products – Recourse to Article 21.5 of the DSU by Malaysia, WT/DS58/AB/RW (Oct. 22, 2001) (adopted Nov. 26, 2001).
11. Granadillo (2000: 437–8).
12. Vienna Convention on the Law of Treaties, 23 May 1969. The Convention came into effect in 1980.
13. *Chubb & Son, Inc.* v. *Asiana Airlines*, 214 F.3d 301, 308 (2nd Cir. 2000).
14. Voon (2000: 77). See also Winter (2000).
15. See *Right of Passage over Indian Territory Case*, ICJ Rep. (1960); *Admission of a State to Membership in the United Nations*, 1948 ICJ Rep. 57, 64 (Advisory Opinion of May 28); *Fortino* v. *Quasar Co.*, 950 F.2d 389 (7th Cir. 1991).
16. More recent conventions contain references to other treaties in their text, although these are often open to interpretation. For example, Article 22.1 of the Convention on Biological Diversity reads: 'The provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity.' The Cartagena Protocol does contain a 'savings clause', which is intended to clarify the relationship of the Protocol and other international agree-

ments. However the provision's tortured language, a function of disparate positions taken by many of the negotiators, does little to achieve this objective. See Bail *et al*. (2002).
17. As articulated in *Agenda 21*, at the 1992 Rio Conference.
18. Doha WTO Ministerial Declaration, WT/MIN(01)/DEC/1, 20 Nov. 2001 (available at http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm, para. 31–3).
19. Ibid.: para. 31(i).
20. See United Nations General Assembly, *Environment and Sustainable Development: Implementation of Agenda 21 and the Programme for the Further Implementation of Agenda 21*, A/57/532/Add.1 (2002); United Nations, *Report of the World Summit on Sustainable Development*, A/Conf.199/20 (2002), at para. 4 & sec. V.
21. CITES, *Consideration of proposals for the transfer of African elephant populations from Appendix I to Appendix II*, Conf. 10.9, 10th Conference of the Parties (1997).
22. 'WTO Agreements in Doha Could Help Fight Poverty and Promote Sustainable Development Efforts', UN Statement, 15 November 2001 (available at www.johannesburgsummit.org/html/whats_new/otherstories_wto_doha_15_11.html); and 'Toepfer Cites Major Issues Leading Up to World Summit in Johannesburg', 14 January 2002 (available at http://usinfo.state.gov/topical/global/environ/latest/02011503.htm).
23. See symposium in *Global Environmental Politics*, **1** (1), 2001.

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21 The environment, trade and international organizations

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The relationship between the international trading system and international environmental politics is one that is clearly of great importance to questions of global environmental management. This importance is reflected by a significant and growing body of literature dealing with the question of the compatibility of the rules of the international trade regime and the imperatives of international environmental management. Much of this literature, from within both the academic and the activist communities, has tended to paint a stark opposition between the goals of the community of scholars and activists focusing on international environmental issues, and the goals of the international trading system, as embodied in the World Trade Organization (WTO). This is true both of those who would not have environmental concerns interfere with the liberalization of international trade and commerce and those who would not have concerns of trade liberalization interfere with sound management of the global ecosphere.

Yet, at the same time, there is a growing recognition that some common ground must be found on these issues, where the demands of international trade and environmental management can be dealt with constructively (Smith, 1993; Shahin, 2002). One way of dealing with the tension between the international trade and environmental regimes is to change the institutional structures through which they interact, by creating a World Environmental Organization (WEO) that would be the institutional equivalent for the environment to the WTO for trade (for example, Esty, 1994; French, 1994; Runge, 1994; Charnovitz, 1995; Biermann, 2000). Interestingly the idea of a WEO (also referred to as Global Environmental Organization, or GEO, and International Environmental Organization, or IEO) has been proposed, not only by environmental activists, but also by participants in the trade regime, most notably by the past director of the WTO, Renato Ruggiero (Biermann, 2001: 45). But is a WEO necessary to counterbalance the WTO?

The argument developed here is that the incompatibility between the rules of the international trading regime and the need for responsible management of the global environment is substantially overstated, and that official interpretations of these rules are becoming consistently more environment-friendly over time. Furthermore, because of this growing compatibility, a WEO would

in fact prove environmentally counterproductive. This chapter will first provide a brief overview of the literature on international trade and the environment from the perspectives both of students of international environmental politics and of international environmental activists. It will then look in more detail at some of the findings that have moulded this literature, which have often been interpreted as suggesting a general incompatibility between the rules of the international trading system and environmental imperatives. It will re-examine these findings, arguing that they are criticisms of specific policies, not broader anti-environmental imperatives. Finally it will argue that, given this re-examination, the solution suggested by much of the literature on international trade and the environment, a WEO, may in fact exacerbate the problem.

The environment and trade disputes

A series of events in the 1990s acted as a catalyst for the debate on international trade and the environment. One was a piece of US legislation called the Marine Mammal Protection Act (MMPA) and the response to it through the arbitration system of the General Agreement on Tariffs and Trade (GATT), the precursor organization to the WTO. Another was the Uruguay Round of GATT negotiations, completed in December of 1993, which led to the creation of the WTO. A third event was the 1998 ruling of a WTO panel against another piece of American legislation, one focused on the effects of shrimping on sea turtles.

The predominant response to the first GATT panel from within the environmental NGO community was clear and unequivocal. Most environmental activists saw this ruling as a defeat for the environment, as a statement by the core institution of the international trading system that the tenets of free and unencumbered trade would continue to be prioritized over the needs of the environment (for example, Charnovitz, 1993). The term 'GATT-zilla' was coined to describe the trade monster that was intent on eating its way through the global ecosystem (Dunne, 1992). The creation of the WTO, which incorporated the GATT largely intact, was seen in much the same light. By recreating the priorities of the GATT within a new and more formal organization without embedding environmental concerns in the decision making structure of the organization, the Uruguay Round agreement was simply embedding the inherent conflict between trade and the environment deeper in the international organizational structure (von Moltke, 1994). And the shrimp/turtle ruling inspired anti-globalization protestors in Seattle in 1999 to wear sea-turtle hats (DeSombre and Barkin, 2002).

The response to all of these events in the scholarly literature, at least in that part of it focused on international environmental politics, was on the whole not notably more positive. While many scholars were not inherently antagonistic to the international trading system, most saw the existing structure as

incompatible with effective international environmental management. In particular, many scholars interpreted the signals coming from the international trading system in the early 1990s, particularly the increasing trade liberalization of the Uruguay Round and the GATT panel decisions on the tuna/dolphin issue, as suggesting a trend towards diminishing freedom of action by states both in managing domestic environmental issues and in unilateral action towards responsible management of the international commons (Charnovitz, 1992; Prudencio, 1993). Discussions of the relationship between the trade and environment regimes have become more nuanced since then, but many scholars still see fundamental problems with the relationship (for example, Shahin 2002).

The primary criticism of the WTO from both the activist and academic communities studying international environmental politics is that its rules on liberal trade hobble the ability of states to make independent policy with respect to environmental management, and that this in turn diminishes the potential for adequate management of the environment, both domestically and globally. This section will address both steps of this argument, particularly with respect to the various GATT and WTO arbitration rulings, and to some of the work of the WTO's Committee on Trade and Environment. It is important to stress again that the argument that WTO rules and adequate environmental management are incompatible is logically a two-part argument, and that both parts must work for the argument to hold. In other words, whether or not WTO rules make it more difficult for states to take unilateral action to enforce environmental management and whether or not these rules diminish the overall global potential for such management are two different questions, and the answer to the first does not necessarily determine the answer to the second.

The rules of the international trading system clearly restrict the policy autonomy of governments in trade issues; that, after all, is the point of the system in the first place. Specifically the rules are designed to ensure the equal treatment of all parties to the WTO by all other parties, and to prevent the use of the mechanisms of trade policy for purposes of economic protectionism and national discrimination. There are exceptions to these rules, allowing, for example, greater levels of protectionism by developing countries, and discrimination in response to specific trade practices by other countries. With regard to discriminatory rules, however, it is the WTO rather than individual countries that is ultimately empowered to decide the appropriateness of specific national rules, to ensure that the discrimination is really for the intended purpose, rather than for hidden protectionism. The question in this context is to what extent discriminatory trade practices are to be allowed to enforce measures for environmental protection.

The relevant rules are encapsulated in Articles III, XI, XIII and XX of the GATT (GATT, 1986). Articles III, XI and XIII restrict the ability of states to

create discriminatory trade measures, and Article XX provides exceptions, areas and circumstances in which states are permitted to undertake activities that would otherwise violate international trade rules. Article III discusses the application of domestic regulation to imported products. It allows countries to apply domestic regulations, such as those relating to health and safety standards or labelling standards, to imported products at the point of importation. In other words, it allows countries to require that imported products comply with national standards in order to be let into the country. It does require of countries, though, that they treat imported products, for purposes of such regulations, in the same way as domestic products, which is to say it forbids countries from using national standards for protectionist or discriminatory purposes. As such, this article is not necessarily environmentally unfriendly; if a particular product is environmentally unsound, countries are allowed to ban it outright or control it in any way they see fit. They are simply not allowed to do so differentially for imports and products of national origin.

The aspect of this rule that is most often criticized by environmentalists is the fact that it refers only to products, specifically at the point of importation (Lee, 1994; Charnovitz, 2002). States are allowed to apply the same rules to products in the condition that they are in as they cross the border as they apply to the equivalent domestically produced product. This means that states are not allowed to apply regulations to imported products based on the processes by which they are made, or extracted, or caught. If a product is made abroad using a particularly dirty process that is illegal domestically, this cannot be used as the basis of regulations applied to the product at the border under Article III. Both GATT panel rulings on the tuna/dolphin issue were very clear and explicit in their interpretation of this rule; products only, not processes, could be the basis of rules applied under Article III (GATT, 1991: 1617–18; GATT, 1994: 889). This interpretation clearly limits the ability of states to externalize their domestic regulations concerning production and resource exploitation standards and methods. It should be noted here, though, that this product/process distinction, the basis of much environmentalist ire against the current international trade regime, is not absolute. It only applies to regulations imposed on imports justified under Article III provisions, and was not mentioned in any other context in either panel finding.

Article XI of the GATT provides that barriers to trade, inasmuch as they are allowed, should be effected through tariffs rather than non-tariff means such as quantitative restrictions (quotas) or prohibitions. Article XIII underlines that such barriers be nondiscriminatory in nature – that they not favour one nation or region over another. These are two of the most basic principles underlying the WTO. There is some potential for dispute with these provisions on environmental grounds: they prevent countries from undertaking certain forms of unilateral action to protect environmental

goods abroad. For example, a quantitative restriction on the importation of the lumber of certain species of trees from a specific set of countries in order to discourage excessive exploitation of forest resources there would run afoul of both of these articles. Such a restriction would constitute a quota, in breach of Article XI, and a discriminatory measure, to the extent that it is targeted against a specific set of countries, in breach of Article XIII. Most complaints to the WTO on environmental issues invoke one or both of Articles XI and XIII.

None of the rules discussed above, though, is absolute. In certain sets of circumstances states are allowed to create trade regulations that break these rules. This set of exceptions to normal practice under the GATT is contained in Article XX. Specifically, clauses XX(b) and (g) provide a basis for exceptions to GATT rules for environment-related concerns, and both clauses were invoked by the United States in support of the MMPA to both GATT panels. The article (GATT, 1986: 37–8) allows that

> Subject to the requirement that such measures are not applied in a manner that would constitute a means of arbitrary and unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction of international trade, nothing in this agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures …
> (b) necessary to protect human, animal, or plant life or health …
> (g) related to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.

In other words, this article allows states to take such measures as they deem appropriate to protect the environment, understood as either a natural resource or as biodiversity, as long as these measures are not deemed to constitute a means of hidden trade protectionism. It should be noted here that these measures can violate other GATT principles, if these violations are deemed necessary to pursue the goals listed in Article XX. Specifically measures can relate to production processes rather than just products themselves, in breach of Article III. For example, Article XX (e) allows states to regulate or ban imports produced by prison labour, clearly a regulation based on process rather than product. Some of the literature interpreting GATT panels has suggested that the product/process distinction is a limitation on the applicability of Article XX exception, which would indeed be problematic for environmental regulation (Lee, 1994). However, in all of the rulings discussed here in which this issue came up, the distinction was mentioned only in the context of Article III, never in the context of Article XX. States therefore can regulate on the basis of process, if such regulation meets both the goals and the limitations of Article XX (Charnovitz, 2002).

Regulations justified under this article have to meet two primary criteria in order to be legal under GATT/WTO rules. The first is that the goal has to be an appropriate one. In the context of paragraphs (b) and (g) this means that that which the regulation is attempting to conserve must be a legitimate environmental goal for the state to pursue. The second is the question of whether or not the specific regulation conforms to the general requirements of Article XX, that the measures themselves be clearly related to the goal being pursued, and that they not be unnecessarily discriminatory or a disguised barrier to trade. The first criterion requires a discussion of general principle, the second an examination of the specific regulation in question (GATT, 1994: 890–94).

In the case of the tuna/dolphin dispute the first criterion can be broken down into two parts, whether the protection of dolphins is a legitimate goal of regulation and whether a country can legitimately attempt environmental regulations extraterritorially. Even though the original complainant, Mexico, made the argument that the species of dolphin in question was not endangered and therefore not an appropriate target for protection, neither panel ruling questioned the appropriateness of applying Article XX (b) and (g) to them. In other words, the protection of dolphins, even though they were not harvested as a resource and were not endangered, was unquestioned as legitimate grounds for regulation under Article XX. The second part, relating to the extraterritorial application of such regulations, yielded a less clear response. The panel deemed that environmental regulation outside of a country's jurisdiction was a problematic basis for exceptions to international trade rules, but was not willing to rule against the regulation solely on this basis (GATT, 1991: 1620–21).

A second complaint on the same issue was launched in 1994, by countries complaining about a secondary boycott of tuna. The second panel explicitly accepted that states could use Article XX to effect environmental conservation outside of national jurisdiction (GATT, 1994: 890–91). Both panels alluded to the role of multilateral environmental agreements (MEAs) in this context, though. The first panel noted that the United States had not made adequate good-faith efforts to address the issue of the incidental killing of dolphins in tuna fishing through multilateral negotiation. The second panel noted that, in the interim between the two panels, the appropriate multilateral organization, the Inter-American Tropical Tuna Commission (IATTC) had made highly successful efforts to deal with the problem (GATT, 1991: 1620; 1994: 886). The panels seemed therefore to agree that extraterritorial environmental regulation should be attempted in the first instance through MEAs, and that national regulation should be subsidiary to these attempts.

It is with respect to the second criterion, that the regulations in question be clearly related to the goals being pursued, and that they not be unnecessarily

discriminatory or constitute a disguised barrier to trade, that the Marine Mammal Protection Act (MMPA) was most consistently criticized by both GATT panels. They ruled that the regulations were not the most effective direct way of achieving the goal of dolphin preservation. More crucially, though, they both found that the regulations constituted unfair discrimination in favour of domestic tuna fishers and thus were a disguised barrier to trade. The MMPA requires that American tuna fishers conform to certain standards of behaviour, such as not using purse-seine nets, which are specified in advance. The Act has different rules for fishers of other nationalities, however. They cannot have a rate of incidental kills of dolphins that exceeds the equivalent American rate for the same period by more that one-quarter. In other words, American fishers know in advance what they must do to be in conformity with the MMPA, but others do not; they must conform to a standard that is not set until after the fact. It is this aspect of the act that both panels found to be unacceptably, and unnecessarily, discriminatory. Were it the case that the American law had been created solely with the intent of environmental protection, this finding might well have constituted the indictment of the international trading system that many environmentalists claimed it was. However a major force behind the creation of the act in the first place was the tuna fishing industry itself, which was more interested in protecting its comparative advantage than in protecting dolphins for their own sake (DeSombre, 2000). Consequently, the panel findings on this issue seem an accurate reflection of a real protectionist intent underlying the legislation.

To summarize, then, the two GATT panel findings on the tuna/dolphin issue agreed that states could legally create regulations for the purpose of environmental management, even if such regulations dealt with processes rather than products. They also agreed that states could only do so if the purpose of the regulation was clearly environmental protection rather than disguised trade protection, and was not unnecessarily discriminatory. Neither panel felt that the MMPA fulfilled this condition. The two panels came to different conclusions as to the appropriateness of extraterritorial regulation, but both emphasized the role of multilateral institutions in the creation of regulatory standards in environmental issues affecting international trade when the environmental goods in question lie outside individual state jurisdiction.

The report of the WTO Committee on Trade and Environment (CTE) to the first WTO Ministerial Conference reinforced some of these interpretations. The report was a statement of the various positions on issues where trade and environmental concerns overlap rather than an authoritative finding, and as such was inconclusive on many issues. For example, it stated simply that there was a difference of opinion as to whether the product/process distinction applied fully to the application of environmental regulations to imported products at national borders (WTO, 1996: para. 52). The report did, however,

express a consensus within the committee on three issues. The first is an acceptance of the principles of sustainable development, and that both states and international organizations have a responsibility to act in accordance with this principle. The second is that national environmental regulation should aim to be as transparent, nondiscriminatory and non-trade-diverting as is consistent with the environmental goal of the regulation. The third is that global and transboundary environmental problems should be dealt with through multilateral environmental agreements (ibid., item 1 and para. 48). While there was some disagreement as to the appropriate relationship between such agreements and the WTO, there was an explicit recognition that the WTO has no competence in environmental matters, while international environmental organizations are authoritative within their particular issue areas (WTO, 1996; para. 8).

These three areas of consensus were reflected in the first major ruling of the new WTO dispute settlement mechanism to address issues similar to those in the tuna/dolphin dispute. In April of 1998, a WTO panel ruled against the use of the United States' Endangered Species Act to prohibit the import of shrimp from countries that did not require that their shrimpers use only nets that have turtle excluder devices (TEDs). The panel addressed each of the three areas of consensus in the CTE. It explicitly accepted the concept of sustainable development as a guiding principle, and perhaps more importantly solicited scientific opinions from experts in relevant fields. Furthermore the panel suggested that the presence of sea turtles on the endangered species list of the Convention on International Trade of Endangered Species (CITES) was sufficient to establish that the turtles were a reasonable object of international regulation. This does indeed set a functional precedent, but one that is far from alarming for advocates of environmental management.

The ruling against the American law was based on three findings. The first was that the law was not in fact designed for the area in which it was being applied; the law was originally intended for application in the Caribbean/Western Atlantic region, and not to the complainants, all South and Southeast Asian countries. The second was that the target of the law was inappropriate. The law required that all of a state's shrimpers behave in a certain way in order for any shrimp to be exportable to the American market. But if other countries unilaterally passed laws of a similar nature, target states could be faced with a situation where they had to comply with potentially incompatible laws in order to export a product. This could undermine the principle of a rule-based system that is fundamental to the international trade regime. In other words, the panel suggested that a more appropriate law would focus on how many turtles were killed, rather than on what equipment the shrimpers used. Finally the panel found that, once again, the USA had not made good-faith efforts to deal with the situation multilaterally. The USA appealed the

ruling, but the appellate panel agreed with the substance of the original ruling. In response, the US government rewrote its regulations to deal with the problems identified by the panels. Although the new regulations were also challenged through the WTO's Dispute Settlement Mechanism, the panel found in favour of the new US regulations.

Returning to the two questions with which this section started, it seems clear from these various panel findings and reports that the rules of the international trade regime do in fact restrict the ability of states to make independent policy with respect to environmental management, in two particular ways. They require that the management efforts be as nondiscriminatory and non-trade-diverting as possible, and they restrict the ability of individual countries to take unilateral action in pursuit of extraterritorial environmental goals. In response to the second question, though, it is by no means clear that these restrictions diminish the potential for global environmental management. The mandating of a clear distinction between environmental management and trade protectionism does limit the tools that individual governments can use to pursue extraterritorial environmental goals. But at the same time it prevents the cooptation of environmentalism for the purposes of industrial protection. Given that there is evidence that industrial protection often underlies much environmental unilateralism, even that with laudable ultimate goals, such a separation can help to reduce the tendency to suspect the motives underlying environmental regulation. This reduction in suspicion should in turn help to reduce trade-based and reflexive opposition abroad to both national and multilateral regulative efforts.

Similarly the agreement that global and transborder environmental issues should be dealt with multilaterally rather than unilaterally is something upon which most environmentalists would in principle agree. Inasmuch as most of the scholarship on the issue begins with the premise of a disjuncture between a system of sovereign states and a global ecology that does not recognize borders, it seems ironic that the international trade system should be criticized for favouring environmental multilateralism over unilateral, and often contentious and conflictual, state action. Furthermore the emphasis within the international trade system on the need for multilateral management of international environmental issues is clearly increasing over time. The explicit recognition in both the CTE report and the WTO panel finding of the need for sustainability, and the consultation by the WTO panel of environmental experts, both suggest that environmental need per se is increasingly becoming an accepted concept within the context of the international trade regime.

Many MEAs or a single WEO?

The international trade regime is thus not in fact inherently anti-environmentalist. It is undoubtedly opposed to unnecessary opaqueness, discrimination

and protectionism in measures designed to pursue environmental goals, but these restrictions may well in the long run prove to make effective multilateral management of global and transborder environmental issues more rather than less effective. There is at the same time a recognition by the institutions of this regime that sustainable development has become a core principle of the international system that must work alongside the principles of the trade regime, and that environmental management is a legitimate grounds for exception from the norm of noninterference in international trade. Furthermore these institutions recognize that they are neither authoritative nor competent in environmental issues, whereas international environmental organizations do have legitimate claims to both competence and authoritativeness in these issues.

This raises the following question: given that these recent findings seem to be accepting of imperatives to environmental protection, to what extent does this ameliorate the need for a WEO? The primary benefit of a WEO in this context would be that it could act as an institutional counterweight to the WTO, one that would be focused primarily on the needs of the global environment. There are, however, a number of ways in which a collection of issue-specific international environmental institutions, created through multilateral environmental agreements as specific situations demand, might prove better able to deal effectively with issues of trade and environment than a single general-purpose WEO. Two in particular will be discussed here, efficiency and research.

A collection of issue-specific institutions is more likely to be able to deal with specific environmental issues in a timely and functional manner than a single WEO. Separate institutions would be able to avoid many of the macropolitical issues that might hobble a WEO, most notably the North–South divide that has appeared in the context of so many environmental issues. This divide has certainly proved problematic for a number of specific environmental institutions and multilateral organizations, less so for others. But in issue-specific situations the divide is likely to manifest itself mostly in terms of practical considerations, in terms of costs and benefits; in other words in terms of issues that are subject to productive negotiation. In a general WEO the divide is more likely to manifest itself at the level of general principle, less amenable to functional compromise, and is therefore more likely to hobble the effective functioning of the institution. An example of this dynamic can be found in the WTO itself, and the North–South divide that undermined its meetings at Seattle in 1999 and Cancun in 2003.

In the same vein, actions or decisions of a WEO on any specific issue are more likely to be seen as general precedent than the equivalent actions or decisions of issue-specific organizations and agreements. As such, the activity of a WEO will likely be subject to more critical scrutiny, and contentious

decisions are more likely to be strongly challenged by states that do not agree. Given that the institutions in question, be they MEAs or a WEO, are designed to provide environmental management, their contentious decisions are more likely to be so because they go farther than some states prefer, rather than not far enough, in protecting the environment. This would suggest that, from the perspective of increasing levels of international environmental protection, MEAs are more likely to be able to get away with more rigorous measures than a WEO. For example, LRTAP, the European Convention on Long-Range Transboundary Air Pollution, regulates emissions of sulphur dioxide on a 'critical loads' basis, meaning that the amount that a country can emit depends on how much can be absorbed by the territory on which, as acid rain, it falls. The USA refuses to accept a critical loads approach to the regulation of its own sulphur dioxide emissions. Were these emissions to be governed by a WEO, the net effect of this American refusal would probably be to prevent its adoption elsewhere, rather than to force the USA to accede to it.

Issue-specific institutions and agreements are also more likely to be successful at fulfilling a key role of environmental organizations, that of research. For a variety of reasons, most MEAs contain a scientific research component, and a WEO as it is usually envisioned would fulfil a scientific research role as well. The issue of research is of great importance to questions of trade and environment because of questions of competence and authority. All states are obligated by international law and treaty to manage the resources of the global commons according to the principle of sustainable development, an obligation recognized by the WTO. The WTO further recognizes that it is not competent to interpret this principle or apply it to specific resources. The Report of the Committee on Trade and Environment suggests a fairly broad consensus that MEAs that are accepted as authoritative within their issue areas are the bodies that are competent to interpret and apply internationally accepted principles of environmental management. Their authority is largely based on their research capabilities; they are the organizations with the data and analytical capabilities to figure out within their issue areas, accurately and impartially, what needs to be done. MEAs are often able to make this claim to authoritative knowledge because they have a dedicated research capability focused on their specific area of competence. A WEO would not be able to make this claim credibly. It is one thing for, say, the Inter-American Tropical Tuna Commission (IATTC) to claim to have the most authoritative data and analysis on the subject of Pacific tropical tuna; it is a reasonably circumscribed area of research. It is another for a WEO to claim a similar authority on all global and transborder environmental issues; this covers such a broad range of issues that the claim is hardly credible. The WEO could focus on some issues rather than others, but this would both undermine its

claim to comprehensiveness, and leave the neglected issue areas under-researched. This suggests that a system of issue-specific environmental organizations and agreements may be able to make more credible claims to scientific authority, and therefore to decision making competence, in trade-related environmental issues than a single WEO could manage.

Conclusion

There are a variety of arguments made against a WEO from a general perspective (for example, Najam, 2003; von Moltke, 2001). But even the argument in its favour from the perspective of the trade and environment issue is weak. The argument for the creation of a WEO is often premised on the idea that there is an inherent incompatibility between the international trade regime as currently constituted and global environmental management, and that a new comprehensive international bureaucracy would help to ameliorate this incompatibility. But the institutions of the international trade regime are coming increasingly to accept the idea that environmental management is a necessary goal of state policy, and that it can provide legitimate grounds for the suspension of trade norms in certain circumstances. When these circumstances involve transborder or global environmental issues, there is a strong bias towards multilateral rather than unilateral action, in both the trade regime and the developing international environmental regime, as illustrated by the Rio Conference documents. The question then becomes, will this multilateralism be more effectively channelled through the existing system of a network of issue-specific multilateral environmental agreements and institutions, or through a single all-encompassing WEO?

The previous section suggested a number of reasons why the current system might be more effective in managing specific international environmental issues. It would not, though, be able to fulfil the role of institutional counterweight to the WTO. The question remains, however, of whether or not such a counterweight is either necessary or desirable. In the cases discussed above that are often taken as a point of departure for arguments in favour of a WEO, it is unlikely that the end result would have been any different had an institutional counterweight to the WTO been in existence. The tuna/dolphin rules and the shrimp/turtle rules were found to be illegal under GATT rules because they unilaterally addressed the issues in ways that undermined the potential for multilateral action, and because they clearly discriminated in favour of American industry, not because protecting dolphins and sea turtles was not a valid reason for regulation affecting international trade. To use the tuna/dolphin case as an example, unless a WEO wanted to go on record either as supporting American trade protectionism or as undermining the ability of the IATTC to fulfil its function as the site of international management of the Pacific tuna fishery, it would not have had grounds for disputing the GATT

panel findings. The outcome in this issue would have been the same. A similar argument can be made in the shrimp/turtle case.

This example suggests more broadly that, given its acceptance of principles of sustainable development and environmental management, the need for a strong institutional counterweight to the WTO may not be necessary. A WEO may in this sense even prove counterproductive, to the extent that it replaces continued pressure on the WTO and its members to further internalize these principles. Furthermore a network of international environmental institutions and agreements is already in place, and will continue to expand to cover a broader array of environmental issues. No body associated with the WTO has ever ruled against or explicitly undermined a multilateral environmental agreement, and the evidence suggests that international trade law increasingly recognizes that international environmental institutions and agreements are authoritative within their particular areas of competence.

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22 Race to the middle: environmental politics in the Mercosur free trade agreement

Kathryn Hochstetler

One of the most common environmental criticisms of free trade agreements is that they set off a 'race to the bottom', with participating countries limiting national environmental protections in order to be more economically competitive with their free trading partners. This is thought to be especially likely for poor countries, whose comparative advantage rests heavily on low labour and regulatory costs. Despite this expectation, the four countries of the Mercosur free trade agreement in South America – Argentina, Brazil, Paraguay and Uruguay – have gradually increased their levels of domestic environmental protections since signing the treaty that formed Mercosur in 1991. At the same time they have refused to add a substantial environmental component to the trade agreement itself. This chapter uses the Mercosur experience to reflect further on the relationship between trade and the environment, especially in developing countries.

How have the Mercosur free trade negotiations affected regional environmental politics? What factors explain the development of domestic environmental agencies and legislation in the Mercosur countries in the 1990s? Using qualitative process tracing methodology, this chapter argues that the Mercosur negotiations did put downward pressure on environmental regulations in the member countries. At the same time, however, countervailing domestic and international pressures encouraged environmental protection, as did some aspects of Mercosur itself. The net effect was environmental improvement across the region, especially in Argentina, Paraguay and Uruguay, which had lagged behind Brazil on this issue: a 'race to the middle'. These arguments are developed empirically after brief introductions to the debate about the relationship between trade and the environment and to the Mercosur agreement.

Race to the bottom: the negative relationship between trade and the environment

Criticisms of free trade from an environmental perspective always include the so-called 'race to the bottom' as one of the negative aspects of opening up trade relations. The fundamental dynamic of this race is the argument that national governments will reduce enforcement of existing domestic environ-

mental protections and even directly lower them in order to make national industries more competitive in a free trade environment. A related effect is known as 'regulatory chill', where governments hesitate to institute new environmental protections for the same reason. The net effect is the association of free trade with suboptimal levels of environmental regulation.

A primary intellectual root of this critique of free trade is in the literature on regulation in the United States federal system. Following several influential articles in 1977 by Richard Stewart (1977a, 1977b), scholars routinely cited such regulatory competition for economic benefits as a major reason for creating federal-level environmental regulation rather than allowing subnational units to set environmental standards. Stewart viewed the issue as a prisoner's dilemma game, where only high-level coordination could overcome the economic incentives that set units against each other and produced environmental harm. In the legal journals, there have been continuing debates on how best to characterize the public choice logic involved, with Richard Revesz (1992) leading those who argue against both the likelihood and the negative consequences of a race to the bottom. Daniel Esty (1996) has countered with the argument that different environmental issues and situations actually have different logics, leading sometimes, but not always, to a race to the bottom inside federal systems or free trade areas.

Esty (1994, 1996) has been a link between this US-based literature and the debates about the environmental impacts of free trade. The international relations literature on trade has been less focused on choice logics than on efforts to examine empirically what happens to environmental protections in free trade areas and negotiations (some of this literature is surveyed in Neumayer, 2001; Thompson and Strohm, 1996; Wheeler, 2002). Researchers have found little systematic evidence about the relationship, partly because of the many ways it can be assessed; for example, studies of whether companies move to locations with low environmental protections (pollution havens), by evidence of diminished environmental enforcement or legislation, by measurements of physical environmental quality or by the counterfactual evidence required by regulatory chill arguments. Even studies of just one of these indicators frequently find inconsistent results across an array of cases. Statistical studies of pollution havens, for example, do generally concur that income per capita and pollution regulation are positively associated and that economic development is negatively correlated with pollution intensity (Wheeler, 2002). The literature also tends to conclude, however, that such effects are short-term or incidental rather than policy-driven (Clapp, 2002).

Nonetheless the argument that free trade reduces environmental protections below desirable levels continues to be compelling to many policy makers and academics, to say nothing of anti-globalization activists. For these actors, supranational provisions that harmonize environmental protections upwards

rather than downwards look like a possible solution (the international equivalent of the domestic solution to have federal environmental regulation) but they have only been achieved so far within the special context of the European Union (Axelrod and Vig, 1999). Given these arguments, the rise in environmental protections in the member countries of Mercosur is surprising. The next section is a brief introduction to Mercosur, which shows that it has few of the supranational dimensions thought necessary for raising environmental protections in a free trade context. The following sections provide a case study analysis of the reasons why the race to the bottom has not dominated in South America despite the lack of supranationalism. A qualitative case study analysis allows for tracing processes closely, which may show relationships that aggregated statistical studies do not.

Mercosur: common market of the south

In March 1991, Argentina, Brazil, Paraguay and Uruguay signed the Treaty of Asunción creating Mercosur, the common market of the South. A partial customs union began to operate among them in January 1995 and they are continuing to work towards full common market status. Progress has accelerated after 2003, with Mercosur-promoting presidents in office in both Brazil and Argentina for the first time. To date Mercosur's institutional structure is quite undeveloped, a deliberate choice of the larger member nations (Phillips, 2001). There are virtually no supranational components to Mercosur, and the region's presidents are fully in charge of collective decision making and most dispute resolution (Cason, 2000). Correspondingly, while the European Union employs 13 000 people and spends a budget that is 1.2 per cent of the total GDP of its member states (Hanagan, 1999: 11), the administration of Mercosur cost about 0.00055 per cent of the total regional GDP in 2002 (calculations based on figures in Hochstetler, 2003) and just a few dozen people work in the central headquarters in Montevideo.

Most of Mercosur's 'institutions' simply consist of regular regional meetings among relevant personnel from national ministries and elected officials. Representatives of the national foreign relations and economy ministries dominate both the agenda-setting body, the Common Market Council (CMC), and the implementation body, the Common Market Group (GMC). The joint parliament is consultative in nature, and is made up of selected members of the four national legislatures. A Socio-Economic Consultative Forum gathers together primarily national business and labour leaders to provide advice on issues related to them. The environmental arrangements follow these patterns, with representatives of the four national environmental agencies meeting several times a year as Mercosur's environmental body. These institutions have not been able to create supranational legislation that harmonizes environmental protection upward for the region.

The Mercosur agreement's downward pressure on environmental regulation

Mercosur documents regularly list sustainable development and regional quality of life as among the broader aims of regional integration. The original Treaty of Asunción cites preservation of the environment in its second paragraph as one of the overarching principles of regional free trade. Working Subcommittee No. 6 on the Environment (SGT 6) was set up in 1995 to oversee environmental issues for the region, replacing a temporary Specialized Meeting on the Environment. In 2001, the governments of the region adopted a long-awaited Mercosur Environmental Framework Agreement (Secretaría Administrativa del MERCOSUR, 2002: 9–13). All of these developments illustrate that environmental issues are on the agenda in Mercosur. Nonetheless the Mercosur negotiations have placed downward pressure on regional environmental protections, with fears about competitiveness driving that pressure. The pressure was especially evident in two processes that will be discussed here: the agenda of SGT 6 and the downgrading of the Environmental Framework Agreement from its original Protocol form.

As an institution SGT 6 has little formal power, in comparison both to environmental institutions in NAFTA and the European Union (Stevis and Mumme, 2000) and to other institutions within Mercosur (Grandi and Bizzozero, 1998). Its agenda is set by the GMC, and its only formal assignment is to help implement the Treaty of Asunción. Participants in SGT 6 clearly understand that their role is a secondary, technical role of assisting the GMC (Breda, 2001; Laciar, 2001; Ollaik, 2002). With the GMC led by financial and economic ministries, it is not surprising that it has given a trade-promoting agenda to SGT 6. Eliminating non-tariff barriers and increasing global competitiveness (through eco-labelling and ISO 14 000 compliance, for example) were at the top of the first agenda the GMC set for the Environmental Subcommittee and continue to be on the agenda (GMC/Res No. 38/95 and SGT 6/Acta No. 01/95).[1] SGT 6 spent 90 per cent of its time from 1995 to 1998, by the estimate of a Brazilian participant, reviewing the environmental merits of claims that environmental regulations were being used as non-tariff barriers within Mercosur (Ollaik, 2002: 8). Brazil's stricter environmental standards (or environmental protectionism, in its neighbours' point of view) were the most frequent targets of such claims (SRNyAH, no date). The 2003 Annual Negotiating Agenda for SGT 6 continued to place non-tariff barriers and mechanisms to increase economic competitiveness at the very top of the agenda (SGT 6/Acta No. 04/02, Anexo 9b). The new intraregional scrutiny of environmental legislation for possible trade and competition effects thus exerts an overall negative pressure on environmental regulation there, although it is difficult to trace such a counterfactual impact directly.

The regulatory chill of Mercosur is clearer in the fate of SGT 6's effort to negotiate an environmental legal agreement for the region. In the Treaty of Asunción, Mercosur's member countries agreed to 'harmonize' national bodies of legislation that were related to the trade relations among them. From the start, there were differences about whether the environmental harmonization should aim to 'harmonize up' to the Brazilian standards or seek a lower 'least common denominator' level. Economic actors weighed in with competitiveness concerns, with Brazilian business leaders supporting higher standards so that they could better compete with their neighbours, while neighbouring economic actors argued that they would be uncompetitive if they had to meet the Brazilian standards (Hochstetler, 2003).

As the President Pro-Tempore of SGT 6 at the time, Brazil's delegation drafted an extensive Protocol on the environment in 1996. The Protocol was both broad and specific, giving directives for national legislation on environmental impact assessment, monitoring, certification, information and emergencies, as well as internalization of environmental costs, biosafety, biological diversity, non-tariff barriers, natural resources, protected areas, species protection, water resources, solid wastes and toxic products (SEMA-SP, 1997: Anexo 1). After a year of consultations at home and negotiations within SGT 6, the Protocol had grown even longer, while incorporating language that allowed for national 'optimization' of levels of environmental protection (Hochstetler, 2003; SGT 6/Acta 06/97, Anexo X). These versions of the regional environmental agreement, without a doubt, would have represented a significant increase in regional environmental regulation once implemented. Instead the agreement was sidetracked and downgraded by larger Mercosur institutions and processes.

SGT 6 has no authority to create agreements on its own, but can only draft proposals it then presents to the GMC for adoption. In June 1997, SGT 6 formally raised its Environmental Protocol to the GMC for approval as an Additional Protocol to the Treaty of Asunción. There it was blocked by the Argentine delegation (GMC/Acta No. 2/1997), despite extensive consultations in Argentina prior to SGT 6 approval (Laciar, 1997). The major sticking points were the treatment of biotechnology issues, especially genetically modified seeds, which Argentina favours; evaluations of environmental impact; and the precautionary principle (ibid.: 9; Ollaik, 2002: 10). The Argentine foreign ministry also objected in general to what it considered excessively high environmental standards and no consideration of the time Argentine industry would need to adapt to these standards (Gudynas, 1998: 139).

SGT 6 made an initial set of revisions that were resubmitted to the GMC in 1999, but the Protocol languished at the GMC for over two years. During this time, the entire Mercosur agreement nearly ended over crises related to Brazil's massive currency devaluation in January 1999, which transformed

the balance of economic competitiveness among the four neighbours overnight (Bulmer-Thomas, 1999). With Argentina especially ambiguous about the entire integration process, the GMC followed its lead in setting out a new directive to SGT 6 in September 2000. The new instructions limited the document to reaffirming principles already in the Rio Declaration of the 1992 United Nations Conference on Environment and Development, which had been signed by all member states (GMC/Acta No. 03/00, point 6). It also allowed commitments to cooperate to implement the Rio Declaration. Finally member states could make a commitment to begin to analyse regional environmental problems.

With foreign ministries joining the environmental ministries in a special meeting, SGT 6 wrote a new document in March 2001, which was quickly approved by the GMC and CMC.[2] The resulting Environmental Framework Agreement, no longer a Protocol, was much shorter than previous versions and cut all specific directives and mandates (SGT 6/ Acta No. 01/01). Since its scope was limited to principles already agreed on in the 1992 Rio Agreement – and it does not even include Rio's precautionary principle (Leichner Reynal, 2001) – Mercosur's Framework Agreement fails to establish a new regional environmental agenda. Instead, following a process that reflected the regulatory chill of competitiveness concerns in a free trade context, Mercosur simply restated a vague commitment to work on environmental issues. The trade-favouring actors of Mercosur, who are its main decision makers, clearly do not intend to have strong collective or supranational environmental governance.

Countervailing pressures favouring greater environmental protections

Despite their reluctance to develop collective environmental protections in the context of Mercosur negotiations, the individual member states have all undertaken significant expansions of their national environmental protections since Mercosur began in 1991. The changes have been most dramatic in Argentina, Paraguay and Uruguay, where environmental policies and legislation really began concurrently with Mercosur, in the early 1990s. This paradoxical result corresponds to a series of countervailing pressures upward, both domestic and international, that have outweighed Mercosur's general downward pressure on environmental protections.

Domestically the political transitions from authoritarian to civilian rule across the region in the 1980s clearly facilitated the greater environmental protections instituted in the 1990s. Only Brazil's military regime instituted any significant environmental programmes and legislation while it held power, notwithstanding its deservedly poor international reputation on key environmental issues. Argentina's military rulers went so far as to dismantle the environmental agency that a brief civilian regime created in 1973,

while Paraguay and Uruguay did not create national environmental agencies until well into civilian rule (Hochstetler, 2003). Thus the four provide some support for theoretical arguments that democracy and environmental protection are linked (for example, Doherty and de Geus, 1996; Press, 1994). Several common mechanisms and processes link the two developments in these countries.

Perhaps most important was the general broadening of national political agendas under civilian, as opposed to military, rule. All four authoritarian governments shared a strong preoccupation with two key issues: internal security (with key threats defined as coming from both guerrilla movements and mobilized lower classes) and economic development, with some variations among them in the priorities and mechanisms for achieving their aims (Rouquié, 1987). The first issue resulted in strong repression of most organized social movements, including environmentalists, while the latter was pursued without regard for resource degradation and pollution. In addition, politics and society became polarized in all these countries between pro- and anti-military forces, and numerous issues were set aside in order to take on this battle. Latin American environmentalists tended to submerge their specific agenda into broader anti-military or human rights movements, rather than leading anti-authoritarian movements like their Eastern European counterparts (Hochstetler, 2001: 276–81). As a direct consequence of these developments, authoritarian governments in the region had poor environmental records across the board compared to subsequent regimes.

Brazil, the environmental pioneer of the region, stands as a partial exception to these generalizations. Compared to its neighbours, Brazil had lower levels of repression (Hayner, 2001), stronger international engagement with environmental issues (including hostile engagement) (Guimarães, 1995), some historic interest in ecological issues (Pádua, 1992), and saw the harsh environmental results of industrialization earlier (Guimarães, 1995; Hochstetler, 2002b). In addition, it had some of the broadest and earliest environmental mobilizations, including a movement to protect the Amazon against deforestation that organized in 18 states and the federal district in 1979 and included much of the opposition to the military.[3]

During the 1980s the four Mercosur countries returned to civilian rule, with Paraguay experiencing its first significant period ever of comparatively open electoral democracy.[4] In all four, the political agenda expanded significantly to include environmental issues. Such issues acquired new legal status as the countries returned to constitutional rule. In Brazil, the 1988 constitution included a chapter on environmental rights and obligations that strengthened the legal standing of a number of environmental provisions, including one requiring environmental impact studies. Paraguay's 1992 constitution and Argentina's 1994 constitutional amendments also gave

foundational status to new environmental norms in those countries, while Uruguay's 1967 constitution has scattered references to the environment. All have seen numerous new ordinary laws regulating the constitutional provisions and extending environmental protections. They have also instituted various kinds of public defenders who can take on environmental infractions in the courts.[5] While implementation has lagged behind legislation in all four, these are important starting points.

One clear mechanism for the expansion of the political agenda was the greater freedom for social mobilization that civilian rule brought. Environmentalists and indigenous activists have worked hard to find space for their concerns in political agendas that are crowded with numerous social issues the military governments had ignored, from human rights to gender rights, to social policies like education and health care. They have participated in a number of different roles, lobbying politicians, leading street protests, as environmental experts and seeking to engage popular interest in environmental issues.

Extensive reorganizations of the national bureaucracies also made new room for environmental policy development and implementation. This was one of the first activities of civilian governments in all of the countries, as they moved to reshape national administrative structures for new policy aims and priorities. While this has generally been a salutatory development, Brazilian environmental administration suffered somewhat from too much reorganization, with annual institutional reorganizations of its federal environmental agencies from 1989 to 1994 (Hochstetler, 2002b: 86). In addition, both Brazil and Paraguay have left important components of environmental policy in the hands of the military, with parts of Brazil's Amazonian policy under military control (Costa, 2001; Zirker and Henberg, 1994) and Paraguay's military retaining important controls over indigenous communities (Díaz Labrano, 1998: 185–7). Both democratization and environmental protection continue to be uneven and partial processes in the region. Overall, however, democratization has meant many kinds of openings, including more openness to environmental issues.

The new democratic regimes in the region have also proved to be more open to international pressures and support for environmental protection than their authoritarian predecessors were. Numerous transnational coalitions have organized to push environmental claims forward in the face of policy and legal processes that are still only partially developed and democratized. In Brazil, mobilizations against Amazonian deforestation began under the military government and helped to make the transnational advocacy model common in the region (Keck, 1995; Keck and Sikkink, 1998). Later mobilizations have used the same model to counter several large transboundary infrastructure projects, such as the Yacyretá hydroelectric dam and a water superhighway

proposed for the Rio de la Plata (Hochstetler, 2002a; Treakle and Diaz Pena, 2003). The mobilizations have met with mixed results, as pro-development actors continue to be very strong politically in the new regimes, especially given the recurrent economic crises in the region. Success has often depended on the coalitions' ability to induce multilateral funding agencies to drop financial support for the projects.

In the 1990s, both multilateral and bilateral financial assistance from abroad have also brought positive incentives for the new governments to promote environmental protection. The Interamerican Development Bank (IDB) – the 'villain' in several of the transnational mobilizations above – provided loans to Argentina, Uruguay and Paraguay for strengthening the agencies and institutions responsible for environmental protection. Between 1994 and 1999, for example, Argentina received loans that allowed it to establish a National Environmental System, including new environmental legislative projects, and to create demonstration projects to control environmental deterioration and plan future projects (SRNyDS, 1999). Paraguay finally set up a national environmental secretariat in 2000, using a multimillion-dollar IDB loan for institutional development (Interamerican Development Bank, 2001: 57). Brazil's civilian governments have proved adept at generating international financial assistance for environmental protection, from the G-7's support since 1990 for a pilot programme to conserve the Amazon (Kolk, 1998) to a large IDB loan starting in 2000 to preserve the Pantanal wetlands region.[6] The comparatively unspoiled ecological diversity of all the countries has made them attractive candidates for international environmental assistance.

The new regimes' willingness to accept loans for environmental purposes was enhanced by their interest in taking their places in the international community of nation-states, after several decades of estrangement from international norms diffusion processes. This was especially evident in the case of the two biggest Mercosur countries, Argentina and Brazil, which sought leadership status in global environmental politics after their political transitions. Brazil successfully competed to host the 1992 United Nations Conference on Environment and Development, and accepted the G-7's offer of money to preserve the Amazon in order to be able to showcase Brazilian environmental progress at the conference (Kolk, 1998: 1487). This argument trumped the nationalist fears of the Brazilian military and others, who are perennially worried about foreign designs on the Amazon (Escola Superior de Guerra, 1990). Argentina chose to make its mark in the ozone and climate change negotiations, hosting the Buenos Aires round of the climate change negotiations and volunteering to reduce its own greenhouse gas emissions to try to move negotiations forward (Hochstetler, 2002a: 41–2). All four countries sent their presidents to the 1992 conference in Rio de Janeiro, and they have been regular participants in subsequent events.

The global conferences and negotiations, in turn, have supported environmental negotiations in Mercosur. They have become important tools for participants in SGT 6, who use the global agreements as consensual starting points. As noted above, the final Environmental Framework Agreement of Mercosur is a document that rests heavily on the Rio agreements. Current extensions of SGT 6's agenda have been justified with reference to the 2002 Johannesburg conference that assessed ten years of environmental developments since Rio (SGT 6/ Acta No. 04/02, Anexo 9b). At every meeting, SGT 6 participants discuss the upcoming global environmental calendar and often develop common regional positions and approaches to specific issues that will be negotiated. They encourage and support each other's participation. When Argentine environmental officials were unable to attend a major preparatory meeting for the Johannesburg conference because of Argentina's severe financial and budgetary crisis, they got their regional counterparts to issue a statement about the importance of participation in the meetings.[7]

Finally the meetings of Mercosur have indirectly stimulated domestic environmental developments even while there have been few collective or supranational advances. Several long-time participants in SGT 6 could not give specific examples of national environmental legislation or programmes that had been directly copied from one Mercosur country to another (Breda, 2001; Laciar, 2001). Nonetheless the participants clearly encourage and support each other in their international environmental participation (as noted above) and their domestic policy efforts. One standard agenda item in every SGT 6 meeting is for member countries to present any new domestic environmental legislation and initiatives to their counterparts, who often make a comparatively appreciative audience. Documentation is available for other countries that might be considering similar programmes. The SGT 6 participants are also working on developing parallel and compatible environmental programmes that fall within their national portfolios and powers of implementation and will not require approval from the formal Mercosur administrative structure.

Conclusion

This chapter explains an apparent paradox: the countries of the Mercosur agreement have hesitated to create strong regional environmental protections while simultaneously initiating and expanding environmental protections at home. This result casts new light on debates about whether or not free trade policies create a 'race to the bottom' in environmental protection in developing countries. A qualitative case study of just the Mercosur agreement allows a better view of the contradictory pressures shaping environmental policies in the region.

On the one hand, regional trade negotiations have generated a regulatory chill for initiatives that would have the four member countries harmonizing

their environmental regulations upwards together. In particular, economic and foreign relations ministers derailed an extensive Environmental Protocol proposed by the environmental ministries of the region. The Protocol was replaced by a much vaguer Environmental Framework Agreement that limits itself to international commitments made a decade before at the United Nations Conference on Environment and Development. Trade promotion activities continue to be a high priority for Mercosur's environmental subcommittee.

The regional regulatory chill is counterbalanced by other dynamics, however, which allow for the expansions in national environmental protections. These reflect the fact that regional trade negotiations are only one small piece of the current regional political economy. All four of Mercosur's members have experienced recent transitions to civilian government that have more open political agendas and participation than their authoritarian predecessors; these have proved to be more open to environmental considerations as well and are more willing to build the institutional infrastructure of environmental protection. International advocacy coalitions, negotiations and sources of funding for environmental protection have supported these changes. Finally the environmental subcommittee members have reinforced each other in domestic endeavours. The net result is an uncoordinated 'race to the middle', where the four member countries of Mercosur find their own paths, at their own pace, to stronger environmental protections.

Acknowledgments

The research for this chapter was funded by an in-residence fellowship at the Instituto de Desarrollo Económico y Social, Buenos Aires, Argentina and by a research grant from the Fulbright Commission.

Notes

1. Minutes of the SGT 6 meetings are available on the websites of the Brazilian and Argentine national environmental agencies (www.mma.gov.br and www.medioambiente.gov.ar). The texts of cited treaties, decisions, resolutions and agreements of the CMC and the GMC are online at www.mercosur.org.uy.
2. As of April 2003, only Paraguay had ratified the Framework Agreement and incorporated it into domestic law. In the other three countries, the Framework Agreement was still travelling through the legislative process.
3. Movimento de Defesa da Amazonia, São Paulo, 'Principios, Objetivos, Cárater e Organização' (São Paulo: mimeo, April/May 1979); Movimento de Defesa do Meio Ambiente do Acre, 'Carta Aberta em Defesa do Acre e da Amazonia' (Rio Branco, Acre: mimeo, April 1979).
4. Full descriptions of the current political regimes are obviously beyond the scope of this chapter. Argentina, Brazil and Uruguay have achieved basic electoral democracy since the mid-1980s, but Paraguay continues to struggle with some serious problems related to the decades-long hold of the Colorado Party on Paraguayan politics (Lambert, 2000). There are flaws in the current democracies of the other three (see Delgado, 2000; Holston and Caldeira, 1998; Hunter, 1998; Roniger and Sznajder, 1998, for illustrative critiques) but they come considerably closer to the ideals of liberal democracy.

5. Once again, full descriptions of the environmental politics of the four Mercosur countries are beyond the scope of this chapter. Surveys of all four can be found in Hochstetler (2003) and Devia (1998). On Brazil in particular, see Ames and Keck (1997–8), Foresta (1991) and Hochstetler (2002b); on Argentina, see Hopkins (1995); on Uruguay, Gudynas (2001). I am unaware of any studies of Paraguayan environmental politics.
6. Brazil and the IDB will each provide US$82.5 million for the first phase of the programme, and US$117.5 for the second phase, totalling US$400 million over nine years. The Executive Summary of the Sustainable Development Program for the Pantanal is available online at www.iadb.org.
7. Author observation of the 20th meeting of SGT 6, Montevideo, 6 December 2001.

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PART IV

CIVIL SOCIETIES, KNOWLEDGE AND ETHICS

23 Science and environmental citizenship

Sheila Jasanoff

Historians of the late 20th century may come to see that period as the proving ground for a new transnational politics, no longer wholly determined by the actions of sovereign nation-states, or even by interactions among them. Instead, the transnational arena emerged as a partially independent political sphere, governed by regimes that could not be characterized simply as the intersection of autonomous national politics and interests. In important respects, it was the environmental activism of the era that prompted the jump from the national to the transnational. Confronted by increasingly persuasive evidence of an Earth of finite resources (Miller and Edwards, 2001; WCED, 1987), states proved willing to cede some of their juridical and territorial rights in order to find appropriate collaborative arrangements for planetary governance and coexistence (Benedick, 1998; Litfin, 1994, 1998). Other novel markers of political organization and activity on a global scale also took shape in the context of environmental protection: transnational networks of nongovernmental organizations (NGOs) committed to environmental issues, among others (Keck and Sikkink, 1998); coalitions of multinational companies subscribing to norms of sustainability, as well as corporate social responsibility (Schmidheiny, 1992); and supranational expert communities dedicated to producing an internationally recognized knowledge base for collective action on the environment (Haas, 1989, 1990).

Political coalitions and international agreements (Weiss and Jacobson, 1998), administered by new 'institutions for the earth' (Haas *et al*., 1994), were among the more tangible indicators of an emergent domain of global environmental politics. Less visible, though potentially of greater long-term significance, were the shifts that these activities heralded in the relations between science and politics, or, put differently, in the production and use of environmental knowledge. For those subterranean shifts carried with them a reframing of what knowledge is relevant for policy making, a corresponding redefinition of the nature of expertise and hence, ultimately, a reordering of relations between global decision makers and the citizens on whose behalf they are empowered to govern.

Three basic understandings that had structured the uses of science in political decision making proved particularly difficult to defend in the context of global environmental policy. First was the idea that natural phenomena are distinct from social ones and can be studied and managed accordingly. Given

near-philosophical articulation in the Gaia hypothesis (Lovelock, 1996, 2003), which treats the earth itself as a living, self-regulating organism, the idea of human symbiosis with nature was soon enshrined in a variety of scientifically more tractable concepts – such as sustainability (WCED, 1987) and vulnerability – that effectively blurred the line between social and natural systems. The recognized interdependence of people and their environment led in turn to new ways of investigating and understanding their interactivity. Second was the assumption that scientific knowledge should be produced and validated exclusively by experts qualified in relevant disciplinary frameworks. As environmental problems grew more complex, it became clear that the category of 'environmental expertise' also had to be expanded to include forms of tacit knowledge and experience that had formerly been dismissed as unreliable or nonscientific (Fairhead and Leach, 1995; Irwin and Wynne, 1994; Wynne, 1989). Third, with the broadening of the category of 'expert', the notion of representative democracy came under renewed scrutiny. Questions in this regard included both how to make technical expertise more accountable to publics and how to incorporate wider categories of public knowledge into policy making.

As a result of these linked changes, rules of participation that had guided administrative decision making well into the second half of the 20th century came to seem progressively less satisfactory. Governments throughout the modern world had once assumed that science could unproblematically 'speak truth to power' (Price, 1965). Under this model, a relatively insulated early phase of expert fact finding and consensus building informed a later stage of political debate; the expert's task, insofar as it was possible, was to provide impartial and apolitical inputs to policy makers. Experts were considered accountable primarily to the truth; policy makers were held to standard political controls on their exercise of discretion. By century's end, however, this linear, compartmentalized view of the science–policy relationship had given way to a more complex recognition that values and preferences are intimately embedded in the production of scientific knowledge (Jasanoff and Wynne, 1998; Jasanoff, 1996; Boehmer-Christiansen, 1994). Democratic decision making was accordingly seen as requiring the injection of public values into matters that had previously been conceptualized as strictly analytic, technical and lying outside politics (NRC, 1996).

Much has been written about the meaning of these shifts for global environmental governance. The questions that occupied scholars, to begin with, focused on the problem of incorporating a more socialized, or *constructed* (Hacking, 1999; Latour and Woolgar, 1979), understanding of science into political analysis. Some continued to believe that science, as the universal language of rationality, could serve as an instrument of global convergence, bringing recalcitrant national actors together around common problem

framings. For them, the primary challenge was to construct spaces of scientific assessment where the 'social' could somehow be leached out of the technical, or at least divorced from localized political ideologies or commitments (Bolin, 1994). Others wondered whether science, its messy humanness ever more plainly revealed, had emerged as just another field of politics, where the conventional dynamics of power would determine which experts had voice and whose problem articulations would shape the instruments of environmental governance (Boehmer-Christiansen, 1994). For these sceptics, the most urgent question was how to make scientific deliberations more inclusive, less self-interested and less subservient to prevailing national or international power relations.

The formlessness of the global political arena gave particular urgency to questions of institutional design. If new expert bureaucracies had to be created to manage the environment on a global scale, then how should these bodies be held accountable for their uses of knowledge as well as power (Miller, 2004a)? Might international expert bodies help to depoliticize science, producing 'serviceable truths' (Jasanoff, 1990) for a global humanity; or would they simply perpetuate older patterns of cognitive and political dominance, now conveniently robed in the mantle of scientific objectivity (Jasanoff and Martello, 2004)? Were existing institutional models capable of accommodating, or wrestling with, the social and political factors that inevitably enter into the production of global environmental science (Jasanoff, 2004b; Miller, 2001a, 2001b)? And to whom should the lines of expert accountability run: exclusively to national authorities as the only legitimate representatives of global populations, or also directly to the people of the Earth, in short, to global citizens?

This chapter approaches the problem of global environmental governance from a somewhat different angle: not from the standpoint of governing institutions but from that of citizens caught up in the changing flows of politics. If a transnational political arena is indeed emerging, constituted at the global level under the threat of planetary environmental degradation (Miller, 2004b), then it is important to ask how the formation of that new domain affects the rights and responsibilities of the Earth's six billion residents. That question commands interest in two linked, yet different, ways. The more conventionally political inquiry has to do with the nature and status of citizens' rights in an emergent, contested and indeterminate political arena, whose contours are for now as poorly defined as the rules of the games played within it. Briefly put, can global environmental politics be democratic, and what does being democratic mean in this context? A second, less obvious, set of questions has to do with changes in the very conception of the citizen, from a person defined primarily by economic preferences and moral or political values to a person who, as importantly, functions as a bearer, producer and consumer of

knowledge. To explore how the world's *knowledgable* human denizens can assert, and be accorded, a role in environmental governance is this chapter's primary aim.

We begin by briefly delineating the problem of citizenship as a feature of environmental politics writ large. We then discuss the changing role of citizens in the production of knowledge, the definition of expertise and the operation of institutions implicated in global environmental protection. We conclude by reflecting on whether and to what extent these changes can be seen as vanguard movements toward a future constitutional order for global governance.

Environmental citizenship

Democratic theorists generally conceive of citizenship in terms of belonging to a *demos*, or a polity, and hence having participatory rights within it. The issue of who belongs to a community of citizens is by no means straightforward, since all functioning democracies exclude at least some of their members from crucial political rights, including even the right to vote. In diverse systems and historical periods, women, children, minorities, the landless and the imprisoned have all been denied the franchise. Non-human entities, such as animals or trees, enjoy no political rights, although the legal scholar Christopher Stone (1974) famously argued in the 1970s for a right of standing for natural objects, entitling them to be represented in environmental proceedings. Membership in an active community of citizens is therefore doubly contingent: first, on the boundaries of the political unit within which citizenship is constituted and, second, on the further principles by which a given unit determines for itself which of its members to include in or exclude from exercising the rights of citizenship (Jasanoff, 2004a; Dahl, 1989).

Competence has long been recognized as a prerequisite for democratic citizenship. Participation in political life, it is universally believed, demands that the participants should possess sufficient understanding and capacity to provide responsible inputs to collective decisions. What has changed over time is not the threshold commitment to competence but the understanding of what it means to be politically competent and, latterly, what counts at all as *political*. Widening principles of inclusion from the mid-19th century onward indicate a growing belief in the democratic world that, in the absence of exceptional circumstances, *all* adult human beings should be regarded as qualified to vote. By the same token, children below a certain age are considered in all modern societies as lacking the capacity to make considered political judgments, and hence are not allowed to vote; of course, the age at which sufficient intellectual and social maturity are thought to set in has fluctuated both within and among democratic societies.

If the bar for voting has been progressively lowered, the same cannot be said for the work of administration. The 20th century witnessed a thoroughgoing restructuring of the field of politics into a component of selecting leaders (politics), everywhere seen as value-laden, and a component of implementing their formal mandates (policy), widely seen as technical, rational and relatively empty of value judgments. The expansion of rights in the field of politics, then, went hand in hand with a restriction of access to policy making. As decision making grew more technical and expert-driven, citizens were progressively distanced from the processes of data gathering and analysis that formed the backbone of administrative decisions. Even then, developments like the exceptionally forward-looking 1946 US Administrative Procedure Act (APA) recognized that administrators ought to consult the public before making costly, irrevocable policy choices. It remained the administrator's prerogative to put together the technical foundations of policy proposals, but in a notable bow to democracy the APA conferred on interested and affected parties the right to challenge administrative decisions that they saw as unsupported by sufficient evidence, and hence as not rational. In so doing, the APA offered a procedural response to a tension between technocracy and democracy that has only intensified with the years (Jasanoff, 1990).

Tellingly it was in the domain of environmental policy that the boundary between expert decision making and citizen control was soonest and most contentiously debated – and the boundary was eventually redrawn so as to make more room for citizen inputs. The 1969 US National Environmental Policy Act (NEPA) elaborated on the APA framework by requiring federal agencies to assess, in consultation with the public, all decisions significantly affecting the quality of the environment. For more than a decade, the US court system grappled with the fallout from that landmark law. Federal judges had to determine who had standing to bring claims under NEPA and for what sorts of causes (Anderson and Daniels, 1973), thereby rewriting some of the ground rules of environmental citizenship; for example, environmental organizations were held to be appropriate representatives of the public interest in protecting and preserving nature. Judges also had to confront issues of proof and evidence in decision making contexts, ranging from air pollution control to nuclear waste storage and disposal, where certainty was an elusive if not unattainable goal. In ruling that pro-environmental actions can be justified on less than complete scientific certainty, American court decisions of the 1970s paralleled European thinking on the precautionary principle, a legal maxim designed to maximize environmental protection under conditions of insufficient knowledge (Tickner, 2003).

But even as courts, and to some degree legislatures, moved to grant ordinary citizens greater participatory rights in technical decisions, other

developments demonstrated the difficulty of integrating lay and expert viewpoints into an effective partnership between knowledge and values. The tensions were most pronounced around the discourse on risk which, in the 1980s, came to dominate environmental regulation, particularly in the United States. Under pressure to justify themselves to deeply divided audiences, administrative agencies throughout much of the industrial world turned to an analytic methodology (risk assessment) that promised to reduce uncertainty itself to a technical calculus. Risk assessment became the preferred technique by which regulators took all of the patchy, heterogeneous knowledge they had about a given product, process or activity and sought to integrate it into a single, objective, quantitative estimate of the probability of the harm it might cause to human health and the environment.

From its birth in the 1970s as an instrument of contemporary environmental policy, risk assessment attracted strong support and equally strong criticism, and underlying each position was a different tacit theory of knowledge and citizenship. For proponents of formal risk analysis, objectivity was the salient goal. Risk assessment should become as far as possible 'scientific', its advocates maintained, and the only way in which this could be accomplished, they thought, was to shield the assessment process from political coloration. This point of view was perhaps most influentially set forth in a 1983 report of the US National Research Council (NRC, 1983), which posited that risk assessment was a largely technical exercise that should precede and be kept distinct from risk management, the phase of decision making at which values and interests might legitimately make their appearance. In this framework, citizens' rights are seen as belonging largely to the political sphere of *managing* risks, not to the identification of hazards, the formulation of research agendas, the gathering of data or the calculation of probabilities of harm. Citizens, in other words, are seen as carriers of essential political values, but not as holders and producers of relevant knowledge, nor as bearers of rights flowing from what they know or may properly demand to know. Because of its conceptual neatness, this way of thinking about risk analysis retains a powerful hold on politicians' and policy makers' imaginations, even though later reflections, including some from the US National Research Council itself (for example, NRC, 1996), backed away from the 1983 statement's rigidly separatist position.

Against the 1983 NRC report's technocratic framing of risk assessment, social and political research on environmental policy has raised powerful counterarguments. The starting point for concern is that 'risks' are not simply found in the world, untouched by any social or political commitments. Rather risk analysis is always formulated within the context of prior framing decisions that determine both the contours of a perceived problem and the range of available solutions. By their nature, these choices are not themselves

technical but are intensely value-laden, and hence are legitimately the preserve of deliberation (NRC, 1996). The conventional technical and mathematized understanding of risk assessment, as many scholars have noted (Jasanoff and Wynne, 1998; Porter, 1995; Winner, 1986:138–54), tends to mask underlying social judgments and framing effects. For example, quantitative risk assessment reduces complex causalities to individual 'risk factors', plays down the distributive effects of risk, emphasizes what is known about an issue at the expense of what is not known, and tends to privilege physical and biological sciences over social sciences. The very concept of risk, moreover, implies the possibility of management, and hence tacitly favours moving ahead with new activities under controls that experts consider suitably protective. Such an approach precludes meaningful normative assessments of the value of the innovative projects in question; instead it presumes that risk is always and inevitably a social good, to be collectively shouldered despite its selectively harmful consequences. These foundational commitments are not available for public questioning within the framework of risk assessment, especially when it is conceived and institutionalized as a 'scientific' exercise (Beck, 1992). Yet social histories of nuclear power and genetic engineering suggest that the development of these technologies would have benefited from an early and wide-ranging discussion of their benefits, as well as their risks, by comparison with the technologies they sought to displace (Gottweis, 1998; Balogh, 1991).

Research findings about environmental risk and its governance point toward special problems for global environmental politics, many of which are rooted in persistent differences among national political systems. Comparative research on environmental policy has revealed that even similarly situated industrial democracies diverge widely in the means by which, and the extent to which, they involve their citizens in the framing and assessment of risk-based decisions (Vogel, 1986; Brickman *et al.*, 1985). These differences correlate with divergent framings of the problems that the nation-state seeks to regulate, and hence with differences in the timing, stringency, form and scope of controls. More important for our purposes, national regulatory systems also entail discrepant cultural understandings of what counts as appropriate knowledge and expertise, and how expert judgments should be made available for public criticism and review (Jasanoff, 2005). In sum, national approaches to environmental regulation are geared not so much to producing objective and universal assessments of safety or harm as to persuading citizens of the legitimacy of particular forms, or modalities, of regulatory action. That legitimacy, in turn, depends on variable, preexisting, robust notions of what it means to be a citizen, and what citizens have a right to expect from their ruling institutions (cognitively, politically, morally) in the polities whose concerns regulation seeks to address.

What, though, are the implications of these national-level findings for citizenship in a global domain? Here, by definition, there are no established rules of inclusion or exclusion, for *everyone* in principle could be a global citizen. At the same time, as far as political rights are concerned, no one, ironically enough, is a global citizen. Instead the dominant logic of environmental governance seems to assume that the rights and responsibilities of citizenship are wholly, and adequately, constituted at the level of the nation-state. The new institutions of the Earth, by extension, are little more than supranational administrative bodies that carry out, within specific treaty regimes, the delegated political will of the nation-states constituting that regime. Accordingly, there are no general guidelines by which citizens may express themselves, whether individually or collectively, in institutions of global environmental governance: no constitutional rights, no legally recognized status under international law, and no established administrative routines that grant de facto rights of participation to subnational groups, even in the absence of law.

Yet the attempt to separate the domain of global environmental action into a political part, constituted by delegating nation-states, and a largely administrative part, delegated to expert regulatory bodies, has proved no more sustainable than in the context of national environmental politics. Issues and agendas continually spill over from one realm to the other, and the monopoly of nation-states to determine the goals of policy is by no means universally accepted. Nor, when it comes to environmental issues, can nation-states necessarily be trusted to strike appropriate balances between environment and development or to protect the interests of ethnic and social minorities. What we see therefore at the global level is the emergence of ad hoc practices of public inclusion, produced under different scientific and political pressures, to solve varying problems of national representation. These practices are by now sufficiently dense and widespread to be constituting, in effect, a notion of global citizenship, tacitly and from the bottom up. To identify and analyse these practices is to take a first step, however tentative, toward refining them into recognizable norms of governance.

Citizens in a global environment

From a purely formal perspective, the domain of global environmental governance seems resistant to the very idea of individual citizenship. Though environmental scientists may regard the 'biosphere' as a meaningful unit of analysis (Miller and Edwards, 2001; Takacs, 1996), politically the world remains very much a conglomerate of autonomous nation-states and some emerging regions, of which the European Union (EU) is unquestionably the most cohesive and influential. Regimes of global environmental protection are constituted under treaties made by national governments; member states,

and not their citizens, are the parties charged with their implementation. Citizens have little or no direct voice in the conferences of the parties through which treaty regimes are made operational and gain continuity. At most, some treaties and implementing bodies permit NGOs, as citizen representatives, to sit in on negotiations, with rights to be informed but without the power to vote. Major political realignments in the structure of treaty regimes, such as the accession of developing countries to the Montreal Protocol framework for controlling ozone-depleting chemicals, or the withdrawal in 2001 of the United States from the Kyoto Protocol for reducing greenhouse gas emissions, are decisions of state, which may be taken without even a bow to national political legitimation.[1] Yet, slowly but surely, the people of the Earth are asserting themselves in global environmental matters in ways that resemble acts of citizenship. To date, these scattered and informal practices remain largely below the threshold of legal recognition, though in a few instances they have begun to rise above it.

New sites of inclusion

Global environmental citizenship arguably came of age in 1992, the year of the United Nations 'Earth Summit' on environment and development in Rio de Janeiro. The use of the word 'development' signalled that people and their concerns were to be central to the agenda of international environmental action. In a significant precursor report, the World Commission on Environment and Development, under the leadership of Norwegian prime minister Gro Harlem Brundtland, had introduced the concept of 'sustainable development',[2] which it defined as 'development that seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). The goal of environmental protection, at least at the global level, was thereby reframed as a search for sustainability. Not pristine nature, but the complex interactions of nature with human societies, became after Rio the focal concern of environmental governance at the supranational level.

As if to mark this transition, the 1992 Earth Summit was a pairing of two events: one a traditional meeting of state government representatives (the United Nations Conference on Environment and Development, UNCED); the other, held in a separate location 40 kilometres away, a large meeting of NGOs drawing together some 18 000 participants (the Global Forum). Both meetings produced documents, to some extent paralleling each other's coverage, for instance, the Rio Declaration produced by UNCED and the Earth Charter produced by the NGO treaty-writing process (Parson *et al*., 1992). More important than formal documents, though, was the principle that this two-track meeting implicitly laid down. Imperfectly, but on an unprecedented scale, the Global Forum articulated a quasi-constitutional principle for the

Earth as a whole: that global environmental governance cannot simply be an undertaking of nation-states; it also demands, at some level, the direct and unmediated participation of the people.

More concrete ideas of popular representation were articulated in *Agenda 21*, a massive, 40-chapter, 800-page action plan for pursuing the entire sweep of the world's environment and development problems into the 21st century. Conceived as a partnership among all possible levels of political organization, *Agenda 21* explicitly recognized that inter-state initiatives would have to be complemented by support from national, regional, local and grassroots actors. The Preamble declared that the 'broadest public participation and the active involvement of the non-governmental organizations and other groups should also be encouraged'. In pursuit of this total top-to-bottom engagement, Chapter 28, dubbed 'Local Agenda 21', translated the maxim 'think globally, act locally' into programmatic terms. Aimed at local authorities, the chapter's goal was to draw ordinary people into the project of global sustainability. This the chapter sought to do in part by recommending consultation between local authorities and their populations, learning from citizens and civic organizations, and seeking explicitly to include traditionally marginalized groups, such as women and youth. In short, Local Agenda 21 framed sustainability not just as a scientific or technical problem, but as a matter of engaging citizens in more inclusive and open models of governance.

World Commissions, such as the body headed by Gro Brundtland and the later World Commission on Dams (WCD, 2000), have emerged as another type of forum that enables citizen participation in global processes. These bodies take evidence from local citizens and their representatives with the explicit aim of drawing people and, significantly, their knowledge into translocal forms of governance.

Citizen experts

The view that citizens have more to contribute to environmental decision making than values alone – that they also possess essential knowledge and experience – has been more readily accepted at the global level than in many national policy systems. The all-too-evident uncertainties of science at planetary and geotemporal scales have made international bodies perhaps more sensitive than their national counterparts to the idea that nonconventional forms of knowledge must be included in global policy. Hence there has been a twofold movement that broadens the inclusion of lay citizens in global expert forums: first, an expansion of the cognitive underpinnings of policy from the narrow category of 'science' to the broader category of 'knowledge'; and, second, the extension of participatory rights in expert decision making to local and indigenous groups, as holders, and sometimes generators, of relevant specialist knowledges (Jasanoff and Martello, 2004: 6–13).

The 1992 Earth Summit once again marked a watershed moment. *Agenda 21*'s Chapter 40, on information for decision making, noted that there were serious data gaps hampering the search for global sustainability. Though couched in the conventional technocratic language of indicators and capacity building, the chapter made substantial concessions to greater inclusiveness. It noted the dearth of information on socioeconomic factors, especially for historically marginalized groups (women, indigenous peoples, youth, children, the disabled) whose well-being had to be encompassed in any viable sustainability regime. One paragraph dealt with strengthening the capacity for using traditional information, noting that states should help their local communities 'to manage their environment and resources sustainably, applying traditional and indigenous knowledge and approaches when appropriate'. The importance of traditional, local or indigenous knowledge has also been recognized in international agreements on biodiversity, forests and desertification; endorsed by the World Bank and various World Commissions; and affirmed at the 1999 World Conference on Science in Budapest, which called for the promotion of traditional knowledge and its integration with science (Martello, 2001). These developments are important for environmental citizenship because they seek to draw back into the policy process groups that have been excluded, for presumed lack of competence, from both scientific and political institutions – and who hence would not normally have any voice in agenda setting or implementation.

Local Agenda 21 is arguably just one formal indicator of a more wide-ranging and less commonly recognized process through which citizenship roles are being defined in the global context: as a by-product of what scholars of science and technology term *co-production*, that is, the simultaneous production of natural knowledge and social order (Jasanoff, 2004b). In particular, the detection and framing of new environmental problems has brought changes in communal self-understandings and, correspondingly, in modes of political organization and self-expression. In Europe, for example, cross-boundary environmental cooperation has produced new regional identities, such as 'the Baltic', that find expression in institutionalized approaches to scientific assessment as well as political representation. Individuals from diverse national and cultural backgrounds can unite, for environmental purposes, as de facto Baltic citizens; at the same time, the expert bodies that help define such environmental regions serve as sites of both scientific and political deliberation (VanDeveer, 2004). Similarly scientists' interests in Arctic environmental conditions have helped establish the area above the Arctic Circle as a region of common concern for its heterogeneous, multinational peoples and cultures (Martello, 2004). Global science can be said, in this sense, to have produced a new political category: the Arctic citizen. Yet a third example is the emergence of a pan-African political identity around successful efforts to delist

the African elephant from a blanket endangered status under the Convention on International Trade in Endangered Species. In this case, ideas of what it means to act in Africa's environmental interests took shape along with new understandings of how best to manage the continent's disparate elephant populations (Thompson, 2004). Finally, vernacular or popular uses of the image of Earth produced by the astronauts of the Apollo missions to the moon have played an important role in defining the planet itself as a unitary space of political action for many environmentalists (Jasanoff, 2001).

Citizenship and global institutions

States and not their citizens, as we have seen, are the primary parties to global environmental regimes. Yet the emergence of new institutional structures at the supranational level has created political possibilities that bypass nation-states in favour of direct links between suprastate institutions and publics around the world. Based on fluid goals and ad hoc practices, and mediated by NGOs whose own capacity for democratic representation is far from settled, these connections do not yet add up to recognized rules of inclusion or deliberation, but their collective impact cannot be ignored.

The most conspicuous popular response to the growth of global rule was, on the surface, anything but deliberative. The anti-globalization movement, as it is called, came of age in violent street protests against the Third Ministerial Conference of the World Trade Organization (WTO) in Seattle in 1999; these were followed by similar protests in 2001 against EU ministers and the Group of 8 (G8) in Gothenburg and Genoa, respectively. While demonstrating against global economic institutions (not only the WTO but the World Bank and International Monetary Fund), protesters also embraced environmental themes and symbols. They expressed particular hostility toward the worldwide spread of biotechnology and its perceived threats to biodiversity and local agricultures. Comprising loose and shifting political coalitions, and unified by no consistent ideology or coherent action plan, the anti-globalization forces were dismissed by some as ignorant trouble makers, lacking the sophistication to understand the economic benefits of free trade and international monetary policy. Yet, no less than the 1992 Rio Global Forum, the anti-globalization movement can be seen as articulating that most foundational of constitutional objectives: a plea by the people for more direct involvement in the structures that govern them. In this respect, even the most unruly street demonstrations may function as staging grounds for an incipient global citizenship.

At the other end of the scale of formality are efforts to make the routine administrative processes of global institutions more transparent, accessible and accountable. In one striking development, massive protests against the Narmada River dam project in India compelled the World Bank in the 1990s

not only to cancel its support for the initiative, but to institute new environmental impact assessment procedures that would be more sensitive to local conditions and local needs. The experience was a spur to establishing the World Commission on Dams, with the express goal of opening up a global planning process to a wider variety of local inputs. A bridge was crossed in the direction of popular accountability, even though it remained questionable how far the Bank, a remote global institution operating under centralized managerial constraints, and closely networked with state bureaucracies, could see or be responsive to real people's on-the-ground experiences and lifestyle preferences (Goldman, 2004).

The WTO, too, has been the target of environmental groups through more formal means than protests in the street. In May 2004, for example, a coalition of 15 prominent international public interest organizations, including Greenpeace, presented a joint submission (or *amicus curiae* brief) to the WTO in a case brought by the United States against the EU, protesting the latter's alleged de facto moratorium on the importation of genetically modified (GM) foods. The coalition asked for caution in accepting as dispositive US risk assessments that had supposedly established the safety of GM foods. In their view, as well as that of some academic social scientists familiar with risk-based regulatory processes,[3] scientific uncertainty mandated a more localized and less expert-driven approach to policy, one respectful of local citizens' agricultural knowledges as well as their values with regard to the standardizing impact of GM technologies. Since the WTO had no official mechanism for encouraging or using such *amicus* submissions, efforts like these can be seen as experiments in global citizenship: as attempts to force global institutions to see beyond their member states and enter into direct communication with people.

In a similar spirit, environmental groups claiming to speak for a global public have sought to prod, if not to shame, multinational corporations into assuming a greater share in environmental stewardship. Companies ranging from McDonald's and Coca Cola to Nike and Royal Dutch Shell have come under intense activist and media pressure to alter their business practices by paying more attention to issues of sustainability. Social justice, for workers, women, ethnic minorities and children, figures prominently in NGO agendas of change, but environmental issues are not absent from those agendas either. NGO involvement has helped to make firms and producers more aware of scientific uncertainty and the discrepant distributive impacts of industrial production than many formal processes of risk assessment and product regulation (Iles, 2004). Correspondingly companies have begun to re-examine their relations with global consumers, looking for ways to meet their environmental and ethical expectations, and even to give them voice in corporate decision making, while catering to their material desires (Doubleday, 2004).

In short, as multinational corporations have taken on more of the attributes of nation-states, especially at the global level, consumption has subtly begun to merge with citizenship; how far such movements will progress and with what consequences remain, of course, unknown.

Constitutionalizing the global environment

That there is at the turn of the 21st century an active domain of global environmental politics seems widely accepted, both as a practical matter and in the work of political and social analysts. It is constituted by international treaties, governed by global institutions and has prompted new forms of scientific inquiry and political coalition building. This much seems clear. But is this, in any conventional sense, a democratic space? Do the inhabitants of the Earth have any say in setting priorities for action, designing instruments of governance or holding global expert institutions accountable? Can they make themselves heard, particularly by influencing the nature and range of information brought to bear in global decision making? Or must ordinary people inevitably express themselves indirectly and from a distance (through national governments and international expert bodies), trusting that the mechanisms of international politics and of disciplinary science will adequately serve their desire for accountability?

This chapter's main contention is that a meaningful notion of citizenship is indeed emerging around the institutions and processes of global environmental governance. That notion is tied in fundamental ways to the recognition that the knowledge of the Earth's citizens is crucial to the effective implementation of global environmental policies, and that this knowledge cannot be harnessed simply by consulting nation-states and their appointed experts. From the 1992 Earth Summit onward, it has been established, virtually as a matter of right, that local communities and their representatives, as well as indigenous peoples and other marginalized groups, should have opportunities to inject their knowledge and understandings into policies for sustainable development. International environmental regimes can even be said in this respect to have led nation-states, by sooner recognizing local, traditional and indigenous knowledge and experience as bases for participating in governance regimes.

Norms of citizenship have also begun to sprout within newly defined regions, from the Arctic and the Baltic to the global, that are, in effect, the geopolitical projections of environmental science. Such regions cannot by definition be contained within existing political systems, but straddle their boundaries. Yet these transboundary regions are not immune to the demands of citizenship. Constituted in response to shared threats to resources and livelihoods, these novel spaces have generated new classes of environmental citizens whose alliances cut across accepted lines of national or ethnic classi-

fication. How best to represent these citizens and their interests – epistemologically and politically – remains in many ways an open question. The task of crafting representative practices has fallen in the first instance to untested institutions and untried political entrepreneurs. But recognizing the phenomenon of environmental regions, and the problems of representation that they make visible, is a necessary step toward more responsible forms of environmental politics.

Finally, the politics of anti-globalization at the turn of the century stands, I have suggested, for the fundamental principle that global institutions, even when they are constituted by international treaties, must be directly answerable to public constituencies. The idea that all earthly politics is at bottom national, and that the global sphere is mainly about expert decision making, constrained by the head-to-head politics of sovereign states, cannot any longer command empirical, or indeed ethical, support. Indeed the historical experience of environmental politics from within nation-states implies that ways must be found, at the global as at the national level, to rework the boundaries between politics and reason, or expertise and democratic participation. How to accomplish this within institutional structures built on the principle of state-to-state negotiation and, to some extent, on outmoded ideas of scientific objectivity will be a great challenge for global environmental management in coming years. But the sustainability of the biosphere *and* of democracy depends on seeing the need for a more active model of global citizenship, and effectively catering to that need in the institutions for the Earth.

Notes

1. Of course, national governments are electorally accountable to their citizens, and at least in theory a government's conduct in global environmental affairs could help determine its success or failure at the polls. In practice, local and national environmental issues are more likely to influence election outcomes than international ones, which are less visible to the electorate. Arguably Hollywood extravaganzas such as the film *The Day After Tomorrow*, released with high publicity in the summer of 2004, can do more to mobilize national and international public opinion than all the intergovernmental negotiations on climate change carried out under formal treaty provisions.
2. The term 'sustainable development' has been elaborated in the United Nations system to 'sustainable human development'. The latter term puts the human even more at the centre of environment–development policy.
3. I was part of a five-member team of academics who also submitted an *amicus* brief to the WTO in this case. Our argument, paralleling that of the public interest groups, was that risk assessment is neither a science nor a unitary methodology, but that – on issues of low certainty and low consensus such as genetic crop modification – risk assessment has to be supplemented by more or less extensive processes of public deliberation. In other words, we argued that risk assessment had political dimensions that needed to be legitimated by interested and affected citizens.

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24 Science and international environmental governance

*Peter M. Haas**

Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information? (T.S. Eliot)

While Speaking Truth to Power has long been a major theme in political science and policy studies (Wildavsky, 1979) commentators are increasingly sceptical about whether modellers and scientists are capable of developing truth, and whether power ever listens to them anyhow. Indeed, at the international level, IR (international relations) scholars tend to be surprised by the occasions when it does. This chapter applies the political science literature to the related question of when power does listen to science, particularly with regard to the management of complex environmental issues associated with sustainable development.

Sustainable development is now one of the major mantras invoked in the area of international environmental governance. Sustainable development was popularized in the seminal 1987 World Commission on Environment and Development report *Our Common Future*. The report served as the justificatory document for the 1992 World Conference on Environment and Development, and put forward a new doctrinal approach to economic development that 'meets the needs of the present without compromising the ability of future generations to meet their own needs'. Sustainable development requires a reorientation of collective understanding and of formal institutions to focus on the key intersecting and interacting elements of complex problems. Technically efforts to cope with environmental threats must be comprehensive if they are to address the complex array of causal factors associated with them. Yet comprehensiveness is difficult to achieve, because few governments or international institutions are organized to cope with the multiple dimensions of environmental problems, and many states lack the technical resources to develop and apply such efforts.

Sustainable development urges a simultaneous assault on pollution, economic development, unequal distribution of economic resources and poverty reduction. It argues that most social ills are nondecomposable, and that environmental degradation cannot be addressed without confronting the human activities that give rise to it. Thus sustainable development dramatically expanded the international agenda by arguing that these issues needed to be

simultaneously addressed, and that policies should seek to focus on the interactive effects between them.

This new policy doctrine – or consensual wisdom within the international community of environmental policy analysts (and, at times, advocates) – rests on two key foundations (Kates *et al*., 2001; National Research Council, 1999). One is that, procedurally, policy should be participatory and transparent: in part to include new perspectives in the knowledge base brought to bear on understanding a particular problem, as well as to promote buy-in and the inclusion of stakeholders in the subsequent application of these policies, and thus to improve the prospects for more effective enforcement and compliance.

The second foundation is substantive and involves more comprehensive and systematic approaches to planning and policy formulation, often through the technique of sustainability impact assessment and forms of interdisciplinary integrated modelling intended to bring together partial insights to sustainable development from different academic disciplines. While sustainability science has been percolating in the various laboratories of environmental analysts for nearly 20 years, there remain few, if any, clearly observable occasions on which there has been effective technology transfer from the laboratory to the government agency or international regime. Even when scientists think they have developed truths for power, power appears disinterested at best, and possibly even uninterested. This is because science is seldom directly converted to policy. The path from truth to power is a circuitous route at best. The reasons for this may be grouped under a set of convenient categories:[1]

1. Science is not wisdom (or true). Science studies scholars dismiss the prospects of objective knowledge about the world, and stress the political dimensions to science and science policy.
2. Science is politically tainted and suspect. Organized modern science embodies implicit values of control, so that decisions made with scientific warrants may unconsciously reflect such hidden values. In addition, the distributional consequences of science-based advice are themselves political (Jasanoff *et al*., 1995; Miller and Edwards, 2001). Science is political in its consequences, because some benefit and others suffer as a consequence of policy options that are supported by the application of scientific understanding. To the extent that those affected by the use of science in formulating policy are not consulted in its development and application, the use of science is potentially regarded by those affected as an illegitimate and exploitative set of discursive practices (Lidskog and Sundqvist, 2002).
3. Power does not care about truth anyhow. Politicians do not want science, they want a justification for pre-existing political programmes which are

driven principally by political anticipations of gain (Miles, 1998; Nelkin, 1979).

Before discussing these reasons in greater detail, let me first dismiss the standard rationalist account that major problems create the incentives for their resolution, and thus modern bureaucracies (or bureaucratic institutions) either develop effective responses almost automatically or are so powerfully constrained by the strategic interests of powerful member states or participants that institutional applications of knowledge are little different than the aggregate wishes of the more powerful members.[2] I reject this proposition for two reasons. One is that, particularly for sustainable development, the material incentives and the nature of the presumptive useful information are not in sync. Few organizations, if any, have the available mission and resources to be able to address the full integrative range of issues encompassed by sustainable development, yet there is an empirical record of shifts beyond what formal organizational assignments would predict (Haas and Haas, 1995).

The second reason can be addressed by way of the historical analogy of scurvy. That is, we should not assume that all organizations are rational and will automatically recognize and adopt what prove to be the appropriate policy responses with the virtue of hindsight or reflect the material needs of their most powerful constituencies. Arguably scurvy was the single most important limiting factor to the expansion of trade and geopolitical influence in the 15th and 16th centuries. Trade and exploration were significantly hampered because the mortality rate of sailors on long-distance expeditions was often in excess of 90 per cent. Expeditions would return with far fewer ships, not because of storms but because too many crewmembers would die off to be able to serve the entire fleet which had left. And yet, in the early 1600s, the scurvy problem was solved by Captain James Lancaster – bringing citrus trees along on ships – and the solution was then forgotten for nearly 150 years, until Captain Cook rediscovered it in the 1760s (Milton, 1999). So much for rational societies responding effectively to important issues. So we should not expect a fully formed sustainable development science to be developed and applied in response to the presumptive need for such a view.

There is a well-developed literature that lays out a variety of arguments for the limitations of science for policy because many policy makers do not view it as essential for policy making or discredit science's impartiality. Ironically those who do accept science's claims to impartiality may be particularly suspicious because science may undermine their political agendas.

Scientific consensus is often suspect because the scientists themselves are part of a broader cultural discourse, and thus lack autonomy or independent stature: in part scientific findings may reflect the bias of sponsors, but more deeply they may reflect the broader culture of the society from which they

emerge and about which they may not be fully conscious. The universe of what is known or deemed knowable may be biased by the availability of funding resources for research, and thus reflect the conscious or unconscious biases of major public and private funding bodies. Public sources of research support tend to reflect the broad political mission of the funding agency, whereas private sources reflect short-term commercial concerns, and philanthropic funding generally tends to cluster around a small number of topics and shift in ways that are seen as capricious and cyclical by recipients.

Science has become extremely politicized. The use of science is mediated and thus possibly distorted by the political goals of potential users. Truth claims are politically suspect because of funding bias or participation exclusion. Science is not pure in the area of sustainable development because scientists' contributions exceed their technical skills. In 1972, Alvin Weinberg (1972) observed that scientists were often asked to provide advice that exceeded their formal disciplinary training.

Science may not be sufficiently simple for the needs of policy makers. Harry Truman is supposed to have complained about his economic advisers who would say 'on the one hand' and 'on the other hand'. Truman said,'Just give me a one-handed economist.'

Science may provide advice that is out of sync with the political plans of decision makers or parliaments, and thus be dismissed. In principle parliamentarians seek to pursue the goals they think the constituency that elected them wants. Thus they will selectively cull advice to find material that will help them to identify what their constituency wants, if there is a dominant constituency on an issue that could potentially unseat them if displeased. Similarly executive branch bodies solicit knowledge. But they are guided by a quest for information that will help pursue either the traditional foreign policy goals of advancing material wealth and power, or the goals that will satisfy their parliamentary oversight committees. Either way the information heard by power is not the same as the truths that scientists think that they are delivering.

I take a late modern view of truth: the domain of science and its ability to confer truth is bounded, but we can talk of better and worse science.[3] In the context of this discussion we can speak of *usable knowledge*. Several different schools of thought exist about usable knowledge, although the core insights are quite similar and complementary. Current research from comparative politics, international relations, policy studies and democratic theory suggests that science remains influential if its expertise and claims are developed behind a politically insulated wall (Botcheva, 2001; Andresen *et al.*, 2000; Social Learning Group, 2001). Moreover efficiency gains from relying on one single source of policy advice are more than offset by the loss of legitimacy, analytic blinkers imposed by relying on just one institutional source

for usable knowledge and the political doubts of bias that are raised by narrowing the source of information. Studies of international environmental assessments and science panels suggest the need for fluid bodies that can bring together multiple sources of information and are not beholden to one single funder or political sponsor (Haas, 2004; Siebenhuner, 2002, 2003; Clark *et al*., forthcoming; Farrell and Jaeger, forthcoming; Jasanoff and Long Martello, forthcoming).

Studies of national level environmental policy processes have convincingly argued against relying on individual institutions for research and policy advice, because they may bias the information flow, and control resources (Skoie, 2001; Brown, 1997). There is a larger volume of national level experiences with establishing standing scientific panels, such as in the US National Academy of Sciences, the EPA Science Advisory Board and the now defunct Office of Technology Assessment, among others. Each is regarded as generating usable knowledge for the government, and enjoyed sufficient autonomy to identify research questions and to convene panels to develop reports. Comparative studies with other countries would be valuable. There are also experiences with ad hoc bodies created to develop usable knowledge for particular issues, such as the German Enquette Commissions for Ozone and Climate Change (Morgan and Peha, 2003; Carnegie Commission, 1992; Smith, 1990, 1992).

I call the relevant body of scientific knowledge 'usable knowledge'.[4] Usable knowledge is accurate information that is of use to politicians and policy makers. It must be accurate and politically tractable for its users. It frequently exceeds the mastery of any individual disciplinary approach. Recent studies of global environmental assessments apply the criteria of credibility, legitimacy and saliency (Siebenhuner, 2002, 2003; Clark *et al*., forthcoming). Credibility means that the key knowledge producers and their consumers believe their product is true. Legitimacy means that the claims are believed to be legitimate, that is, developed through a process that minimizes the potential for bias and is more equitable in terms of participation by those who are dependent upon the information. Finally saliency means that such information is provided in a timely manner and contains information that is useful for public policy making by decision makers: that is, in practice it arrives in conjuncture with the policy process and provides advice that can be converted into laws or decisions by decision makers. In practice credibility and legitimacy are mutually reinforcing, as a procedural approach to developing consensual knowledge is likely to generate both accurate and acceptable knowledge. Yet saliency and credibility may be at odds, as the long time often necessary for developing credible knowledge may interfere with the short-term needs for applying the knowledge to making policy. In practice, then, existing knowledge is

more likely to play a role in usable knowledge than is knowledge being developed concurrently with the policy process.

This articulation of usable knowledge builds on prior efforts to formulate a sense of what kind of technical information is likely to be useful for policy making relating to matters of complexity, and which is also likely to be used by decision makers.

Clark and Majone (1985) offer four criteria of usable knowledge: its adequacy, value, legitimacy and effectiveness. Adequacy relates to including all the relevant knowledge or facts germane to the matter at hand. Value has to do with contributing to further understanding and meaningful policy. Legitimacy relates to its acceptance by others outside the community that developed it. Effectiveness relates to its ability to shape the agenda or advance the state of the debate and, ultimately, to improve the quality of the environment (Social Learning Group, 2001: 15; Clark and Majone, 1985).

The CICERO group (1999: 8) in Oslo applies three requirements for a solution design model to be considered adequate: (a) it must be capable of mobilizing sufficient political support to produce agreement, (b) it must be capable of generating solutions that can be implemented, and (c) it must be capable of generating solutions that are instrumental towards solving the problems for which they were designed. In short, usable knowledge, even, or particularly, when it is expressed in the form of a model, must be seen as accurate, accessible and contribute to the achievement of collective goals. It must represent consensus and be provided through a medium that is politically palatable.

A new consensus is emerging among social scientists who study the use of science in international regimes that a procedural or discursive model of the policy process is normatively superior and is growing in frequency of application, as against the former policy analytic approach associated with cost–benefit analysis and analytic efforts to identify the best policy solution. Policy analysis is a process of exchange and mutual learning between policy makers and policy analysts. Policies themselves are experiments, which participants monitor and about which they reflect in order to improve them over time (Ascher, 1986; Lindner and Peters, 1995; Lee, 1993; Funtowicz and Ravetz, 1991, 2001). Consequently policy making is a process rather than a fixed set of analytic techniques. Language may play a role (Fischer and Forester, 1993; Hajer and Wagenaar, 2003), but the constructivist argument pursued here stresses the political parameters within which debate occurs rather than the connotations generated by the language that is used.

Constructivists argue that under conditions of uncertainty, such as are associated with contemporary globalization and highly technical issues, it is impossible to create, ex ante, sufficient information to follow the policy analytic model. Alternatively the key is to design policy analytic processes

from which actors learn about the world and about each other. This view is anti-rationalist in the sense that the process model entails path dependency and uncertainty assumptions that presume that outcomes, and indeed preferences, are often underspecified or indeterminate, and thus that regimes and political interactions can best be appraised in terms of process rather than outcome. All outcomes will be suboptimal in some sense as compared to the ex post ideal outcome; but one can just hope that by using an open discursive process better outcomes may result (Dryzek, 1997).

Constructivist approaches to policy analysis suggest that science must be developed authoritatively, and then delivered by responsible carriers to politicians. Doctors, scientists and engineers remain the most esteemed professions in Europe, and thus command the greatest social legitimacy and deference when providing policy advice (Ziman, 2000; Jasanoff and Wynne, 1998). The transmission belt of like-minded scientists is called an 'epistemic community' (Haas, 2001a). The more autonomous and independent science is from policy the greater its potential influence (Andresen *et al*., 2000; Botcheva, 2001; Haas, 2001b). Consensus in isolation builds value and integrity, and then its consequences should be discussed publicly. Measures of autonomy and integrity include the selection and funding of scientists by international organizations (IOs) rather than by governments, their recruitment by merit on important panels, and reliance on individuals whose reputation and authority rest on their role as active researchers rather than policy advocates or science administrators. Accuracy can be achieved via peer review, interdisciplinary research teams and independence from sponsoring sources. Increasingly sustainability scientists, themselves an epistemic community, argue for the need to include local knowledge with the more formally technical understanding of traditional disciplinary elites associated with formulating sustainability policies (Haas and Haas, 2002; Jasanoff and Long Martello, forthcoming). However the criteria for participation remain loosely defined, but perhaps no more so than the broad injunctions for multidisciplinary participation that do not clearly identify which disciplines need to be consulted for which types of questions.

Political legitimacy rests on a process of knowledge development and diffusion that is scrupulously free of political interference. International institutions can help foster and disseminate information, and sanitize it so that it is not seen as compromised by potential users who may fear that the information is controlled by one country.

Usable knowledge is developed by international and transnational networks of scientists. It is heeded, to the extent that it is, after widely publicized shocks or crises. While usable knowledge contributes to broader patterns of social learning, the delivery of knowledge and its application are often carried out by different communities. This involves, not reflective learning by

decision makers, but the recognition by decision makers of the limits of their abilities to master new issues and the need to defer or delegate to authoritative actors with a reputation for expertise. In the aggregate, social learning and human betterment emerge when the experts have been able to develop usable knowledge, and the decision makers feel compelled to apply it (see Haas and Haas, 2002).

Let us now discuss the properties of collective action based on usable knowledge, and then conclude with some lessons about how to generate and mobilize usable knowledge. Over the last 30 years there has been a massive surge in the adoption of international treaties and regimes to address many aspects of transboundary and global environmental threats (Tolba and Rummel-Bulska, 1998; Haas, 2001b; Miles *et al*., 2002). When regimes are negotiated with the involvement of epistemic communities and strong international institutions, they develop through a process of 'social learning'. Negotiations occur within a scientific discourse, in which political debate and compromise reflect expert consensus on the behaviour of ecosystems and their ability to sustain stress. The substance of regimes reflects scientific consensus about the most important environmental threats, and negotiated standards reflect consensus about the degree of environmental stress that the target environment can sustain. Social learning generates treaties with differentiated national obligations and substantive commitments, based on expert consensus on causes and environmental effects. For instance, the 1980 Land-Based Sources Protocol for the Mediterranean requires more stringent emission controls on the industrialized countries than on the developing countries, because the magnitude of degradation of the northern coast of the Mediterranean was much more severe than it was on the southern coast (Haas, 1990).

Other regimes developed through social learning include the stratospheric ozone protection regime, the 1979 Geneva Convention on Long-Range Transboundary Air Pollution (LRTAP), and subsequent treaties addressing European acid rain, and pollution control efforts for the Mediterranean, Persian Gulf, South Pacific and South East Pacific.

Maurice Strong, Secretary General of the 1972 UN Conference on the Human Environment and the 1992 UN Conference on Environment and Development as well as the UN Environment Programme's first executive director, helped design the outlines of this process of social learning. Strong believed that 'the policy is the process'; that is, by generating an open political process in which states are exposed to consensual science, government officials may be persuaded to adopt more sustainable policies, and individual scientists may gain heightened political profiles at home which may ultimately increase their effectiveness as well. Most social learning treaties have standing environmental monitoring and research committees to provide timely warnings of new problems, monitor achievements of

regime goals and educate politicians and policy makers on environmental issues.

However social learning takes time. Comprehensive treaties are slower to negotiate than are others, because they require persuasion and consensus rather than mere compromise. From a policy perspective, though, comprehensive regimes are likely to be superior in their ability to protect the environment in a cost-effective and politically acceptable manner. Moreover treaties developed with help from the scientific community typically enter into force more rapidly than those developed without it, presumably because of the weight that involvement of scientists carries in the ratification process. Substantively they are more comprehensive, and attuned to the emergent sustainable development doctrine's sensibility and injunctions. Regimes that were built with usable knowledge appear to be more effective at inducing states to achieve their intended goals of improving environmental quality. For instance, stratospheric ozone and European acid rain efforts are widely hailed as some of the more successful and effective international environmental governance efforts of the modern era (Miles *et al.*, 2002; Andresen *et al.*, 2000; Haas, 2001b).

Epistemic communities often work in conjunction with broader policy networks, functional bureaucrats, transnational scientific organizations, NGOs and international civil servants. A small number of international institutions have supported the development and transmission of usable knowledge. UNEP has played a powerful role in environmental protection over the last 30 years. With a staff of less than 200 professionals and a budget now of the order of $150 million a year, UNEP has led global environmental monitoring efforts, catalysed environmental protection activities in other UN bodies, served as the environmental conscience of the UN system and sponsored the conclusion of dozens of international environmental treaties. The UN Economic Commission for Europe (UNECE) and the International Institute for Applied Systems Analysis (IIASA) helped develop and circulate usable knowledge for the effective management of European acid rain.

Given our 30-year experience of addressing transboundary and global environmental threats, what lessons are available about developing and mobilizing usable knowledge for sustainable development? The following points come to mind.

1. Create standing international interdisciplinary scientific panels or committees to address specific topics.
2. Create subcommittees responsible for different functions of governance, such as basic research, environmental monitoring, policy analysis and policy verification and evaluation.
3. Carefully survey the population of scientists to identify a core group sharing values and causal beliefs. For instance, in the Mediterranean a

UNEP consultant spent nine months visiting national laboratories to inventory national capabilities and to personally build the scientific network.

4. Ensure that networks and international panels have interdisciplinary representation, including the social sciences. Individuals should have high regard in their own disciplines as well as being able to talk to experts from other disciplines.
5. Recruit carefully for national and regional institutions; base judgments on professional credentials and networking ability.
6. Avoid relying on one national institution to provide or sponsor research and training.
7. Provide professional outlets for members through conferences and publications in refereed professional journals. This also elevates the domestic profile of individual scientists in the community of expertise who may then be recruited to fill positions in national administrations.
8. Promote scientific discussions on topics that are likely to lead to consensus, that is, ripe research topics.
9. Avoid government designation of scientists for international meetings.
10. Try to make use of joint international panels for environmental risk assessment rather than relying on national assessments; avoid capture by one scientific discipline or school of expert analysis.
11. Assure the timely submissions of scientific advice in advance of meetings. The timely submission of reports according to the legislative cycle in the major countries is also crucial.
12. Arrange for focused interactions between scientists and policy makers to discuss the technical substance of the issues. For instance, in LRTAP the International Institute for Applied Systems Analysis (IIASA) arranged for two-day sessions to familiarize policy makers with acid rain transfer and deposition models developed by scientists.
13. Maintain momentum within the community by continuing to have projects and research opportunities so those members do not drift away. This avoids having to reconstitute the community each time a new problem emerges.
14. Funding for studies should come from multiple sources in order to avoid budgetary shocks if money is withheld from a principal funder. Thus economically inefficient redundancy is politically warranted.
15. Models should be constructed so that effects are calculated at meaningful political scales; that is, corresponding to significant political divisions that are relevant in developing policy applications. For instance, at the international level this means that models should explicitly identify effects by country and even, if possible, by domestic districts (at least in countries without proportional representation). So far climate change

models have only yielded effects at a scale of resolution sufficient to demonstrate to countries able to vote in the General Assembly that they are likely to suffer, and thus they keep the issue on the international agenda.

16. Train or recruit scientists who have a high profile within their own discipline who are able to communicate effectively with counterparts from other disciplines, as well as with the media, politicians and popular audiences.

Broader considerations of the proper institutional design of science policy entails timing. When consensus has been achieved before an issue reaches the agenda and policy discussions have begun, scientists can merely be introduced as experts, following the above lessons. However at times it is necessary simultaneously to develop scientific consensus and advance policy debates. For such issues, such as was the case in the Mediterranean and ozone regimes, the parallel development of science and policy must be kept insulated from current policy debates, with the two streams united only when consensus has been achieved. In other cases, where consensus remains elusive and policy debates have already attained their own momentum, as in climate change and biodiversity, it may be best if the two activities can be kept as separate as possible.

Examples

Internationally states are increasingly relying on this procedural approach to the development and application of truth to power. The European Commission developed a set of guidelines and proposals for the collection and use of expertise by the commission that is very similar in orientation (Commission of the European Communities, 2002; White Paper on Governance, 2001).

The Intergovernmental Panel on Climate Change (IPCC) is one of the most concerted efforts by the international community to harness usable knowledge for addressing transboundary and global environmental threats (Skodvin, 2000; Agrawala, 1998a, 1998b; Siebenhuner, 2002, 2003). The IPCC was established in 1988 as an international science policy advisory body for global warming, but is widely believed to have also been formed politically in order for governments to reassert control over the science process in an issue which was accelerating on the policy agenda more rapidly than most leaders in the North were comfortable with. Thus the IPCC was the consequence of a General Assembly initiative for a climate change regime, and did not rely on UNEP, as had most previous international environmental regime initiatives. The IPCC consists of three working groups, with members chosen by governments subject to the scientific reputation of the candidates. Working Group One addresses questions of atmospheric science, Working Group

Two assesses social and economic impacts and adaptation measures, and Working Group Three examines mitigation alternatives.

Each working group is administered by a bureau composed of the IPCC Bureau members, working group co-chairs, and vice chairs and a technical advisory unit drawn from the country of the working group's chair, except for the technical support unit (TSU) of the scientific Working Group One, which has always remained in the UK. To date, the IPCC has produced three three-volume assessment reports (1990 with 1992 revisions, 1995 and 2001, with a fourth assessment under way), each with a summary for policy makers, as well as various ad hoc special reports and technical papers. The working groups report to a plenary composed of government delegates who review the summary reports on a line-by-line basis, and also approve the working group assessments and special reports in more block-like fashion. All reports other than the summary reports rely on extensive peer reviews, and the material presented must come from peer-reviewed journals or be in the process of publication in a peer-reviewed journal. The summary reports, which command the greatest publicity and hence public attention, are written by the working group leaders along with the lead authors and specially invited experts (Skodvin, 2000: 108; Swart *et al*., 2002: 155). The bureaus are responsible for drafting an initial table of contents and topics for each chapter. This agenda is then approved by the political plenary of the IPCC. The reports are drafted by the scientific committees, and are then approved subject to careful scrutiny by government representatives on the plenary.

Thus governments have striven to exercise control over the scientific process, while also allowing for some degree of scientific latitude in order to generate accurate advice, even if the process is designed in such a way that the advice is unlikely to be particularly salient. Governments appoint the IPCC chair, and in 2002 the USA vetoed the appointment of Robert Watson, a well-regarded American candidate, in favour of an Indian, based on the belief that Watson was too independent of the US administration. Politically charged language in the Third Assessment Report (2001) was criticized by the US government for containing language which the USA claimed was stronger than had been approved by the plenary, although the authors were able subsequently to prove that their draft was consistent with the IPCC's rules of procedure (Seibenhuner, 2002: 417).

The IPCC is of interest because it highlights the way in which states may choose to shape the science advisory process. All individuals are nominated and chosen by governments, although there is little evidence of direct government manipulation in recruitment or the inclusion of material. The procedures are carefully designed to maximize the seeming procedural scientific legitimacy and accuracy of the work, by stressing peer review and reliance on peer-reviewed material. Yet the IPCC does not enjoy a high degree of legitimacy

in the eyes of many science policy consumers (Biermann, 2002). It suffers from the appearance of governmental control, because governments appoint the scientists and also vote on the reports. The distribution of scientific participants comes overwhelmingly from the North, despite the best efforts of the bureaus to increase participation from developing countries since the release of the First Assessment Report (ibid.).

Table 24.1 shows the crude national breakdown of scientific involvement in the Third Assessment Report by country of origin of the scientific participants. The IPCC is limited in its legitimacy through its seeming lack of equity in participation. While the IPCC has helped pay for the participation of scientists from developing countries, it faces the deeper structural science policy issue that the overwhelming majority of climate change research is conducted in the North by Northern scientists. Its saliency is particularly poor. For one thing it has been unable to develop policy advice that resonates domestically in any of the major countries. To date the scientific work has narrowed the range of likely warming that will occur by 2100, and generated scenarios of what the global environmental consequences may be of such effects. However the scenarios are so crude as not to engage any significant political interests in any of the member countries, other than reinforcing the prior knowledge of Egypt, Bangladesh and the small island countries that they may well be submerged. Thus the political effect of the new knowledge is only adequate for the aggrieved parties to continue to keep the issue on the General Assembly agenda, where they have sufficient votes, but not to influence

Table 24.1 Third assessment report: distribution of nationality of scientific participants

Nationality	WG 1 lead authors (98)	WG 1 contributing authors (708)	WG 2 authors and expert reviewers (626)	WG 3 authors and reviewers (22)	Synthesis report authors and expert reviewers (375)
Industrialized countries	80%	97%	79%	75%	81%
Developing countries	20%	3%	21%	25%	18%
Technical support unit	UK		USA	Netherlands	

Note: Industrialized and developing country categories follow the accounting scheme of the *2003 Human Development Report.*

Source: www.ipcc.ch, accessed January 2004.

directly policy outcomes. In fact the Kyoto Protocol's death is in large part due to the fact that the USA has not found any of the advice sufficiently salient, and that Russia may even have found it sufficient to justify noncompliance thanks to benefits that would accrue from climate change.

The Assessment Reports' publication did not fit in well with the negotiating cycle of the Kyoto Protocol and the efforts to follow up the 1992 UN Framework Convention on Climate Change. A few of the special reports, such as the 2000 Report on Land Use, Land Use Changes and Forestry, corresponded with meetings of the Conference of the Parties, and thus were able to provide a timely submission of scientific policy advice to the actual negotiators. Otherwise though, the reports have not coincided closely with the negotiation process, so they have had little impact other than periodically reminding mass publics of the potential severity of global warming.

In short, the IPCC is designed to keep science on a tight leash and, not surprisingly, IPCC scientists have been unable to exercise sufficient discretion to develop more politically tractable advice, although, to be fair, this may also have to do with the relative complexity of the scientific undertaking, the modelling limitations and the limits in scientific knowledge about global carbon processes. Nonetheless it is striking that a subject that has commanded the majority of international diplomatic and financial resources for environmental research and cooperation for the last decade has failed to advance the knowledge base to a state where it can significantly inform policy. Few governments outside the EU have proved willing to make national decisions based on this collective enterprise.

The limits of the IPCC's ability to speak truth to power may well be easily explained through recourse to principal–agent theory.[5] While in general constructivists are reluctant to rely on the rationalist assumptions of theories such as this, in the particular issue of global warming the material incentives to the principals are so clear that the principal–agent theory's rationality assumptions are warranted. It is only in cases with greater uncertainty about material national interests and national effects from environmental harm that more constructivist approaches are warranted, although some dimensions of the global warming issue are subject to fruitful constructivist analysis (see Miller and Edwards, 2001; Jasanoff and Long Martello, forthcoming).

The principals here are the governments of the industrialized countries. In 1988, they were tired of being lambasted by the UNEP in multilateral environmental negotiations, and were concerned that uncontrolled scientific panels might give rise to policies that they did not deem warranted. The 1988 Toronto conference, convened by non-state actors, had called for 20 per cent reductions in greenhouse gas emissions and had the effect of warning foreign ministry officials of the political threats posed by non-state actors' potential control of the climate change agenda. The recent lesson of

the powerful influence of the Ozone Trends Panel on the rapid conclusion of the Montreal Ozone Protocol was also fresh in the minds of foreign ministries. Moreover the short-term costs of addressing the problem for the industrialized countries (or even, one could say, the net discounted value of efforts for mitigation adaptation), appeared prohibitive so that they wished to rein in any independent political pressure that would be generated from an organized scientific involvement in collective discussions on climate change. The agents in this regard are scientists, who were recruited and organized through the IPCC in a way that ensured that governments would be able to exercise maximum control over individuals, as well as to shape the agendas. Admittedly, by relying on extensive peer review, some degree of control was lost, but at the end of the day governments appoint the individuals and the reports are approved on a line-by-line basis by foreign ministry officials. Thus the principals establish and enforce the parameters within which the agents have to act, ensuring cautious outcomes by the agents.

But the IPCC is an extreme case. It is extreme in terms of the clarity with which the powerful industrialized countries recognized their material interests in the matter, and it is extreme in terms of the widespread transformations in industrial and individual behaviours that effective preventive policies were presumed to entail. Most other environmental and sustainable development issues do not share these characteristics and hence there is greater potential for governments to create more legitimate and porous scientific processes to guide their policy work. A major research challenge facing analysts of international institutions is to better understand the conditions under which international institutions are established by member countries that are able to operate with discretion and independently of the direct wishes of the member states. What motivations exist for states to create international institutions that are able to exercise discretionary action independently of the wishes of the states that created them?

The future of effective scientific policy advice may also suffer from declining public faith in science as an institution that can contribute to public welfare. This is an increasingly common theme in the public discussions of science use in the USA and in Europe, and leads public officials to become disillusioned with the technical and political utility of relying on science following a decline in trust in scientists (Topf, 1993: 109). To some extent the greater the anthropological accumulation of research on the seemingly random way in which individual discoveries are made, the less there is public support for reliance on science, even in the realm of highly technical and complex issues of public policy.

Conclusion

Thirty years of speaking truth to power has yielded some beneficial outcomes. This chapter has tried to outline the form and process by which organized science – usable knowledge – may be generated and applied to the management of transboundary and global environmental threats. While it only occurs infrequently, when it does it leads to distinctive and desirable outcomes. Carefully constructed institutions that provide for the generation and diffusion of usable knowledge contribute to more effective management of transboundary and global environmental risks.

It is widely recognized that the environment is of paramount concern in international relations, and that good science is necessary for improving environmental quality. Indeed the renowned Harvard biologist E.O. Wilson (2000) has proclaimed the 21st century to be the age of the environment. Al Gore in the mid-1990s asserted the need for confident science on which to rest environmental policy. Sometimes power listens. Dramatic transformation occurred over the last 30 years in the understanding of the behaviour of natural ecosystems and their impact on human life (or, as is widely stated on American National Public Radio, the value of healthy ecosystems for human life). There now exist far more extensive legal commitments on environmental protection than ever existed before, and most areas of human activity in most countries of the world are now regulated as a consequence, even with recent American backsliding. Markets exist for green technologies that were never there before. These markets were created to respond to the demand created through political will on behalf of sustainable development. This would never have happened without developments in scientific understanding and concerted efforts to apply it to international regime creation through the actions of epistemic community members and sympathetic international institutions.

Notes

* Much of this paper was originally presented as a keynote address to the Workshop on Sustainability Impact Assessment of Trade Agreements and New Approaches to Governance, 28 March 2003. My thanks to Rebecca Root for research assistance on the IPCC, and to Bernd Siebenhuner for comments on my interpretation of the IPCC at the Université Catholique de Louvain-la-Neuve Workshop on Science, Legitimacy and the IPCC, Louvain-la-Neuve, 8 November 2003. Much of this text was published as Haas, Peter M. (2004), 'When does power listen to truth? A constructivist approach to the policy process', *Journal of European Public Policy*, **11** (4) (August), 569–92.

1. For a recent summary of arguments about science policy and an argument for a pragmatic procedural approach to generating scientific knowledge for public policy, see Ziman (2000).
2. For international institutions, see Koremenos et al. (2001); for domestic, see Moe (1987).
3. For an application to the study of international institutions, see Haas and Haas (2002).
4. See Clark (1990) for an earlier and slightly different usage. Dimitrov (2003) also has a slightly different usage.

5. See Guston (1996) for an effort to capture science policy issues more generally within a principal–agent framework.

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25 Knowledge and global environmental policy

Marc Williams

In modern, technological society knowledge is a prized asset. Knowledge has a number of dimensions and includes instruction, learning, information and authorized belief. The possession of knowledge provides its holders with the skills to enhance their material well-being. At base knowledge is concerned with the production of truth and with accurate representations of reality. The importance of knowledge in environmental policy making arises from a number of sources.

It is widely accepted that modern global environmental challenges are characterized by uncertainty, irreversibility and uniqueness or nonsubstitutability (Pearce, 1990: 366). And it is the first of these three features that directs attention to the role of knowledge in environmental policy making. Whether we are concerned with greenhouse gases and global warming, biodiversity, hazardous and toxic wastes, desertification, the hole in the ozone layer or the impact of acid rain, the role of knowledge becomes an important consideration. There are, of course, many factors that account for the success or failure of international efforts to halt or reverse environmental decline, but it is widely accepted that knowledge plays an important role in the policy process. Furthermore debates in society about how to respond to environmental degradation – for example, what forms of conservation or preservation are required – are shaped by conceptions of knowledge. In the absence of a single truth about the human/nature interface (Pepper, 1996) competing conceptions abound concerning appropriate policy responses.

Although knowledge is not the sole factor determining environmental policy, it is, as will be demonstrated below, an important aspect of environmental governance. This chapter will therefore examine the role of knowledge in global environmental politics. I argue that knowledge can be seen to have an impact on global environmental governance in two ways. First, knowledge is an important component in the framing or construction of problems. Secondly, knowledge is crucial in determining solutions to the problems uncovered.

Ideas, interests and knowledge

Environmental policy making is dependent on reliable and accurate information. In the absence of empirical knowledge, theoretical analysis and appropriate methodologies, decision makers would be incapable of making decisions concerning complex problems. However policy making should not

be conceived solely in terms of problem solving, with knowledge perceived as an objective and neutral input into the decisional process. Instead knowledge should be seen as an integral structure of world politics (Paterson, 2000: 40). In this sense knowledge is not only an input but also a set of conditions that enables some actions and curtails others. This section, therefore, examines the intersection of power and knowledge in the making of environmental policy.

Knowledge as discursive power

The standard approach to environmental policy making is to present the approach as one in which the application of scientific or economic analysis will reveal uncontested truths. Knowledge represents scientific certainty, and comprises testable propositions. This approach to the impact of science is mirrored in studies of the role of ideas in politics. In their discussion of ideas in international relations, Goldstein and Keohane (1993) distinguish between causal beliefs, principled beliefs and worldviews. Causal beliefs refer to the derivation of causation between variables; principled beliefs refer to a normative commitment to specific policies; and worldviews refer to an overall theoretical (or ideological) position. From this perspective, international organizations and national governments change their approach to problems in the light of new evidence.

But this separation neglects the linkages between the three components and disavows the role of ideology in the construction of knowledge. As a result such arguments omit the contestation surrounding environmental policy making. It is assumed that new (good) ideas will drive out bad (old) ideas. The political sociology of this transformation is never made explicit. However, since the publication of Thomas Kuhn's ([1962]1970) *The Structure of Scientific Revolutions* it has been widely accepted that science does not follow this simple path. Nevertheless, despite awareness of the work of Kuhn and others, the model presented in the dominant political science literature is one of a logic of discovery (Woods, 1995: 167). As Woods (168) correctly observes, 'the problem with the "logic of discovery" answer is that it assumes that ideas change when new, better ideas are discovered. This offers no explanation for theories that have been around a long time and which suddenly come into fashion (such as neo-liberal ideas)'. Furthermore it does not explain why, despite similar circumstances, public authorities may opt for different ideas.

Instead of maintaining this separation between knowledge and power, some analysts emphasize the interrelation of power, knowledge and interests through a focus on the concept of discourse. Discourses constitute ways of specifying knowledge and truth. In other words, knowledge is institutionalized through the creation of discourse, a 'conceptual terrain in which

knowledge is formed and produced' (Foucault, 1981: 48). The rules and practices surrounding discourse delimit and define the legitimate mode of thought and perception of the thinker; one therefore cannot think outside a limited field of knowledge. Thus external forms of knowledge are dominated by being excluded. In short, 'to know involves acts of power' (Hobart, 1993: 9). Discourse determines ways of doing things through which the real is given shape by those who conceptualize and manage it. Within environmental policy making neoclassical economics has assumed a privileged position. The discursive power of neoclassical economics in environmental policy is evident in discussions on the relationship between trade and the environment.

Framing the relationship between trade and the environment: the discursive power of neoclassical economics

Conflict over the role of knowledge is a constitutive practice of the trade–environment debate. In other words, knowledge is internal and not external to the construction, development and resolution of the trade–environment debate. The ways in which trade and environment issues are currently constructed and negotiated reflect a specific global distribution of power, and central to this distribution of power is a global knowledge structure. Within this structure a dominant perspective has emerged. At the outset of the trade–environment debate two broad positions were discernible, based upon conflicting interpretations of the impact of the liberal trading system on environmental degradation, the potential of market-based solutions for environmental degradation and commitment to continued economic growth (Williams, 1993): a dominant position in support of liberal trade and an environmentalist approach.

The immense task faced by those who challenge the prevailing orthodoxy has been concisely summarized by David Pearce (1991). He argues that the environmentalist case must pass three tests before trade can be restricted for environmental reasons. First, environmentalists need to show that free trade, rather than some other factor, does in fact cause degradation and, furthermore, that the loss in welfare resulting from environmental degradation is greater than that which would result from trade restriction. Second, environmentalists need to provide a convincing defence for the imposition of extraterritoriality. That is, import of a good should not be restricted because of the environmental damage caused in its production, unless it can be shown that importers lose something through the production process, thus making it a legitimate concern of the authorities and traders in the importing country. Third, environmentalists need to show that the most effective means of changing the production process giving rise to the externality is through resort to trade controls. In regard to the first test, since it is not possible at present to calculate the monetary values of environmental losses from trade, environmentalists can exaggerate the damage accruing from trade. The second test

raises political issues surrounding the exercise of sovereignty. Where producers damage global heritage the solution should be through existing multilateral treaties rather than resorting to unilateral action. Pearce concludes that the environmentalists' case is weak with regard to the third test because trade restrictions may not be the least cost policy.

Pearce establishes clearly the dominant orthodoxy's conception of legitimate knowledge. He creates an 'objective' set of tests for challengers to the dominant orthodoxy and implicitly accepts the parameters of neoclassical economics as normal science. He assumes that, in the absence of politically inspired and state-imposed barriers, trade would function freely and to the common good through the operation of market forces. That this construction of free trade is itself an historically specific, normative proposition is not acknowledged. Economic theory and practice reproduce the separation of nature and society, and are incapable of asking critical questions about the organization of the international economy and world trade. The emergence and development of international trade cannot be understood solely through an examination of trade itself since trade is located within certain material and ideational structures. In other words, our understanding of environmental degradation and trade is constrained by the generation of particular hegemonic discourses within power/knowledge structures. The theorization of environmental degradation and trade is based on a specific set of economic theories, and reflect a distinct set of practices. Within the debate on trade and environment, neoclassical economics occupies a privileged place. Indeed neoclassical economics functions in a hegemonic fashion, circumscribing meanings and actions and privileging certain kinds of knowledge.

Science, (un)certainty and environmental policy

Uncertainty is a central feature of environmental crises and policy is formed in the context of uncertainty (Bryner, 1997: 306–7). The existence of uncertainty highlights the importance of science and knowledge as the basis for sound policy. In the absence of the best available knowledge, policies promoting sustainable development are likely to fail. Moreover a widening knowledge base is likely to enhance cooperation through the identification of common interests.

Within approaches to environmental politics scientific reasoning has been afforded a central role (Andresen and Østreng, 1989) because science has the potential to remove uncertainty. Discussion of the role of knowledge is normally related to the natural and physical sciences since it is science that typically alerts us to the existence of a problem. Indeed, while some environmental crises are easily visible, others are not. It is only through science that we can know the extent of pollution or whether certain chemicals are harmful or not. Thus scientific research has been central to the identification of

ecological problems. In short we would not know whether an environmental problem exists or not in the absence of scientific research. But caution should be observed in making a simple connection between knowledge and policy since in many cases the scientific evidence of environmental degradation may exist for some time before the issue becomes a political problem. Munton (2002) has shown how, despite considerable evidence of forest damage in Ontario caused by sulphur fumes, this resulted in governmental inaction rather than the construction of an environmentally sustainable response

The information provided by natural science is not only crucial in framing and constructing global environmental problems. Science also has an important role to play in seeking solutions to environmental crises. Environmental degradation arises from complex linkages and processes defining the relationship between humans and the natural environment. The causes of environmental degradation are not self-evident and neither are the solutions. Given the transboundary nature of many environmental problems, solutions cannot be found solely at the national level. Science has a crucial role to play in fostering international cooperation among competing national interests. It has been argued that 'New scientific knowledge about the physical and ecological processes of the earth has been an especially important factor in motivating cooperation among nations to solve problems such as species extinction, stratospheric ozone depletion, and global warming' (Vig, 1999: 5).

The impact of science stems from its acceptance as an impartial, objective enterprise. Science is highly prized because objectivity and truth are key goals of the scientific enterprise. Nevertheless, despite these claims to universality, objectivity and impartiality, the application of scientific knowledge to environmental problems remains a contested, controversial and conflictual enterprise. On one hand, science can provide the knowledge that enables publics and decision makers to overcome uncertainty. On the other hand, the authority of science has frequently been called into question. Recently publics in many Western countries appear to have lost their faith in the reliability and infallibility of science. For example, in Western Europe, health scares surrounding bovine spongiform encephalopathy in cattle has had an impact beyond the immediate health issue. Moreover, science is a social activity and, although the scientific method may aim at objectivity, the uses to which science can be put engenders conflict. Scientists have an interpretive flexibility in the construction of knowledge and experts can be found supporting very different conclusions. Furthermore, the importance of science in determining outcomes varies from case to case.

While it is widely agreed that major scientific efforts are needed to identify the scale of problems and to provide solutions to environmental degradation, no consensus exists on the role of science in facilitating international agreement. To some extent this is because science is important for three aspects

related to policy formulation. Science is not a single variable. It can be disaggregated into three components: '(1) knowledge about the extent of the problem, (2) knowledge about the causes of the problem, and (3) knowledge about its consequences' (Dimitrov, 2003: 128). Thus knowledge about the extent, causes and consequences of environmental degradation is not uniform. In some circumstances there may be agreement concerning the extent of a problem but none on the causes or consequences. Similarly, although the consequences may be apparent, this does not guarantee agreement concerning their extent or the causal processes accounting for the problem. In other words, scientists may be in a position to demonstrate the extent of pollution without successfully establishing the causes of pollution.

Two case studies will be used to highlight the complex relationship between uncertainty, science and policy making. The first case concerns the formation of an international regime for stratospheric ozone. It shows the possibility of constructing new governing arrangements in the face of uncertainty. But it is also a case in which there are conflicting interpretations of the role of science in facilitating this outcome. The second case concerns the dispute over genetically modified crops. It shows how, in the face of contested knowledge, some groups and governments support the precautionary principle and others contend that special interests are disregarding scientific expertise.

Regime formation in the absence of consensual knowledge

The conventional wisdom suggests that science through consensual knowledge is likely to help states to create binding multilateral agreements. But the proposition that some degree of scientific consensus is necessary before successful efforts at international cooperation can be concluded is not borne out by case studies (Dimitrov, 2003: 123). This result suggests that the relationship between expert, scientific knowledge and environmental policy making is an extremely complex one. The case of regime formation to protect the stratospheric ozone layer has given rise to conflicting interpretations of the impact of science on the outcome.

The ozone regime consists of the Vienna Convention for the Protection of the Ozone Layer (1985), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987) and four amendments to the Montreal Protocol. Ozone depletion was the first truly global environmental crisis to be the subject of a successful negotiated outcome. Negotiations on ozone depletion are generally regarded as signalling a triumph for science and also as providing a model on how to proceed in the absence of scientific uncertainty. The framework convention approach allows negotiators to make agreement cognizant of existing scientific consensus but which can be modified later to take account of new scientific developments.

The fact that the regime for the protection of the ozone layer has followed this stage-by-stage approach suggests that increased cooperation between states has depended on improved knowledge. The view that science and scientists played an important role in the creation of a regime to protect the stratospheric ozone layer is well supported in the literature (Benedick, 1991; Dimitrov, 2003: 129–34; Haas, 1992b). These analysts emphasize different aspects, but reliable scientific knowledge is consistently a key explanatory variable. As the chief American negotiator of the Montreal Protocol has argued, 'the Montreal Protocol was the result of research at the frontiers of science combined with a unique collaboration between scientists and policymakers' (Benedick, 1991: 9). The relationship between ozone science and ozone negotiations can be briefly sketched through an historical account of the background to the Montreal Protocol.

While fluctuations in the levels of the ozone in the atmosphere are standard, by the 1960s concern was expressed that human activity was having a negative impact on the ozone layer. By the mid-1970s there was heightened scientific interest in the impact of human activity on the stratospheric ozone layer. In the 1970s, four types of human activity were perceived as harmful to the ozone layer: nuclear weapons, supersonic transport, mass consumption and agriculture (Kemp, 1990: 123–30; Rowlands, 1995: 43–52). Initially most attention was given to the impact of supersonic aircraft. The first report linking mass consumption came in 1974 when Mario Molina and Sherwood Rowland, in an article in the June edition of *Nature*, argued that chlorofluorocarbons (CFCs) were responsible for the depletion of stratospheric ozone through the release of chlorine into the atmosphere. Molina and Rowland's research findings were catalytic in stimulating national and international interest. They sparked a series of national initiatives and international discussions over the next decade, culminating in the Vienna Convention for the Protection of the Ozone Layer in March 1985.

The Vienna Convention for the Protection of the Ozone Layer was agreed to at a time when there was still considerable controversy concerning the loss of ozone in the atmosphere and the causes of ozone depletion. Indeed a combination of uncertainty and diminished concern were key features of the process in the late 1970s and early 1980s (Rowlands, 1995: 52–5). Moreover it was accompanied by disputes over the findings. Industry representatives challenged the scientific findings (Kemp, 1990: 130). The head of the Environmental Protection Agency in the USA called for further scientific investigation (Rowlands, 1995: 53). The Vienna Convention reflected the state of knowledge at the time. It was a framework agreement that did not halt or reverse ozone depletion since no consensus existed on either the extent of the problem or the causes of the problem. Nevertheless some action was taken and a basis was laid for further international cooperation.

Science was instrumental in shifting international action from the Vienna Convention to the Montreal Protocol. In May 1985, two months after the Vienna Convention was opened for signature, an article published in *Nature* by the British Antarctic Survey team revealed the existence of a hole in the ozone layer above the Antarctic. They reported an alarming and unprecedented drop (over 40 per cent) in ozone levels during the spring. This evidence was startling because it did not conform to the results and predictions of scientific tests and modelling. Confirmation of these results was soon forthcoming and a new phase of scientific activity was set in motion. The significance of the discovery of the ozone hole is contested. On one hand, some writers evince scepticism concerning the extent to which the Antarctic 'hole' influenced the negotiating process (Benedick, 1991: 18–20; Dimitrov, 2003: 131). On the other hand, it has been claimed that 'the ozone hole created a sense of crisis that was conducive to the precautionary approach eventually sanctioned in the Montreal Protocol' (Litfin, 1994: 97). If the evidence of the Antarctic ozone hole was not significant in influencing the negotiations, nevertheless 'science became the driving force behind ozone policy. The formation of a commonly accepted body of data and analyses and the narrowing of ranges of uncertainty were prerequisites to a political solution among negotiating parties initially far apart' (Benedick, 1991: 204). The Montreal Protocol on Substances that Deplete the Ozone Layer (1987) went further than the Vienna Convention, which had been limited to the enunciation of general principles. It proposed a 50 per cent cut in certain CFCs by 1999, and a freezing on halons at 1986 levels by the end of 1992. The Montreal Protocol explicitly included the provision for treaty revision in the light of new knowledge, and subsequent amendments – the London Amendment to the Montreal Protocol (1990), the Copenhagen Amendment to the Montreal Protocol (1992), the Montreal Amendment to the Montreal Protocol (1997) and the Beijing Amendment to the Montreal Protocol (1999) – have reflected the development of scientific knowledge.

While the role of science in the ozone negotiations is certainly important, it is not necessarily determining, since the science was mediated through political and discursive processes. First, because the science was uncertain it was not always persuasive. Consensus on the consequences of depletion was not replicated in relation to the extent of depletion or the causes of depletion. This led to conflicting positions for most of the negotiations between the USA and the European Community. Furthermore, in the absence of agreement on the causes of ozone depletion, there could be no consensus on the solutions required. The positions of the developing countries were influenced by this uncertainty and the insistence of more advanced, populous developing states, such as China and India, on technology transfers and financial aid reflected doubts about the status of the knowledge. Secondly, 'the science

was framed and interpreted by a group of knowledge brokers with strong ecological beliefs who were associated with UNEP and the US Environment Protection Agency' (Litfin, 1994: 10). That is, the ability to persuade industry groups and countries to change their positions was the outcome of a political process in which institutional actors played an important role. Third, Litfin (ibid.: 116) argues that the impact of the science has to be understood in the context of other discursive factors mediating scientific knowledge. She contends that the discovery of the Antarctic ozone hole was important in this context because it changed the perception of risk.

Biotechnology and the environment: the battle for consensual knowledge

Different national authorities have taken contrasting positions concerning the regulation of genetically modified (GM) food. Antithetical positions have been developed, for example, in Europe and the United States. Disputed knowledge claims have been at the centre of a transatlantic conflict and bitter trade dispute (Levidow and Carr, 2000). In the absence of consensual science competing claims abound, and public policy making becomes even more difficult in the face of scientific uncertainty and competing knowledge claims. Conflict over the role of knowledge has been a constitutive feature of the debate on biotechnology. In other words, knowledge is internal and not external to the construction, development and resolution of the debates over the benefits and dangers of biotechnology. Proponents of the application of genetically modified organisms (GMOs) to agriculture express confidence in the available scientific evidence. Opponents argue that, in the context of uncertainty, the precautionary principle should be applied. The dispute between supporters of GMOs and opponents should not be constructed as one between objective science and unnecessary caution. Both positions contain values.

These two contrasting views can be termed the regulatory approach and the precautionary approach. The regulatory perspective and the precautionary perspective adopt radically different postures concerning the impact of biotechnology on the environment. The regulatory approach claims that biotechnology is a vital tool for the promotion of sustainable development and that its impact on the environment is positive, whereas critics from the precautionary perspective argue that negative impacts on the farm and hinterland environments have occurred and will likely increase in the future. The debate has been framed around three issues: the impact of transgenic biotechnology products on ecosystems; the dangers arising from genetically modified organisms escaping into the environment; and the impact of biotechnology on farm efficiency.

Advocates of the precautionary principle argue that the release of a single novel protein into the soil microbiological community is likely to have an

adverse effect on soil function. From a regulatory perspective this is seen as unlikely, since GM organisms are finely modified forms of existing ones. Given the existence of established procedures for their use it is unlikely that harmful effects on the soil will remain undetected before preventative measures can be put in place.

Critics of the use of gene technology in agriculture contend that transgenes will escape from agriculture, with serious environmental consequences (Coleman and Gabler, 2002: 482). They claim that GM crops will become invasive. This will result in the development of more aggressive weedy types. The resulting superweeds will, it is claimed, reduce crop yields and cause serious disruptions to natural ecosystems and losses in biodiversity. Supporters of the use of gene technology dismiss these claims and argue that superweeds are a fairly remote likelihood. While the possibility of outcrossing from domesticated GM crops to weedy and indigenous wild relatives remains a possibility, proponents claim that the frequency of such events will be extremely low. Furthermore very few domesticated plants naturalize, and almost none are weeds in natural ecosystems. They argue that it is difficult to see how the traits that are currently being introduced into genetically modified organisms will improve their fitness in ways that allow these plants to pose a threat to the environment. Moreover these writers have faith that regulatory authorities will construct guidelines to prevent the untrammelled spread of genetically modified organisms.

The regulatory perspective emphasizes the contribution biotechnology makes to environmentally sustainable development through promoting more efficient farming practices, higher yields and increased food security. As George Khachatourians (2001: 13) says, 'genetic engineering promises to make important contributions making agriculture environmentally sustainable and providing food security'. From this perspective biotechnology promotes environmentally sustainable production through a reduction in the application of chemicals to the soil in the form of pesticides and herbicides, a resource saving by decreasing water usage, a lessening of soil erosion and gas emissions, and improvement in the productivity of marginal cropland. The biotech industry promotes research whose conclusions support this line of argument. The benefits of biotechnology extend beyond more sustainable farming practices to an improved yield per acre, thus increasing the world's food supply and thus making a direct contribution to food security. Given the rising food demands of an increasing world population, biotechnology will promote food security through achieving higher yields and improving the use of marginal agricultural land.

The regulatory view is shared by governments, international organizations and biotech companies. The Food and Agriculture Organization (FAO) and the World Health Organization (WHO) promote the use of gene technology

in agriculture. The FAO's director-general has claimed 'Biotechnology and genetically modified organisms (GMOs) can help to increase the supply, diversity and quality of food products and reduce costs of production and environmental degradation' (FAO, 2001). While proponents emphasize the potential beneficial impact of biotechnology on productive efficiency through its impact on land, water and plants, critics maintain that biotechnology is environmentally harmful, contributing to unsustainable and damaging practices. For example, Ann Clark (no date) contends that transgenic solutions are more expensive than conventional farming methods. She argues that genetically engineered crops do not produce higher yields, and indeed her study of Bt corn production in the USA points to lower yields. She further argues that the claim that pesticide use will be less fails to recognize the development of pest resistance: that is, insects, diseases and weeds will evolve resistance to the new strains.

Actors, knowledge and environmental negotiations

Effective participation in global environmental politics is dependent on possession of specialized knowledge available only to a small section of the world's elite. Multilateral environmental discussions are complex and complicated and require specialized scientific, economic and legal knowledge. The ability of groups to participate in an effective manner in negotiations on environmental issues is dependent on possession of such knowledge. The main actors in global environmental politics – governments, firms and nongovernmental organizations (NGOs) – support their positions through a claim of legitimate knowledge. Clearly not all actors in global environmental politics have the same access to knowledge. Access to and control over knowledge resources is a function of financial resources and legitimacy. In the search for reliable knowledge some groups and institutions are more privileged than others, either because they control finances or because they have legitimate authority

The framing of environmental issues and the search for solutions are dependent on access to finance. In the absence of well-funded research it is possible that a country or group may be unaware of environmental harm. The trade in toxic or hazardous wastes provides a pertinent example of the link between issue prominence and knowledge (Clapp, 1994, 1998). The research necessary to undertake an extensive study of environmental issues is a large-scale enterprise. Even before issues such as the allocation of funds to specific projects are undertaken a budget has to be agreed. The costs of knowledge retrieval and storage give an advantage to wealthy states. It is only the most advanced economic powers that have the capacity to engage in pioneering research across the board. OECD states have large scientific, economic and legal establishments. It has been found that national capacity

is also linked to the ability of governments to participate actively in international scientific networks (Biermann, 2002). The differential access to knowledge of OECD states and developing countries has a definite impact on international negotiations.

Who has legitimate knowledge? Indeed what is accepted as legitimate knowledge? These questions are difficult to answer but it is clear that not all perspectives are granted the same degree of legitimacy. The ability of an actor to secure legitimacy for their expertise is an important resource. Given their position in the political system it is usually accepted that governments possess legitimate knowledge. However a government can forfeit the trust of its citizens. Furthermore, science itself and rational enquiry can come under scrutiny in the light of environmental disasters. Although many NGOs lack large financial resources, they have managed to be accepted as holders of legitimate knowledge. The ability of NGOs to represent themselves as disinterested 'friends of the environment' has helped to secure legitimation for the knowledge claims they make.

Epistemic communities

A positive view of the way in which those in possession of scientific knowledge can influence policy making has been developed by theorists who emphasize the importance of epistemic communities (Haas, 1990). An epistemic community has been defined as 'a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area' (Haas, 1992a: 3). These transnational knowledge-based communities link scientists and policy makers together and, it has been argued, play decisive roles in the creation of environmental regimes through dissemination of research findings. Members of an epistemic community are held together by their 'shared belief or faith in the verity and the applicability of particular forms of knowledge or specific truths' (ibid.). Thus members of an epistemic community articulate conceptions of a problem and propose solutions in keeping with the science and not the political interests of the state and other actors. In this sense epistemic communities are real knowledge brokers who can make a significant difference to the formation of international regimes. Epistemic communities exercise power and influence in regime formation.

Sceptics point out that 'scientific communities are not necessarily consensual or impartial. Tensions and conflicts occur within epistemic communities' (Hurrell and Kingsbury, 1992: 19). Moreover, others claim that, while scientists may possess relevant information, their prime interest is in securing continued funding (Boehmer-Christiansen, 1996). Thus the policy outcome reflects the nature of social institutions, values and power rather than the activities of an epistemic community. It is also possible to distinguish

between an epistemic community comprising scientists with reliable information and one in which the knowledge claims remain subject to critique and contestation.

Policy makers often rely on information and expert advice. In environmental policy making, given the high levels of uncertainty, decision makers frequently turn to experts for assistance. Knowledge is transmitted from the laboratory, field station or office via the input of scientists. While the image of the individual scientist making brilliant discoveries still dominates much public perception, science today is usually a group rather than an individual exercise and it is the influence of group science that is important to study. To what extent do scientists determine outcomes of policy processes? And is the possession of prized knowledge the key to influencing policy? No single answer exists to these questions and indeed the history of cooperation on global environmental problems suggests that the process is a highly ambiguous and complex one. The dissemination of knowledge and the influence of knowledge brokers varies according to a number of factors.

Conclusion

Knowledge is crucial for a holistic understanding of global environmental policy making. In the first instance, the framing of an issue as an environmental problem is dependent on knowledge. As the chapter has argued, scientific information is not objective. Knowledge is socially constructed. Because knowledge is a social construction we need to look at the way knowledge is framed. In examining knowledge and global environmental policy it is important to look at competing knowledge claims, the engagement between competing perspectives, and the differential access to knowledge by the diverse participants. In this sense knowledge is internal to the construction of environmental issues.

Secondly, uncertainty over knowledge claims features prominently in international policy making on the environment. Because policy makers are dealing with uncertainty, knowledge is important in trying to find solutions to problems. But the chapter has also argued that no simple relationship exists between uncertainty and knowledge. If the relatively successful conclusion of ozone negotiations is suggestive of the varied ways in which science moves from uncertainty to certainty, from absence of consensus to shared knowledge, the politics of climate change presents an arena in which the absence of consensual knowledge has continued to prevent the adoption of a treaty that garners universal support.

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26 Vulnerability analysis and environmental governance

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Global change science is as much about understanding the biosphere as it is about working out the practices and norms of environmental governance (Jasanoff, 1999; Hajer, 1995; Takacs, 1996; Miller and Edwards, 2001). The very notion that a global environment exists and should and can be managed via transnational cooperation is buttressed by numerous scientific contributions and claims (Beck [1986] 1992; Taylor, 1997). The view of our planet as captured by the Apollo astronauts is widely credited with revealing the fragility and interconnectedness of 'spaceship Earth' and thereby providing the basis for modern environmentalism (Hajer, 1995; Jasanoff, 1999). Discovery of a hole in the ozone layer is often cited as an explanation for the relative ease with which the international community negotiated a ban on chlorofluorocarbons (CFCs).[2] General circulation model projections of globally averaged temperature and mean sea level have been an important part of global framings of climate change. And the idea of biodiversity has been central in promoting a vision of a global nature requiring transnational stewardship (Takacs, 1996). Such symbols of a global environment and the research worlds that helped give them life underpin the plethora of multilateral environmental policy initiatives that have emerged in the last generation. Within specific issue areas, scientific organizing concepts such as maximum sustainable yield, ecosystem and toxicity have helped to establish and reinforce framings of environmental problems and their preferred solutions. These concepts have also shaped and been shaped by the practices and processes through which understandings of and responses to environmental challenges are developed.

Given the myriad ways in which science permeates environmental regulation and management, it is not surprising that some critics have faulted certain approaches to global environmental policy making for being technocratic. In the mid-1990s, some leading social theorists, for example, lamented an 'overproduction of expertise on green issues' (Szerszynski *et al*., 1996: 1). These commentators cautioned against the shutting out of local voices in the quest for global sustainability.

> There is a danger at present that the international debate over sustainability will be conducted without a critical account of science itself – and indeed that a global

> scientific discourse will prevent the expression of more localized understandings and expertises. A particular form of science will 'frame' the issues in a manner which may not be open to other ways of knowing and other ways of living in a sustainable fashion. (Irwin, 1995: 7)

Some scholars criticized global change science as being positivistic, standardized and lacking in attention to social, cultural and experiential aspects of environmental challenges (Szerszynski *et al*., 1996: 1). They referred to assessment processes such as the Intergovernmental Panel on Climate Change (IPCC) and to ideas such as planetary management and environmental risk and impact as fostering reductionist, economistic and uncritical approaches to comprehending and articulating environmental phenomena. Critics claimed that scientific interpretations of global dangers dichotomized categories of nature and culture, drew clear boundaries between observer and observed, and emphasized the physical dimensions of environmental problems at the expense of their social meanings (ibid.). The multilateral and national-level institutions that relied on these approaches were seen as lacking a full conception of the human condition and an understanding of 'real-world day-to-day relationships' of the people they govern (Grove-White, 1996: 284). Critics called for new forms of research to emphasize the importance of context and place, focus on particular human and cultural aspects of human–environment experiences (Grove-White, 1996), acknowledge human agency in the face of environmental threats (Szerszynski *et al*., 1996: 1) and incorporate ways of knowing that sit outside the realms of those activities conventionally defined as scientific (Irwin, 1995).

Now, a decade later, it is interesting to consider how these calls for reform have fared and to what extent, if any, they have been addressed by scientific and policy communities. An opportune place to begin such an analysis is with the notion of vulnerability, an organizing concept increasingly in play at the frontiers of global change science. This concept has a long history in environment and development research (for example, White, 1974; Kates, 1971; Liverman, 1990; Dow, 1992; Cutter, 1996; Turner *et al*., 2003a).[3] Researchers interested in hazards and disasters (Blaikie *et al*., 1994; Cutter, 1996), food security (Bohle *et al*., 1994; Easterling, 1996), climate impacts (Kates *et al*., 1985; IPCC, 1997; Parry *et al*., 1988; Cutter, 2001), and resilience (Berkes and Folke, 1998; Berkes *et al*., 2003) have long employed vulnerability as an organizing concept. Over the last 20 years or so vulnerability has gained increasing attention and use in global environmental change fields (for example, Kates *et al*., 1985; IPCC, 1992, 1995, 2001; Kasperson and Kasperson, 2001). In these fields, vulnerability has acquired a number of varied meanings (Cutter, 1996). Recent definitions generally refer to vulnerability as a function of the exposure, sensitivity and adoptive capacity of human and natural systems to social and environmental change. Vulnerability assessment

is often presented as a complement to and, in some cases, an advance on more traditional forms of inquiry centred on the concepts of environmental risk and environmental impact.

In some respects, recent approaches to vulnerability analysis[4] resonate with the critiques of ten years ago. Emergent forms of vulnerability analysis focus on nature–society interactions; particular peoples, places and ways of life; the role of 'stakeholders' and their knowledge in designing and carrying out research; and the ability of humans to respond to and withstand environmental degradation. These foci hold promises as well as challenges pertaining to at least three areas of environmental governance: (1) integrated views of nature and society and their implications for conventional notions of environmental stewardship, causation and responsibility; (2) the localization of environmental risks and attendant questions about appropriate ways to respond to risk; and (3) decisions about what ways of knowing should contribute to environmental knowledge making.

Defining vulnerability

Throughout decades of research into environmental risk, scientists have devoted a great deal of attention to understanding the 'upstream end' of problems such as pollution and global warming by focusing on physical sources, processes and manifestations of environmental change. This work has tended to treat nature and society as separate, focus on a single type of environmental stress (for example, as arising from a pollutant, ozone depletion or climate change), universalize the nature and characteristics of environmental hazards, and grant little, if any, agency to the person or group experiencing, or expected to experience the stress. This style of analysis is evident in early forms of risk assessment that investigated the release of pollutants into the environment and their accumulation in environmental media, plants, animals and ultimately humans. This style is also notable in early forms of climate impact assessment. These assessments often focused on the likely physical manifestations of climate change, with less consideration for the ways in which social systems might interact with, mediate or otherwise respond to these changes. Early forms of environmental risk and impact work were classic targets for the above-mentioned critiques which described them as top-down, technocratic, reductionist, standardized and devoid of social meaning. The construction and evaluation of risk and impact in biological and physical terms required the specialized knowledge, methods and tools of scientists, and were generally closed to 'lay' perspectives. The tendency to frame risks and impacts in cause-and-effect, stimulus–response formulations and to consider them as acting everywhere equally was viewed as masking the human dimensions and heterogeneity of environmental problems (Lash *et al*., 1996; Jasanoff, 1999).

Vulnerability analysis as most recently conceived departs from early risk and impact formulations of environmental problems. The vulnerability of a system has been described as a function of three interrelated factors: exposure to stress(es), sensitivity and adaptive capacity (IPCC, 2001; Turner *et al*., 2003a; Polsky *et al*., 2003). Exposure is defined as the extent to which a system experiences particular stresses. Sensitivity refers to the degree to which a system is adversely or beneficially affected by stimuli. Adaptive capacity is the ability of a system to respond to change by ameliorating damages, taking advantage of opportunities or otherwise coping with or adjusting to change (IPCC, 2001). In a simplistic example, the vulnerability of a community and its surrounding environment to ozone depletion would depend on the extent to which this system encounters increased UV radiation, the degree to which this increased UV radiation affects the health of people and ecosystems in the system and the degree to which humans and the environment could adapt to the radiation. Adaptation might involve the development of a UV index, programmes to publicize this index, changes in behaviour resulting in less time spent outside during high UV periods, the use of sunscreen and the use of sunglasses.

Risk and impact analyses focus primarily on understanding the sources and manifestations of environmental change. By contrast, vulnerability analysis directs attention to particular peoples, environments and their interactions. These focal points are referred to collectively in some vulnerability literature as 'coupled human-environment systems' (Turner *et al*., 2003a). Vulnerability studies investigate multiple forms of environmental and social change that affect or could affect the human-environment system, consider dynamics spanning local to global scales, and assume that people have the ability to respond to or otherwise interact with stress in ways that intensify or mediate it (Kasperson, 2001). A primary goal in vulnerability analysis is to understand the special characteristics of a human-environment system existing in a particular place such as a watershed, agricultural community, nation-state, transnational region and so on, the nature–society interactions at play within it, and the ways in which the system has in the past or could in the future respond to environmental and social change. Variation in adaptive capacity (and underlying factors such as economics, institutions, and culture) helps to explain why the same types of environmental and social change affect different systems in different ways.

Politics of vulnerability

In May 2001, scholars at the forefront of vulnerability research gathered for a workshop at the Stockholm Environment Institute to critically examine varied conceptual approaches to vulnerability and to develop an agenda for advancing research on vulnerability to global environmental change. As part

of the workshop programme, participants reviewed the vulnerability analyses contained in the Draft Synthesis Report of the Third IPCC Assessment. Workshop participants lauded the IPCC for its efforts in inventorying empirical findings on vulnerability and providing legitimacy to vulnerability issues. However the researchers took issue with much of the way in which the IPCC framed and applied the vulnerability concept. Their criticisms were similar to those expressed by social theorists in response to global environmental change science of the mid-1990s. The vulnerability researchers, for example, lamented the way in which the IPCC treated vulnerability as a residual notion (that is, as a derivative of climate change impacts); oversimplified the concept of vulnerability by equating it with poverty; framed vulnerability in terms of sectoral categories, thereby overlooking the importance of more holistic social and environmental contexts; and treated people as victims and not active agents of potential change. Workshop participants recommended that future IPCC work on vulnerability be decentralized, place-based, participatory and inclusive of local perspectives (Kasperson and Kasperson, 2001). These recommendations suggest that vulnerability analysis could contribute to the localization and humanization of global change science. Yet these possibilities also entail a number of challenges.

Integration, causation and responsibility

Recently devised frameworks for vulnerability analysis entail integrated views of human and natural systems with responses to, as well as sources of environmental change arising from social and biophysical interactions (Cutter, 1996). These frameworks recognize that environmental phenomena (for example, temperature change, sea level rise, bioaccumulation) are without meaning unless considered in relation to and in interaction with social factors such as culture, governance and economics (van der Leeuw, 2001). A leading scholar in the field of vulnerability research (Kasperson, 2001) has noted:

> The close interaction that exists between the social and economic vulnerability of populations and the degree of resilience of ecosystems suggests that an integrated approach treating both the human and natural realms is required for significant progress in understanding differential vulnerability of regions, places, and peoples.

According to Kasperson, it is impossible to evaluate the implications of environmental change without a holistic understanding of the socioecological contexts in which change occurs. Some of the most recent work on vulnerability research also calls for attention to multiple and interacting forms of environmental change. Climate change, for example, will not occur in a vacuum, but will affect and be affected by other environmental phenomena

such as those associated with pollution, ozone depletion and biodiversity loss.

Integrated views of nature and society found in the latest generation of vulnerability literature blur conventional cause-and-effect models and raise questions about what counts as a stress and who or what is responsible for adverse effects of human–environmental change. Early forms of risk and impacts research drew clear distinctions between the categories of cause and effect and tended to focus on inanimate causes of environmental change (Jasanoff, 1999). The earliest framings of climate change impacts were based on understandings of a unidirectional process whereby a stress (for example, climate change) leads to exposure, which leads to some impact (see Kates *et al*., 1985). Greenhouse gas emissions and resultant sea level rise, carbon fertilization and increased frequency of extreme events appeared as the agents of environmental and social change in climate impact assessments. At the other end of the causal arrow was the ecosystem, economic sector or nation-state expected to experience the effects of such changes. Similar causation models appeared in early risk literature in which single pollutants were linked with cancer risk in humans. These linear, uncomplicated models in early climate change and risk assessments rest on assumptions about cause-and-effect in which the agents of change are easily parsed out from other socioecological factors. In addition, because these agents of change are material, they are presumably more amenable (than human agents) to control through conventional approaches to risk management (Jasanoff, 1999).

Cause-and-effect relationships in conceptual frameworks for vulnerability are more complicated. Pollution-related vulnerabilities might be found to depend not only on pollutant properties, sources and the transport of pollutants to or within the system, but also on, for example, interactions of climate and pollution on the bioaccumulation and effects of pollutants (including effects on biodiversity), regulations governing food safety, lifestyle choices concerning diet and time spent out of doors, the cultural meaning and role of particular foods, economic activities involving contaminated foods (for example, farm produce, fish, livestock) and so on. The vulnerability of a human–environment system reliant on a logging economy might depend on climate-induced alterations in forest growth and biodiversity, options for foresting alternative species, options for alternative livelihoods, regulations governing forestry practices, and so forth. The vulnerability of a human–environment system exposed to elevated levels of UV radiation depends on the sensitivity of the system to UV radiation, public information about exposure levels, the amount of time people spend outdoors, and protective measures that people adopt. So vulnerability, according to recent conceptualizations, is not caused by an easily identified and controlled inanimate agent, but is instead a condition that arises from interactions among a number of social, biological and physical factors.

The complexity of vulnerability poses both challenges and opportunities for policy making. When problems are framed simply in terms of climate change, ozone depletion, and pollution, prescriptive policy action is clear: reduce emissions of greenhouse gases, chlorofluorocarbons, and other problematic chemicals. Often, the route to regulating such substances is difficult and questions over the exact nature of policy are often contested. Nevertheless, the above problem framings point to a particular type of policy action based on direct cause-and-effect relationships linking emissions to environmental damage. By contrast, determinations of vulnerability rest on dynamic and integrated representations of nature and society and generally do not point to a single causal factor such as pesticide use or overgrazing. An agricultural community that wishes to reduce its vulnerability may need to address changes in temperature and precipitation due to climate change, state subsidies, regulations governing pesticide use, and their ability to move or change crops. A fishing village interested in minimizing its vulnerability might contend with sealevel rise and ecosystem changes associated with climate change, contamination of fish due to mercury and other forms of chemical pollution, the historical and cultural role of fishing, global markets for fish, and regulations at local to global levels governing who can fish and the size of catches. Vulnerability analysis offers a means of illuminating complex relationships between environment, society and vulnerability. Which of these relationships warrant attention and, what, if anything, should be done about them, and who has the authority and responsibility to act are questions that vulnerability analyses raise, but do not necessarily answer.

Localization and human agency

In early approaches to understanding environmental risk and impacts, citizens were assumed to have little or no recourse in the face of universal, environmental threats. Ulrich Beck ([1986] 1992: 41), for example, refers to (in the developed world) a 'global ascription of risks, against which individual decisions hardly exist'. Beck (ibid.) describes a '*risk fate in developed civilization*, into which one is born, which one cannot escape with any amount of achievement … we are *all* confronted similarly by that fate'. According to Beck, this ascription is responsible for a sense of victimization and helplessness experienced by many people. The term 'vulnerability' similarly suggests weakness and loss (Cutter, 1996). However vulnerability, as defined in global change research, is a function of adaptive capacity. Vulnerability analysis emphasizes the potential ability of human–environment systems to respond to, mediate and withstand adverse effects. A notion of risk grounded in vulnerability analysis differs from the universal risk Beck describes in at least two ways. First, vulnerability analysis recognizes that there exist various resources (whether they are, for example, knowledge-based, natural, material

or financial) upon which people can draw in assessing, ameliorating or possibly exacerbating risks. Second, these resources, because they differ among human–environmental contexts, act essentially to localize the potential consequences of risk for a given human–environment system. In other words, so-called 'global' forms of environmental degradation manifest themselves differently in different contexts. This localization of global hazards results, in part, from the varied human–environment conditions, interactions and possibilities for human agency existing at the specific place at which a hazard is expected to unfold.

In vulnerability analysis, risks are localized. Climate change discourse, for example, often focuses on aggregate measures such as globally averaged temperature and mean sea level rise. However, the manifestations of climate change will vary throughout the world depending, not only on general circulation patterns and energy budgets, but also on the characteristics of particular peoples and places. A community's history, culture and resources, for example, are critical in determining whether its members will take advantage of the opportunities that climate change presents and minimize its adverse repercussions. To take another simplified example, a decrease in the thickness and extent of Arctic sea ice could positively affect those who benefit from the opening of northern trade routes. Realizing these benefits and managing where possible the negative side effects that accompany them, at the individual and community level will require foresight, capital, investment, new policies and perhaps new governance structures. These same changes in Arctic sea ice do not bode as well for many of the Arctic's indigenous peoples who depend on the ice. Seal hunting communities with diverse human skills and resources could perhaps adopt alternative livelihoods, but with devastating ramifications for traditional Arctic lifestyles and cultures that have, for centuries centered on seal hunting. So climate change is not simply a unilateral global force transforming the lives of defenseless peoples. As conceptualized through vulnerability analysis, the meaning of climate change and the risks and benefits it entails, take shape in local contexts through complex interactions of environment and society.

Vulnerability frameworks acknowledge that human agency (in the context of specific cultures, histories, economies, institutions, and so on) shapes environmental risk. However, vulnerability analysis focuses attention on defensive human actions. In the above-mentioned IPCC definition of vulnerability, human agency appears most explicitly in the explanation of adaptive capacity. Humans can shape their own vulnerability by reacting to a known or anticipated stress. In the face of climate change coastal communities can move inland and build dikes and other infrastructure. Farmers can relocate, change their practices, technologies and crops. Vulnerability analysis can provide valuable insights into the efficacy of these various activities. The

role of vulnerability analysis in informing the proactive mitigation of adverse environmental and social change is less clear. An evaluation of vulnerability at national levels might aid a nation-state in evaluating its national level policies on climate change and its engagement in multilateral efforts on this issue.

In addition, a vulnerability analysis that reveals a human–environment system that is likely to suffer detrimental consequences because of adverse change might provide evidence of use to people opposing that change. Such evidence might also serve as an instrument of mobilization to galvanize people to act collectively in relevant political forums responsible for addressing change. The Alliance of Small Island States, for example, appears to be a sort of 'vulnerability alliance'. This social movement is predicated, in part, on knowledge about the vulnerabilities of the human–environment systems within small island developing states as they face the effects of climate change. So vulnerability analysis follows the critics' calls for greater attention to context and place and to particular human and cultural aspects of human–environment experiences, (Grove-White, 1996). The knowledge developed through vulnerability analysis can usefully inform people as they defend themselves against environmental and social change. However, while vulnerability approaches can underscore the need for offensive action, they provide little in the way of insights into what form that action should take.

Knowledge, values and voice

In addition to setting forth new ways of conceptualizing global change and its consequences, vulnerability approaches also require the incorporation of new participants knowledges and practices in global change science. Early forms of risk and impact assessment generally drew upon disciplinary and standardized understandings of environmental phenomena developed by the natural and social sciences. Vulnerability analysis requires disciplinary as well as local knowledge[5] about particular people and places. Emergent frameworks for vulnerability assessment depend on understandings of how people interact with environments, including how people have responded or might respond to social and environmental change. Moreover, claims about the vulnerability of a given community and its environment will have meaning only if based upon the perspectives and values of the community in question.

Local knowledge is important in understanding 'local' manifestations of global environmental phenomena, interdependencies and interactions that link humans with their environments, the stresses that a given human–environment system has encountered or might encounter in the future, and how the system has or might respond to stresses. For example, one area of global change research that has incorporated local knowledge focuses on

understanding the effects of climate change in the Arctic. Indigenous Arctic peoples have provided evidence of changes in seasonal and wind patterns, increases in sun intensity, unpredictable weather and ice conditions, and alterations in temperature, precipitation, water levels, snow quality and the health of certain animals (Krupnik and Jolly, 2002). Indigenous participants in research have also imparted insights into the ways in which they and their ancestors have responded to environmental change. Responses include diversification of economic and subsistence activities, changes in hunting and fishing areas, and harvesting of new species at different times of year (Fox, 2002).

An assessment of vulnerability, however, requires more than observations of environmental change or information about the way a community has coped with environmental change in the past. Assessments of vulnerability as recently conceived also require the explicit incorporation of the worldviews and values of those who form part of the human–environment system whose vulnerability is being assessed. Such worldviews and values inevitably pervade observations and historical accounts of human–environment interactions. However explicit attention to values, interests and priorities is necessary in determining, for example, what constitutes as an environmental stress and adverse effect, what aspects of the human–environment system in question the people comprising it wish to protect and sustain, and what counts as a vulnerability. The view of one's own vulnerability will reflect, among other things, one's historical experience, position in the social structure and trust in social institutions (Irwin, 1995). Therefore a scientist from outside a particular community may define the key vulnerabilities of the community much differently than would a community member. Likewise two community members might see vulnerability in different ways (Martello, 2004).

The incorporation of 'stakeholders' and their values and interests in the research process appears to answer some of the critiques of the mid-1990s which called for less of a gulf between observer and observed and for more open and participatory research processes. The degree to which such calls are answered depends, of course, on how 'stakeholder' is defined and the specific circumstances under which stakeholders become engaged in an assessment process. Other important considerations concern the role of stakeholders in deciding the appropriateness of vulnerability as an organizing concept, the definition and framing of vulnerability, how vulnerability determinations are made and how people and their environments should be represented in the analysis. Involving stakeholders in research could provide lay publics with a greater voice in what and how global environmental problems are studied and how they are framed. Indeed it is impossible to carry out a meaningful vulnerability project without the central involvement of 'local' people in the process.

However, little if any of the literature on vulnerability analysis identifies the number of challenges that could surface when a group of people attempts to decide collectively about what or who is vulnerable. Such challenges include negotiating among different opinions about whether vulnerability and the conceptual frameworks that have been attached to this term are appropriate for producing and organizing knowledge about nature and society. A given community might oppose the implementation of a vulnerability project on the grounds that the term 'vulnerability' implies that the community comprises helpless victims facing social and environmental change. A community might also reject vulnerability research because it is grounded in a worldview that is at odds with those of its members. Other challenges might stem from disparate views about the meaning of vulnerability, appropriate methodologies and standards of evidence. Still other obstacles to vulnerability analysis could reside in divergent opinions about what counts as an adverse effect of social and environmental change, what should be sustained and who or what in a given human–environment system is at risk. While some participants in a vulnerability project might view the effects of economic globalization as detrimental to human–environment systems, others might disagree. Similarly some individuals might favour the prohibition of logging in a forest containing endangered species, while others favour logging as important to the economic viability of people dependent on forest resources. While these sorts of disagreements are by no means new, vulnerability analysis presents a new context for addressing them. And it remains to be seen by what methods and processes participants in vulnerability studies will define and delineate a human–environment system, decide what counts as a stress on the system and determine what features of the system are vulnerable.

Knowledge-making and policy making

Researchers are developing a type of vulnerability analysis that, at least on the surface, addresses some of the critiques aimed at global change science in the mid-1990s. Conceptual frameworks for the newest style of vulnerability science promise to break down conventional barriers separating nature and culture, localize global risks in ways that acknowledge human conditions and agency in shaping these risks, and involve 'other' ways of knowing and the people who possess them in research processes. Emergent forms of vulnerability analysis offer a number of opportunities. They invite a rethinking of nature–society relationships and the 'moral obligations' (Jasanoff, 1999: 147) of people to one another and the environments of which they are a part. They present new ways to capture the public imagination and galvanize public action on environmental issues, and they may offer a means for more democratic forms of knowledge making. Vulnerability analysis also entails a number

of potential pitfalls. Despite its emphasis on nature–society integration, human agency and participation, the forms of vulnerability discourse discussed in this chapter have tended to develop in a 'top-down' fashion, may underemphasize some of the most important aspects of human agency in the face of environmental risks and oftentimes suggest that vulnerability is some sort of objective, measurable parameter.

Through its emphasis on nature–society interactions, particular peoples and places and its opportunities for participatory research, vulnerability analysis has the potential to make oft-standardized and universalized risks meaningful to ordinary people. Vulnerability studies require information about specific human and environmental conditions and interactions. Consequently vulnerability analysis benefits significantly from the involvement of people who are knowledgable about these conditions and interactions, have an interest in the ways in which these conditions and interactions are interpreted and represented in research processes, and have a stake in the results that these research processes produce. Vulnerability assessment, then, could offer new ways of connecting research and policy. Knowledge about the vulnerability of a given human–environment system could be useful to a community in deciding how best to allocate resources so as to strengthen resilience. Vulnerability research could support specific actions in areas of infrastructure development, economic policy and natural and human resource management. Vulnerability research could also conceivably help to mobilize a community to take action on a particular environmental issue.

At the same time, vulnerability research has the potential to embody technocratic, positivistic worldviews and employ overly narrow and standardized representations of nature and society. Much work still remains in figuring out how to explicitly incorporate varied worldviews, values and knowledge into determinations of vulnerability. The literature on vulnerability analysis, for example, has yet to address the subjectivity inherent in vulnerability assessment and how vulnerability analyses can be designed to accommodate differing ideas about what counts as a stress, what should be sustained and how vulnerability should be defined. Without awareness of these challenges and methods to address them, proponents of vulnerability analysis could default to a positivistic, standardized notion of vulnerability that resembles more conventional forms of global change science.

Notes

1. Preparation of this chapter was supported by NSF grant SES-0328350 and by grants from the National Oceanic and Atmospheric Administration's Office of Global Programs to the Research and Assessment Systems for Sustainability Project based at Harvard University and to the Atmospheric Policy Program of the American Meteorological Society.
2. See Jasanoff (1996) for an analysis.
3. For recent reviews, see Cutter (1996), Golding (2001), Polsky *et al.* (2003), Turner *et al*. (2003a).

4. The author recognizes that there have been myriad ways of defining and operationalizing vulnerability (see list of review papers in note 3). In this short chapter it is not possible to address all of these approaches. Instead the paper focuses on some of the most recent trends in vulnerability analysis. Two publications in a recent issue of the *Proceedings of the National Academy of Sciences* are particularly useful in illustrating emergent approaches to vulnerability research, and the discussion that follows uses these publications as a reference point (Turner *et al*., 2003a, 2003b).
5. For a discussion of local knowledge in relation to global environmental science and politics, see Martello (2001) and Jasanoff and Martello (2004).

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27 Growth and fragmentation in expert networks: the elusive quest for integrated water resources management

Ken Conca

Water is affected by everything, and water affects everything and everyone. (World Water Council[1])

> The river basin management concept has been driven by a rational analytical model as seen in the use of the words such as 'coordinated' and 'comprehensive'. While this model might provide an ideal, no matter what shape it takes, it does not fit reality. The reality of river basin management goes beyond notions of unified administration and rational analytic models to one of facilitated dialogue and negotiation among stake-holders in the basin. (Jerome Delli Priscoli[2])

Expert networks have often been an important lubricant to international environmental cooperation. They move information, frame problems and responses, and press governments in ways that can promote the creation of institutions for supranational environmental governance, such as treaty-based international regimes. Models of knowledge-driven institution building have stressed several different factors, ranging from the influence exerted by 'epistemic communities' of technical experts to the more politicized role of problem-framing 'knowledge brokers' to the knowledge-disseminating role of transnational 'social learning' networks (Litfin, 1994; Haas, 1990, 1992a, 1992b; Social Learning Group, 2001). These models differ, often dramatically, in their characterization of the networks that shape and carry knowledge. They also differ in their conception of the balance between narrowly technical and more broadly political sources of influence, but they share a presumption that actors with shared knowledge foundations and value orientations can be an important – perhaps even authoritative – source of norms in world politics.

Most studies of the political effects of such networks have focused on their role in promoting inter-state collective action on problems of regional or global commons such as climate change, stratospheric ozone depletion or ocean pollution. This chapter examines the role of expert networks in promoting normative shifts, institution building and the institutionalization of governance practices for a very different, increasingly important, and arguably much more difficult challenge. The case examined here – water – is illustrative of a broad class of

problems that link a critical ecosystem (in this case, freshwater ecosystems), a commodity with increasing market value (water), contentious social controversies (water privatization and construction of water infrastructure) and a 'local' environmental policy matter (watershed management) that is increasingly subject to international forces and pressures.

This class of environmental challenges, which includes issues ranging from forests, soils, grasslands and deserts to rivers, wetlands, coastlines and fisheries, has been stubbornly resistant to effective formal inter-state cooperation. One reason for this is that these problems are largely localized in their physical manifestation, even though they are increasingly (and sometimes quite thoroughly) transnationalized in terms of their socioeconomic causes and consequences. One of the major challenges to effective international response to these problems, therefore, is the intersovereign paradigm that currently dominates approaches to global environmental governance, which frames these problems as falling within the domestic purview of the state.

This chapter describes the role of expert networks in undermining some elements of that intersovereign framework with regard to water. They have done so by shifting elements of authority over water from a political and territorial basis to a knowledge-based and stakeholder basis, with the idea of 'integrated water resource management' (IWRM) serving as the frame for that authority shift. IWRM is significant not only as a conceptual approach but also as a political force. More than two decades of transnational networking among water policy elites has rewritten the conceptual rationale for global water governance. A set of transnationally disseminated water management norms that began with the specific goal of supplying clean water for human needs would expand and evolve to the point that, by the late 1990s, they bore the unmistakable stamp of IWRM. In the process, IWRM evolved from being merely an expression of frustration on the part of water planners and managers to become *the* language in which the challenge of global water governance is framed.

In tracing this history, particular emphasis is give here to three aspects: first, to the ideational content of the concept of IWRM; second, to the key events, organizations, programmes, publications and other strands along which transnational networking and institution building for IWRM have taken place; and third, to the stance of that knowledge content and those institutions toward underlying understandings about knowledge and authority. In other words, IWRM is interpreted both as an increasingly clearly specified conceptual blueprint and as an increasingly embedded and institutionalized transnational political phenomenon, with both having important ramifications for the way we conceive of global environmental governance.

Yet the chapter also underscores the limits of expert networks in the face of enduring social controversies: in this case, controversies surrounding the

value of water and the meaning of 'participation' in decisions about its governance. Water experts' successes in constructing water as a complex global problem have also helped to construct these localized controversies as international matters. As a result, the same networks that elevated IWRM to the level of the dominant international water paradigm have grown increasingly fragmented and ineffective in grappling with the fundamentally political dimension of water controversies. Where water is concerned, they have succeeded in challenging the intersovereign paradigm, yet with tools that have been unable to resolve resulting distributive and authority-based controversies.

Water as international politics

Water has emerged as an issue of high politics in international relations. Looming fears about conflict over scarce water supplies ('water wars') litter the opinion pages of leading publications and have spawned many popular books on the topic in the past few years. The World Bank now expects a cooperative inter-state agreement to be in place before it lends money for water development projects in river basins that cross or form international borders. In 1997, the UN General Assembly approved a framework convention on internationally shared watercourses. Water was the 'w' in Kofi Annan's so-called 'WEHAB' agenda for the 2002 World Summit on Sustainable Development. Authoritative sources such as the World Resources Institute warn that freshwater ecosystems, already among the planet's most threatened critical ecosystems, face mounting pressures as perhaps half of the world's population comes to live under conditions of water insecurity within a few decades (WRI *et al*., 2000: 107; see also UNCSD, 1997). The Third World Water Forum, held in Kyoto in March of 2003, drew more than 24 000 participants from around the world.

According to water expert Peter Gleick (1998: 9), developments such as these are part and parcel of a global paradigm shift on water:

> The twentieth-century water-development paradigm, driven by an ethic of growth, has now stalled as social values and political and economic conditions have changed. More people now place a high value on maintaining the integrity of water resources and the flora, fauna, and human societies that have developed around them. There are growing calls for the costs and benefits of water management and development to be distributed in a more fair and prudent manner and for unmet basic human needs to be addressed. And more and more, efforts are being made to understand and meet the diverse interests and needs of all affected stakeholders.

A central element in this new thinking is the idea of integrated water resource management (IWRM). As a conceptual approach to water problems, planning and practice, the IWRM framework typically stresses three interrelated themes:

the importance of recognizing the full range of social, economic and ecological uses of water; the importance of 'cross-sectoral' water management, in the sense of integrating planning and practice related to agricultural, industrial, municipal and ecosystemic or 'in-stream' demands for water; and the importance of water management at multiple scales and levels, in the sense of coordinating local, regional, national and transnational practices and institutions.[3]

These themes are captured in the World Water Council's (Cosgrove and Rijsberman, for the World Water Council, 2000b: 1) *World Water Vision*, launched at the second World Water Forum in 2000, which states that

> To ensure the sustainability of water, we must view it holistically, balancing competing demands on it – domestic, agricultural, industrial (including energy), and environmental. Sustainable management of water resources requires systemic, integrated decisionmaking that recognizes the interdependence of three areas. First, decisions on land use also affect water, and decisions on water also affect the environment and land use. Second, decisions on our economic and social future, currently sectoral and fragmented, affect hydrology and the ecosystems in which we live. Third, decisions at the international, national, and local level are interrelated.

Similarly, according to the Global Water Partnership (no date, e: 5; see also Global Water Partnership Technical Advisory Committee, 2000), 'IWRM is a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems'.

From Mar del Plata to Dublin: constructing water as a global problem

Although water was a central concern at the UN Conference on the Human Environment, held in Stockholm in 1972, the emphasis was primarily on various localized problems of water pollution which had become contentious political issues in Europe and North America during the 1960s.[4] The first attempt to take a more comprehensive and global-scale look at water problems came five years later, with the 1977 UN Water Conference in Mar del Plata, Argentina. The UN Water Conference brought together representatives of 116 governments, the major multilateral development banks and specialized UN agencies, several regional intergovernmental organizations, eight international river commissions, and observers from 63 nongovernmental organizations (United Nations, 1977b: 554–5). The secretary-general of the conference noted that 'For the first time the range and complexity of the problems of water development confronting mankind were being taken up in their totality by a world forum in a systematic and comprehensive manner' (ibid.: 555).

Despite this claim, the resulting framing of global water problems proved to be substantially narrower. The principal themes of the conference were safe drinking water supplies, sanitation and, to a lesser extent, water for agriculture. The final declaration emerging from the conference stressed that 'all peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs' (United Nations, 1977a: document E.77.II.A.12). The Action Plan emanating from Mar del Plata called for governments to give priority to providing universal access to safe drinking water supplies and sanitation services. In the wake of the Mar del Plata meeting, the UN General Assembly marked the 1980s as the International Drinking Water Supply and Sanitation Decade, the goal of which was to provide universal access to safe and adequate water supplies and basic sanitation services by 1990.

This call to meet the most basic human water needs was accompanied by a conventional 'intersovereign' framework for environmental governance. Sovereign territoriality was never in question: the recommendations and resolutions in the Mar del Plata Action Plan drew a sharp distinction between the 'domestic' and 'international' manifestations of rivers and watersheds. Nor were there doubts about who was in charge: the plan's main elements strongly reinscribed state authority in the domestic sphere. The knowledge framework accompanying this political roadmap was one of universal expertise to be disseminated to governments by technically competent intergovernmental organizations.

On the domestic side of this comfortably dichotomous domestic/international problem construction, local watersheds were discussed primarily in the context of specific aspects of river development, including hydropower development, river navigation and the need for 'systematic planning' for inter-basin water transfers. A few associated problems were also highlighted: specifically, the potential impact of dams in spreading disease and problems associated with rampant destruction of wetlands (United Nations, 1977b: 556). But these considerations were subsumed under the larger concern for water supply development to meet human needs.

On the international side of the equation, efforts to inject the theme of inter-state cooperation in shared river basins produced substantial political controversy. A proposed paragraph on the cooperative responsibilities of states sharing international rivers proved to be one of the most contentious topics at the conference. A general statement urging cooperation, explicit agreements, and information exchange was adopted by a roll-call vote of 29 to 13, but with 48 abstentions, with resistance focused on the implications for the principle of national sovereignty over natural resources. Reflecting the high level of contentiousness, the resolution enjoyed a smaller margin of

victory and drew more abstentions than did a resolution on the always provocative issue of the Israeli-occupied territories.[5]

The rise of the water experts' network

Over the course of the 1980s and the early 1990s, several forces converged to stimulate the emergence of a more complex, comprehensive and transnationalized problem construction surrounding water. One such force was the accumulation of authoritative environmental knowledge. Ecologically oriented knowledge about water – be it human impacts on the global water cycle, the value of ecosystem services, the effects of deforestation and land conversion on watersheds, or the ecological importance of 'in-stream' uses – was in its infancy at Mar del Plata. As recognition of these effects and problems grew, many water analysts, scientists, managers and advocates began to seek a more comprehensive conceptual and policy framework that could incorporate this richer understanding.[6]

A second driver in the search for a more comprehensive approach was the failure of Mar del Plata to galvanize action to meet the declared goal of universal access to basic water services. According to the World Health Organization, by the end of the International Drinking Water Supply and Sanitation Decade in 1990 an estimated 1.3 billion people worldwide lacked access to safe drinking water, while a staggering 2.6 billion still lacked adequate sanitation services.[7] Ten years later, a report to the eighth session of the UN Commission on Sustainable Development underscored the entrenched character of the problem, estimating that in the year 2000 some 1.1 billion people remained without clean drinking water and almost 2.5 billion without sanitation (UNCSD, 2000; see also World Health Organization and United Nations Children's Fund, 2001). In other words, the rate of expanding access to drinking water and sanitation barely kept pace with world population growth during the 1990s.

In 1990, some 600 delegates from 115 countries met in New Delhi for the Global Consultation on Safe Water and Sanitation for the 1990s, sponsored by the United Nations Development Programme (UNDP) and hosted by the government of India. The conference's 'New Delhi Statement' reiterated the central goal of the International Drinking Water Supply and Sanitation Decade, presenting 'an appeal to all nations for concerted action to enable people to obtain two of the most basic human needs – safe drinking water and environmental sanitation'(WSSCC, no date). But Delhi also offered a new and broader approach to the problem. According to UNDP (1998),

> The term 'enable' can be considered a significant new direction, in that the New Delhi statement recognized that international donors and national governments could not achieve the goals of universal coverage without (1) participation of and

partnerships with NGOs, (2) human resources development at all levels – from community members to political leaders, (3) education, and (4) community management and ownership of water supply systems.

Reflecting this broader problem construction, the New Delhi Global Consultation (WSSCC, no date) also embraced four 'guiding principles':

- Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes;
- Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions;
- Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programs; and
- Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies.

These were themes that had received only passing mention, at best, at Mar del Plata 13 years earlier.

Both the heightened emphasis on ecological concerns and the push for a more comprehensive, multidimensional approach to water emerged as central themes in the idea of IWRM. The growth of IWRM in the 1980s and 1990s was fuelled by a process common to many aspects of environmental science and policy more generally: the proliferation of professional membership organizations, specialized publications, professional journals, international congresses, technical meetings and issue-oriented global summitry.

Table 27.1 identifies several key networking moments and network-strengthening events related to the emergence, growth and consolidation of IWRM. Networks can be highly fluid in their spatial composition, and it would be a mistake to define the particular expert networks that have sprung up around the idea of IWRM solely in terms of particular organizational nodes. Nevertheless, such nodes play an important role in networking activities. One such catalysing node has been the International Water Resources Association (IWRA), a membership organization for water professionals. Founded in 1972, IWRA today has more than 1400 members in 110 countries. Older professional groups such as the International Commission on Large Dams (ICOLD), the International Commission on Irrigation and Drainage (ICID) and the International Association for Hydraulic Engineering and Research (IAHR) typically had a narrowly functional focus. IWRA had a far broader emphasis from the start, seeking explicitly to span the boundaries of both academic disciplines and geographic settings. According to its mission statement, IWRA (1998–9) 'seeks to continually improve water resource decisions by improving our collective understanding of the physical, ecological, chemical, institutional, social, and economic aspects of water'.

IWRA has facilitated networking among water professionals in several ways. It publishes a membership newsletter and the peer-reviewed quarterly journal *Water International*; holds a World Water Congress every three years; sponsors international meetings, workshops and symposia; maintains an online 'Directory of International Water Experts'; and forms ad hoc committees on topics such as integrated water resource management or international collaboration. IWRA also played an instrumental role in the formation of the World Water Council (discussed below).

A second important institutionalizing development has been the routinization of global water conferences, world congresses and international expert meetings (third column of Table 27.1). IWRA has held 11 world water congresses since the early 1970s. The Stockholm Water Symposium, held annually since 1991, has emerged as an important networking event between these world congresses. Events such as interministerial meetings and expert working groups accelerated dramatically in the post-Earth Summit 1990s. Earlier in the process, when such events were relatively rare, they created important opportunities for frame shifting, as in Mar del Plata's emphasis on human water needs (1977) or New Delhi's greater emphasis on participation and community-scale management (1990). As these events became far more common in the second half of the 1990s, their effect would shift toward enhancing the continuity of IWRM as the predominant discursive framework.

A third network-sustaining development has been the emergence of several important professional publications. The IWRA began publishing the journal *Water International* in 1975. In marked contrast to established professional publications such as *Irrigation and Drainage*, early editions of *Water International* stressed a wide range of themes: water law, education and policy; global perspectives on the water cycle and water for human needs; technical aspects of water quality and aquatic ecosystems; and accounts of various national experiences with water planning, policy and management. Articles related to water economics and water engineering projects began to appear with regularity in the 1980s; new themes such as water and women, water and public health and water-related sustainability began to appear in the 1990s. As indicated in Table 27.1, several other publications with a similarly broad water focus have emerged since the late 1970s.

Tellingly, this process of professional–conceptual networking, which emerged in the 1970s and gained momentum in the 1980s, did so in a context of formal institutional fragmentation. There has never been a predominant water-related entity within the institutional apparatus of the United Nations and its associated multilateral organizations. Although the UN's Administrative Committee for Coordination (ACC) has had a Subcommittee on Water Resources since 1960, water has always been a highly fragmented intergovernmental domain.[8] More than 20 UN-related bodies and agencies claim

Table 27.1 A chronology of international water network building

Period	Organizations	Events	Programmes, projects and assessments	Publications	Other
Up to 1975	1972: Founding of the International Water Resources Association (IWRA) 1972: UN creates UN Environment Programme 1975: UNESCO launches International Hydrological Programme	1972: United Nations Conference on the Human Environment (Stockholm) 1973: 1st World Water Congress (Chicago)	1975: UNEP launches Global Environment Monitoring System	1975: IWRA launches the journal *Water International*	1965: Beginning of UNESCO's International Hydrological Decade
1976–80		1976: 2nd World Water Congress (New Delhi) 1977: United Nations Water Conference (Mar del Plata) 1979: 3rd World Water Congress (Mexico City)		1976: World Health Organization and Environment Canada begin publishing *Water Quality Bulletin* 1978: Launching of the journal *World Water*	1977: UN declares 1980–90 the International Drinking Water Supply and Sanitation Decade
1981–5		1982: 4th World Water Congress (Buenos Aires)		1983: Launching of the journals *International Journal*	

		1985: 5th World Water Congress (Brussels)	*of Water Resources Development* and *Journal of Water Resources Planning and Management*	
1986–90	1990: UN General Assembly creates Water Supply and Sanitation Collaborative Council	1988: 6th World Water Congress (Ottawa) 1990: Global Consultation on Safe Water and Sanitation for the 1990s (New Delhi)	1987: Brundtland Commission releases *Our Common Future*	
1991–5	1992: UN creates Commission on Sustainable Development 1993: Organization of American States creates Interamerican Water Resources Network 1994: International Network of Basin Organizations established with help of French government	1991: First Stockholm Water Symposium held 1991: 7th World Water Congress (Rabat) 1992: International Conference on Water and the Environment (Dublin) 1992: UN Conference on Environment and Development (Rio de Janeiro) 1994: Interministerial Conference on Drinking Water Supply and		1991: First ‘Stockholm Water Prize’ awarded

Table 27.1 continued

Period	Organizations	Events	Programmes, projects and assessments	Publications	Other
		Environmental Sanitation (Noordwijk) 1994: 8th World Water Congress (Cairo)			
1996–2000	1996: Creation of the World Water Council 1996: World Bank, UNDP and Swedish International Development Agency create Global Water Partnership	1996: First international General Assembly of Basin Organizations 1997: First World Water Forum (Marrakech) 1997: 9th World Water Congress (Montreal) 1998: International Forum on Global Water Politics (Bonn) 1998: Expert Group Meeting on Strategic Approaches to Freshwater Management (Harare)	1997: UN Commission on Sustainable Development releases *Comprehensive Assessment of the Freshwater Resources of the World* 1999: Global Environment Facility launches Global International Waters Assessment 2000: World Commission on Dams releases *Dams and Development*	1998: Launching of the journal *Water Policy*	1998: First Water Information Summit launches the WaterWeb Consortium 2000: Stockholm Water Foundation presents first annual Stockholm Industry Water Award 2000: UN proclaims 2003 the International Year of Freshwater 2000: Ministerial Declaration of The Hague on Water Security in the 21st Century

		1998: Ministerial Meeting on Water Resources & Sustainable Development (Paris) 2000: Second World Water Forum (The Hague) 2000: 10th World Water Congress (Melbourne)	2000: WHO/UNICEF release *Global Water Supply and Sanitation Assessment 2000 Report* 2000: UN Administrative Committee on Coordination Subcommittee on Water Resources (UN–ACC/SCWR) launches World Water Assessment Programme		2000: UN Millennium Summit endorses goal of reducing world population lacking affordable access to safe water by one-half by 2015.
2001–date		2001: International Conference on Freshwater (Bonn) 2002: World Summit on Sustainable Development (Johannesburg) 2003: Third World Water Forum (Kyoto)11th World Water Congress (Madrid)21st ICOLD Congress (Montreal)	2003: International Year of Freshwater; G-8 releases its ‘water action plan’	2003: UNESCO publishes first *World Water Development Report*	2002: World Summit on Sustainable Development focuses on water as one of five key themes

some sort of freshwater mandate, including the World Health Organization (water and health), Food and Agriculture Organization (water and agriculture, particularly irrigation), World Meteorological Organization (hydrologic and climatological aspects of the water cycle), UNESCO (sociocultural dimensions of water, water science programme), UN Development Programme (water infrastructure development), UN Environment Programme (freshwater ecosystems, water pollution) and several others (Björklund, no date). Similarly, although many international accords signed in the 1970s and 1980s touched upon specific aspects of global water problems, such as protecting wetlands or managing transboundary rivers, there exists nothing even approaching a comprehensive framework convention on water. Instead IWRM emerged and developed within a politically ambiguous space, bounded by several tangential intergovernmental organizations and inter-state accords. In essence, the absence of a coherent global water regime or global water organization seems to have created space for a broader, less state-based discursive process.[9]

By the late 1980s, IWRM was a well-established concept in the key water journals and at the international meetings, congresses and expert working groups that brought together the international community of water policy professionals. But it had yet to emerge as the dominant framework for discussing water issues in the wider context of environment–development issues. A telling benchmark is *Our Common Future*, the influential 1987 report of the World Commission on Environment and Development. *Our Common Future*, which embraced rhetorically the idea of so-called 'sustainable development', had very little to say about water – and nothing at all to say about a more holistic, IWRM-style approach to water management. Other than passing references to problems of water supply and water quality, the discussion of water in the WCED report is limited to a few paragraphs on the need for improved water management for agricultural productivity and a brief allusion to the potential for international conflict over scarce water resources (see WCED, 1987: 134, 293, respectively). The IWRA released a draft statement at its Fourth World Congress (1988) lamenting the report's lack of serious attention to water issues (IWRA, Committee on Water Strategies for the 21st Century, 1988: Appendix II).

In other words, when one shifted from professional water networks to the wider diplomatic and intergovernmental stage, the discussion remained more or less within the framework established at Mar del Plata: national action to address national water needs, expert support from intergovernmental organizations, and inter-state diplomacy to manage transboundary water flows. Serious political momentum for a more globalized, holistic perspective would come only with two key developments of the 1990s: the rise of sustainability as a discursive movement and the growing density of global conferencing

opportunities to authorize and legitimate increasingly well-established professional ideas about water resources management.

Our common water future: sustainability, the Dublin principles and the 1992 Earth Summit

With the publication of *Our Common Future* in 1987, a global discourse of sustainability was beginning to take root. The core idea of sustainability – meeting present needs without imperilling the ability to meet future ones – validated more complex problem constructions in the face of seemingly daunting tradeoffs. What it means to put sustainability into practice has always been contested, but most who use the term would agree that doing so entails optimizing across a heterogeneous array of ecological, economic and social criteria.[10] Growing recognition of the twin problems of freshwater ecological stress and unmet human water needs seemed to demand a more comprehensive conceptual framework; the optimistic stance of sustainability seemed to enable it.

Despite being underemphasized in the Brundtland report, strong links between water and the concept of sustainability began to emerge in the build-up to the 1992 UN Conference on Environment and Development (UNCED), which took sustainability as its mantra. In preparation for UNCED, 505 participants representing 114 countries, 28 UN agencies and 58 intergovernmental and nongovernmental organizations met in Dublin in January of 1992 for the International Conference on Water and the Environment (ICWE) (Young *et al*., 1994).[11] Dublin would prove to be a seminal frame-shifting event, and the shift was unambiguously toward IWRM.

Several features of the Dublin Conference worked to maximize the influence of professional water networks in shaping its results.[12] The conference was defined explicitly as a gathering of water experts, 'of government-appointed experts, rather than of government delegations' (Young *et al*., 1994: 33). The meeting was organized by the Intersecretariat Group for Water Resources (ISGWR) of the UN's Administrative Coordination Committee. During the run-up to the conference, the rotating chair of ISGWR was held by the World Meteorological Organization, an organization emphasizing expert credentials and systems modelling, and one without strong incentives to skew the agenda toward a narrow or particular set of water-resource interests. The lead time between the decision to hold the conference and the meeting itself was less then 18 months, and the agenda was set only four months before the meeting. This compressed time frame enhanced the voice of readily available, off-the-shelf expertise. So too did the framework for NGO participation, which was limited to international NGOs already accredited for the upcoming Earth Summit. With a few exceptions such as Greenpeace, Worldwide Fund for Nature (WWF) and Environmental Defense Fund, the

35 international NGOs represented at the conference were water-specific organizations with an emphasis on law, management, science and policy.[13]

In contrast with Mar del Plata's relatively narrow focus on clean water and sanitation, or even New Delhi's more comprehensive approach to the same specific challenge, Dublin posed a problem set of much greater complexity. The Dublin Statement on Water and Development identified multiple goals: alleviation of poverty and disease, protection against natural disasters, water conservation and reuse, sustainable urban development, agricultural production and rural water supply, protecting aquatic ecosystems and resolving water conflicts (ICWE, no date). In an effort to chart a course toward attaining these goals, the conference also ratified four 'Dublin principles' which also reflect elements of the larger paradigm shift:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good.

The first principle, on water's finiteness and vulnerability, supplants the idea of river manipulation for water supply with a far more complex problem construction. According to the Dublin Statement (ibid.):

> Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer.

A similar theme had been articulated one year previously at the first annual Stockholm Water Symposium (no date), which asserted that 'The sectoral approaches of the past are highly ineffective and have to be replaced by new approaches.'

The second Dublin principle affirms rights of local participation, thereby challenging, at least implicitly, the idea of the nation-state as inherent instrument of the public good. The same is true of the third principle emphasizing gender, which points to the socially differentiated character of water supply and use, at scales ranging from the household to the globe. According to the summary text of the 1991 Stockholm Water Symposium (1991),

> In all water-related activities it is essential to involve women. Men and women tend to see problems quite differently, a difference that society must be able to

> handle. What roles women can play strongly depend on the conditions under which they live, the culture, the traditions and the education level in society.

The fourth principle, on recognizing water as an economic good, is also a major departure from Mar del Plata 15 years earlier, in that it shifts the focus away from an implicit, fundamental human right to clean water. In its place is a more complex construct, in which valuation mechanisms are required to rank order and allocate water across its many competing uses.

In addition to articulating general principles, Dublin also identified some specific ramifications for river basins and watersheds. Noteworthy here is the tension between an expanding water-management paradigm and a powerful inertial tendency to reaffirm conventional stances toward sovereign authority and expert knowledge. Regarding sovereignty, the Dublin Statement wrestles with the way to balance the ecologically integrated character of river basins against the divisions imposed by sovereign authority and sharply demarcated territoriality. On the one hand, Dublin asserts that 'The most appropriate geographical entity for the planning and management of water resources is the river basin' and that 'Ideally, the effective integrated planning and development of transboundary river or lake basins has similar institutional requirements to a basin entirely within one country' (ICWE, no date). But rivers only enter the discussion in significant form when they are international (read: border-spanning) and the dominant norm for international rivers remains territorialized national sovereignty enhanced by inter-state development assistance. 'The essential function of existing international basin organizations is one of *reconciling and harmonizing the interests of riparian countries*, monitoring water quantity and quality, development of concerted action programmes, exchange of information, and enforcing agreements' (ibid., emphasis added). International river governance is still the domain of sovereign, territorialized states:

> In the coming decades, management of international watersheds will greatly increase in importance. A high priority should therefore be given to the preparation and implementation of integrated management plans, *endorsed by all affected governments and backed by international agreements*. (Ibid., emphasis added)

The value attached to expert knowledge is also apparent. The Dublin Statement places a strong emphasis on national processes of knowledge generation in the service of water management, including data collection, 'measurement of components of the water cycle', global monitoring and data exchange, interdisciplinary 'research and analysis techniques', technical training, periodic national assessments of progress and technology development. Although the general rhetoric of participation is frequently invoked, the envisioned flow of knowledge is clearly unidirectional. The only reference that extends

beyond the closed club of elite managerialism is a call to raise 'public awareness' of the problem; that is, the problem as diagnosed by the water elites constituting the Dublin conference.

The Earth Summit and Agenda 21: new water in old bottles?

A similar tension between paradigm-shifting principles and the reinscription of sovereign, territorialized, expert-driven institutions emerged from the treatment of water issues at the 1992 UNCED Conference itself, to which Dublin was a precursor. More than a decade after its occurrence, the UNCED meeting (widely referred to as the 'Earth Summit') remains an ambiguous event. Most sceptics and enthusiasts alike would concur with the observation of Haas *et al*. (1992: 32) that UNCED created a more complex problem construction, embracing 'a tightly linked policy agenda that reflects the complex ecological and sociopolitical links among various human activities and between human activities and the environment'. Proponents point to the Summit's endorsement of linkages between environmental protection and development efforts; to the high-level attention it garnered from governments, media outlets and publics around the world; to its adoption of broadly global treaties on climate and biodiversity; and to its role in strengthening ties among NGOs and social movement groups around the world. Critics and sceptics, in contrast, stress the skewing of the agenda toward Northern environmental concerns on climate and biodiversity; the failure of vague conceptions of sustainability to engage central issues of global production and consumption patterns; and the lack of tangible commitments at the meeting or actions in its wake.[14]

At the Earth Summit, water issues did not generate the sort of high-profile, regime-building negotiations that surrounded climate, forests and biodiversity. Instead, UNCED's output on global water problems came in the form of *Agenda 21*, the conference's voluminous action plan for global sustainable development. Unlike the passing references in the Brundtland report, water became a central theme of *Agenda 21*, earning an entire chapter on 'Protection of the Quality and Supply of Freshwater Resources'. The water chapter of *Agenda 21* underscores the complex problem construction framed in Dublin as well as the centrality of the idea of integrated water resource management. This can be seen in the chapter's subtitle – 'Application of Integrated Approaches to the Development, Management and Use of Water Resources' – and in this introductory passage:

> The widespread scarcity, gradual destruction and aggravated pollution of freshwater resources in many world regions, along with the progressive encroachment of incompatible activities, demand integrated water resources planning and management. Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multisectoral nature of water resources development in

> the context of socio-economic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities. (UN Commission on Sustainable Development, no date)

The Dublin principles on participation, gender and economic valuation are endorsed, albeit in a nonspecific way. In particular, the participatory and gender-based elements stressed in Dublin's expert network setting featured far less prominently in the inter-state atmosphere of *Agenda 21* negotiations.

Once again, however, the application of this expanded problem construction reveals the enduring pull of sovereign territoriality, state-centred authority and expert knowledge. Integrated water resource management is to be carried out at the level of the catchment basin, but, where these extend across national boundaries, the primary task is for states to promote the 'harmonization' of national strategies and action programmes (ibid.: section 18.12.o.c.).[15] Moreover, in doing so, they are to wield the implements of universalized, centralized knowledge: risk analysis, impact assessment, optimum allocation, research cooperation and operational guidelines. Again the knowledge flow is seen as unidirectional, in the form of calls for public education and the raising of awareness.

It is noteworthy that *Agenda 21* remained largely silent on the highly contentious disputes surrounding the construction of large dams, canals, irrigation schemes, hydroelectric facilities and other projects with highly destructive consequences for watersheds and local populations. Nor did it have much to say about the controversies of water pricing policies, allocation mechanisms and privatization initiatives. These complex disputes, at once geographically localized and socially transnationalized, remained unacknowledged within a statist–developmentalist frame of international river cooperation and domestic water sovereignty.

In other words, both the Dublin principles and *Agenda 21* reflect tensions between sovereign and trans-sovereign approaches to global water governance. On the one hand, we see clear movement toward a more complex problem construction, a more holistic set of human–natural linkages and a new ethic of stakeholder participation. We also see the enduring pull of traditional institutional forms related to the state, its territory and its knowledge. Rather than reading the process of global conferencing and elite networking as merely a top-down inscription of would-be global norms, it can be understood instead as a symptom of this underlying tension, and therefore as a social space within which the struggle engendered by that tension has played out.

From Dublin to The Hague: institutionalization of the IWRM paradigm

By the latter 1990s, the idea of integrated water resource management had emerged as the predominant paradigm through which to view and discuss water policy issues in international contexts. A large professional community of water knowledge experts had crystallized around the concept, promoted it vigorously and enjoyed increasingly robust transnational linkages in doing so. These linkages included several professional publications; well-established expert networks centred on the International Water Resources Association; important stock-taking exercises such as the 1997 *Comprehensive Assessment of the Freshwater Resources of the World* by the UN Commission on Sustainable Development; and an array of international symposia, congresses, expert working groups and global summits that had literally reached the saturation point (see Table 27.1, above).

Much as 'sustainable development' had become the near-universal language of global environmental discussions in international forums, IWRM had achieved pride of place in global water discussions. Table 27.2 provides several illustrations of this increasingly reflexive invocation of IWRM in several key documents and major global policy statements beginning in the late 1990s.

Table 27.2 IWRM as the language of global water policy discussions

UN Commission on Development's *Comprehensive Assessment of the Freshwater Resources of the World* (1997)	'The findings of this report dramatize the importance of putting into practice the concept of a holistic management of fresh water as a finite and vulnerable resource, and the integration of sectoral water plans and programmes within the framework of national economic and social policy.… Manage water quantity and quality together in an integrated and comprehensive manner, taking into account the upstream and downstream consequences of management actions, regional and sectoral relations and social equity.'
Expert Group Meeting on Strategic Approaches to Freshwater Management (1998)	'Integrated water resources management within a national economic framework is essential for achieving efficient and equitable allocation of water resources and thus for promoting sustainable economic development and poverty alleviation. The adoption of an integrated approach to the environmentally sustainable management of water resources is also fundamental for protecting freshwater ecosystems, water quality and human health.… there is much to be done, but an integrated approach is the way forward since it offers a means of reconciling competing demands with dwindling supplies, as well as a framework in which hard choices can be made and effective operational actions can be taken. It is valuable for all countries and at all stages of development.'

Table 27.2 continued

World Water Vision (2000)	'It is essential to take a holistic approach to integrated water resources management (IWRM). Decisions must be participatory, technically and scientifically informed, and taken at the lowest appropriate level – but within a framework at the catchment, basin, and aquifer level, which are the natural units by which nature manages water.… This framework incorporates the intersection of three complex and rapidly changing systems: the environment, of which water is a vital part of all living things; the hydrological cycle, which governs the flow and regeneration of water; and the human socioeconomic system of activities.'
Global Water Partnership's *Towards Water Security: A Framework for Action* (2000)	'The philosophy underlying the translation of the Vision into action is integrated water resources management (IWRM).… IWRM holds that if water is managed holistically, a more equitable, efficient and sustainable regime will emerge. Instead of fragmentation and conflict, competing sectoral interests and responsibilities for the whole water domain can be resolved within a single integrated framework.'
Ministerial Declaration of The Hague on Water Security in the 21st Century (2000)	'The actions advocated here are based on integrated water resources management, [*sic*] that includes the planning and management of water resources, both conventional and non-conventional, and land. This takes account of social and environmental factors and integrates surface water, groundwater, and the ecosystems through which they flow.… Integrated water resources management depends on collaboration and partnerships at all levels, from individual citizens to international organizations, based on a political commitment to, and a wider awareness of, the need for water security and the sustainable management of water resources.'
International Conference on Freshwater (2001)	'[Water] allocation mechanisms should balance competing demands and take into account the social, economic and environmental values of water. They should reflect the links between surface and groundwater and those between inland and coastal water, growing urbanization, land management, the need to maintain ecosystem integrity and the threats of desertification and environmental degradation. Integrated water resources management should be sustainable and optimize water security and human benefit per unit of water while protecting the integrity of ecosystems.'

Sources: GWP (2000: 14–15), Ministerial Declaration of The Hague (2000), World Water Commission (2000: 25, 29), UN Economic and Social Council, Commission on Sustainable Development (1998: paras 11, 13, and page 2), UN Commission on Sustainable Development (1997: paras 131, 157, and pages 45, 49), International Conference on Freshwater (2001a: 4).

The World Water Council and the Global Water Partnership

Two ambitious efforts to give this process of institutionalization a more tangible organizational form also emerged during this period. Both the World Water Council (WWC) and the Global Water Partnership (GWP) were established in 1996. Four years later, in March of 2000, they combined to present a 'World Water Vision' and a 'Framework for Action' at the Second World Water Forum in The Hague. These organizations and the framework they present for global water management represent the apogee of IWRM influence. They also illustrate the important ways in which IWRM has fallen short of becoming a hegemonic frame for global water norms, and the important cleavages in the expert networks that have championed the idea of IWRM over the past two decades.

The idea for a world water forum or council to 'involve private institutions, regional and non-governmental organizations along with all interested governments in the assessment and follow-up' was broached originally at the 1992 Dublin Conference (ICWE, no date). When no action was taken on this suggestion at the Earth Summit, IWRA took up the call to create an umbrella organization for the purposes of raising the profile of freshwater issues globally, providing expertise and authoritative recommendations, and undertaking periodic assessments of the world water situation (see Grover and Biswas, 1993). A resolution calling for the creation of such a body was passed at IWRA's Eighth World Water Congress in 1994. According to the WWC (no date a), 'The consensus was established around the need for the creation of a common umbrella to unite the disparate, fragmented, and ineffectual efforts on global water management.'

Institutionally the WWC represents an intersection of water elites from national and international development agencies, the private sector and international professional–technical associations related to the building of water infrastructure. The three founding institutions signing the original articles of incorporation in 1996 were the Egyptian Ministry of Public Works and Water Resources, the Canadian International Development Agency and the French firm Suez-Lyonnaise des Eaux, a leading multinational corporation in the water sector. These founders were backed by a set of ten supporting or 'constituent organizations' drawn from intergovernmental and international professional organizations active in the water sphere.[16] WWC's 313 member organizations are mostly private firms, government agencies, research institutes and international organizations and associations (in part because WWC collects an annual membership fee of $1000).

Since its inception, the main activities of the WWC have been to organize three so-called 'World Water Forums' – in Marrakech (1997), The Hague (2000) and Kyoto (2003). These major global conferences have been attended by thousands of water professionals from around the world and have

been accompanied by parallel interministerial meetings. They are intended to raise awareness about the global water challenge, disseminate knowledge about water problems and solutions and generate political pressure on governments to respond. The WWC's 2000 *World Water Vision* (Cosgrove and Rijsberman, 2000b: iv) defines that challenge in a statement that reveals much of how the organization understands its mission:

> As the world population increased and urbanization and industrialization took hold, the demand for water kept rising while the quality continued to deteriorate. Water scarcity afflicted many more nations, and access to clean drinking water and sanitation remained poor. A decline in public health financing and a rise in transboundary water conflicts made these problems worse. But awareness of the problems was limited to a few on the 'inside', in the water sector.

This rhetorical stance and the understanding it reflects (of a global problem reaching crisis proportions, well understood by experts but unrecognized by politicians and the general public) suffuses WWC efforts and activities.

A second effort to give organizational form to IWRM networking is the Global Water Partnership (GWP), created in 1996 as a joint initiative of the World Bank, UN Development Programme and Swedish International Development Agency. Their rationale in creating the GWP was 'promoting and implementing integrated water resources management through the development of a worldwide network that could pull together financial, technical, policy and human resources to address the critical issues of sustainable water management' (Global Water Partnership, no date f). The Work Program of the GWP has as its stated purpose 'to help countries to apply integrated water resources management in a participatory manner as a means to provide equitable, efficient and sustainable management and use of water' (GWP, 2001: 6).

Based in Stockholm, the GWP (GWP, no date b) describes itself as 'a working partnership among all those involved in water management: government agencies, public institutions, private companies, professional organizations, multilateral development agencies and others committed to the Dublin–Rio principles'. In practice, the GWP consists of a Stockholm-based secretariat with a small professional staff and a membership consisting of regionally organized networks of organizations 'that recognize the Dublin–Rio principles and are involved with issues related to integrated water resources management' (GWP, no date d). A steering committee elected by the membership consists primarily of water professionals from national bureaucracies, intergovernmental organizations and water-for-development NGOs.

IWRM rhetoric, thought and conceptualization suffuse the GWP. Along with acceptance of the Dublin–Rio principles, involvement in IWRM activities is a criterion for GWP membership. Its Associated Programmes, intended 'to help [GWP] partners develop and implement good practices for the

sustainable management of their water resources', include programmes on institutional roles in IWRM, IWRM capacity building and IWRM information systems.[17] The GWP maintains a ten-member Technical Committee charged with providing guidance on IWRM priorities. On its website, GWP maintains an IWRM 'Toolbox' containing planning tools, case studies, references and contacts, emphasizing the legal and financial context, institutional roles and management instruments. The purpose of the Toolbox is to 'provide water management professionals clear examples of good and bad practices and lessons learned from real life experiences of implementing IWRM' (GWP, no date a).

The division of labour between the WWC and the GWP has not been entirely clear and smooth. The battery of major documents released at the Second World Water Forum (discussed below) created substantial confusion as to the central voice and message. A 2002 survey of WWC membership organizations indicated that most members did see the two organizations as having different objectives and missions: 'The WWC is a think tank mostly working in the field of policy making and lobbying, whereas GWP is more active at the grass-roots level by implementing projects' (World Water Council, no date c). The survey also showed a wide diversity of views among the WWC member organizations as to its most important functions. The emergence of these newer entities has also provoked discussions within IWRA as to that organization's mission statement and strategic goals (discussed below).

The World Water Vision

The peak expression of IWRM influence came at the Second World Water Forum in The Hague in March of 2000. This meeting, organized by the World Water Council, was intended to create greater visibility and political pressure on world water issues by promoting networking and consensus building among the international community of water experts. Although billed as the launching of a 'water movement', the meeting consisted principally of water professionals, experts, government officials, business interests and mainstream NGOs (World Water Council, 2000a: 5).[18] It reflected the WWC aim of constructing a global, expert-based lobby.

The Hague forum saw the launching of several major statements. The WWC had commissioned a 'World Water Commission for Water for the 21st Century', chaired by World Bank Vice President Ismail Serageldin, to produce a forward-looking document on global water challenges. This *World Water Vision* (hereafter, *Vision*) was released at the Forum, along with a companion 'Framework for Action' (hereafter, *Framework*) put together by the Global Water Partnership.[19] At the meeting itself, a parallel Ministerial Conference involving 149 governments produced a formal ministerial

declaration on water security in the 21st century (Ministerial Declaration of The Hague, 2000).

The WWC's *Vision* described a global water crisis – 'the gloomy arithmetic of water' – driven by population growth, urbanization and industrialization combined with declining water quality, inadequate public investment and increasing transboundary water conflicts (World Water Commission, 2000: 15; see also Cosgrove and Rijsberman, 2000b: 2, 3). It projected a world in which four billion people will live under conditions of water stress by 2025, according to a 'business as usual' scenario (Cosgrove and Rijsberman, 2000b: 25). In response, the *Vision* called for a combination of research and innovation to enhance water-use efficiency; reformed management practices to enhance efficiency and accountability; 'full-cost pricing' of water to promote efficiency and conservation; greatly expanded capital investment in water (coming mainly from the private sector); enhanced intergovernmental cooperation in shared river basins; and greater stakeholder involvement in decision making.

Accompanying the *Vision*, the Global Water Partnership released *Towards Water Security: A Framework for Action*, meant as a set of steps to make the *Vision* a reality. Among the report's 'global water security targets' were the following goals (GWP, 2000: 13):

- comprehensive policies and strategies for IWRM in process of implementation in 75 per cent of countries by 2005 and in all countries by 2015;
- proportion of people not having access to hygienic sanitation facilities reduced by half in 2015;
- proportion of people not having sustainable access to adequate quantities of affordable and safe water reduced by half by 2015;
- increase water productivity for food production from rainfed and irrigated farming by 30 per cent by 2015;
- reduce the risk from floods for 50 per cent of the people living in floodplains by 2015;
- national standards to ensure the health of freshwater ecosystems, established in all countries by 2005, and programmes to improve the health of freshwater ecosystems implemented by 2015.

To make progress toward these goals, the *Framework* identified four broad action themes (making water governance effective, generating water wisdom, tackling urgent water priorities, and investing for the water future) and a series of 126 recommended actions that largely echo the technical, financial and managerial emphasis of the WWC's *Vision*. The core themes of IWRM suffuse both documents: multisectoral and multi-level frameworks,

better technical and managerial systems, policy optimization and enhanced participation. The *Framework* invoked IWRM not simply as a means to the end of water security but as a measurable target in itself, calling for comprehensive policies and strategies for IWRM to be in place in all countries by 2015. The *Vision* tended toward the technocratic side of IWRM, conceiving of water policy as a set of levers to be pulled by water managers: increasing water productivity, changing the price charged for water and the value assigned to ecosystem functions, and deploying technological and administrative innovations.

Emergent rifts: valuation and participation

The Second World Water Forum also laid bare some important controversies that mark the limits of IWRM's political reach and governing power, as well as some important cleavages within the IWRM community itself. Substantive controversies loomed large at The Hague, including contentiousness over the construction of large dams, water pricing/privatization policies, water and gender, and cooperation on international watercourses. Anti-dam protesters interrupted the opening ceremony in dramatic fashion, stripping naked and displaying protest banners in the midst of the opening addresses. Among 'major groups' providing formal commentary on the Forum, the *Vision* and *Framework* documents, and the final Ministerial Declaration, supportive statements from business and scientific groups contrasted sharply with dissenting perspectives. The NGO forum rejected the *Vision* and the *Framework*; the 'gender ambassadors' to the event decried the failure to go beyond 'lip service' in recognizing the gendered aspects of water inequality; and the international trade union confederation Public Service International rejected the trend toward privatization of water services ('Statements by Representatives of Major Groups', in World Water Council, 2000a: 79–92). Latin American and African governments issued statements dissociating themselves from the *Vision* and *Framework* and taking exception to aspects of the Ministerial Declaration.[20] The Turkish government rejected references to international sharing of water resources; the French government expressed reservations about the emphasis on privatization.[21] In comments to the NGO Forum, Ismail Serageldin, the World Bank's Vice President for Special Programs and the chair of the WWC's World Commission on Water for the 21st Century, identified controversies surrounding large dams and water pricing as the principal barriers to effective progress along the lines envisioned in the *Vision* and the *Framework*. What was becoming clear at The Hague, and what has been reinforced since, is the limited capacity of IWRM – as a set of ideas, as a policy-framing discourse or as an expert-driven political movement – to create a normative structure for the resolution of social conflicts.

Valuation

One of the central tensions underlying water-related conflict has been that of valuation. The question of whether water constitutes an economic good or a basic human right has become an increasingly problematic schism within the IWRM movement. On the one hand, getting the price of water right, for the sake of economic efficiency, as a more accurate reflection of its full social cost, and as a stimulus for more appropriate investment patterns in the water sector, has long been a central theme in IWRM reasoning and rhetoric. In this context, IWRM fits comfortably within the global trend toward so-called 'full-cost' pricing, water service privatization and the 'marketization' of water. For example, the Global Water Partnership's call to increase water-sector investment levels from the current $75 billion per year to $180 billion annually envisions most of the money coming from the private sector, with full-cost pricing the necessary stimulus to mobilize that investment (GWP, 2000: 78).

On the other hand, as Peter Gleick (1999: 487–503) has documented, there is also growing momentum behind the idea of water as a basic human right, grounded in both water-specific considerations and the broader notion of a 'right to development'. The UN Commission on Sustainable Development's *Comprehensive Assessment of the Freshwater Resources of the World* (1997: 3) stated that 'all people require access to adequate amounts of clean water, for such basic needs as drinking, sanitation and hygiene'. A coalition of municipal labour unions, parliamentarians and greens emerged in the late 1990s to push for a 'social charter' for water, in which the basic water rights of all people are articulated even as the need to move toward more efficient pricing systems is acknowledged (see, for example, Académie de l'Eau, 1999). This theme also produced one of the liveliest and best-attended sessions at The Hague, and one of the few to be conducted in a language other than English (French), although any mention of it was studiously avoided in the Forum's official final report. The idea of water as a public good that constitutes a human right has also been central to innovative, influential experiments with national water-law reform in countries such as Brazil and South Africa.

As discussed previously, the 1992 Dublin principles affirmed both ideas, stressing the importance of recognizing water's life-sustaining role (Dublin principle 1) but also citing water's economic value in all of its competing uses (Dublin principle 4). In the context of the times, there was a political logic to this formulation: Dublin was pushing against state-allocated, state-monopolized water management practices that too often responded neither to water's growing scarcity value nor to its life-sustaining role as a basic human need. Nor is it impossible to entertain both notions. One leading figure in IWRM networks, Jerome Delli Priscoli of the US Army Corps of Engineers, has described IWRM as being marked by a 'dialectic between two philosophical norms; one, the rational analytic model, often called the

planning norm, and two, the utilitarian or free market model, often couched in terms of privatization' (Delli Priscoli, 1996: 30). The long-standing presence of this 'dialectic' hardly precluded the growth and institutionalization of IWRM as a set of water-management norms, as we have seen. But as the idea has become established that water must be managed comprehensively across its competing human, market-based and ecosystemic uses, the debate over reconciling the tension between human need and market good has sharpened dramatically.

One example of IWRM's inability to speak to this tension is seen at the level of intergovernmental organizations, which constitute critical organizational nodes in the IWRM expert network. In the past decade, the World Bank, UN Development Programme and UN Food and Agriculture Organization have produced policy frameworks on freshwater that take strikingly different stances on the question of valuation. Each organization has embraced IWRM as a fundamental policy guide and a frequently invoked rhetorical device. Yet each organization has found a strikingly different basis in IWRM for approaching the valuation controversy.

In March of 2002 the World Bank (2002) made public its draft 'Water Resources Sector Strategy'. This report was prepared to assess the Bank's experience with its 1993 reform of water-sector guidelines. The 1993 reforms had been based on the idea that much of the problem of poor water resources management lay in inefficient public agencies, distorted prices, excessive centralization and poor investment choices.[22] The 2002 report endorsed this 1993 policy framework strongly, while also calling for a repositioning of the Bank with regard to controversies surrounding water privatization and pricing reforms and water infrastructure projects. The report's main conclusions were that the Bank should stress public–private partnerships for water service delivery and manage more effectively the political risk associated with large infrastructure projects.

With regard to IWRM, the Bank found strong conceptual support for its approach of reducing poverty through market-oriented reforms. The report argues that 'There is broad consensus on what constitutes good water resources management.… Water resources should be managed holistically and sustainably, respecting subsidiarity and ensuring participation, and treating the resource as an economic good' (ibid.: 28).[23] IWRM in this context is understood to mean creating the proper institutional framework, management instruments, and infrastructure for sector-specific water uses (irrigation, water supply and sanitation, energy, environmental services and industrial uses, while relying on price signals to allocate water to its highest-value uses within and across these sectors). Essentially, IWRM to the Bank means getting the prices right while paying attention to distributive issues in each sector, within a stable, efficiency-maximizing institutional framework at the

national level. The virtues of full-cost pricing, the willingness of most social actors to pay these prices and the efficiency-enhancing value of privatization are extolled throughout the report.

FAO has taken a very different tack toward the question of water and valuation in its water resources policy guidelines. In the wake of the Earth Summit, FAO launched its International Action Programme on Water and Sustainable Agricultural Development as a response to the water-related aspects of *Agenda 21*. As part of this effort, FAO (1995) established a framework for national-level water-sector policy reviews. In sharp contrast to the Bank's approach, the FAO framework stresses the 'special attributes of water' that make 'a high degree of government involvement in the sector inevitable'. These include water's character as a basic human right, the role of non-market considerations such as culture in shaping water-related choices, water's high mobility but low transportability, the many externalities associated with water use, and economies of scale in water collection and distribution that create natural monopolies. FAO's bottom line on the valuation controversy is as follows:

> Economic treatment of water, especially pricing, should be in balance with water as a social good, considering the basic needs of the poor and their limited ability to pay for it … Water should be treated as an economic resource. However, a number of other criteria – which are often inter-related – come into play in planning and managing water systems, and different countries will place varying emphases on these. They include: Effectiveness, efficiency, equity and distributional effects, public health and nutrition, environmental impact, fiscal impact, political and public acceptability, sustainability, and administrative feasibility. (FAO, 1995: ch. 3).

The UNDP has also taken a lead role in promoting IWRM. UNDP is a co-sponsor of the Global Water Partnership, and in 1998 its board of directors approved a proposal to make water resources one of the main focal points of UNDP efforts. This decision led to the development of a new strategic plan for UNDP water-sector activities (UNDP, 1998). Like the Bank, the UNDP approach begins with the presumption that there is a broad expert consensus on appropriate water management practices rooted deeply in IWRM concepts (UNDP, no date) (although stressing participation, environmental management and building knowledge-based capacity in contrast to the Bank's narrower emphasis on management instruments and legal/policy frameworks). In terms of valuing water, the UNDP framework underscores the importance of pricing reforms as part of demand management strategies. But it invokes the comprehensive planning stressed by FAO as well as the efficiency-oriented market reforms of the Bank, and places greater emphasis on environmental protection, the status of women and participatory reforms than either the Bank or FAO strategic plans. The UNDP framework

(1998: ch. 3, s. 1) cautions explicitly against an overly economistic approach to water valuation:

> The water problem facing humanity is not simply a matter of better resource allocation in the economic sense. Even more formidable tasks are the effective and equitable distribution of water and water services to the billions of individual users, and the development of measures that can provide holistic protection of the health and viability of the entire aquatic environment. These are central precepts of sustainable water management.

None of these three strategic frameworks for water management is particularly surprising given the overall orientation and ideology of the organization in question. Indeed, that is the point: each organization has found a reaffirmation of its predisposition toward the water valuation controversy within the malleable language of IWRM.

Of course such gaps may be intraorganizational as well. Evidence of a cleavage on valuation questions appeared when the World Water Council surveyed its member organizations in 2002. In response to a query on WWC priorities, most of the WWC board of governors identified 'increasing investments for water' and 'moving to pricing of all water services' as important priorities, whereas WWC member organizations ranked these items at the bottom of the list of ten options offered to respondents. The top priorities of the membership were those most closely aligned with a human needs/human rights valuation framework: providing safe drinking water, sanitation and water for food security (see World Water Council, no date c: 3).[24]

Participation

A growing rift has also developed on the question of participation. Conceptually, enhanced participation in water-related decision making flows directly from the core IWRM theme of comprehensive management of multiple uses. Broadened participation is necessary given the informational intensity and social complexity of the management task. Participation is often couched as well in terms of subsidiarity, the notion that management functions and resource decisions are generally made best when made closest to the source, or at the lowest feasible level of social aggregation.

Exactly what constitutes participation is often described in bland, universalizing and undifferentiated terms, as in the suggestion of one expert working group that 'The basis for a strategic approach to integrated freshwater management can be founded on a set of key elements that bring together all the relevant parties and their particular socio-economic and environmental concerns that are bound by freshwater'(UN Economic and Social Council, Commission on Sustainable Development, 1998: para. 11, 2). In practice, IWRM's rhetorical embrace of participation leaves unresolved

important tensions with its often technocratic understanding of knowledge and rationality, its emphasis on the state as the source of change, and its mounting vested interests in a water sector increasingly colonized by IWRM thought, if not practice.

Not surprisingly, an approach grounded in expert knowledge, scientific rationality and increasingly bureaucratic organization has often reinforced a limited, hub-and-spoke notion of participation: helpful information about uses, preferences, behaviour and effects flow in from society to expert centres; scientific truths to guide social action flow out. The practices surrounding development of the *World Water Vision* reflect this model. The main participatory channels were a set of regional consultations organized by the Global Water Partnership and four 'sectoral' consultations organized by 'water experts and water-related interest groups' such as the International Commission on Irrigation and Drainage, the Collaborative Council on Water Supply and Sanitation, and the Consultative Group for International Agricultural Research (see Cosgrove and Rijsberman, 2000a: 5, cited in Dubash *et al*., 2002: 77). Commenting on the *Vision* participation process, a report from the World Resources Institute concluded that 'Widespread accounts of the consultations, including accounts by the WWV Secretariat itself, indicate that governmental and quasi-governmental water agencies did play a dominant role … The Vision's organizers concede that, overall, the process was not as inclusive of grassroots and civil society inputs as they had hoped' (Dubash *et al*., 2002: 77). A coalition of NGOs was less charitable, describing the process as a 'sham' and arguing that 'the process has been controlled from the start by a small group of aid agency and water multinational officials, mainly from the Global Water Partnership, World Water Council, World Bank and [French multinational] Suez-Lyonnaise des Eaux' (ibid.).

However, rather than yielding a monolithic result of water managers-as-technocrats, questions swirling around participation often produce fragmentation, dissension and debate. IWRM networks are better understood as a political space in which participatory conflicts are joined, rather than as a dominant form marked by the hegemonic imposition of solutions and the negation of controversies. Rifts may form within or between nodes in expert networks, between clusters of nodes in a particular network, or across parallel/rival networks. Again the gap between the World Water Council's board of governors and its member organizations provides an example. In the members' survey discussed previously, board members identified 'governments/water agencies' and 'private sector consultants' as the most underrepresented groups on the board, while member organizations identified 'civil society' and 'research/universities' (see World Water Council, no date c: 6).[25]

A second source of tension related to participation is the strong tendency of the IWRM approach to define its task as pushing the state toward more

rational water management practices. This often ends up simply exporting the participation problem to the state, as can be seen in the way the *World Water Vision* understood participation:

> A model for participatory basin management has developed … A central feature is the integration of participation and the use of economic instruments. It is equally imperative that decisionmaking be informed and scientifically sound. Effective river basin management thus walks on two legs: parliaments, where users make policies and decide on the raising and spending of money, and excellent technical agencies, which provide the parliaments and users with the raw and processed information necessary for management. (World Water Commission, 2000: 29)

When parliaments and technicians do not fulfil these functions, the rational, orderly notion of participation as knowledge guide for state action quickly breaks down, as seen in the controversies surrounding the Second World Water Forum.

There is also an ironic twist to participation controversies. As IWRM has undergone enhanced legitimation, rapid institutionalization and growth within and among associated organizations, its main purveyors have been turned into stakeholders themselves, making it harder to maintain a detached stance of whispering in the king's (or citizen's) ear. For example, there have been continuing organizational tensions between the IWRA as the historically established hub of IWRM networking and the WWC as a high-profile newcomer to the field. IWRA played a key role in the formation of WWC, with the expectation that the latter would serve as 'an umbrella organization for water resources policy'.[26] But WWC evolved instead into a direct competitor in some important domains. It organizes a major global meeting (the World Water Forum) that competes directly with IWRA's World Water Congress for attendees; the Second World Water Forum, held in the Netherlands in March 2000, overlapped IWRA's IX World Water Congress thousands of miles away in Melbourne. WWC also publishes *Water Policy*, featuring articles from leading voices in the international water policy arena and thus competing with IWRA's *Water International*. A proposal to withdraw IWRA's membership from the WWC was voted on (and defeated) at the 1999 IWRA Executive Board meeting (see Executive Board of the International Water Resources Association, 1999).

Beyond IWRM?

Both the influence and the limits of IWRM were on display in December 2001 when, in preparation for the 2002 World Summit on Sustainable Development, the German government hosted the International Conference on Freshwater, more commonly referred to as the Bonn Freshwater Summit. Bonn constituted a now-familiar process, the next in a series of global

convergence points for increasingly well-institutionalized water policy experts, rubbing elbows with social movement groups, businesses, trade unionists, farmers and government delegations. As has also become the norm, the Bonn meeting included a governments-only session producing a Ministerial Declaration. Strikingly, however, Bonn also incorporated a 'multistakeholder dialogue' in which farmers, unionists, NGOs, business groups and other nominal representatives of sectoral interests came together with government representatives to discuss key controversies such as the role of the state and the suitability of privatization. The discussion of IWRM that ensued (as documented by the International Institute for Sustainable Development in its role as conference *rapporteur*) is striking in its unfocused character and the broad array of themes smuggled in under the notion of IWRM:

> Integrated Water Resource Management (IWRM) was extensively discussed. **FRANCE** emphasized state water management, universal provision of drinking water and commercialization rather than privatization. **IRAQ** distinguished between water pricing and sale, stating that water sale was unacceptable. **GLOBAL WATER PARTNERSHIP** said discussion should focus on farming, which accounts for 70 percent of water use. **ADB** identified key issues for farmers as access, conservation and fair and equitable returns. **FARMERS**, the **US** and **MOROCCO** shared their experiences, respectively on water pricing, managing water contamination and managing riverine catchments. **UZBEKISTAN** called for donor coordination, and for donors to respect local knowledge and experience. **NGOs** stressed participatory decision making and **BRAZIL** drew attention to water quality and pricing. (IISD, 2001)

The final statement emerging from this multi-stakeholder dialogue was strikingly devoid of IWRM themes and imagery, stressing instead specific points of political controversy (on privatization, the role of business and international financial institutions, and urban/rural competition for water) and political consensus (on eliminating corruption, mobilizing financial resources, and the importance of local governments). The discussion of 'participation', a core IWRM theme, moved substantially beyond the notion of everyone talking to everyone else, to stress specific themes such as strengthening rights to information, creating more transparent processes, and taking action to create and enforce clear legal and regulatory frameworks (International Conference on Freshwater, 2001b). Similarly the declaration of recommendations for action adopted by the Conference as a whole took as its point of departure not only such core IWRM concepts as better management, subsidiarity and efficient allocation across competing uses, but also the very questions related to authority, privatization, valuation and the role of the state that IWRM has proved unable to bring to closure (Table 27.3).

Table 27.3 Recommendations for action, International Conference on Freshwater

Secure equitable access to water for all people
Ensure that water infrastructure and services deliver to poor people
Promote gender equity
Appropriately allocate water among competing demands
Share benefits
Promote participatory sharing of benefits from large projects
Improve water management
Protect water quality and ecosystems
Manage risks to cope with variability and climate change
Encourage more efficient service provision
Manage water at the lowest appropriate level
Combat corruption effectively
Ensure significant increase in all types of funding
Strengthen public funding capabilities
Improve economic efficiency to sustain operations and investment
Make water attractive for private investment
Increase development assistance for water
Focus education and training on water wisdom
Focus research and information management on problem solving
Make water institutions more effective
Share knowledge and innovative technologies

Note: The conference recommendations also included more detailed recommendations on the roles of governments, local communities, workers and trade unions, nongovernmental organizations, the private sector and the international community.

Source: International Conference on Freshwater (2001a).

Conclusion: expert water networks as an institutionalized space for normative struggle

Over the past few decades, the idea of integrated water resources management has emerged to offer a new paradigm for water-related decisions and practices. IWRM has become *the* discursive framework of international water policy, the reference point to which all other arguments end up appealing. Much like the thoroughly picked-over concept of sustainability, IWRM combines intuitive reasonableness, an appeal to technical authority and an all-encompassing character of such great flexibility as to approach inherent vagueness. This feature is well captured in the statement of the World Water Council (2000a) quoted at the outset of this chapter: 'Water is affected by everything, and water affects everything and everyone.' Actors routinely appeal

to IWRM arguments, concepts and rhetoric to bolster their positions, almost entirely independently of what those positions are.

Part and parcel of this development has been the growth, extension and increasing influence of networks mobilizing various forms of water-related expertise. Neither the ideas nor the networks can be said to be causally prior to the other: the ideas provided a pole around which the networks could be built, and the networks carried the ideas to greater prominence, legitimacy and influence in national and transnational policy circles. The clearest evidence of their joint success is the near-hegemony that IWRM phrases and concepts had come to enjoy by the late 1990s as the language of international water policy.

IWRM stresses an integrated, holistic, multi-task, multi-level approach. At times, the resulting framing of the problem can sound abstract to the point of vacuity: everything is connected to everything else, everyone is a stakeholder and all aspects must be considered. Platitudes abound: one of the recommendations for reform in the Global Water Partnership's *Framework* called upon 'government and other agency staff to voluntarily reduce their own power and involve communities in the decision making process from the beginning' (GWP, no date e: 6; GWP, 2000: 27). Such statements, however, must also be understood in the historical context of dismantling a prior era of water policy as damming, diverting, draining and dumping. The sort of paradigm shifts, reframed meanings and new policy discourses described in this chapter are part and parcel of political struggles. The political power of authoritative technical expertise and appeals to broader stakeholder participation became important resources in that process of dismantling.

Yet, far from generating consensual norms, the broadened political space for discussing water in an international context has instead become embroiled in conflict and controversy. For some, IWRM represents the death of the idea of water as merely a resource, substituting in its place an imperative for comprehensive planning to balance economic, ecological and social considerations. For others, IWRM constitutes an effort to perfect rather than abandon the idea of water as a resource: to shift water-development projects and water itself from state-supplied public good to privately-sourced economic good, subject to the disciplining rule and valuation techniques of the market. As a result, the IWRM arena has been replete with struggles over public versus private authority, conflict over market versus non-market foundations for resource valuation and allocation, and tensions between the territorially fixed character of the state and the transnationally fluid character of modern global capitalism.[27]

To the extent that new norms regarding water management are being embraced, they are not simply the result of a technical–rational assessment or a consensual process of learning; they are a byproduct of intense, bitter

conflict about the appropriate uses of water, rivers and watersheds. In these struggles, expert networking has offered a set of norms for the technical–rational management of water in a world not organized around metanorms of technical rationality. In the process, expert water networks have had several effects. They have played a powerful role in delegitimizing historical norms of state-centred water manipulation, an influential role in shaping the broad outlines of a new normative structure for global water governance, and a fragmented, ambiguous role in adapting that normative structure to the most contentious social conflicts and controversies related to water. They have simultaneously grown and become more brittle, fragmented by the central and increasingly bitter controversies engulfing global water politics. IWRM shows both the power and the limits of governance models grounded in authoritative expert knowledge and transnational professional networking.

Notes

1. World Water Council (2000a).
2. Delli Priscoli (1996: 33). The author attributes these ideas to Allee (1989).
3. For a discussion of the evolution of IWRM, see White (1998: 21–7).
4. On the Stockholm Conference, see McCormick (1989) and Caldwell (1996). Water issues were first discussed within the UN framework at the 1949 Conference on the Conservation and Utilization of Resources. See United Nations (1951: 3–8).
5. Resolution X denounced the water policies of colonizing powers in occupied territories, singling out the territories of Palestine, Zimbabwe, Namibia and Azania (South Africa). The resolution passed by a vote of 52 to 17, with 22 abstentions (United Nations, 1977b: 557–8).
6. See, for example, early editions of the journal, *Water International*, launched in 1975.
7. Preliminary UN estimates of the effects of the International Drinking Water Supply and Sanitation Decade suggested that significant progress had been made during the 1980s. The number of people with access to clean, adequate water supplies reportedly jumped by 1.3 billion from 1980 to 1990, while those with adequate sanitation jumped by an estimated 750 million, leaving some 1.2 billion without safe drinking water and 1.7 billion without sanitation services. However the World Health Organization, pointing to problems of underreporting and overly optimistic notions of access, revised these 1990 estimates upward in 1996, to 1.3 billion lacking safe drinking water and 2.6 billion lacking sanitation services. See Gleick (1998: 40).
8. On the ACC Water Resources subcommittee, see http://acc.unsystem.org/-subsidiary.bodies/accswr.htm.
9. The notion that fragmentation and ambiguity play a role in promoting paradigm shift is suggestive of Ernst Haas's ideas about the institutional context of learning in international relations. See Haas (1991).
10. Although the concept of sustainability has deeper historical roots, most observers agree that the key catalyst behind its rise to prominence was *Our Common Future*, the influential 1987 report of the World Commission on Environment and Development chaired by Gro Brundtland.
11. These attendance figures differ slightly from those in the Dublin Statement itself.
12. On these and related aspects of planning for the Dublin Conference, see Young *et al*. (1994: ch. 1).
13. For a list of NGOs represented at the conference, see Young *et al*. (1994: Annex 3, 180).
14. For a range of viewpoints on the significance of UNCED, see Conca and Dabelko (1998). For a critical view of the Earth Summit, see Chatterjee and Finger (1994).

15. Grover and Biswas (1993: 81) concluded that 'Agenda 21 … reflects no substantive inputs from the Dublin Conference'.
16. The ten constituent organizations are Canadian International Development Agency (CIDA); International Water Resources Association (IWRA); International Commission on Irrigation and Drainage (ICID); World Bank (WB); International Water Association (IWA); United Nations Development Programme (UNDP); United Nations Educational Scientific and Cultural Organization (UNESCO); World Conservation Union (IUCN); Water Supply and Sanitation Collaborative Council (WSSCC); and CIHEAM – Bari (Istituo Agronomico Mediterraneo). See World Water Council (no date b).
17. Other associated programmes include gender mainstreaming and awareness, water resources assessment, floods management, groundwater management, water management and ecosystems, water supply and sanitation, and water conservation in agriculture. (See GWP, no date c).
18. According to the conference final report, the event's 5700 participants included 400 'nontraditional' participants from the global South sponsored by the conference organizers (p. 6).
19. On the latter, see Global Water Partnership 2000. On the *World Water Vision*, see World Water Commission (2000). See also Cosgrove and Rijsberman (2000b).
20. The delegations of Brazil, Costa Rica, Paraguay and Uruguay took the unusual step of issuing a formal joint statement dissociating their governments from the *Vision* and *Framework* documents and reiterating *Agenda 21* as the 'sole document' for future UN initiatives. The regional meeting of Ministers of the Americas issued a statement underscoring the 'non-binding' character of the Ministerial Declaration, citing its inappropriate use of the term 'water security' and its underemphasis on stakeholder participation in decision making processes. The report from the regional session on Africa (involving ministers and other heads of delegation) called for the documents to be noted rather than adopted and rejected language that 'welcomed' the statements from the major groups. See World Water Council (2000a: 58, 78, 153).
21. See statements of the French and Turkish governments in World Water Council (2000a: 107–10, 146–8).
22. The 1993 guidelines are described in World Bank (1993).
23. The report finds the basis for this consensus in the 1992 Dublin Principles, although these principles are characterized in a very different fashion than in the original Dublin statement.
24. The survey question on Council priorities listed ten options: meeting basic needs/helping to provide access to drinking water and sanitation facilities in emergency situations; meeting basic needs/helping to provide access to drinking water and sanitation facilities in the long term; promoting peaceful cooperation in international river basins; promoting better management of water services; moving toward pricing of all water services; increasing investments in water; helping to improve agricultural water management to enhance food security and sovereignty; protecting aquatic ecosystems; managing risks associated with water including those related to climate change; and avoiding transboundary water-related conflicts.
25. The survey question on board representation listed 11 options: civil society, women, media, trade unions, governments/water authorities, water supply companies, private sector consultants, other private sector, research/universities, international organizations and banks/financial institutions.
26. For a discussion of IWRA/WWC tensions, see the meeting minutes for the 6 June 1998 meeting of the Executive Board of International Water Resources Association (Executive Board of the International Water Resources Association, 1999).
27. This distinction is similar to Kuehls's (1996) distinction between 'smooth' and 'striated' spaces in international environmental politics.

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28 After nature: environmental politics in a postmodern age

Paul Wapner

Environmentalism has been called the 'most enduring and important social movement of the twentieth century' (Thiele, 1999: xii). It has mobilized activists on all continents, won worldwide public support, convinced most states to establish environmental ministries, and facilitated the signing of over 500 international environmental treaties. As the new century unfolds, it is worth asking about environmentalism's staying power. How relevant will environmentalism be in the 21st century? Will it continue to excite and mobilize people throughout the world and translate that energy into significant political change?

There are, of course, no simple answers to these questions. Environmentalism is a multifaceted movement operating in a complex world, so its future trajectory will always be a function of many elements. Part of its prospects, however, rests on how well it can anticipate and respond to changing sociohistorical conditions. All social movements wither or thrive depending on their ability to speak meaningfully to people's concerns about contemporary, public issues. Environmentalism is no exception. Can it speak to changing sociohistorical conditions and widespread public concerns of the 21st century?

Environmentalism has a relatively strong track record of twisting and turning with the times. Indeed its very roots in the late 1800s and early 1900s lie in intellectual and political responses to a profound set of changes associated with industrialization. As the industrial revolution gained momentum and magnitude, proto-environmentalists such as Wordsworth, Blake, Emerson and Thoreau worried aloud about the incipient loss of pastoral and wild landscapes and simpler ways of life threatened by industrialization. Their intellectual descendants, people like Marsh and Muir, wove such concern into a moral and cultural critique of industrialization that resonated with many and essentially started the environmental movement. From a different corner, early environmentalists such as Pinchot and Humbolt translated this critique into a scientific discourse of conservation aimed at redirecting industrialization's largely unmindful and rapid use of resources (Shabecoff, 2003; Guha, 1999). Both orientations developed evocative and consequential language to highlight the stakes of industrialization and provided interpretive frameworks

that resonated with broad public sensibilities. Environmentalism, in short, cut its teeth on providing meaningful responses to industrialization. Its long-term prospects rest on its ability to do the same in the face of future sociohistorical changes.

Environmentalism responded throughout the 20th century to a host of challenges that had to do with both the substance and the scope of environmental concerns. Until the late 1960s, environmentalists organized themselves around, and focused upon, domestic politics. They worked within national boundaries and sought to protect the quality of air, water, soil and species within those domains. This made much sense because what little environmental legislation existed during this time tended to be domestic, as indeed the architecture of global governance was in its infancy.[1] In the 1970s and 1980s, this changed dramatically. With the emergence of transboundary environmental issues, such as ozone depletion, long-range air pollution, expansive oil spills and nuclear testing, it became increasingly clear that a single country could not protect its environment unless it was willing to engage and cooperate with others. Air, water, shifting soil, migratory animals and the like ignored national boundaries and thus environmentalists needed to expand their base of support and operations transnationally to remain relevant and effective in a globalizing, ecological age.

Environmentalists successfully adjusted to this world as they set up shop in and coordinated activities across multiple countries. Greenpeace, Earth Island Institute, Rainforest Action Network, World Wildlife Fund and Conservation International emerged along with others as transnational environmental activist groups working to protect environmental quality the world over.

Environmentalism responded to changing conditions in a different way when it was confronted with the challenge of protecting ecosystems in the global South. While environmental groups extended themselves across national boundaries throughout the 1970s and 1980s, most had headquarters in the North and focused on issues of concern to northern citizens. This meant that much of their international work focused on protecting spectacular landscapes and biological diversity in the South while ignoring the plight of the South's people. Throughout the 1980s, environmentalists realized the folly of such a narrow agenda as they saw many of their conservation efforts come to naught. It became increasingly clear that environmental groups could not save wildlife, biologically rich areas and stunning landscapes in the South unless they also worked to help citizens in the South prosper economically and enjoy the fruits of socioeconomic development (Wapner, 1996). Moreover the global South grew increasingly more vocal during the 1980s with regard to global environmental affairs as it recognized how many international environmental actions threatened to stymie its own development plans.

Environmentalists responded to these challenges by taking social justice and economic issues more seriously and, in turn, helped to fashion the notion of sustainable development. Embracing sustainable development has been crucial for environmentalism to retain its modern relevance.

To be sure, environmentalists did not surmount the above challenges with ease, and parts of these challenges obviously continue to confront environmentalists. Moreover environmentalists probably missed many opportunities to respond to and capitalize on changing sociohistorical conditions. Nonetheless the movement's ability to recognize, address and engage large-scale, sociohistorical change helps explain its staying power and significance through the last century. Can it continue this track record into the future?

Challenges of the new century: crowding out nature

Environmentalism faces a number of new challenges that have been building up over the past century but whose authentic character is only emerging fully in these first years of the new millennium. Two, in particular, stand out as premier tests of environmentalism's continued relevance. These challenges are, admittedly, abstract and may not strike the reader as particularly urgent or even palpable in the modern landscape of environmental politics. Nonetheless, as I hope to show, they rumble under the surface of every environmental issue and the ways environmentalism responds to them will set much of the agenda for environmental activism over the course of the present century.

The first challenge has to do with the extensive and intensive footprint (or, as Irvine, 2002, likes to say, 'bootprint') of humanity on the earth. People have always exerted an ecological presence on the planet. Studies show that the earliest farmers in ancient Mesopotamia used forms of agriculture that led to salinization of the soil and humans have continued to affect adversely the earth's ecosystems since then (Hughes, 1975). The difference today is that, while earlier peoples exerted influence on only parts of the earth, now humanity has left its signature everywhere. By, for example, rerouting rivers, emptying out mountains, deforesting large tracts of land, pumping chemicals into the air, polluting the oceans and decimating the vast diversity of the earth's species, humans have, as McNeill (2001) makes clear, penetrated the lithosphere, pedosphere, atmosphere, hydrosphere and biosphere.

Take the oceans, for instance. For centuries the oceans were seen as vast expanses against which humanity seemed puny and certainly powerless to exploit. Humans could navigate the oceans and steal fish, whales and other creatures from their waters. But, for most of history, humans barely skimmed the surface, as it were. This changed with the advent of steam-powered factory ships in the 19th century and with the introduction of trawlers and, later, drift, sine and bag-shaped trawl nets in the 20th century.[2] At the end of the last century, these technologies took another qualitative leap as sonar, underwater

video cameras and geographic information systems became part of the fishing enterprise. These have allowed ocean trawlers, for example, to drag their nets across every part of the Dutch region of the North Sea once a year (McKibben, 1998: 85) and, more generally, to deplete the oceans of fish to such an extent that the United Nations was able to claim that, by the late 1990s, three-quarters of global fishery stocks were overfished or fully exploited (UNEP, 2002). While the deepest depths of the oceans still remain relatively free from human activity, our reach into and across the oceans extends far, deep and wide.

Human reach goes beyond the oceans. It extends greatly into the earth's landmasses and into the habitats of almost all creatures. This has made humanity not simply another species in a vast evolutionary process but actual governors of the process itself. Palaeontologists tell us that, according to the fossil record, there have been five great extinctions in the geological past. The last one was roughly 64 million years ago, when the dinosaurs disappeared. According to conservation biologists, we are now in the midst of the 6th great extinction and this time we know the cause is not an asteroid hitting the Earth or some other cosmological event. Today, humans are destroying diverse habitats, hunting untold species and otherwise compromising the ability of creatures to live on Earth to such an extent that close to 100 species are disappearing every day and roughly one-quarter to one-third of all species will become extinct within the next 50 years (Wilson, 2003: 102). This diminishment has already reduced the variety of genetic diversity among species to such an extent that the evolutionary process itself has been undermined. According to Michael Soule, human action has had such an impact that '[f]or the first time in hundreds of millions of years significant evolutionary change in most higher organisms is coming to a screeching halt' (quoted in Thiele, 1999: 48–9). Put differently, we have extended our reach so deeply into the plant and animal worlds that we have essentially taken over the reins of evolution.

As is well known, humans have also changed the skies. The planet possesses a stratospheric ozone layer that protects living entities from harmful ultraviolet radiation. For millennia, the constitution of the ozone layer remained fairly constant. This changed in the 1930s with the invention of chlorofluorocarbons (CFCs) and the increasingly widespread use of other ozone-depleting substances (ODS). By the 1990s, ozone levels had fallen so much that skin cancer and cataract rates in humans had gone up, phytoplankton (which are part of the backbone of the marine food chain and provide significant amounts of oxygen for the earth) showed signs of reduction, and susceptible animals such as certain species of frogs showed signs of deformation or disappeared from the earth altogether.[3] Although the 1987 Montreal Protocol and its subsequent amendments have significantly curbed the production of ODS, the threat still exists and a human signature on the constitution of the ozone layer will remain for decades.

These conditions are, of course, well known. Most of us are familiar with the litany of environmental problems. I rehearse some of that litany here, not to provide new details but to frame environmentally harmful actions in such a way that we can appreciate how they are fashioning a new set of challenges for environmentalism. Environmentalists have long worried about the threats pollution, loss of biological diversity and so forth pose for humans and other creatures. Traditional environmentalism, however, always assumed that the nonhuman world formed a benchmark against which one could measure degradation and stand as a domain of what the earth is like without human influence. Our steady encroachment and indeed colonization of the air, water, soil and species is removing that vestige of environmental insight. Bill McKibben (1997) famously referred to this loss as the 'end of nature'. He claimed that we have empirically erased the divide between the human and nonhuman worlds by making so many inroads into nature that we must abandon the whole idea of a self-willed, other-than-human world. Crossing this divide is a profound historical event and offers a significant challenge to environmentalism.

The profundity, however, goes deeper. As McKibben and others talk about the 'end of nature', they provide a linear narrative. They explain how humans have increasingly encroached upon nature's domain and how, eventually, the circumscriptions became so narrow that there is now no longer anything we can comfortably call 'natural' or 'nature'. Implicit in this narrative is that we can one day pull back from encroachment and resurrect nature. That is, one day nature may regain a foothold if we sufficiently withhold our powers of intervention and stop trespassing. Crowding out nature, however, is only one part of the problem. Recent advances in biotechnology, nanotechnology, pharmacology, artificial intelligence and so forth point to a different type of colonization, one that may never be undone. Here we are not so much circumscribing nature as splicing ourselves into its very processes and, in turn, changing our own identities and nonhuman identities. Humans, animals, plants and machines are now morphing into each other, so much so that the entire idea of a divide between the human and nonhuman – with the quiet hope that this divide may one day be resurrected and expanded – may be folly.

In his book, *Evolution Isn't What It Used To Be*, Walter Anderson (1996) chronicles successive augmentations to the human body. From eyeglasses and hearing aids to pacemakers and artificial limbs, technologies have allowed so many of us to become part human and part machine. We see this dramatically in, for example, synthetic materials used in medicine that resemble and can ultimately bond with human bone and tissue. We see it also in dialysers and artificial organs which perform essential biological functions. According to Anderson, these innovations are creating genuine bionic bodies.

They are enabling us to engineer ourselves by designing mechanical and electrical apparatuses that can be folded into our very bodies.

The correlate to bionic bodies is organic machines. Advances in artificial intelligence, robotics and the like blur the lines between the living and nonliving, inviting artifice into the privileged fold of the organic. Machines now move, self-design, and even learn. To some, this is shifting the balance of animation. As Haraway (1991: 153) puts it, 'Our machines are disturbingly lively, and we frighteningly inert.' As we increasingly rely on machines, they take over more of our lives, conditioning us to live according to mechanical rhythms rather than biological ones. The extreme of this is some sort of *Matrix*-like world in which we humans become subject to our own technical creations. The general point is that the mechanical more and more conditions the biological so that the latter is no longer a distinct realm. It is contaminated, as it were, by the artificial, and it may be impossible to pull them apart. Haraway (1991), Luke (1997) and others reflect on the political meaning of this breach of boundaries. They all recognize, however, that the breach cannot be repaired.

On the other side of the divide, humans are increasingly melding their bodies with plants and animals. At the most basic level, humans have long domesticated various creatures and have made them part of our diets, medicines and cosmetics. The early use of insulin from cattle and pigs to treat diabetes is perhaps one of the most obvious examples of this. Such practice is now being accelerated and intensified. One sees this in the use of animal organs for human transplants and in production processes that use animals as 'living factories' whose bodies produce proteins, peptides and modified amino acids to supplement human endocrine systems. In one of the more interesting inter-species medical innovations, scientists are now creating human skin replacements by combining the cells taken from the foreskins of baby boys after circumcision with purified collagen from cows.[4] These types of procedures and advances are erasing the boundary between nonhuman animals and people.

One of the most extensive types of such erasure is the entire field of biotechnology. Among its many variants, the effort to splice genes from one species into another to affect certain characteristics represents one of the deepest human cuts into nature. To be sure, much biotechnology usually involves cultivating genes from one type of plant or animal and inserting them into another. Such transgenic operations include, for example, vegetables injected with salmon genes to avoid freezing and potatoes engineered to produce their own insecticide (Pollan, 2001). While not aimed at human subjects, human design is at the heart of such procedures. Bioengineered creatures represent new species on Earth whose very biophysical character reflects human fabrication. Such species are literally artifacts.

Humans and animals are blending together in a different way in our efforts, ironically, to protect wildlife and restore wildlands. Historically, preserving wilderness meant drawing a boundary between human activity and natural processes, and allowing the latter to prosper free from human intervention. Wilderness areas and preserves won official designation around the world and are supposed to be guarded from sustained human activity. In fact, the US Wilderness Act defines wilderness as an area 'untrammeled by man [*sic*], where man [*sic*] himself is a visitor who does not remain' (Sec. 2 (*c*), Wilderness Act 1964). Over the past few decades, this has changed dramatically. Wilderness areas may still look like untamed or unconquered territories but this is far from being the case. So-called 'wild' animals such as cougars, bald eagles, tigers and rhinoceros now typically wear radio collars that allow biologists and wildlife management officials to track their movements and design protective measures. Likewise whole populations of animals are moved about to sustain certain species and keep particular ecosystems vibrant. The introduction of the grey wolf into Wyoming or moose into Michigan represents examples of human management of wildlife. A further example is the prescribed burns that fire engineers undertake to mimic nature's rhythms in efforts to manage wildlife.[5]

Wilderness protection is not simply a matter of maintaining certain landscapes or animals; it often includes restoration in the sense of reclaiming ecological conditions before the onslaught of human intervention. The idea is to peel back human influence by, for example, removing nonnative species or reintroducing long-gone but once native creatures. Recreating such conditions, however, is a complicated feat. What is the benchmark for doing so? In North America, for instance, many point to the pre-Columbian age as the ideal. This makes sense in that the North American landscape changed dramatically with the arrival of European settlers, an event which ignited the huge environmental changes we see today. But were pre-Columbian times devoid of human influence? Crosby (1993) and others point out how human migration, a process that has been going on for millennia, fundamentally shaped ecological conditions throughout the world, including North America. Other scholars point out how Native Americans, long seen as mindful stewards of the land, used agricultural and hunting methods that radically shaped the North American environment (Cronon, 2003). How far back, then, must one go to restore a given landscape? Can one go *way* back, to a time before humans? How reliable are our records for such a time and what would it mean to try to recreate such places when many of the key plants and animals of that time are now extinct? By any measure, excising human influence is a seemingly impossible task given the layers of history laid upon the landscape (Schama, 1995) and the irreversible changes that have occurred. More problematic and more significant, however, is the simple point that ecological

restoration can never mean pulling back from nature and letting it do *its* thing: re-establishing its so-called 'natural' conditions before human intervention. Any effort to do that obviously entails sustained and intense human involvement and management, something that takes away from the idea of wildlands in the first place (Baldwin *et al*., 1994). Such considerations raise the question of 'nature' more generally.

McKibben (1997) argued that the most obvious example of the 'end of nature' is anthropogenic climate change. By increasing greenhouse gases, humans have altered temperatures, seasons and weather patterns, and these in turn affect the living conditions of all creatures. The kind of food animals eat, amount of moisture forests produce and benefit from, and levels of atmospheric carbon that vegetation absorbs – all of these are subject to climate change. McKibben takes the insight further by pointing out that anthropogenic climate change greatly minimizes nature's foothold in the world. One can no longer wake up in the morning, for instance, and comment on what a beautiful day the world has given us; one must now note that we have partially manufactured its quality.

The 'end of nature' challenges environmentalism. If there are no pristine landscapes left, genuine wilderness areas around, or spaces devoid of human signature, what does it mean to protect nature? How can a movement, dedicated to bringing human activities more in line with the natural world (by being mindful of the earth's biophysical limitations and committed to harmonizing human life with, rather than imposing it upon, nature), orient itself in nature's absence? Put differently, the 'end of nature' suggests that humans have finally extinguished all remnants of the natural world and that, when we look at nature these days, we are not looking at a self-willed realm that operates independently of human beings but are largely gazing into a mirror. How can we reclaim, harmonize, respect or love nature – orientations environmentalism has long preached – if we cannot find any genuine instances of it? Answering these kinds of questions must be on environmentalism's agenda in the coming years.

Challenges of the new century: no more natures

Many environmentalists lament the 'end of nature' and see themselves working to bring nature back. Doing so may be hard – in fact, impossible – but the ideal of doing so still sits squarely in the mind's eye of many environmentalists and motivates much of the environmentalist movement. Nature may be a distant dream, something only to be approximated, but it nevertheless still exists on some level. Consequently, it can serve as a marker against which to measure human prowess and model human communities in relation to, or otherwise simply respect as, a realm beyond human life (Soule and Piper, 1992; McDonough and Braungart, 2002). Put differently, nature's physical

space may have shrunk over time, to the point of disappearing altogether, but this does not mean that the concept is worthless. There is more in the universe than human beings and, although we have imprinted ourselves onto much of this, we have always used the word 'nature' to depict that otherness. Maintaining the conceptual status of the other-than-human is seemingly crucial for environmentalism and any attempt to confront the 'end of nature' challenge will seemingly need to sustain this status in its response. This becomes difficult, however, given the second challenge of the new century, namely, the postmodern critique of 'nature' itself.

Over the past few years, postmodern scholars have enjoyed pointing out that the disappearance of nature is not the result of a steady encroachment on the nonhuman world. That is, nature's demise is not a historical event or a new phenomenon; in fact, it is not an event or phenomenon at all. 'Nature', as it were, *never* existed in the sense of being a self-subsisting entity with a character independent of human beings. Rather 'nature' has always been a human idea; it is a concept with which we encounter the nonhuman world. 'Nature', in other words, is a social entity that assumes meaning within various cultural contexts and is fundamentally unknowable except as a social construct. It is not something 'out there' that the mind discovers but rather something the mind constructs. 'Nature' thus cannot serve as an ideal to which environmentalists can appeal or as a ground against which to gauge human enterprise. 'Nature' is a concept that has been invested across time and place with multiple meanings and is thus fundamentally contested. We have not reached the end of nature; there was never any 'nature' in the first place.

The postmodern critique of 'nature' comes up all the time in environmental politics. One of the consistent mishaps in environmental affairs is the assumption that all parties concerned with climate change, loss of biological diversity, ocean pollution and so forth share the same understanding of the problem. To take the most obvious example: many Northern states and nongovernmental organizations (NGOs) work on behalf of wilderness preservation and biological diversity in the developing world, yet many in the developing world argue that one person's wilderness is another person's home, and that what is a valued endangered species to some is a threat, potential income or dinner to another (Terborgh, 1999; Agarwal *et al*., 2002). 'Nature', as such, is not a single realm with a universalized meaning, but an ideational canvas on which people project sensibilities, cultural attributes, economic conditions and social necessities (Schama, 1995). Postmodernists are quick to point this out when, in the midst of conversations about 'nature', they ask whose concept one has in mind.

Conventional understandings distinguish 'nature' from 'convention'. The roots for doing so lie in the ancient distinction between *physis* (nature) and

nomos (law or custom), in which the former is unconnected to any consciously purposeful activity, and thus fundamentally independent of human agency, while the latter is a product of human thought and purpose (Torrance, 1999a: xiv–xv). Today we generally make the same distinction between nature and culture. The boundary between these concepts, however, has always been difficult to locate, for humans never come to know nature in any direct perceptual manner but always through certain cultural or social categories of understanding. As Steven Vogel (1997: 184; see also 1996) puts it, humans 'can have no access to anything like a pre-social nature in itself; the very idea is incoherent, because all access is socially mediated'. Our categories for understanding nature, in other words, are social through and through, and thus 'nature' is not separate from human life but part and parcel with it. It is an institution in much the way our collective understandings of any shared idea are. Thus postmodernists do not see the human–nature divide as something that shrinks or grows over time or place; the divide itself simply does not exist.

To say that the dichotomy between nature and humans does not exist is not to deny the reality of things other than human beings. Postmodernists recognize that there is a fundamental substratum of materiality in the world; they are not philosophical idealists in this sense (Rorty, 1989). Social construction, for postmodernists, only becomes an issue when it involves people interpreting material reality – something people do all the time. People understand the world through narratives or discourses. Narratives are ways of talking that emerge in, and have an effect on, social context. They come about through people talking to each other and express themselves as socialization forces that organize human experience. For postmodernists, people can never escape interpretation via narrative; indeed we are always interpreting things in terms of *some* narrative. Our conceptions of 'nature' are no exception.

We know this through studies that show how the idea of 'nature' varies between cultures and historical periods. Social and cultural anthropologists show the changing meaning of 'nature' across space as they point out cross-cultural variations of the concept of 'nature' (Ellen and Fukui, 1996). Environmental historians highlight the changing meanings of 'nature' across time. Nash (1989), Oelschlaeger (1991) and Callicott and Nelson (1998) chart how the meaning of wilderness, often a stand-in for 'nature' itself, has shifted within the USA over the decades. Literary critics and philosophers do a little bit of both as they catalogue widely different interpretations of 'nature' throughout history and across cultures (see, for example, Glacken, 1967; Evernden, 1992; McLuhan, 1994; Torrance, 1999b). Scholars of international relations similarly show how the meaning of specific transnational environmental issues changes at the hands of 'knowledge brokers' (Litfin, 1994), research institutes (Luke, 1997), epistemic communities (Haas, 1992) and environmental activists (Wapner, 2002), and how these changes, which often

turn on contested meanings of 'nature', motivate international action. 'Nature', as these authors of various disciplines demonstrate, is not simply a material substratum whose essential character we glean from study and observation, but rather is a repository for meaning. For this reason, it has meant and still means a host of different things to different peoples. As Raymond Williams (quoted in Harvey, 1996: 24) has observed, 'The idea of nature contains, though often unnoticed, an extraordinary amount of human history.'

The postmodern critique of 'nature' may seem overly abstract, dreamed up in the ivory towers of academia and thus fuel for theoretical debate but unimportant to the real world of politics. Were it so! Many anti-environmentalists have found the idea quite attractive and have used it to argue for loosening environmental regulations and attacking environmentalism in general. People like Rubin (1994) and Chase (2001), for example, argue that, since there is no authentic, unproblematic entity called 'nature', we need not treat the nonhuman world with any special kind of respect or follow dictates of policies based on understandings of preserving 'nature'. In contrast to the appeals of environmentalists, Rubin and others maintain that trees, animals, canyons and rivers are just like anything else in the world, ontologically equivalent to all other entities, and thus we can preserve or exploit them as we see fit. At the extreme, this view can justify paving rainforests, wiping out the last panda bears or pumping high levels of carbon dioxide into the atmosphere. For, if the only things preventing us from doing so are our own interests, desires, beliefs or values, and these differ according to who is expressing them, then there are always going to be justified arguments for ignoring environmental protection efforts.

Environmentalists should take postmodern eco-criticism seriously. Postmodern sensibilities increasingly pervade popular culture and, as more people recognize the weak ontological foundations of 'nature' protection, environmentalists need a persuasive form of response. This will not be easy to find. Environmentalism has always cherished the idea of 'nature'. One of environmentalism's dearest slogans is 'Nature bats last'. This means that no matter what human beings do, sooner or later the laws of nature will express themselves and take precedence over human activity. Thus humans can build houses in flood plains, pump excessive amount of toxins into the air or wipe out species in inordinate numbers. At some point, however, nature will bite back. Nature, which sets the biophysical parameters for life and operates according to unbending laws, will exert itself. Environmentalists have always respected this profound otherness of nature. To them, nature's ways are matters of necessity. They will take place whether one likes them or not. Environmentalists have fashioned a politics around respecting nature's power and otherness. They call on humans to harmonize themselves with nature's imperatives or to suffer the consequences. Moreover they advocate a type of

respect and even love of nature, given how different it seems from human life. What does a postmodern sensibility do to this long-standing commitment? Can environmentalism continue to advocate regard for nature if 'nature' does not really exist? What does it mean to protect, preserve and care for 'nature' if the very meaning of the term is contested?

The 'end of nature' argument suggests that we know what nature is, recognize its disappearance, and therefore need to rethink human actions to resuscitate it. Can humans be persuaded to change their ways and pull back from colonizing successive realms of the nonhuman world? Can they be taught humility and respect for the other? Is it possible for people to withhold themselves from imprinting their signature on the planet? As if these were not difficult questions and political challenges in themselves, postmodern eco-criticism problematizes the other side of the coin. It questions the identity of 'nature' itself. It assumes that people know neither human nature nor nature's 'nature' and this makes environmental practice quite difficult. The postmodern critique gets rid of nature on all sides and thus leaves us ontologically floating, forever denied a mooring to secure our evaluations, understandings and actions. This poses significant challenges to environmentalism.

Environmentalism after nature

Scholars of global environmental politics must have an interest in the state of environmentalism. Environmentalism represents the great hope for protecting the biophysical quality of life on Earth and it is almost a duty for scholars to make sure that it focuses on the most significant issues, conceptualizes its work accurately, inserts itself into political dynamics most effectively and anticipates future challenges. As Wolin (1960) has said of political theorists in general, the role of the scholar is partly to post warnings. This chapter has tried to underline important changes, both empirical and intellectual, that are afoot and that will deeply affect environmentalism's prospects. This chapter may be seen as an exercise in posting warnings.

As mentioned in the beginning, the changes outlined in this chapter are happening below the radar screen of most environmentalists, and popular culture in general, but they will not remain there for long. Both sets of changes are difficult to dismiss and have profound implications for environmental thought and practice. It is only a matter of time until people all over the world begin to see humanity's dramatic imprint on all domains of the nonhuman world and understand the weak ontological foundations on which, traditionally, environmentalism rests. When this happens, environmentalism's ability to play a meaningful political role will be, even more, up for grabs.

While the warnings posted here may be future-oriented (directed toward relevance in the new millennium), adjusting to them may not simply be a

matter of staying abreast of the times. Doing so may also answer some of environmentalism's most long-standing dilemmas. Traditional environmentalism takes the human/nature distinction as a given. Debates about conservation versus preservation, anthropocentrism versus biocentrism, technological optimism versus technophobia, people versus nature and so on have all assumed the distinction and have tried to negotiate it as best they could. Given the increasing irrelevance of environmentalism in world politics and discussions about the death of environmentalism, it appears that this negotiation has been far from successful. While environmentalism has galvanized widespread concern and action, and was arguably the most important social movement of the last century, it is clear that environmentalism has not realized its full potential. There has always been a sense in which all the enthusiasm, concern and otherwise significant action on behalf of environmentalism has not translated into levels of mobilization or large-scale reorientation of global politics to address successfully the most significant assaults that have been, and are currently being, waged on the Earth. Put differently, while the spirit of environmentalism has infiltrated many domains around the world and has animated untold numbers of people, environmental quality itself remains elusive for many of the most troubling problems. Perhaps – just perhaps – one of the reasons for environmentalism's limited reach has to do with the distinction it makes between humans and nature.

Environmentalism has always seen environmental harm as a matter of violation. The nonhuman world has a way about it and human intervention is often seen as throwing off the balance or at least the character of nature. The distinction has led to a long-standing polarization that may be an obstacle to imagining effective political programmes. At a minimum, it has made it difficult to imagine practices that combine environmental and social agendas. The human/nature divide that has undergirded environmentalism for so long, however, has remained invisible to most observers and practitioners. It has been more assumed and undertheorized than justifiably expounded. We are moving into times when this can no longer be the case. Soon environmentalists will not have the luxury of reflecting passively on the meaning of the divide as it will become obviously clear that there is no distinction upon which to reflect.

Environmentalism can remain one of the most enduring social movements in the new century. Its ability to do so rests on how well it can make meaningful sense of current challenges and, ironically, how well it can use those challenges to reflect upon its deepest commitments and understandings. The purpose of this chapter is to question the evolving character of environmentalism as it moves into a post-nature age. How can environmentalism make itself relevant after nature?

Notes

1. There were, of course, numerous international organizations before this time and these constituted a significant degree of international governance (see, for example, Murphy, 1997). Nonetheless, as Boli and Thomas (1999) make clear, the real growth years for global governance took place from the 1970s on.
2. See http://www.stonehaven.org.uk/history/fishing/genfish.htm.
3. See http://www.gcrio.org/ozone/ozoneFAQs.html#m.
4. See http://wghs.client.web-health.com/web-health/topics/GeneralHealth/generalhealthsub/generalhealth/skin&hair&nails/AGING&COSMETIC/skin_grafts.html.
5. For reflections on 'nature' and the concept of nature, see Callicott and Nelson (1998).

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29 Transnational environmental harm, inequity and the cosmopolitan response

Lorraine Elliott

Issues about justice, ethics and equity are fundamental to the challenges of understanding and overcoming global environmental change. A helpful starting point for addressing these challenges, this chapter suggests, is to understand environmental degradation as a particular form of transnational harm that arises through environmental displacement. This harm is characterized by forms of inequity in which the lives of 'others-beyond-borders' are shaped without their participation and consent. These transactions of harm therefore extend the bounds of those with whom we are connected, to whom we owe obligations and against whom we might claim rights. They create, in effect, a cosmopolitan community of reciprocal rights and duties which are expected, as Andrew Linklater (1998: 26) points out, to transcend the 'morally parochial world of the sovereign state'.

The question of how best to respond to this form of inequity has both ethical and political dimensions. The purpose of this chapter is to examine whether and in what ways ideas drawn from cosmopolitan thought can provide a normative basis for a global structure of rights and duties which responds to the harm inequities associated with environmental degradation. The chapter argues that, as an ethical project, cosmopolitan thought establishes at least three conditions for an equitable and just form of global environmental governance. There must be recognition of moral obligation across borders, there must be compensatory burden sharing, and governance must be based on a politics of consent. This is not simply an intellectual account of the good political community. Rather, as Anthony McGrew (1997: 252) points out, it identifies the political possibilities inherent in the present and, as Graeme Cheeseman (2001) observes, 'seeks to put in place the means to translate these into future actualities'. The concern here is primarily with the substance of the ethical debate rather than the institutional arrangements that follow from it. Nevertheless there are a number of important demands of cosmopolitan institutions. They must take 'individual human persons as the ultimate units of concern', they must attach that status 'to every human being equally' and they must regard persons as the ultimate unit of concern for *everybody* (Kuper, 2000: 654).[1] While there is some evidence that a cosmopolitan rhetoric has begun to inform global environmental

governance, there is little to suggest that the institutions and practices established are capable of achieving either cosmopolitan ends or means.

Environmental displacement and transnational harm

The structure of inequity and injustice in the global politics of the environment is perhaps best captured in two related ideas, displacement and transnational harm. These ideas enable us to understand environmental degradation as an ethical problem as well as an ecological or scientific–technical one. Drawing on John Dryzek's work, Paul Wapner (1997: 217) argues that displacement is 'about shifting the experience of environmental harm'. This 'shifting' occurs across space: that is, the physical transportation or the unintended dispersal from one part of the world to another of the byproducts and environmental consequences of economic activity. It also occurs across time, so that future generations will suffer the environmental effects of today's lifestyles. Displacement also applies to the outputs and inputs of economic activity. The outputs are perhaps the most obvious, involving the various forms of waste, pollution and environmental damage that are the result of production and consumption and which are frequently felt somewhere other than the location in which the source activity occurs. The 'input' dimension of displacement refers to the exploitation of the renewable and non-renewable (or non-replenishable) resources and environmental services upon which production and consumption are based. There can be little argument with the proposition that present-day economic activity (which includes everyday subsistence and lifestyle activities as well as corporate practices) exploits resources unsustainably across space and across time.

Another way of understanding this problem of displacement is through the conceptualization of ecological footprints and shadow ecologies. The footprint is a conservative measure of 'how much productive land and water an individual, city, country or humanity requires to produce all resources it consumes and to absorb all the wastes it generates' (Wackernagel *et al*., 2002: 12). Globally humanity is outstripping biospheric capacity. There is, however, an equity dimension to this as well, in that some countries are running at an ecological deficit: that is, their ecological footprint is both greater than the biological capacity of the country itself and greater than the per capita global average, based on present economic activity and the level of economic activity that is required to ensure that natural capital is replenished. Sachs (2002: 14) argues that the OECD countries 'surpass (in terms of ecology and equity) the admissible average size of [their ecological] footprint by a magnitude of about 75 to 85 per cent'. Thus their economies cast an ecological shadow over poorer countries from which the centres of production and consumption derive their raw materials (see MacNeill *et al*., 1991).

The ethical challenge arises because this displacement is implicated in transnational harm. Linklater (2002: 327) defines transnational harm in a broad sense relating to 'distress, suffering, apprehension, anxiety or fear' as well as the 'damaging [of] vital interests'. The agency of harm is not confined to states but can include non-state actors (including economic actors). Linklater makes it clear that not all harm is intentional or deliberate. Rather, and he suggests that this applies especially in the case of environmental displacement, it includes harm through unintended consequences and negligence or 'the failure to take reasonable precautions to prevent the risk of harm to others' (ibid.: 330). The extent to which harm is unintended or the result of negligence rather than deliberate intent sometimes involves a fine interpretive line. In 1991, for example, Lawrence Summers (then chief economist for the World Bank, later US Treasury Secretary) argued that 'the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable … underpopulated countries in Africa are vastly under-polluted' (cited in Puckett, 1994: 53).

Harm and inequity

Three specific forms of environmental inequity arise through these processes of displacement and harm. The first involves the disproportionate consumption of resources and production of waste. The rich consume more resources and produce more waste than the poor and this disproportionate consumption of resources has an historical as well as a modern dimension. The visible consequences of environmental degradation, such as deforestation, desertification, pollution and loss of habitat, are concentrated more in developing countries. The invisible causes, however, are embedded in the ecological shadow cast by the industrialized economies. Affluence rather than poverty remains the primary and disproportionate cause of global environmental degradation. In 1998, the richest 20 per cent of the world's population (mainly in industrialized countries) accounted for 86 per cent of total private consumption and consumed 58 per cent of the world's energy (UNDP, 1998: 2). Per capita carbon dioxide emissions in the OECD countries average 12.4 tonnes; in the lowest-income countries the average is only 1.0 tonne per capita (UNDP, 2003: 10).

The second measure of inequity, which is related to the first, involves the disproportionate impact of environmental change which reproduces the pattern of winners and losers associated with globalization. Vandana Shiva (2000: 136) puts it bluntly: 'the natural resources of the poor are systematically taken over by the rich and the pollution of the rich is systematically dumped on the poor'. Those who are most immediately affected by global environmental decline are those who have contributed least to the problem. These are the 'subaltern groups' (Stevis, 2000: 63) – the poor, women, indigenous peoples – who are now ecologically as well as economically and

politically marginalized. The poor and disadvantaged are the least able to buy their way out of the consequences of pollution, environmental degradation and resource scarcity. They are less able to control the causes or mitigate the impacts of environmental change without assistance. Material inequities reinforce practices, such as overuse of water resources or arable land, which contribute further to local environmental degradation and unsustainable development. Yet environmental and resource inequities are more than statements about geography. Countries that are already ecologically and economically vulnerable face such challenges in part because of the past extractive practices of colonialism. These are often compounded by a legacy of repressive and corrupt regimes. The disproportionate impact is often bound up in an inequity whereby the regulatory structures that apply to environmental protection and industrial production in poorer countries (and to poorer areas within richer countries) are frequently more permissive and, at the same time, less effectively implemented and policed.[2]

The third form of inequity arises in the politics of inclusion and exclusion from the practices and structures of environmental governance. Those who are most affected by the displacement of environmental harm are more likely to have limited access to decision making about environmental protection, sustainable development and the use of resources within countries and internationally. The reasons lie in both deliberate policies of marginalization and the structural asymmetries of power and access to knowledge and influence. The environmental politics of gender and indigeneity demonstrate this double inequity.[3] For women and indigenous peoples, the disproportionate impact of the causes and consequences of environmental degradation on their daily lives and, in the case of indigenous peoples, their cultural as well as physical survival, are symptomatic of the biases of a more extensive structural inequality. Unequal and inequitable allocation of resources, including access to commons or traditional lands, to decision making authority over the resources and environmental services of daily life, compound the problem.

These inequities which arise through environmental displacement and transnational harm are also unjust. In other words, it is unfair as well as inequitable that some are harmed by activities not of their own making and over which they have little or no control. As David Held (1997: 244) describes it, 'the quality of the lives of others is shaped and determined in near or far-off lands without their participation, agreement or consent'. It is also unfair and inequitable that those who contribute less to the problem end up suffering more, and those who contribute more, suffer less. Environmental harm and inequity is implicated in and connected with a range of other harms. Charles Beitz (2001), for example, points out that inequality is also associated with material deprivation, increased suffering, humiliation and denial of agency, and with procedural unfairness.

A cosmopolitan ethic

In a globalized world, transnational harm deterritorializes risk. It therefore demands, as explored below, a deterritorialized understanding of the nature of rights and obligations. In one sense, the victim of transnational environmental harm, and the inequities and injustices that it inspires, remains 'the other'. Displacement and harm therefore invoke and demand a cosmopolitan morality of distance.[4] Yet transnational environmental harm affects not just distant others, even if it affects them disproportionately.[5] Because the biophysical complexities of the planetary ecosystem define it as a global commons and a public good, humanity constitutes an ecological community of fate. 'Damage done to the environment', as Amedeo Postiglione (2001: 212) points out, 'is damage done to humanity'. A world risk society (Beck, 1999) is therefore defined by 'sameness' as well as by 'otherness'.[6] Indeed Beck goes so far as to suggest that with ecological threat, which 'eliminates all the protective zones and social differentiations within and between nation-states', comes 'the "end of the Other", the end of all our carefully cultivated opportunities for distancing ourselves' (ibid.: 62).

The cosmopolitan ethic rests on the proposition that humanity is ultimately bound together as a single moral community with shared rights and obligations. The consequence of such a world is that, as Kant avowed, a right violated anywhere is felt everywhere. We therefore have a moral obligation to those who are not our co-nationals, a position Richard Falk (1996: 499) describes as an 'ethos of responsibility and solidarity'. Justice, as Onora O'Neill (2000: 45) argues, is 'owed [equally] to all, regardless of location or origin, race or gender, class or citizenship'. This stands in contrast to a communitarian position which, while not necessarily rejecting the proposition that peoples within a state can or should have duties or obligations for justice to those beyond their borders, attaches moral priority to the community bounded by the state. But, as Linklater (1999: 480–81) argues, the 'moral claim that insiders come first is ethically insecure in the context of increasing transnational harm'. Indeed Beck argues that Kant's cosmopolitan society 'can take shape in the perceived necessity of world risk society' (1999: 20).

This generates two categories of obligation that apply to environmental issues. The first involves an obligation to avoid or to cease doing (transnational) harm. The 'no-harm' principle is a standard convention of liberal natural law theory. In an international sense, it can be understood in both Kantian and Grotian terms. The former relies on a 'community of all human beings [which] entails a common participation in law and … in a virtual polity, a cosmopolis that has an implied structure of claims and obligations' (Nussbaum, 1997: 37). The Grotian tradition in International Relations, on the other hand, requires *states* to avoid doing harm to one another (Linklater, 1999: 478).

A second category of obligation involves demands to address the inequities that arise from transnational harm. That is, the transnational moral responsibility associated with environmental change constitutes more than a negative requirement not to harm others or hinder their efforts to provide a minimum for themselves. It also involves a positive requirement to assist those who are harmed to overcome the consequences of environmental degradation. The principles of justice and equity that should apply to environmental issues, in this case, are bound up in a number of practical questions relating to burden sharing and the allocation of costs and benefits, 'justifiable entitlement' (Pan, 2003: 1), the nature of fault and complicity and how to account for historical practices in current rights and obligations (see Rowlands, 1997).

Moral obligation

As noted above, a first requirement of a cosmopolitan response to transnational environmental harm is that there must be a clear acknowledgment of the moral obligations to which it gives rise. An environmental no-harm principle has both first-order and second-order dimensions. The first-order approach emphasizes duty to others as individuals within the moral community. The liberal Enlightenment tradition has imbued cosmopolitan thinking with a legacy of concern with individual autonomy that is argued to hold universally. It is from this value that other rights, duties and institutions (including environmental ones) are assumed to derive. As Janna Thompson (2001: 140) observes, 'traditional cosmopolitanism is based upon the moral premise that all individuals deserve respect as autonomous agents'. An ecologically sensitive cosmopolitanism needs to accommodate this emphasis on autonomy because, as James Tully (2001: 148) suggests, most ecologists would not rate autonomy as highly as do liberal cosmopolitans. In part, this reflects a tension between individual rationality and group rationality when faced with a problem that requires collective action (sometimes captured in the concept of the tragedy of the commons). The two are not incommensurable when it comes to issues of environmental harm and the inequities that it engenders. Henry Shue (1981: 588) makes it clear that 'there is no freedom to injure and endanger'. With respect to the environment, and the liberal cosmopolitan commitment to autonomy, those who are most disadvantaged do not have the 'liberty' to choose whether they harm the environment or not, or whether they are harmed by the environmental impact of the activity of others. Thus the injury and endangerment arises not only because of the impact of transnational environmental harm on their lives and livelihoods, but also because their autonomy is undermined.

The second-order dimension of moral obligation to individuals arises from a consequentialist approach. While it is difficult to cast 'the environment' or the 'global ecosystem' as a moral subject, an obligation to avoid transnational

environmental harm to others will nevertheless have more force if it is accompanied by an ethic of stewardship towards the environment. In other words, a commitment to protect the environment will contribute to protecting near and distant others against the consequences of environmental change. Richard Falk (2001: 231) suggests that there is a 'general community duty to respect the integrity of the global commons' and that such an ethic enjoys 'provisional status' as an obligatory feature of international law. Shue shares this expectation that statements of obligation will be more than declaratory. His argument is not only that 'it is wrong to inflict avoidable harm upon other people' but that 'it ought often to be prohibited by law' (1981: 587). In other words, transnational environmental harm should be not only immoral but also illegal.

Within the *normative* structures of global environmental governance, there is an apparently strong declaratory commitment to environmental stewardship, harm minimization and attention to justice. Ideas about the ecological community of fate would seem to be echoed in the concept of the common heritage of humankind. This has evolved from its original concern with sharing the benefits of resource exploitation (although there is some dimension there of a compensatory burden) to one that expresses, in theory at least, the imperatives of a shared environmental stewardship. The image of a shared vulnerability to and responsibility for global environmental insecurities has been reproduced in the metaphors of the 'common future' in the title of the 1987 report of the World Commission on Environment and Development, the 'global partnership' which accompanied the 1992 Rio Summit, and the 'global neighbourhood', the title of the 1995 report of the Commission on Global Governance.

Despite its vagueness, the definition of sustainable development elaborated by the World Commission on Environment and Development in its report *Our Common Future* also reflects a concern with equity and autonomy as well as with an environmental community of fate. Sustainable development is development that 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987: 43) thus giving some force to the concept of intergenerational equity. The Commission argued that the failure to meet this common interest was intimately connected with the 'neglect of economic and social justice within and amongst nations' (ibid.: 47).[7] In elaborating its view of a sustainable future, the WCED acknowledged that sustainable development demanded attention to equity and justice, and to the building of a future that was 'prosperous, just and secure' (ibid.: 63). The Commission also made clear that we have a 'moral obligation to other living beings and future generations' (ibid.: 37).

The principle of harm minimization has been expressed primarily through a Grotian demand that states have a responsibility not to harm each other. Princi-

ple 21 of the Stockholm Declaration, adopted in 1972, drew on earlier international legal decisions to affirm that states had a responsibility to limit environmental damage beyond their borders, in effect to minimize harm. The principle is reinforced in Principle 2 of the 1992 Rio Declaration and in most multilateral environmental agreements. In theory, this principle of transboundary responsibility establishes an obligation with respect to displacement, requiring states to take action to ensure that the outputs at least of economic activity do not cause damage to the environment and therefore (by implication) the lives of peoples and places elsewhere. An obligation not to cause damage to the environment could also address the input problem. In other words, the exploitation of resources and environmental services for economic purposes should not result in a drawing down of the ecological capital of other states or areas beyond national jurisdiction (that is, resources should not be overexploited) and nor should there be irreversible or even severe environmental consequences of such exploitation. It is open to question whether there is much more than fragmentary evidence that such principles have become customary international law. That would require evidence of general state practice, and that is not yet the case. States have paid less attention to their obligations than to their rights. Multilateral environmental agreements continue to affirm the physical rights of states to their resources and the authority rights of states over the way those resources can be used and exploited.

Obligations regarding transnational environmental harm are likely to be stronger if they are invoked by corresponding individual or collective rights that can be claimed against moral agents. There is a substantial body of international law which provides the basis for *some* claim regarding a human right to a clean environment or for establishing that a clean environment is essential if other human rights are to be met.[8] Some of these move in the direction of a substantive right, whereas others focus on procedural rights (particularly related to information and decision making). However there is as yet no treaty-based right to a clean environment (or an environment of a certain quality) or to sustainable development. For that reason, rights to a clean environment tend to be aspirational and at times rather vague, although they can provide what Schwartz (cited in Bosselmann, 2001: 122) calls a 'surrogate protection' against environmental harm. This surrogate approach is evident in the suggestion that 'most of the acts causing environmental degradation would also violate and interfere with universal human rights, such as the right to life and security of person, the right to health and the right to livelihood' (International Peoples' Tribunal, 1997: 121).

Burden sharing

The challenge of identifying an equitable environmental 'entitlement' within the moral community animates questions about whether 'autonomy' and

fairness require an equal share of material benefits, or only a minimum to ensure that basic needs can be met and harm limited. What would constitute a 'rightful share' to environmental goods or resources and how would a proportionate (as opposed to a disproportionate) impact be defined? Henry Shue argues that an equity principle in the global politics of the environment must involve *compensatory* burdens on the part of the rich developed countries whose past actions have created environmental inequity, especially because the 'damaging behaviour has continued unabated long since it became impossible to plead ignorance' (1999: 536). He also demands that equity take account of greater ability to pay for mitigation of environmentally damaging behaviour and adaptation to environmental change. Linklater raises the admittedly contentious proposition that 'we have obligations to help the poor overcome the effects of inequalities, even if we have had no part in creating them' (1999: 476). This implements, in effect, a progressive rate of payment. It also requires that those who are already the worst off are not made worse off still, thus effecting a guaranteed minimum in ecological as well as material terms.

This is potentially more than just respect for liberty and autonomy. Rather it involves social rights to resources and benefits (Thompson, 2001: 141). This suggests that the social dimensions of human rights and justice, expressed in solidarity (or fraternity) principles, are as important as the individual ones of liberty and equality (see Bosselmann, 2001). In practice, environmental justice would involve, at minimum, enhancing the transfer of resources to developing countries. It would also involve international legislative programmes that would effectively restrict or minimize the ecological footprint of those who have a disproportionate impact on the environment.

The declaratory ethic of burden sharing is most notable in the principle of common but differentiated responsibilities. The concept is meant to convey both solidarity and a particular kind of burden sharing that takes account of inequities in global resource use and in contribution to environmental harm. Most multilateral environmental agreements require that the special needs of developing countries be given priority, and refer to the importance of special provision to meet developing country needs, or require developed countries to mobilize new and additional financial resources, or acknowledge that developed countries must take the lead in resolving particular environmental problems (climate change, for example).

In practice, burden sharing has been one-sided and driven as much by risk prevention for the North (see Shiva, 1993). Rich countries have been reluctant to adopt policies that would minimize transnational environmental harm. Nor have they been willing to commit the kinds of material resources required to help the most disadvantaged to recover from the consequences of environmental damage or to minimize their impact on the environment in the

absence of 'autonomous choice'. Global funding for sustainable development remains unacceptably low and the recent emphasis on foreign direct investment rather than official development assistance has meant that the poorest countries are increasingly disadvantaged. Because burden sharing has focused primarily on managing the *political* relationship between rich and poor countries, much less attention has been paid to the issue of compensatory justice for poor peoples. This runs the risk of reducing burden sharing to a form of proxy cosmopolitanism, confining justice to the inter-state level on the assumption that individuals' 'basic claims to justice have already been [or will be] taken into account' in just (domestic) societies (see Kuper, 2000: 641).

Consent and the cosmopolitan public sphere

Two key political demands derive from this binding together of peoples as an ecological 'community of fate'. First, such a community 'rightly governs itself and determines its future' (Held, 1997: 239). Second, 'people should be free and equal in the determination of their own lives, so long as they do not deploy this framework to negate the rights of others' (Held, cited in Achterburg, 2001: 192). In effect, those who are most affected by transnational harm must be heard and decisions about the protection of the environment and allocation of resources must be subject to democratic control. This reflects the principle *quod omnes tangit ab omnibus comprobetur*: what touches all should be agreed to by all (see Low and Gleeson, 1999: 189).

Accountability and transparency, along with participation, are seen to be intersubjectively and practically bound up with autonomy and dignity. As a political project, cosmopolitanism is therefore tied to demands for a 'rights based system of global governance' (Kaldor, 2000: 7). Democracy in the cosmopolitan sphere, Martin Köhler (1997: 390) argues, 'provides the conditions for non-discriminatory discourse within and among societies'. In this context, cosmopolitan governance requires democracy within states, the extension of democratic practice to relations among states and the enhancement of democracy within global institutions. This cosmopolitan democratic imperative invokes new forms of global political community, based on the principles of dialogue and consent rather than power and force, and on the construction of universal frameworks of communication (see Linklater, 1998). As Tully (2001: 148) points out, if 'environmental justice is to be democratic, then the principles, values and goods that are brought to bear … must be open to democratic discussion and debate'. This is a 'thicker form of public dialogue which goes beyond the thin "proceduralism" of liberal democracy' (Barns, 1996: 2). Humanity is argued to form a political (and dialogic) community in which centres of power are diverse and overlapping. This ensures that those who are most vulnerable, powerless and marginalized are empowered to refuse, renegotiate and contest (O'Neill, cited in Linklater, 1998: 28).

Dialogic or communicative processes do not require actual participation. They do, however, demand that 'all who are possibly affected *could* assent as participants in rational discourses' (Habermas, in Brulle, 2002: 4; emphasis added).

Multilateral environmental agreements and associated declarations have made much of the importance of environmental information and education and access to decision making.[9] The cosmopolitan emphasis on information and consent as necessary conditions to minimize transnational harm has perhaps been best captured in the concept of prior informed consent (PIC). This is expressed in a number of environmental treaties, most notably the 1989 Basel Convention on the transboundary movement of hazardous waste and the 1998 Rotterdam Convention on prior informed consent (in the context of managing hazardous chemicals and pesticides). This issue of 'whose consent' is central to the way the PIC principle is given effect in international law and as a more general normative principle. In particular, it is important that consent operates 'at the level of the local community' (Anuradha, 2001: 33) for two reasons. The first has to do with the input component of transnational harm: in many cases it is the knowledge and resources of local communities that are being accessed, exploited or expropriated. The second reason arises from the output dimension of transnational harm. Local communities and peoples should have the right to determine, on the basis of accurate knowledge of environmental and other consequences, whether or not to accept waste of whatever kind which arises from economic activity elsewhere. PIC assumes that the appropriate authority in the importing state will act in the interests of local communities, yet as Jim Puckett (1994: 54) argues, PIC can 'undermine local democracy and institute a system of decision making that is wide open to abuse'.

There has been growing unrest among grassroots organizations and NGOs that the much-lauded democratization has done little to democratize or make equitable the outcomes. This draws attention to a second important theme in the cosmopolitan politics of consent, that of a cosmopolitan public sphere or the development of a global civil society. In response to transnational harm and political marginalization, local voices are demanding to be heard and are constituting alternative, albeit not always clearly articulated, forms of resistance to globalism. In such a 'global' cosmopolis, the state is decentred (but not dismissed) as political actor and as moral agent and subject or, as Daniele Archibugi (2001: 204) puts it, 'deprived of [its] oligarchic power'. This equates with a 'globalization from below' in which local voices do more than legitimize global democracy. They constitute an autonomous source of political and communicative power that serves also to sever the link between democracy and the state (on the latter, see Dryzek, 1999: 277). On the other hand, it is becoming increasingly important to distinguish between civil society as a

cosmopolitan public sphere and civil society as professionalized non-state activism. Participatory rights run the risk of becoming most meaningful for those NGOs which are 'well-organised, well-financed and well-informed' (Anon., 1991: 1589).

In general, the creation of a political space in the global politics of the environment for actors other than states has been justified on the grounds of democratic pluralism, efficiency and effectiveness rather than autonomy and justice. Decision making by governments and the implementation of legislative and regulatory frameworks is argued to be more effective if all stakeholders are represented and if the legitimate interests of actors other than states are recognized. Greater inclusiveness can only be welcomed as a precondition for sustainable development and more effective environmental outcomes. But the whole issue of rights and freedom from oppression (in effect, justice and autonomy) is played down. This is not a process by which those who are affected are able to negotiate and contest. The emphasis on democratic efficiency and pluralist governance takes little account of the relations of power and powerlessness which mute local or marginal voices. Those at the margins, or those most harmed (such as the poor, women and indigenous peoples) have become defined as objects to be acted upon, to be educated, consulted and informed, to be empowered from above or from outside, or as a source of knowledge to be appropriated and incorporated into the discourse of the global as and when needed. The themes of emancipation and equity, and new visions of development which so often animate the outcomes of collective global activism on environment and development are, for the most part, absent in official discourse.

Some concluding thoughts

An ecologically sensitive cosmopolitanism demands transnational environmental justice between peoples within a world society as well as, and possibly in preference to, international justice between states in an international society. What this does not tell us (and perhaps cannot tell us) is whether these are perfect duties, which must always be observed. If the cosmopolitan duty is an imperfect one that admits exceptions, then it signifies only a 'general good' that leaves the choice of specific action to the moral agent. Faced with such an imperfect duty, it is not wrong *not* to discharge that duty on any *particular* occasion, as long as one has adopted, in Kantian terms, the right maxim (see Kleingeld, 2000: 335).[10] There is, nevertheless, a meritorious duty to act when one can. However, if obligations to others in the moral community constitute a perfect duty – something more than an 'optional act of charity' (O'Neill, in Jones, 1999: 92) – moral agents no longer have an option to decide how far to honour their obligations. The cosmopolitan commitment to minimize harm may well be seen as something approaching a

perfect duty. That is, we should minimize harm as a general good, even if we do not specifically know who might (or might not) be harmed by our actions. Compensatory burden sharing, on the other hand, is more contentious as a perfect duty. An obligation to assist those who have been harmed through environmental degradation not of their own making, in circumstances where we can provide such assistance (the ability to pay), would nevertheless seem to constitute at least a meritorious duty.

The nature of environmental displacement, transnational harm and environmental inequity forces us not only to confront the obligations that we have to each other but also to seek to establish ways to meet those obligations. The question of agency is therefore critical. As moral actors, states are expected to act as 'local agents of the world common good' (Bull, cited in Linklater, 1999: 478). For many, the state – or at least the liberal state – can and should be strengthened because it has the resources to enforce implementation of environmental agreements including those which seek to minimize environmental harm and enable compensatory justice. The state thus becomes a vehicle, even if not the only one, by which the democratization of governance and the politics of consent at a global level can be achieved. Falk (2001: 223) expects that a 're-empowered state would act alongside other political actors'.

Yet forms of liberal democratic pluralism reliant on the state have proved insufficient to overcome the political structures of inclusion and exclusion. In practice, the mechanisms of environmental governance do not 'institutionalise global responsibility' despite some claims to the contrary (see, for example, Wapner, 1998: 283). The very groups and voices whose participation is essential to sustainable development and responses to the challenges of global environmental change remain distanced from the domestic and global practices of environmental governance. The normative interests of the state remain evident in the dominance of sovereignty claims and national interests that are pursued at the expense of cosmopolitan values and at the expense of the environment. The state therefore remains ambiguous as cosmopolitan moral agent.

Notes

1. The focus here is on harm, inequity and justice between and among peoples. This is not to deny the crucial importance of an ethic that helps to define the relationship between people and the non-human world. I acknowledge that this is a strong theme in the literature that deploys liberal and cosmopolitan values, which reduces the human/non-human relationship to a second order or consequentialist form of cosmopolitan ideas (see, for example, Brulle, 2002; Wapner, 1997).
2. See Shue (1981) for what remains a seminal examination of whether the 'application of lower standards to foreigners [can] be given some reasonable justification' (Shue, 1981: 580).
3. For more, see Elliott (2004).
4. This is distinct from Bauman's 'morality of proximity' (cited in Lacy, 2002: 49).
5. The idea of distant others invokes not simply a geographic interpretation. Rather the

distant others may be geographically proximate but 'socially' distantiated. This has been the basis of the environmental justice movement within industrialized countries, particularly the United States.

6. Risk society defines the ecological crisis in part as a product of the institutional practices associated with the technological advances of industrial modernity. As Marshall summarizes it, 'the risk society becomes gripped by the hazards and potential threats unleashed by the exponentially growing productive forces in the modernisation process' (1999: 264). In turn, the risks associated with modern society impel the transformation of that society.
7. However, this emphasis on justice as a key feature of environmental governance and sustainable development has been overshadowed by the report's commitment to continued economic growth, the maintenance of a liberalized world economy and the articulation of a key role for corporate actors.
8. For a detailed listing of international legal instruments in this context, see Wagner *et al*. (2003). For a discussion of the key issues, see Elliott (2004).
9. On the other hand, the explosion of information, Virillo suggests, can have disenfranchising effects (cited in Lacy, 2002: 48).
10. Lacy refers to this as a form of 'green categorical imperative' (2002: 49).

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30 Gaia theory: intimations for global environmental politics

Karen Litfin

Gaia theory, first proposed in 1970 by British chemist James Lovelock and later elaborated by microbiologist Lynn Margulis, has developed from a controversial hypothesis to a broadly accepted set of ideas about the relationships among Earth's physical, chemical and biological features. Gaia theory represents a creative synthesis that has emerged through and built upon reductionist science, viewing the Earth holistically as a living entity in two senses. First, living organisms regulate the planet's geochemistry to the benefit of the whole. Second, and more radically, Earth itself may be understood as a complex, bounded, self-organizing, adaptive organism. The Gaian perspective has helped to spawn a paradigmatic shift in the natural sciences, most clearly seen in the new integrative field of Earth system science. Because the concept of Gaia appeals to the popular imagination, its societal influence is already surprisingly deep and broad. Lovelock (2000: xi) was astonished to receive twice as many letters in response to his first book on Gaia from people interested in its religious aspects as from those with a more scientific bent. The evocative image of Gaia as Earth goddess and mother of all creation has animated discussion in religious, literary and philosophical circles. The political implications of Gaia theory, however, have not been so widely explored. This chapter seeks to open that discussion.

The image of a living Earth may be as old as the human species. Throughout history, the perception of the Earth as a sacred and self-generative organism was common in religion and mythology. Among modern scientists, this perspective was rare but never fully absent. Johannes Kepler viewed the Earth as a single round organism. The Scottish scientist James Hutton, recognized as the father of geology, suggested in 1785 that the Earth is a superorganism that can only be understood in terms of physiology (Lovelock, 1990: 10). More recently, French palaeontologist Teilhard de Chardin (1959) proposed that evolution is a spiritual unfolding from cell to organism to planet to solar system and ultimately the entire universe. Because none of these earlier ideas made testable predictions, they were not considered scientific hypotheses. Gaia theory brings the ancient idea of a living Earth into the realm of verifiable science. Whereas past science, divided into the separate disciplines of biology, chemistry and physics, provided an inventory of the Earth's parts,

Gaia theory offers us a view of the Earth as a living entity. The theory comes just at a time when the twin phenomena of globalization and environmental destruction call us to adopt a planetary perspective.

Gaia theory, which views the Earth as a complex and bounded system, draws upon the more general systems theory. The basic ideas of systems theory open up fresh possibilities and a new language for understanding political processes. Gaia theory helps us to awaken to the fact that we are embedded in and dependent upon a greater whole. Because the Earth system is the wider context in which our political systems operate and because our actions now have planetary consequences, we are increasingly faced with the need to develop forms of governance that are compatible with the larger system which sustains us. This monumental task may well occupy generations to come. Therefore this brief chapter can only be suggestive at best.

This chapter examines the central concepts of systems theory in light of Gaia theory, and attempts to draw out in a rudimentary way some of their applications to global politics. These interrelated concepts include holism, autopoiesis (or self-making), networks, feedback, homeostasis and punctuated equilibrium. While human systems are subsystems of Gaia, they are also distinctive, especially with regard to temporal scale and questions of purpose. Gaia theory may have something to offer with respect to our political ideas and practices. As an alternative to the reductionistic worldview of modern science, Gaia provides important concepts and metaphors that can help move us towards a sustainable future.

Principles of systems theory

One of the pioneers of systems thinking, the 19th-century American scientist Josiah Willard Gibbs, defined a system as

> any portion of the material universe (including ourselves and everything we have invented including social systems) which we choose to separate in thought from the rest of the universe for the purpose of considering and discussing the various changes which may occur within it under various conditions. (Rukeyser, 1942: 445; cited in Madron and Jopling, 2003: 43)

In other words, the universe is the largest system, containing all other systems, and whenever we delineate the boundaries of a particular system, there is always a subjective quality to our decision. This is true whether we are investigating an ecosystem, a planet, an organism, a country or the global economy.

Systems theory has developed over the last 50 years and has been beneficially applied in engineering, education, finance, health, psychology and natural science. There are three broad types of systems.[1] *Hard systems* include many of the technologies associated with industrial life, such as electrical

grids, transport systems and telecommunications. Because of their mechanical character and their linear logic, hard systems are very effective in terms of their efficiency, predictability and performance. *Living systems*, of which Gaia is the largest known instance, are nested systems of biota and their environments. These complex systems cannot be understood in terms of the linear, reductionist logic of purely physical or chemical systems. They require a more dynamic, interactive and holistic approach. *Soft systems*, or purposeful human systems, encompass all social institutions and organizations: marriage, warfare, schools, corporations, governments, clubs and so on. Like living systems, they are nested and complex; they can evolve, reproduce themselves and die. In contrast to living systems, however, the human faculties of perception, intention, interpretation and imagination make soft systems far more complex and dynamic. Purpose, which is not an obvious property of hard or living systems, is essential to soft systems. The purposes of human systems are often tacit, and rarely acknowledged and debated publicly. Soft systems problems, which have no obvious solutions and involve many actors with differing perspectives, are generally exacerbated when they are addressed in terms of hard systems logic and methods. Therefore neither the Earth system nor the world political system, to say nothing of problems arising as a consequence of their interaction, can be understood in the linear logic of hard systems thinking.

The following section explores three central features of living and human systems: holism, autopoiesis and networks. These concepts are essential to Gaia theory and may also shed some light on political and economic practices in a global era. Holism helps us to see each system as more than the sum of its parts. Living and human systems, including Gaia and the world political system, are self-generative entities composed of dynamic and interactive networks.

Holism

Any system (except perhaps the universe itself) is also a subsystem or a part, yet can also be understood as a bounded whole. Holism means that, if a system is broken down into its component parts, it will not behave in the same way as when it was undivided: the whole is more than the sum of its parts. In systems language, the emergent properties of a system are those novel phenomena that are qualitatively different from the phenomena out of which they emerged. For example, when sodium and chlorine atoms bond in a specific way to make salt, the resulting saltiness is an emergent property that results not from the atoms but from their combination. In systems language, life is an emergent property of the interaction of cells. Cognition is an emergent property of networks of neurons. And the self-generative Earth system is an emergent property of the interaction of the planet's atmosphere,

lithosphere (soils and rocks), hydrosphere and biosphere. Among human systems, the United States, for instance, is an emergent property of governmental agencies, cultural practices and shared meanings.

Living and human systems are also bounded, that is, they are distinguishable in some sense from their environments. A cell, the simplest living system, is a 'membrane-bounded, self-generating, organizationally closed metabolic network' (Capra, 2002: 31). That network includes complex macromolecules, such as proteins, enzymes, RNA and DNA. The permeability of the cell's membrane gives it access to the nutrients and waste depositories it needs to survive, while also making it vulnerable to incursions from outside. Thus cells and all living systems, including human systems, are autonomous in the sense that they maintain some degree of structural integrity, yet they can never be truly independent. From a Gaian perspective, it is not possible fully to isolate one environment or system from all others.

This radical concept of systemic interdependence stands in contrast to modern political and psychological notions of human independence. In the words of Vernadsky, the Russian systems biologist, 'human independence is a political, not a biological concept' (quoted in Primavesi, 2000: 6). At the level of the individual, a healthy human body is host to billions of bacteria, upon which its survival depends. Human well-being is utterly dependent upon local ecosystems and the larger Gaian system, which includes that ceaseless generative and decompositional work of plants, phytoplankton, bacteria, fungus, earthworms, and so on. Current economic and political institutions reflect a state of consciousness that is essentially oblivious to our embeddedness within and dependence upon the entire Gaian system.

The holism of Gaia is also relevant to current social and political questions in that it invites a planetary perspective. Oddly enough, the Gaia hypothesis had its origins in the search for life on Mars, when Lovelock was hired by NASA in the 1960s to design sensitive instruments to analyse the atmospheres of other planets. The surprising consequence of that research was a fresh look at the Earth's highly anomalous and chemically unstable atmosphere. In Lovelock's (1990: 8) words,

> The unceasing song of life is audible to anyone with a receiver, even from outside the Solar System.…[Unless] life takes charge of its planet, and occupies it extensively, the conditions of its tenancy are not met. Planetary life must be able to regulate its climate and chemical state. Part-time or incomplete occupancy or mere occasional visits will not be enough to overcome the ineluctable forces that drive the chemical and physical evolution of a planet.

The 'amazing improbability of the Earth's atmosphere' includes the persistence of oxygen and methane in constant quantities, despite the fact that they easily react to form carbon dioxide and water vapour. Approximately one

billion tons of methane and two billion tons of oxygen must be introduced into the atmosphere to maintain constant concentrations of these gases. The only explanation is 'the invisible hand of life'. Indeed, apart from miniscule amounts of certain rare gases, virtually all of the Earth's atmosphere recently existed as parts of living cells (ibid.: 29, 72). Thus the US space programme not only brought us the physical image of the Earth as seen from outer space, but it also contributed to a paradigmatic shift in evolutionary science. Life, it turns out, is 'a property of planets rather than of individual organisms' (Morowitz, 1992: 6). From a Gaian perspective, our blue planet is a living entity with internal metabolic systems of temperature and chemical modulation, enveloped by an atmospheric membrane that separates it from an otherwise lifeless Solar System.

The planetary perspective of Gaia science appears just as the effects of human systems have become global in scope. For the first time in history, humanity has become a geophysical force with planetary effects. The rate of species extinction is between 1000 and 10 000 times faster than in the preindustrial era, rivalling the last great wave of extinctions that wiped out the dinosaurs 65 million years ago (UNEP, 2002). Climate scientists predict that global temperatures will rise between 1.5 and 5 degrees Celsius in the coming century, a warming on the order of a shift from an ice age to an interglacial period (Houghton *et al.*, 2001). Most key resources, including forests, minerals, petroleum, freshwater, topsoil and fisheries, are being depleted at unsustainable rates. Like life itself, human beings have evolved the capacity to inhabit virtually every corner of the Earth. Globalization of some form therefore seems to be part of our destiny (Madron and Jopling, 2003: 10). The question now before us is what new forms globalization might take as the incompatibility of current practices with the larger Gaian system becomes increasingly acute. As part of a greater whole, we are called upon to harmonize our social, economic and political systems with Gaia. International environmental politics over the past 30 years represents a piecemeal movement in this direction, yet, because it sidesteps the crucial questions of purpose and process that give rise to the destruction, green diplomacy and its variants do not offer a systemic solution.

From a Gaian perspective, it is the health of the planet that matters, not that of any particular species – including humans. We are just another species, far more expendable to Gaia's functioning than bacteria. While some may find solace in the fact that Gaia has survived for aeons by always establishing a new homeostasis after each 'catastrophe', any future equilibrium state will almost certainly be far less favourable for humans than the present one. For most of Gaia's 3.8 billion years, glacial periods have been the norm and species diversity has been far lower than at present. So a healthy dose of prudence would make sense. In Lovelock's words (1990: 212), Gaia is 'stern

and tough, always keeping the world warm and comfortable for those who obey the rules, but ruthless in her destruction of those who transgress'.

Autopoiesis

Living systems and human systems are self-organizing, meaning that they generate high degrees of order through complex relationships among their parts and with the environment rather than as a consequence of any clear external agency. The system is maintained through dynamic interaction of its subsystems. In the Gaian system, the main chemical subsystems involve the cycling of key elements: carbon, nitrogen, oxygen and sulphur (Lovelock, 1990). The largest human system, the global political economy, involves the dynamic interaction of corporations, governments, international organizations, banks and nongovernmental organizations. In both cases, the systems may be said to be 'self-making'.

Biologists Humberto Maturana and Francisco Varela (1998) coined the term 'autopoiesis' (from the Greek words for 'self 'and 'making') to describe 'the systemic organization of the living'. This term highlights the self-generative network of metabolic processes within an organism. The network continually 'makes itself', maintaining its structural integrity and organic functioning through exchange with its environment: intake of solar energy and nutrients, breathing and excretion. The minimal autopoietic entity is a bacterial cell, and the largest is likely to be Gaia (Primavesi, 2000: 2). An essential feature of an autopoietic system is that it undergoes unceasing change, all the while preserving its weblike pattern of organization. In the words of microbiologist Lynn Margulis (quoted in Primavesi, 2000: 4), 'It changes in order to remain the same.' During the first two billion years, bacteria ruled the planet and devised all of life's essential processes: reproduction, photosynthesis, fermentation, nitrogen fixation, respiration and locomotion (Capra, 2002: 29). For nearly four billion years, Gaia has repeated and elaborated upon these processes.

Despite the proliferation of life forms over the millennia, some essential characteristics of Gaia have remained relatively stable. For instance, even with a 25 per cent increase in the sun's heat since the emergence of life, the Earth's surface temperature has been fairly constant. Ocean salinity has also been stabilized at a level tolerable for marine life by cyclical life processes. The term for this tendency towards constancy is 'homeostasis', another property of living systems. The American physiologist who popularized the term also called it 'the wisdom of the body', since a healthy body is in a stable state. Gaia theory predicts that the climate and chemical composition of the Earth will remain in homeostasis for long periods of time until some internal contradiction or external force causes a jump to a new stable state (Lovelock, 1990: 13, 18). Most external forces have been meteor impacts. Earth's first

'environmental crisis' from internal causes probably occurred with the invention of photosynthesis, when the consumption of carbon dioxide by bacteria threatened to consume the greenhouse blanket that made the planet habitable for life. Oxygen, one of their waste products, opened up a tremendous niche for oxidizing consumers, and the subsequent growth of more complex organisms (Margulis and Sagan, 2001).

Human systems are also autopoietic, tending to reproduce and modify themselves in response to changing conditions over time. The autopoietic nature of both living and human systems means that they can adapt to internal or external changes. In his theory of social autopoiesis, sociologist Niklas Luhmann (1990) describes social systems as self-generating networks of communications. These networks have both material and cultural effects, generating both external social structures like the corporation and internal structures of meaning like rights. For example, the global economy is continually reproduced through networks of communication involving advertising, production, entertainment, financial transfers, education and so on.

According to Gaian scientists, when the activity of an organism favours both the Gaian system and itself, it will tend to spread. Eventually both the organism and the environmental change associated with it may become global in scope (Lovelock, 1990: 236). We may therefore be tempted to infer optimistically from humanity's relatively rapid globalization that this trend is favourable to (or at least compatible with) Gaia. What this logic ignores is that the time scales associated with Gaian processes are vastly longer than human concepts of time. A period of 100 000 years, for instance, is many times longer than all of human history, yet represents less than 0.003 per cent of Gaia's lifetime. Only in the last part of the 20th century did the human species become a geophysical force operating on a planetary scale. We do not know exactly when or how the Gaian system will respond to these relatively recent changes. According to the geological record, the pattern is long periods of homeostasis followed by sporadic catastrophes. These crises spark an intense period of innovation leading to a new stable state. This pattern of punctuated equilibrium seems to characterize the evolutionary trajectory of all living systems (Gould, 2002). Gaian theorists believe that, once a Gaian system-shift gets under way, it moves into a new and very different stable state very quickly – perhaps 50–100 years (Madron and Jopling, 2003: 64). Therefore it is prudent to bear in mind that the converse of the above optimistic inference also holds: any species that impairs Gaia's functioning will face extinction, even as the web of life continues towards a new homeostasis.

The concept of autopoiesis raises an important philosophical question. If a living system somehow 'makes itself', does it do so purposefully? Because it hinted at such a possibility, Lovelock's (1979) original formulation of the Gaia hypothesis met with intense scientific criticism, especially from

neo-Darwinists. Critics interpreted him as proposing a sentient Gaia able to consciously control the Earth with foresight and planning. In his later formulation, Lovelock (1990) illustrated the principle of homeostasis through a simple model that involved dynamic interaction but not intentionality. For instance, the automatic self-regulation of the carbon cycle, which has stabilized atmospheric concentrations of oxygen at 21 per cent and carbon dioxide at a mere 0.03 per cent, requires no foresight and planning. Yet these numbers are very different from the virtual absence of oxygen and the 95–8 per cent concentrations of carbon dioxide on Venus, Mars and pre-life Earth (ibid.: 9). The Earth's improbable atmosphere is a consequence of the mutual interaction of her biota with its nonliving systems.

The feedback mechanisms that lead to homeostasis in Gaia do not require intention or altruism, but rather only a reciprocal flow of influence.[2] Whenever the rate of change in a system is getting faster, positive feedback is at work. This kind of reinforcing feedback is important when a new homeostasis is getting established, but it can also lead to a pernicious spiralling effect. Examples include avalanches, stock market booms and cattle stampedes. On a Gaian scale, an example with respect to global climate change is the increase of evaporation that occurs on a warmer planet; the added water vapour, itself a greenhouse gas, increases the temperature further. When positive feedback gets out of control, the resulting runaway system can only be stopped when either the external environment or an internal instability halts the positive feedback loop. Balancing, or negative feedback, prevents the system from running away with itself. For instance, the absence of predators in an ecosystem will lead to an overpopulation of their former prey, who will in turn not be able to subsist on the given food supply, so that their numbers will fall to a sustainable level. With respect to climate change, an example of negative feedback would be the increased growth of plants in a warmer climate. Since plants take up carbon dioxide and store carbon, their enhanced growth would tend to decrease the greenhouse effect. In each of the cases above, the feedback is an automatic function. The system is responsive, yet no purposeful agent is responsible; Gaia theory does not entail teleology.[3] Questions of larger purpose and intention in living systems are simply beyond the bounds of scientific methodology.

Purpose, however, is essential to human systems. It consists of the most cherished values that inform and orient the system. Humanity is just beginning to awaken to the necessity of aligning our purposes with the functioning of Gaia. In the examples of climate change feedback mechanisms cited above, Gaia is *responsive* but human systems are *responsible* for setting them in motion. As a consequence of our global economic, political and social networks, people have become a geophysical force operating on a planetary scale.

While a system's purpose might be unexamined, misunderstood, ignored, debated and even disguised, reconfiguring the system requires identifying its purpose(s) and implicit values. The global economy is a self-reproducing network of networks, but can we point to a basic purpose or set of purposes that drive it? Growth, development, prosperity, wealth – these are different words for what many would agree is the underlying purpose of the system. Some might say that economic growth is only a means to a greater purpose of increasing human happiness, but the link between wealth and happiness is a murky one at best (see Durning, 1993). The systemic nature of this purpose is evident in the fact that it is almost universally embraced: across the political spectrum from left to right, and around the world from North to South. There is plenty of disagreement on how to pursue this goal, but a striking consensus on the fundamental purpose itself. Yet, because infinite growth on a finite planet is impossible, this purpose will inevitably be thwarted at some point.

Understanding the core purpose of a human system is necessary but not sufficient for empowering us to reorient it. With respect to the global economy, we must also discern how the pursuit of growth is institutionalized in actual practices and embodied in social networks. Though such a task is beyond the scope of this chapter, we can make some simple observations. Systems theorists Madron and Jopling (2003: 69–73) suggest that the true purpose of the 'Global Monetocracy' is that of 'money growth in order to maintain the current debt-based money system'. Virtually all of the money we use (all except notes and coins, which constitute only about 3 per cent of the total) comes into existence as a result of interest-based loans or 'debt-money'. As a consequence, the economy must grow to avoid collapsing. In systems terms, the growth imperative imposed by the debt-money system is a positive feedback mechanism, and therefore runs the risk of creating a runaway system that can only be stopped when either the external environment or an internal instability halts it. Systems theory does not predict exactly when or how that might happen, but it does say something about the consequences of positive feedback loops in general.

If human systems are to persist as a global subsystem of Gaia, we will need to align our purposes with the functioning of Gaia. The longer we wait, the greater the risk. If monetary growth is the purpose of the global economic system, reconfiguring the current system means first and foremost rethinking our purposes. For human systems to be harmonious with the wider Gaian system, sustainability must become a core human purpose. Other purposes could include justice, a less materialistic vision of human well-being, the growth of knowledge, and so on. Individuals and groups around the world are taking up the challenge of revising the purposes of human systems in light of Gaia (see Berry, 1999; Redefining Progress, 2004; Jackson and Svensson, 2002). They are articulating different purposes and setting up new networks

of communication. In short, they are seeking to establish the rough outlines of an alternative to current practices.

Networks

All parts of any living or human system are interconnected in an intricate network of relationships. Life, human and otherwise, is social in the sense that it exists in nested collectives. For instance, our bodies consist of a collection of organs and tissues. These are in turn made up of billions of living cells, each one of which can also live independently. The cells themselves are communities of microorganisms (Lovelock, 1990: 18). On a larger scale, ecosystems are sustained by complex food webs. Gaia theory holds that the Earth system consists of networks of organization analogous to the physiological processes of an organism. Every organism in Gaia, including the human body, is a product of billions of years of interaction between sunlight, soil, air, water and the biosphere.

Living systems are constituted through symbiosis, whereby dissimilar entities coexist in a mutually beneficial arrangement. Contrary to the popular neo-Darwinist view of life as a harsh competition for survival, Gaia theory proposes that cooperation is much more the rule than competition. Bacteria, the most long-lived class of organisms and the basis of all subsequent life, are inherently social animals. They 'live by collaboration, accommodation, exchange, and barter' (Thomas, 1974: 6–7). Most bacteria cannot be isolated because they live in extremely dense communities, reconstituting their shared environment for their mutual benefit. At the macro scale, Gaia is a magnificent symbiotic network viewable from space, the result of aeons of symbiogenesis (Margulis and Sagan, 1995: 156). 'Life did not take over the globe by combat, but by networking' (Margulis and Sagan, 2001: 11).

Like other living systems, human systems consist of networks. On a global scale, the human system comprises innumerable networks of communication in the arenas of production and consumption, diplomacy and warfare, advertising and entertainment, education and ritual. Many (if not most) social systems are more rooted in cooperation than competition: for instance, the global transportation and postal networks. Yet the overarching premise of the global economy, in contrast to living systems, is competition. Firms compete with one another for resources and markets; workers compete for jobs; countries compete for investment. Capitalism has legitimated itself in terms of the Darwinian notion of 'survival of the fittest'. Both capitalism and Darwinian biology also presume that the natural environment is a stable background to which individuals must adapt. In contrast, life from a Gaian perspective is about the ability of cooperative networks not only to adapt to but also to alter their environment on a planetary scale for their own enhancement. Both the unrelenting drive to compete, an intrinsic consequence of the growth

imperative, and the notion of environment as backdrop are at odds with Gaia theory. A sustainable global economy would consist of symbiotic networks acting in harmony with Gaia.

In living systems, networks continuously reorganize their elements in cyclical processes. In ecosystems and in Gaia as a whole, recycling is the rule; one species' waste is always another species' source of nourishment. Cyclical exchanges of energy and resources in a living system are sustained by pervasive cooperation. Since the first nucleated cells emerged over two billion years ago, Gaia has generated increasingly diverse arrangements of collaboration and coevolution (Madron and Jopling, 2003: 33). Neither for Gaia nor for any local ecosystem is there an 'out there' into which 'waste' can be dumped. Gaia knows no such concepts as garbage and pollution.

For the most part, existing political systems for regulating the disposal of waste (whether solid, atmospheric, toxic, biomedical or nuclear) are oriented towards developing safer technologies and practices, without ever questioning the underlying concept of waste itself. This is true for all levels of mainstream 'waste management', from municipal policies to international treaties. Yet, little by little, ecological principles based upon cyclical processes are being introduced into human systems. The recent growth of consumer-based recycling in the industrialized countries is one such trend, although it has not served to decrease overall consumption or waste production. Virtuous cycles in human systems largely eliminate waste (ibid.: 35). Some promising examples include zero-emissions production processes (see http://www.zeri.org) and community supported organic agriculture (see http://sare.org/csa).

The emerging field of eco-design organizes human systems according to the principles of ecology: networks, symbiosis, cyclical processes, dynamic balance, diversity and the primacy of solar energy in animating all living systems. Writ large, these are also the fundamental principles of Gaia theory. In contrast to industrial society, eco-design 'introduces us to an era based, not on what we can *extract* from nature, but on what we can *learn* from her' (Benyus, 1997: 2; cited in Capra, 2002: 233). The idea is to use our intelligence to sense nature's design, thereby making our own systems coherent with the larger Gaia system. Hundreds of 'eco-villages' around the world, many of them drawing upon Gaian imagery, are experimenting with principles of eco-design in order to bring this vision to life (see www.gaia.org; www.gen.org; Jackson and Svensson, 2002).

While human systems have always consisted of networks of communications, only recently have those networks been globalized. Information technologies are giving rise to a network society in economics, culture and politics (Castells, 1996). In this society, the generation of new knowledge, wealth and power is based upon global networks of communication. The

so-called 'global market' is not really a market, but an electronically based network of financial transactions informed by the fundamental purpose of money growth (Capra, 2002: 141–2). In contrast, a new kind of global network, organized around reconfiguring human systems around the core purposes of human dignity and sustainability, is gradually emerging (Keck and Sikkink, 1998). The nongovernmental organizations (NGOs) that constitute this network are using communication technologies, especially the Internet, to establish global networks of local grassroots organizations (Warkentin and Mingst, 2000). These transnational activist networks include the Climate Action Network, the Rainforest Action Network and the International Forum on Globalization. The alternative globalization movement, green politics and the global eco-village network all represent citizen-based efforts that move towards a Gaian human system.

As human systems become more complex, hierarchical and centralized forms of governance are becoming increasingly dysfunctional. Policy makers and leaders simply cannot process the enormous quantities of information required to make skilful decisions. Consequently information-processing and decision making power need to be devolved as widely as possible if human systems are to become viable members of the Gaian system. Madron and Jopling (2003: 110–27) propose a Gaian model of democracy as a nested system of governance at all levels, from the neighbourhood to the global. Unlike the current system, whose purpose is money growth, Gaian democracies would be oriented towards sustainability and justice. They would be modelled upon a network model of governance, participatory change processes and forms of leadership that empower people. The command-and-control culture that still prevails in business and politics would be replaced by a culture of dialogue. Autopoiesis, or self-making, would take on new meaning with the globalization of democracy as people organized themselves according to Gaian principles.

The rise of a network society coincides with the decline of the sovereign nation-state. State autonomy, authority and control, the three components of sovereignty, are undermined by global networks of communications, finance, crime, terrorism, disease transmission, ecology and transnational activism (Litfin, 1997). From a Gaian perspective, the nation-state is neither large enough to be planetary in spirit, nor small enough to nurture the kinds of local identity and civic involvement that could form the basis for participatory governance (Thompson, 1985: 165). This does not mean that the nation-state will cease to exist, but only that it may be incorporated into broader networks of supranational, regional and local forms of governance.

If the principles of Gaia theory were applied to global political and economic systems, our world would be a very different place. The natural world would move from backdrop to centre stage, and principles of eco-design

would become foundational rather than peripheral. Farming and industrial practices, architecture and transportation would be radically different. Cyclical processes would replace wastefulness with creative methods of regeneration. Hierarchical structures of domination would give way to participatory networks, and symbiosis would displace competition as the defining modality in economic exchange.

Yet we are wise to remember that, while Gaia theory can be helpful in reorienting our thinking about human systems, it is not a panacea. Systems language and concepts offer an integrative way of understanding current problems and redirecting us down a more sustainable path, but they do not lay the stones along the path. Gaia theory can help us with the essential task of seeing the big picture, but it does not resolve the thorny problems of practical politics. In this sense, Gaia may be more important for its broader contribution to our ethical and political imagination than for its direct policy effects.

Gaian ethics and political imagination

Gaia theory raises some disconcerting ethical questions. If value in the Gaian system is related to the continuance of life in general, must our ethical concern extend beyond humans to other creatures? To the planet? In some ways, our concern for the Gaian system comes, not so much from ethical obligation, but from an enlarged sense of pragmatism: we want to save our own skins. Gaia will survive, but our interference may catapult her into a new state that is not so hospitable to ourselves. Thus Gaian pragmatism points to some ethical principles. 'Is' may not dictate 'ought', but it is suggestive. If, for instance, species diversity and a stable concentration of greenhouse gases are critical for a healthy functioning of the Gaian system, we 'should' prevent species extinctions and reduce our use of fossil fuels. Gaian thinking supports the precautionary principle: if the risk is high, action to prevent harm should be taken, even in the absence of full scientific certainty. If current practices risk destabilizing the Earth's climate and life support systems, then we should take precautionary action and change them.

If Gaia focuses our attention on the Earth, what happens to our generally accepted ethical commitments to other people? What, for instance, of questions about justice under conditions of extreme global inequality? At first, we might think that, if Gaia is the object of our concern, we must sidestep those thorny questions of North–South inequity and get onto the business of 'saving the planet'. Because Gaia's 'big picture' perspective is out of step with anthropocentrism, we might be tempted to believe that human questions can be ignored. But it turns out that Gaia brings out the human questions in stark relief.

Paradoxically a Gaian perspective compels us to consider justice. When we could naively assume that infinite growth on a finite planet was possible,

we could also believe that economic growth would eventually 'trickle down' everywhere and to everyone. The recognition is dawning upon us: the overconsumption of the North cannot be globalized without endangering the Gaian system. Yet this is exactly what is happening. With 80 per cent of the human population, developing countries represent the wave of the human future. They are not going to change their development trajectories without enormous assistance from the wealthy countries. Justice, therefore, becomes a matter of 'geoecological realism' (Athanasiou and Baer, 2002: 74). While Gaia's planetary perspective may undercut humanism in the big picture, the pragmatic requirements of moving towards sustainability have the ironic effect of highlighting questions of justice and equity. Gaia reminds us that we are all in this together.

Because human systems are a subset of Gaia, perhaps it should not be surprising that the key concepts of Gaia theory are also relevant to current social and political questions. Our utter dependence upon a planetary network of living systems is just dawning upon our collective awareness, and therefore is only beginning to be expressed socially and politically. Until recently the scientific metaphors that dominated the modern Western political imagination were drawn from an atomistic, mechanical and reductionistic worldview (MacPherson, 1962). Nation-states, firms and people were conceived as independent, acquisitive individuals competing for resources, power and wealth; nature was merely a backdrop to our human dramas. Gaian concepts of holism, autopoiesis and symbiotic networks offer a very different language for exploring social and political organization. Gaia theory not only provides an alternative set of ideas for describing and relating natural and human systems, it also contributes new metaphors to the political imagination. Symbols can be powerful sources of motivation, and the image of the Earth as a living, self-regenerating being is an especially powerful one. If affect precedes cognition, as many psychologists claim, then the emotional appeal of Gaia theory may be far more important than its conceptual contributions to sustainability.

An Internet search for 'Gaia theory' yields over 63 000 results, and a search for 'Gaia' yields 1 420 000 websites. Of the latter, most are about environmentalism and various forms of spirituality, but their topics also include the arts, urban planning, tourism, feminism and even sporting goods. Gaia is most often invoked by environmental activists and spiritual seekers. Had Lovelock named his hypothesis 'Earth systems theory' instead, my Internet search might not have been so fruitful. Language matters, and the ancient image of the Earth mother is far more compelling to most people than the comparatively cold language of systems theory.

Gaia theory at once revives this ancient symbol and endows it with scientific legitimacy, synthesizing empiricism with poetic inspiration. In much the same way that the image of the Earth as seen from space has been invoked by

environmentalists, Gaia is, at a minimum, a symbol of wholeness, interdependence and dynamic complexity. For many, Gaia also evokes a sense of awe and reverence, restoring a sense of connection to the cosmos that Western culture abandoned with the medieval conception of the Great Chain of Being. By evoking a sense of the sacred, Gaia challenges secularism's utilitarian orientation while leaning on its appeal to science. Yet, because we are products of a rational, technological and male-oriented culture, a simplistic revival of this ancient symbol runs the risk of shallowness. A spiritual symbol is not merely cognitive or sentimental, but rather stirs and shapes us in the deepest parts of our being.

Gaia theory encourages us to contemplate larger questions of meaning and purpose, both individually and collectively. On the one hand, the growth imperative of the dominant human system has become a planetary malady, calling into question existing arrangements. On the other hand, we are a species with the same bacterial ancestry as all other species and that is also struggling to become conscious. We are the means by which Gaia is growing into self-awareness, and current conditions may be the labour pains of that birth of consciousness. Gaia enlarges our vision of human purpose beyond the growth imperative, and reorients our action beyond the personal and local onto a planetary scale. And because Gaia acts locally as well as globally, we become more, not less, intimate with the particular landscapes we inhabit. Yet, as David Spangler (1993: 82) rightly warns, invocations of Gaia run the risk of becoming empty slogans if we do not allow them to inhabit us. If we sincerely want to reinvent our relationship with the Earth, we cannot simply deploy images of Gaia to meet emotional, religious, political or commercial needs 'without allowing them to transform us in unexpected and radical ways'. Both as a scientific theory and as a cultural image, Gaia has the potential to become an enormously transformative idea for our time.

Notes

1. This threefold typology is adapted from Madron and Jopling (2003: 30–31) and Checkland (1981).
2. The discussion in this paragraph is drawn from Madron and Jopling (2003: 38–9).
3. But neither can Gaia theory rule it out. The question of purpose informs the observation that Gaia theory is a spectrum of ideas, 'ranging from the undeniable to the radical' (Wikipedia, 2003). At one end of the spectrum is the undeniable claim that life has dramatically altered the Earth system's composition. Moderate views understand Gaia as a self-organizing system or, more radically, a single planetary being. The most radical Gaia thinkers believe that there is an underlying intelligence directing the coevolution of Gaia's physical and living systems.

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Index