

# **TRANSPARENT GOVERNANCE: THE ROLE OF NONGOVERNMENTAL ORGANIZATIONS AND THE INTERNET**

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## Summary

Transparent governance is fundamental to the long-term maintenance of global life support systems, by promoting accountability, soundness, and legitimacy in the decision making processes that directly and indirectly influence those systems. This topic summary provides a working definition of transparent governance, articulates its importance for governments and institutions whose decisions impact life support systems, and explores key enabling transparency forces and mechanisms. After an initial overview of transparent governance and a survey of its enabling forces and mechanisms, focus is placed on the Internet and nongovernmental organizations (NGOs), that are becoming the primary driving forces for promoting transparent governance around the world. Specific Internet-based transparency mechanisms are examined, together with selected Internet-based means by which NGOs increase transparency. The experience of a Norwegian NGO and its use of the Internet in fighting for transparent governance in Russia provides an illustrative case study of both forces. The topic paper concludes with the authors' perspectives on the future of transparent governance and suggestions for increasing transparency in all countries and at all levels of governance.

## 1. Introduction

For the purposes of this discussion, transparent governance refers to decisionmaking processes within governance processes and civic institutions that are open and accessible to the public and for which quality, understandable information is available. It supports open competition among arguments, ideas, and policies; it promotes civic participation in decisions; and it opposes secretive decision-making by governmental or institutional elites. Quality of, and access to, information and decisionmaking processes lie at the heart of transparent governance. As described here, it can be achieved through a wide variety of practices, mechanisms, and efforts supported by government institutions, civil society, non-governmental organizations, and individuals.

Research shows that participation in decision-making, particularly in communities, is fundamental to the long-term maintenance of life support systems, which can be defined

as any natural or human-engineered system that furthers the life of the biosphere (including humans and their social systems) in a sustainable fashion. Participation requires both access and appropriate information. At higher levels of governance, in which direct participation is less practical, transparency of decision processes is critical. Because institutions at all scales can influence the health of life support systems, transparency is pertinent to decision-making within national, regional and local government institutions, as well as within many international organizations. While it can be messy, transparent governance promotes accountability, soundness, responsiveness to public values, and legitimacy in the decisionmaking processes that concern those systems. It provides a framework for an informed public to gain awareness of the interactions between societies and the life support systems on which they rely. It also supports citizen involvement in decisionmaking concerning those interactions. Whether the issue is depletion of natural resources, air and water pollution, climate altering activities, waste disposal practices, or the destruction of fragile habitats and ecosystems, transparent governance supports more sustainable choices.

During the last decade of the 20<sup>th</sup> century, major geopolitical developments created new opportunities for spreading and deepening transparent governance around the world. The Cold War ended and the struggle between capitalist and communist world visions diminished, thereby removing one of many obstacles to improved international environmental cooperation. According to data published by Freedom House, a nonprofit organization that monitors and evaluates the state of freedom in nations around the world, the Cold War's end accelerated the general trend of the 20<sup>th</sup> century for nations to move towards more free and open societies. The fall of communism and the end of the Cold War brought with them a significant and rapid increase in the number of nations that afforded their citizens political rights and civil liberties. Freedom House statistics indicate that the percentage of nations in the world that could be considered at least "partly free" rose from 62.8% in 1989 to 75.5% by 1999, whereas in the preceding ten year period, the percentage of free nations actually fell from 65.2% to 62.8%.

The post-Cold War relaxation and transformation of the international political environment increased the transparency of governance in many countries. In Eastern and Central European nations previously under the direct control or the influence of the former Soviet Union (FSU) the rejection and the replacement or reform of rigid authoritarian systems made governance more transparent. In many cases, the relaxation of ideologically-driven economic policies in order to promote economic growth, trade, and foreign investment, while sometimes creating hardship, also contributed to an environment in which limited transparent governance could take root, if not flourish.

The end of the Cold War also created opportunities in the West for increased transparent governance. In the United States, an important example was the lifting by the U.S. Department of Energy of the veil of secrecy that surrounded the sites of the U.S. nuclear weapons complex. Vast amounts of information about the severely contaminated sites and their surroundings were made available to nongovernmental organizations and the public, and mechanisms were established to involve citizens in decisionmaking processes about the fate of the sites and the manner in which they would be remediated. Information became more readily available and decisionmaking processes more accessible. While transparency gains with respect to the United States' national security

apparatus were not necessarily dramatic, without the end of the Cold War, it is conceivable that even limited gains would have been realized.

Prompted by the end of the Cold War and the desire to improve living standards, some developing countries, including India, China and Vietnam, have pursued domestic economic reforms and have begun to open their economies to trade and foreign investment. Some have become members of international economic institutions, creating opportunities for (and stimulus of) elements of transparent governance. For example, India and China are now members of the World Trade Organization, while Vietnam holds observer status with the expectation of joining in the near future. The WTO requires its members to make public economic data that developing countries have often chosen to suppress. Improving living standards and greater per capita income provided many citizens of liberalized economies with better means to access information, if not to participate directly in decision-making processes. Trade and foreign investment placed transparency pressures on governments and provided citizens with increased exposure to political ideas and values that encourage transparency.

The end of the 20<sup>th</sup> century brought with it an explosion in the capacity, availability, and affordability of information and communication technologies, and their usability for governance. Rapid advances, widespread dissemination, growing penetration, and decreasing costs of technology (both hardware and software) created new opportunities for extending or improving transparency of government decision-making. Perhaps the most important occurrence was the rise and dramatic growth of the Internet and the development of a host of transparency-enabling mechanisms available to all governments, multilateral institutions, nongovernmental organizations, and citizens. Governments in Western countries took the lead in using information and communication technologies to promote interaction with the public, provide government services, and improve access to information used in, or relevant to, decision-making. Other countries followed suit, albeit slowly. Nongovernmental organizations around the world also began to use information technology to promote transparency in government.

## **2. Transparent Governance: An Overview**

While most people recognize voting as the mainstay of democracy, a truly strong participatory system requires public awareness and participation in all aspects of governance. Because many of the decisions that affect the public's quality of life are made by civil servants in administrative agencies rather than by elected officials, participation beyond the voting booth is particularly important for environmental governance. Principle 10 of the Rio Declaration on Environment and Development outlined such a vision of transparency for environmental governance: "Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. . . [E]ach individual shall have appropriate access to information concerning the environment that is held by public authorities...and the opportunity to participate in decisionmaking processes."

As outlined in the Rio Declaration, transparency requires both information and access to decisionmaking. The two components are inseparable. Without information, citizens cannot know when to make their voices known in decisionmaking nor formulate the

arguments that sway policy. Even well-informed citizens, however, are shut out of formal decisionmaking if opportunities to participate do not exist. They are left only with informal, or even illegal, opportunities to influence or oppose governmental decisions. Although a number of economic and political developments in the last decade have smoothed the way for the greater participation of citizens in governance, many barriers remain. For example, the United Nations Environment Program's (UNEP) Geo-2000 report notes that very few countries worldwide have effective legislation enabling full freedom of access to government information. The US Freedom of Information Act (FOIA) is an example of a good, though imperfect, law that protects the rights of the press and the people to access information on the inner workings and decisions of the government.

The need for legislation to assure citizens' access to information on government decision-making in itself indicates that governments in modern democracies often are less transparent than they should be. From a misguided sense of national security to open mendacity, democracies across the world, including those in North America and Europe, have often been less than fully open with their citizens. In addition, few democracies allow direct participation in every important decision by the citizens affected. The US is a republic yet the federal government has no provision for referendums and local participation in environmental decision-making is the result of more than three decades of judicial action forcing federal, state, and local governments to open their policymaking processes.

In this section we examine the rationale for transparency in environmental governance and the various methods by which people outside of government educate themselves about, provide input to, or make environmental decisions. The rationales for transparency range from normative arguments about why the public should have access to information and decisionmaking to practical arguments about the value of accountability and the importance of information that citizens provide. The mechanisms for transparency range from laws that grant the public access to government documents to formal negotiations that bring disputing parties together to determine what policy should be. Examples from a number of countries around the world are used as illustrations.

### **2.1. Why is Transparency Important?**

A discussion of transparency best begins with a justification for why it is important. That is, how does transparency contribute to conservation of ecological systems and sustainable development of human societies? In countries with democratic traditions, the rationales for transparency are often taken for granted. When the legitimacy of government comes from the consent of the governed, transparency is, in principle axiomatic. But not all countries share the democratic tradition.

Even in those that are democracies, history has shown that transparency is not guaranteed in practice. Indeed, sometimes it may not be desirable for citizens to have universal access to information or explicit involvement in every decision that governments make. For example, security matters generally demand restricted access to relevant information. Articulating the rationale for transparency, then, provides a

starting point for understanding when it is appropriate, what kinds of mechanisms are called for, and what kinds of outcomes can be expected. Here we discuss five ways in which transparency increases sustainability: accountability, responsiveness to public values, improved information, effective implementation, and social change.

### **2.1.1. Accountability**

The most often cited rationale for transparency is accountability. Transparency ensures that those making public decisions are accountable to the people they govern. An obvious target of accountability is corruption, where public servants act in their own self-interest at the expense of the broader public interest. A less obvious, but no less important target is clientelism, where public servants act in the interest of powerful and concentrated interests at the expense of the public interest. Scholars of public administration have long recognized the potential for an alliance of incentives between government and special interests that work against the broader public interest and the difficulty of organizing the public as a countervailing force. Transparency can help counteract the pressures toward corruption and clientelism through the threat of monitoring. Whether anyone is actually monitoring every action and decision or not, such a threat can be sufficient to counteract tendencies toward subverting the public interest. While we often think of accountability as changing the behavior of public servants, transparency can also change the behavior of those outside of government. When actions are publicized, their protagonists are exposed to the sanction of public norms or even public action. Laws that allow access to government documents, that open meetings to the public, or that require disclosure of information from private firms are all examples of transparency acting to increase accountability. Freedom of the press and freedom of association are integral to accountability because it is often the press or organized NGOs that act as society's monitors.

### **2.1.2. Responsiveness to Public Values.**

A second rationale for transparency concerns the responsiveness of government to public values. Science plays a large role in identifying the existence and nature of environmental problems, for example, whether man-made chemicals deplete the stratospheric ozone layer or industrial emissions are toxic. But politics, the process in which policy is formed, is a struggle over values and the politics of the environment mobilizes values more than most competing issues. Traditional technocratic decision-making tools such as risk assessment and cost-benefit analysis inevitably miss the subtle and unquantifiable interplay of subjective values.

The importance of public values is increasingly recognized in the study of decisions about environmental risks. Study after study document that the public perceives environmental risks in very different ways than do experts. While experts see risk in terms of the probability of the occurrence of adverse events, the public often takes a more holistic view, accounting for who generates the risk, how much control the public has over the risk, and the power dynamics of decisionmaking. As a result, technocratic assessments of risk often run counter to what the public cares about. Transparency promotes participation and provides fora in which the relevance of public values to risk decisions can be aired and addressed.

### **2.1.3. Improved Information**

A third rationale for transparency relates to how the public can improve the substantive quality of decisions. Transparency can lead to objectively superior decisions by introducing new information, ideas, and analysis into decision-making. Public participation in government decisionmaking is often portrayed as government experts confronting uninformed lay citizens. However, the public is often an important source of local information and innovative ideas. In investigations of hazardous waste sites, for example, local citizens are the “experts” in the history of the site, local patterns of use, local geography, and often local patterns of disease. Even if not directly contributing to decisionmaking, citizens have often identified mistakes and misinformation produced by government experts. Sometimes indigenous knowledge is more effective than scientific comprehension for resolving local environmental problems. For example, a study of the impact of the Chernobyl nuclear disaster on sheep farmers in England’s Lake District documents how scientific experts consistently ignored local knowledge and custom in investigating and explaining the effects of nuclear fallout on sheep. The low regard accorded to local knowledge led to mistaken analysis, improper policy prescriptions, and a complete loss of trust in government decision-makers. In developing countries, science has often overlooked or under-appreciated local knowledge embedded in cultural practices and social institutions that have developed over time in response to environmental conditions.

### **2.1.4. Effective Implementation**

The fourth rationale discussed here is perhaps the most practical: transparency can help overcome barriers to implementation. Environmental decisionmaking often occurs in an atmosphere of conflict between different interests and distrust in government. Transparency, especially through participation, can improve the implementation of policy by fostering decisions that are more broadly appealing, providing opportunities for disputing interests to cooperate, and perhaps giving citizens more reasons to trust government decisionmakers. In the United States, where it seems that all environmental controversies end up in court, there has been an increasing trend toward “alternative dispute resolution” where parties seek to identify policy alternatives that leave them all better off. Even just the act of participating in such processes may have benefits. Many theorists argue that the act of participating strengthens civil society by building what political scientists term “social capital” – the norms, networks, and trust that make societies cohesive and effective. If citizens participated in making the decision, they are more likely to participate in implementing it. And their assistance in implementation is usually vital.

### **2.1.5. Social Change**

Transparency also may be the best way to balance the power of environmentally destructive commercial interests with people acting communally for a commonly preferred good. By opening up decision-making, individuals and communities are empowered to protect their local environment. By changing power relations in society, transparency also contributes to sustainable development because it allows public

scrutiny of, and contributions to, the policy processes by which solutions to social problems are crafted.

Development is more than economic growth; it is a continuous process that opens new possibilities for personal freedom and individual self-expression. Sustainable development is an indefinite process by which life for all is 'improved' without destroying the natural systems on which the society relies. Thus, sustainable development is about managed social change.

Usually social change within a community emerges from the interplay of several informal and formal processes. The quality of social change reflects (1) the relative importance of formal and informal institutions in the community and (2) the power relations within formal processes. In authoritarian societies, formal (government) institutions dominate. Yet, many rural communities in poorer developing countries are substantially beyond the reach of formal governance institutions. Such communities make themselves through relatively informal institutions and governance processes. The relative weight of formal and informal institutions in forming the quality of social change is specific to each community.

Within formal governance processes the rules determine the relative power of each of the participants. Environmentalists often complain that in capitalist societies the rules favor corporations. If transparency processes are substantive rather than merely formal, the rules should be designed to include all the stakeholders and to 'level the playing field' so that none is unduly favored.

## 2.2. Transparency Mechanisms and Forces

Accountability, responsiveness to public values, improved information, effective implementation and social change all justify transparency and participation. But how do people actually get informed and get involved? Here we describe a set of mechanisms – from information provision policies to formal negotiation – by which citizens engage government, and each other, in decisionmaking about energy and environmental systems, among others.

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### Bibliography

Afsah, Shakeb (not dated). Program for Pollution Control Evaluation and Rating: A Model for Promoting Environmental Compliance and Strengthening Transparency and Community Participation in Developing Countries. Washington, DC: International Resources Group. Available at [http://www.worldbank.org/nipr/work\\_paper/PROPER2.pdf](http://www.worldbank.org/nipr/work_paper/PROPER2.pdf). [This paper describes Indonesia's experience

with the implementation of a public environmental reporting initiative and its applicability to other countries in the developing world]

Cronin, Thomas E. (1989). *Direct Democracy: The Politics of Initiative, Referendum, and Recall*, 289 pp. Cambridge, MA and London, England: Harvard University Press. [This early work provides an interesting overview of a wide range of 'direct democracy' pressures in the United States and addresses the advantages and disadvantages of giving voters a more direct voice in democracies].

Federal Facilities Environmental Restoration Dialogue Committee (1996). *Consensus Principles and Recommendations for Improving Federal Facilities Cleanup*, Washington, DC: Environmental Protection Agency (April). [The report of a federal advisory committee in the United States, which provides recommendations on the cleanup of contaminated federally-owned facilities, including a recommendation for public participation in cleanup decisions].

Felleman, John (1999). Internet Facilitated Open Modeling. *Policy Studies Review*, Vol. 16, Nos. 3 and 4, (Fall/Winter) pp. 192-219. [This work discusses the potential of the Internet and information technology to influence decisionmaking by bringing advanced tools, such as systems science and managerial models, into the hands of the public].

Finney, Colin (1999). Extending Public Consultation via the Internet: The Experience of the UK Advisory Committee on Genetic Testing Electronic Consultation. *Science and Public Policy* 26(5): 361-373. [This paper describes the electronic consultation set up for the UK Advisory Committee on Genetic Testing to address its draft code of practice on over-the-counter genetic testing].

Finney, Colin (2000). Implementing a Citizen-based Deliberative Process on the Internet: The Buckinghamshire Health Authority Electronic Citizens Jury. *Science and Public Policy* 27(1): 45-64. [This paper describes the UK Buckinghamshire Health Authority (BHA) experience with electronic citizens' juries as complementary deliberative processes].

Florini, Ann (1999). Does the Invisible Hand Need A Transparent Glove? The Politics of Transparency. Paper Prepared for the Annual World Bank Conference on Development, April 28-30, URL: [http://www.worldbank.org/research/abcde/washington\\_11/pdfs/florini.pdf](http://www.worldbank.org/research/abcde/washington_11/pdfs/florini.pdf). [This paper explores the politics of transparency – why it is emerging, and what are the advantages and difficulties inherent in relying on transparency to address global issues].

Food and Agricultural Organization of the United Nations (2001). *Global Forest Resources Assessment 2000*, URL: <http://www.fao.org/forestry/fo/fra/index.jsp> [A periodic assessment of global forest resources conducted by the United Nations Food and Agricultural Organization that contains information about forest cover and forest cover changes around the world].

Freedom House (2004). *Freedom in the World Country Ratings: 1973 through 2003*, URL: <http://www.freedomhouse.org/ratings/index.htm>. [An annual survey of nations that characterizes their freedom status, which in Freedom House's methodology depends on the degree to which political rights and civil liberties are afforded].

Grossman, Lawrence (1995). *The Electronic Republic: Reshaping Democracy in the Information Age*, pp. 290, New York: Viking [An early examination of the growing impact of information technology and telecommunications on the American political system, and a look at the advantages and disadvantages for American democracy of these technological changes].

Guston, David (1998). Evaluating the Impact of the First U.S. Citizens Panel on "Telecommunications and the Future of Democracy." Paper Delivered at the 1998 Annual Meeting of the American Political Science Association. September 3 – 6. URL: <http://policy.rutgers.edu/papers/5.pdf> [This paper evaluates the impact of a citizens' panel that focused on the topic of telecommunications and the future of democracy. The impact evaluation is based on telephone interviews with citizens, experts, media, policy makers, and other identifiable consumers of the panel's work.]

Intergovernmental Panel on Climate Change (IPCC) (2001). *Third Assessment Report of Working Group I: Summary for Policymakers*, URL: <http://www.ipcc.ch/pub/spm22-01.pdf>. [This work describes the current state of understanding of the climate system, provides estimates of its projected future evolution, and addresses the impacts of human activities on climate].

International Telecommunications Union. (2001) *The 2001 Yearbook of Statistics: Chronological Time Series 1990 – 1999*, Geneva, Switzerland [The ITU statistical yearbook provides an authoritative source

of data about the evolution of the public telecommunications sector in selected nations around the world].

Jandl, Thomas (1998). Secrecy Vs. the Need for Ecological Information: Challenges to Environmental Activism in Russia. *Environmental Change and Security Project Report*, Issue 4, Spring, 45-52. Woodrow Wilson Center, Washington, D.C. [This paper addresses the tensions in Russia between government efforts to control information for national security purposes and civil society demands for greater access to environmental information].

McGovern, Michael H. and Beierle, Tom C. (1997). E-Part: The Future of Public Involvement?, *Center for Risk Management Newsletter*, Resources for the Future, Issue 12, Fall 1997 [This article examines a range of electronic mechanisms in use in the United States to promote transparency in environmental decision-making].

McGovern, Michael and Hersh, Robert (1998). Social Values. *Pollution Control in the United States: Evaluating the System*. Edited by J. Clarence Davies and Jan Mazurek, pp. 151-191. Washington, D.C: Resources for the Future. [This chapter examines selected social values (public involvement, nonintrusiveness, and environmental justice) that influence the development of government programs and citizen perceptions and acceptance of those programs].

Nilsen, Thomas, Kudrik, Igor and Nikitin, Aleksandr (1996). *The Russian Northern Fleet: Sources of Radioactive Contamination*, 168 pp., Oslo, Norway: Bellona Foundation. [This Bellona report describes in detail the decaying infrastructure of the Russian navy's Northern Fleet and the associated health and environmental impacts. It led to the indictment, prosecution, and eventual acquittal of Aleksandr Nikitin, a former Russian Navy officer who co-authored the report].

Olson, Mancur (1965). *The Logic of Collective Action*. Cambridge, Massachusetts: Harvard University Press. [A seminal book that addresses the incentives of the public to organize politically in order to achieve common interests].

Rodriguez, Francisco and Wilson, Ernest J. (2000). Are Poor Countries Losing the Information Revolution? *infoDev Working Paper Series*, World Bank. (May). <http://www.infodev.org/library/wilsonrodriguez.doc>. [This paper examines the economic impacts of Information and Communications Technologies (ICTs) on developing countries, including ICT effects on economic gaps between poor and rich countries and gaps between wealthy and poor groups within these countries].

Sabatini, Francisco and Sepulveda, Claudia (1996). Negociacion ambiental, participacion y sustentabilidad. *Ambiente y Desarrollo* 12(3):19-24. [An article describing the movement toward negotiation and public participation in decisions about large infrastructure projects in Chile].

Sclove, Richard E. (1996). Town Meetings on Technology. *Technology Review*, 99(5): 24-31. [An article describing Danish "consensus conferences" and their potential application in the United States].

Suthawan Sathirathai (2000). Report to the Chairman of the Workshop on Good Governance, Public Participation, and the Decision-making Process for Environmental Protection. Presented at the Workshop on Good Governance, Public Participation, and the Decision-making Process for Environmental Protection, Bangkok, Thailand, March 18 -19, 2000. [A report detailing the challenges for public participation and good governance in decisionmaking about large-scale infrastructure projects in Thailand].

United Nations Environment Program (UNEP) (1999). *Global Environmental Outlook-2000 (GEO-2000)*. Nairobi, Kenya: United Nations Environment Program. [An assessment of the environmental problems facing humanity in the new millennium, including the degradations resulting from the continued poverty of the majority of the planet's inhabitants and the excessive consumption of the minority].

Well, Donald T. (1996) *Environmental Policy: A Global Perspective for the Twenty-First Century*, 208 pp. Upper Saddle River, New Jersey: Prentice-Hall. [A comprehensive and interesting overview of the environmental policy challenges facing the United States and the world].

Wynne, Brian (1989). Sheepfarming After Chernobyl: A Case Study in Communicating Scientific Information. *Environment* 31(2), 10-38. [An article detailing the importance of local knowledge in making high quality and effective decisions about environmental risks].

World Bank (2000). *World Development Report 2000/2001: Attacking Poverty*. New York: Oxford

University Press, 335 pp. URL: <http://www.worldbank.org/poverty/wdrpoverty>. [The World Bank's annual *World Development Report* (WDR) is an invaluable guide to the economic, social and environmental state of the world today and includes comprehensive data in the World Development Indicators section at the end of the report].

World Bank (2000). *The Networking Revolution: Opportunities and Challenges for Developing Countries*. *infoDev Working Paper Series*, World Bank. URL: <http://www.infodev.org/library/NetworkingRevolution.pdf>. [This informative paper reviews the dynamics of the networking revolution in the 1990s, the role of information and communication technologies (ICTs) in the process of development, and the numbers behind the “digital divide” debate. It concludes with a discussion of ways to promote “digital” opportunities via policy reform and specific initiatives].

### Biographical sketches

**Michael H. McGovern** is a Senior Scientist at Science Applications International Corporation (SAIC), where his work focuses on the important role of infrastructure, including information infrastructure, in supporting government missions and meeting societal needs. Prior to joining SAIC, Mr. McGovern worked at Resources for the Future (RFF), an environmental policy research organization, where he co-authored articles, reports, and a book addressing the environmental cleanup of the U.S. nuclear weapons complex and the influence of social values on pollution control regulation. Mr. McGovern has examined and written about nuclear and environmental issues for diverse governmental, private, nonprofit, and educational institutions, including the Center for Verification Research, the Bellona Foundation, the Century Foundation, the American Embassy in Paris, and Princeton University. Mr. McGovern received a Master of Public Affairs degree, with a focus on international affairs, in 1994 from the Woodrow Wilson School of Public and International Affairs at Princeton University, and a Master of Science degree in Physics from the University of Massachusetts at Amherst in 1991.

**Thomas C. Beierle** is an Associate at Ross & Associates Environmental Consulting, where his work focuses on environmental policy innovation. Prior to joining Ross & Associates, Mr. Beierle was a Fellow in the Risk, Resource, and Environmental Management division at Resources for the Future (RFF) and a visiting fellow at the Office of the United States Trade Representative. His work focuses on issues of democratic governance, transparency and public involvement. Mr. Beierle is the author of the book *Democracy in Practice: Public Participation in Environmental Decisions* (RFF Press, 2002). His recent articles and papers have examined the question of how to evaluate the success of public participation programs, the role of the Federal Advisory Committee Act on collaborative decision-making, and the influence of the Internet on public involvement. Mr. Beierle received his Masters of Public Affairs degree, with a focus on economics and public policy, from the Woodrow Wilson School of Public and International Affairs at Princeton University in 1997. At Princeton, he was senior managing editor of the *Journal of Public and International Affairs*. Beierle received a bachelor's degree in history from Yale University in 1990.

**Thomas Jandl** is currently pursuing his doctorate degree in international relations at American University with a focus on economic development issues. He is an environment and development consultant in Washington, D.C. and the former Director of Bellona USA, the U.S. affiliate of the Bellona Foundation. As Bellona USA director, Mr. Jandl worked to raise awareness in the United States about increasingly severe environmental degradation in Russia caused by deteriorating nuclear infrastructure and nuclear naval vessels. Mr. Jandl authored papers on this problem and brought together Russian and U.S. lawmakers, technical experts, and industry representatives in periodic meetings to consider solutions involving the support of the United States and Norway. Prior to taking the helm of Bellona USA, Mr. Jandl worked as a reporter and editor for a Washington trade publishing company, where he focused on international security issues. Mr. Jandl has a master's degree in International Development from American University and a bachelor's degree in Political Science from San Diego State University. He received a diploma in economics from the Karl Franzens Universität in Graz, Austria, and a journalism certificate from the Ecole Supérieure de Journalism in Paris.

**Neil E. Harrison** was born and raised in England, and educated there and in the United States. He has an earned a doctorate in International Studies from the University of Denver. In his graduate work he concentrated on development and technology studies, and his dissertation compared the formation of national policies on climate change in ten countries and the effect of those positions on the international negotiations.

Dr Harrison researches and writes on sustainable development and international relations and is especially interested in how complex systems theory can explain environmental policy and illuminate the path of sustainability. His book *Constructing Sustainable Development* (SUNY Press, 2000) showed how current thinking about sustainable development is incomplete and often dangerously misguided and how effective integrated strategies for sustainable development will emerge from a complex systems theory of social and political systems. He has edited *Complexity in World Politics* (SUNY Press, forthcoming) that adapts complex systems concepts to relations between states and with Dr Gary Bryner he co-edited *Science and Politics in the International Environment* (Rowman & Littlefield, 2004) that investigates how international environmental policy emerges from the interaction of science and politics. He has published technical papers, articles, and chapters on sustainable development, technological innovation, international environmental policy, and the politics of climate change.

He has taught at three universities, most recently at the University of Wyoming, and is Executive Director of the Sustainable Development Institute (SDI), a non-profit research institute. Current research projects at SDI include the effect of institutions on resilience in social-ecological systems and how businesses may aid sustainable development while pursuing profits. Dr Harrison has consulted on many issues in Europe and North America and has traveled or worked in forty countries on four continents.