



NEWSLETTER OF THE SECTION ON ENVIRONMENT AND TECHNOLOGY OF THE AMERICAN SOCIOLOGICAL ASSOCIATION

SUMMER 2004

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MASON UNIVERSITY

MEMBER NEWS

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Reflections on the STIRPAT Research Program

Eugene A. Rosa
Washington State University

Richard York
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Thomas Dietz
Michigan State University

A research program called STIRPAT has been in development and in application for the past decade. It was initiated by Tom Dietz and Gene Rosa about a decade ago and then joined by Richard York four years ago. The foundation of STIRPAT is an orienting perspective that combines insights from human ecology with a version of environmental sociology that insists on examining a combination of physical, biological, and social variables in combination (Rosa 1999). The principal goal of the program is to develop a systematic way of empirically assessing the anthropogenic (human-generated) driving forces of environmental impacts (see Dietz and Rosa 1994). It takes as a starting point for analyses the I=PAT formulation, well-known in demography and ecology.¹ I=PAT specifies that total environmental impacts (I) are a multiplicative function of population (P), per capita consumption or affluence (A), and impact per unit of consumption or technology (T). The I=PAT identity, relabeled the "Kaya" equation, lies at the heart of efforts to project greenhouse gas emissions by the Intergovernmental Panel on Climate Change (Nakicenovic 2000).

Although a useful heuristic device, the venerable I=PAT formula does not lend itself to straightforward hypothesis testing since it is an accounting equation that must balance by definition. So balanced, it assumes *a priori* that the effects of P, A and T on I are strictly proportional. To address these limitations we reformulated the I=PAT formula into stochastic form (Dietz and Rosa 1994), calling it STIRPAT for Stochastic estimation of Impacts by Regression on Population, Affluence, and Technology (Rosa and Dietz 1998). The mathematical specifics of the formula do not concern us here. In fact, the statistical modeling techniques we have used in our research are simply a means for furthering our understanding of the social conditions that lead to environmental degradation.

Our empirical applications of STIRPAT have focused on cross-national analyses of the material driving forces of environmental degradation, particularly demographic and economic factors (Dietz and Rosa 1994). However, there is nothing intrinsic to our approach that rules out addressing the empirical predictions of other perspectives. In fact, our recent work (York, Rosa, and Dietz 2003a, 2003b, 2003c) explicitly expands the STIRPAT framework to allow for an empirical assessment of the theoretical claims of a diversity of theoretical perspectives, including human ecology, political economy, and ecological modernization. We have used STIRPAT to conceptually refine models of environmental impact (Dietz and Rosa 1994; York, Rosa, and Dietz 2002), while simultaneously performing empirical analyses of the driving forces of a variety of

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all council members

Section Website:

[http://socsci.colorado.edu/
SOC/ET/ets.html](http://socsci.colorado.edu/SOC/ET/ets.html)

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for this section go to the
website and follow the
relevant link and directions.

environmental impacts, including the “ecological footprint”, carbon dioxide emissions, and a host of other measures of environmental impacts (Dietz and Rosa 1997; Rosa, York, and Dietz forthcoming; York, Rosa, and Dietz 2003a, 2003b, 2003c). We note that other scholars have begun to use the STIRPAT model in their research (Cramer 1996, 1998; DeHart and Soulé 2000; Shi 2003; Soulé and DeHart 1998), while others are citing our results in general assessments of the environmental problematic. (Ehrlich and Ehrlich 2004)

The program has produced some clear empirical findings. Most strikingly, population size has emerged as a persistent, major factor influencing the scale of national environmental impacts of all varieties. All of our analyses suggest that, controlling for other factors, population size proportionately scales national environmental impacts. This body of findings is not simply an affirmation of Malthusian thinking for there are important variations in national environmental impacts after controlling for population. Indeed, we consistently find that there is dramatic inequality in resource consumption and waste emissions across nations even after controlling for population, with wealthy core nations consuming the bulk of the world's resources and emitting the bulk of the world's wastes. We find that national affluence (GDP per capita) has a strong effect on environmental impacts, although its effect differs across types of impacts (e.g. among different types of greenhouse gases). With few exceptions, however, we find that national impacts increase with affluence, providing little support for the “environmental Kuznets curve” hypothesis or ecological modernization theory, which predict a decline in impacts in the later stages of economic development. Furthermore, we find that other material structural factors, such as urbanization and geography, influence environmental impacts.

The program has helped to clearly specify the anthropogenic factors that drive environmental change and point to testable hypotheses. We do not view STIRPAT as a substitute for more elaborate abstract theorizing, but rather see it as a robust framework for disciplining abstract theoretical claims and for furthering our understanding of human interaction with the environment.

¹ Ehrlich and Holdren (1970) were first with the idea of $I=PAT$, while Barry Commoner (1971; also see Commoner, Corr, and Stamler 1971) was first with an algebraic formulation which Ehrlich and Holdren (1972) refined to its current form.

SUNDAY, 8/15**Section on Environment and Technology Council Meeting**

Sunday, 8/15/2004 from 2:30 p.m. - 4:10 p.m.

Paper Session on "Risk in Modern Society"

Sunday, 8/15/2004 @ 12:30 p.m.

Organizer(s):

J. Steven Picou (University of South Alabama)

1. Lee Clark (Rutgers University)

Best Case Assumptions and Long Term Fantasies

2. Kari Marie Norgaard (University of California at Davis) and Anne Kristine Haugestad (University of Trondheim)

Norway as a Post Risk Society?

3. Klaus Peter Japp (Bielefeld University)

Terrorism and Risk In Modern Society

4. S. Harris Ali

The End of Nature and the Emergence of Disease in the Risk Society

5. Eugene Rosa, Discussant (Washington State University)

MONDAY, 8/16**Section on Environment and Technology Reception**

Monday, 8/16/2004 from 6:30 p.m. - 8:15 p.m. at Johnny Foley's Irish Pub, 243 O'Farrell St. This is on Union Square, and about a 2 block walk from the SF Hilton. Please attend this fun event and buy drinks in order to help meet our financial costs for it.

Section on Environment and Technology Business Meeting (40 minutes)

Monday, 8/16/2004 from 3:30 p.m. - 4:10 p.m.

Section on Environment and Technology Paper Session. Blue-Green Coalitions: Labor and Environmentalists (co-sponsored with the Section on Collective Behavior and Social Movements)

Monday, 8/16/2004 from 10:30 a.m. - 12:10 p.m.

The papers in this session examine the history of and potential for coalition building between labor and environmental groups.

Organizer(s):

Beth Schaefer Caniglia (Oklahoma State University)

Participant(s):

1. Tammy Lewis (Muhlenberg College), Kenneth Alan Gould (St. Lawrence University),

J. Timmons Roberts (College of William & Mary)

From Blue-Green Coalitions to Blue-Green Partnerships? Creating Enduring Institutions through Just Transition, Climate Justice and the World Social Forum

2. Brian Mayer (Brown University)

Blue and Green Shades of Health: Coalition Framing in a Local Labor-Environment Alliance

**ASA ANNUAL
MEETING
SCHEDULE**

**SAN
FRANCISCO,
AUG. 14-17
2004**

3. Hwa-Jen Liu (University of California, Berkeley)

Red or Green? Historical Trajectories of Labor and Environmental Movements in Taiwan and South Korea, 1971-2000

4. Patrica A. Widener (Brown University)

Burdens of Transnational Networks on Local Actors: Oil Opposition and Negotiation in Ecuador

Section on Environment and Technology Paper Session.

Environmental Justice

Monday, 8/16/2004 from 4:30 p.m. - 6:10 p.m.

Organizer(s):

Phil Brown (Brown University)

Participant(s):

1. Dana R. Fisher - Columbia University (Presider)

2. Liam Downey (University of Colorado, Boulder)

Assessing Environmental Inequality: How the Conclusions We Draw Vary According to the Definitions We Employ

3. Sandra George O'Neil (Boston College)

The Road to Superfund: Environmental Equity Examined

4. Eric J. Krieg (Buffalo State College), Daniel R Faber (Northeastern University)

Time and Change: A Longitudinal Analysis of Cumulative Environmental Impacts in Massachusetts

5. Julie Sze (University of California, San Diego)

Environmental Justice Activism: A response to Privatization and Deregulation

Section on Environment and Technology Paper Session.

Environmental Mobilization: From Individuals to Nations

Monday, 8/16/2004 from 8:30 a.m. - 10:10 a.m.

Organizer(s):

Phil Brown (Brown University)

Participant(s):

1. John B. Foster - University of Oregon (Presider)

2. Patrica A. Widener (Brown University), Valerie J. Gunter (University of New Orleans)

"Recovery" in the Media: An Alaska Native Perspective on the Exxon Valdez Oil Spill

3. Riley E. Dunlap (Abo Akademi University), Aaron McCright (The University of Chicago)

Social Movement Identity: Validating a Measure of Identification with the Environmental Movement

4. Lori M. Hunter (University of Colorado, Boulder), Alison Hatch (University of Colorado), Aaron Johnson (University of Colorado at Boulder)

Cross-National Gender Variation in Environmental Behaviors

5. Maurie J Cohen (New Jersey Institute of Technology)

Sustainable Consumption and Global Citizenship: An Empirical Analysis

**ASA ANNUAL
MEETING
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CONT'D

Section on Environment and Technology Roundtables (one-hour)

Monday, 8/16/2004 from 2:30 p.m. - 3:25 p.m.

Table 1. Environmental Justice and Urban Environmental Quality

1. Allison Varga - Northeastern University (Presider)

Allison Varga (Northeastern University)

An Exploration of Asthma from an Environmental Justice Perspective

Chad Leighton Smith (Texas State University - San Marcos)

From Green to Red: The Intersection of Class and Race in Urban Environmental Inequality

Diane M. Sicotte (Drexel University)

Whose Risk in Philadelphia: Comparing Proximity to Risky Facilities Using EPA's New RSEI Data

Table 2. Information and Social Networks

1. Rachel Schurman - University of Illinois (Presider)

Elizabeth L. Malone (Pacific Northwest National Laboratory)

Social Network Ties among Rhetors in the Climate Change Debate

Christine A. Overdevest (University of Wisconsin)

Information Politics, Environmental Politics, and Public Policy: Toward a Political Economy of Information

Rachel Schurman (University of Illinois)

Intellectuals, Ideology, and Social Networks: The Process of Grievance Construction in the Anti-Genetic Engineering Movement

Table 3. Transnational Environmentalism

1. Christopher Rootes - University of Kent (Presider)

Koichi Hasegawa (Tohoku University, Japan)

The Development and Recent Trends of Environmental NGOs in Japan: Analysis from Social Movement Perspectives

Christopher Rootes (University of Kent)

The Transnationalization of Environmental Movements

Table 4. Social Movements and the Environment

Andrew D. Van Alstyne (University of Michigan)

The Two Logics of Environmental Action

William T. Markham (Univ. of North Carolina, Greensboro)

Fundraising in Mass Membership Environmental Organizations

Table 5. Risk and Risk Perception

1. Raymond J. Murphy - University of Ottawa (Presider)

**ASA ANNUAL
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CONT'D

James David Ballard (California State University, Northridge), Amanda Dean (University of Nevada, Las Vegas)

Perceptions and the Social-Political Aspects of Environmental Issues Like Nuclear Power and Nuclear Waste Disposal

John T. Lang (Rutgers University), Karen O'Neill (Rutgers University), William K. Hallman (Rutgers University)

Expertise, Trust, and Communication About Food Biotechnology

Raymond J. Murphy (University of Ottawa)

Technological Disasters, Natural Disasters, Environmental Disasters: Toward the Integration of Social Constructionism and Critical Realism

Table 6. Place, Community, and Environmental Decision Making

1. Annemarie Harrod - Belmont University (Presider)

Karl P. Reitz (Chapman University)

Landscaping in Southern California, Overcoming Obstacles to Change

Caroline W. Lee (University of California, San Diego)

In Between the Commons: Insiders, Outsiders, and the Bowling Shirt Politics of Environmental Decision-Making

Alison Hope Alkon (University of California, Davis)

Place, Narratives and Consequences, Erosion on Lake County Vineyards

Annemarie Harrod (Belmont University), Howard L. Harrod (Vanderbilt University (deceased))

Social Constructions of the Natural World: An Essay in Phenomenological Sociology

Table 7. Natural Resource Management

1. Robert Brulle - Drexel University (Presider)

Cliff Brown (University of New Hampshire)

Environmental Links to Recent Social and Economic Changes in Eastern Iceland

Lynn Horton (Chapman University)

Ecotourism in Costa Rica: A Sustainable Form of Green Capitalism?

Liesel Turner (Drexel University), Robert Brulle (Drexel University)

Voluntary Compliance and Logging: An Analysis of Forestry Certification Adoption by Timber Companies in the U.S.

Table 8. Environmental Sustainability

1. Karen Ehrhardt-Martinez - Denison University (Presider)

Andrew K Jorgenson (University of California-Riverside)

Exporting Environmental Degradation: International Trade Dependency and Deforestation in Less-Developed Countries

Stephen J. Scanlan (University of Memphis)

Feast or Famine? Food Security, Democracy, and Information Technology in Less Industrialized Countries

Karen Ehrhardt-Martinez (Denison University)

Environmental Sustainability and Ecological Deficits

**ASA ANNUAL
MEETING
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CONT'D

TUESDAY, 8/17**SPECIAL ASA PLENARY SESSION****Twenty-Five Years after Love Canal:
The Environmental Health and Environmental Justice Movements**

Organizers: Robert Brulle (Drexel University) David Pellow (University of California, San Diego), Phil Brown (Brown University)

Phil Brown - Brown University (Presider)

Lois Gibbs (Center for Health, Environment and Justice)

25 Years after Love Canal: The Struggle for a Healthy Environment.

Lois Gibbs is the internationally known activist who led the Love Canal struggle beginning in 1978. She catapulted toxic waste issues to the forefront of American politics, and follows in the steps of Rachel Carson as a catalyst for the spread of the modern environmental movement.

Robert Bullard (Clark-Atlanta University)

The Environmental Justice Movement since Warren County.

Activist and sociologist Robert Bullard is probably the most widely known scholar of the environmental justice movement. Since his 1990 book, *Dumping in Dixie*, he has written and edited numerous other books, and has been a major voice for environmental justice in academics, activism, and in pressing the federal government to do more in this area.

Ted Smith (Silicon Valley Toxics Coalition)

Organizing For Healthy and Sustainable Communities.

Ted Smith is the articulate leader of one of the country's most innovative and successful environmental justice organizations. Working with labor, community, civil rights, and environmental groups, as well as with government health offices, he has for over 15 years been a major leader in environmental justice organizing.

Phil Brown (Brown University)

Commentary on the Environmental Health and Environmental Justice Movements

Call for Participants interested in the Global Carbon Project:

Penelope Canan hopes to identify colleagues interested in the human dimensions of the global carbon cycle when she attends the ASA meetings in San Francisco. As the Executive Director of the Global Carbon Project (GCP) in Tsukuba, Japan, her job is to foster integrated, interdisciplinary research relevant to understanding the carbon cycle and points/paths of intervention. Next spring she will host an international conference in Tsukuba, Japan to discuss directions for research to integrate the "human dimensions" of the global carbon cycle into current natural science research. At the ASA meetings in Philadelphia, the GCP will host a didactic seminar on the same topic to encourage university programs and graduate students to take up the challenge. Please contact Penelope in at the San Francisco ASA meetings if you are interested in participating in any way. For more information, please see www.globalcarbonproject.org or write to penelope.canan@nies.go.jp.

**ASA ANNUAL
MEETING
SCHEDULE**

CONT'D

**GLOBAL
CARBON
PROJECT**

Special Issue of *Law & Policy*, V. 26 Issue 2, July 2004.

Toxic Torts and Environmental Justice

Editors

Steve Kroll-Smith and Sandra Westervelt

Prelude

"People, Bodies, and Biospheres: Nexus and the Toxic Tort"

Steve Kroll-Smith and Sandra Westervelt (s_krolls@uncg.edu)

"Toxic Torts, Politics, and Environmental Justice: A Case for Crimtorts"

Thomas Koenig and Michael Rustad (Tkoenig@neu.edu)

"Equity in Toxic Tort Litigation: Unjust Enrichment and the Poor"

Allan Kanner (a.kanner@kanner-law.com)

"Daubert and the Exclusionary Ethos: The Convergence of Corporate and Judicial Attitudes Towards the Admissibility of Expert Evidence in Tort Litigation"

Gary Edmonds and David Mercer
(g.edmond@unsw.edu.au)

"Technological Disasters, Litigation Stress and the Use of Alternative Dispute Mechanisms"

Brent K. Marshall, J. Steven Picou, and Jan R. Schlichtmann (bmarshall@pegasus.cc.ucf.edu)

"Toxic Torts, Public Interest Law and Environmental Justice: Evidence From Louisiana" Melissa

Toffolon-Weiss and J. Timmons Roberts (jtrobe@wm.edu)

George Mason University seeks Social Networks Professor

The Department of Sociology and Anthropology announces a tenure-track position for an Assistant Professor, beginning in Fall 2005. The department seeks a quantitative sociologist or anthropologist with a strong background in the study of social networks. This position is being filled in collaboration with the Center for Social Complexity (<http://socialcomplexity.gmu.edu>) and its new Ph.D. program in Computational Social Science; hence, candidates with expertise in the use of simulations and advanced modeling techniques are especially encouraged to apply. Candidates should have demonstrated excellence in both research and teaching and should have the Ph.D. in hand. The successful candidate is expected to be an active member of the Center for Social Complexity and teach a graduate course on social network analysis plus another graduate course in the CSS program among other courses. George Mason University is a large, diverse, and growing public university located in Fairfax, VA, just 15 miles west of Washington DC. The Department of Sociology and Anthropology is an expanding unit whose undergraduate and graduate programs center on social inequality, the structural bases of social conflict, and cultural differences (see www.gmu.edu/departments/soci). Send letter of application, curriculum vitae, samples of scholarship, three letters of reference, and course syllabi to: Cindy Roberts, Social Networks Search Committee, Center for Social Complexity, George Mason University, 4400 University Drive, MS 3F4, Fairfax, Virginia, 22030-4444. Review of applications will begin September 1, 2004 and will continue until the position is filled.

Jason W. Moore, University of California-Berkeley, was awarded the 2004 Alice Hamilton Prize from American Society of Environmental Historians, for the best article published outside the journal *Environmental History* in 2003:

"The Modern World-System as Environmental History" *Ecology and the Rise of Capitalism, Theory & Society* 32(2003): 307-377.

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