

Comment

Climate Change and Rural Sociology: Broadening the Research Agenda

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Climate change is the preeminent environmental problem of our time, and Joseph Molnar's call for greater attention to it by rural sociologists is both welcome and timely. The agenda he lays out for rural sociology's engagement with climate change, however, seems rather narrow and restrictive. Examining the potential impacts of climate change, feasible mitigation options, and possible coping or adaptive strategies for agricultural (and other natural-resource) industries and rural communities are obviously topics for which rural sociologists are particularly well qualified. However, rural sociology should be able to make broader contributions to understanding the human dimensions of climate change.

To make this point I will comment in particular on the scope of Molnar's research agenda, its dependence on natural science, and its rather casual treatment of the "climate debate." In the process of dealing with these interrelated issues, I suggest a broader research agenda for rural sociologists and other social scientists interested in climate change and reference a wide range of literature that should provide guideposts for pursuing such research. These suggestions are informed in part by a report from a 2008 National Science Foundation workshop on "Sociological Perspectives on Climate Change" (Nagel, Dietz, and Broadbent forthcoming). My fundamental goal is to complement and extend Molnar's call, not to critique it, even though some of my commentary will of necessity be critical.

Downstream versus Upstream Roles for Social Science

Molnar lays out an overly restrictive agenda in two senses. The first relates to his portrayal of rural sociological involvement with the topic of climate change as representing "a new research paradigm" in which policymakers and the geophysical community have "largely set the . . . terms of engagement for climate change issues." The second and related issue is that Molnar neglects social science contributions regarding the social causes or "driving forces" of climate

change,¹ one of the key contributions of environmental sociologists in recent years. The result is that Molnar proposes a “downstream” agenda, in which others set the parameters and priorities for social science research. In contrast, since the earliest days of social science engagement with climate change, many sociologists have argued for the importance of working “upstream.”

Deconstructing Climate Change and Its Scientific Grounding

With regard to the first issue, the role of rural sociology in climate change research, from the early 1990s onward several sociologists—particularly in the United Kingdom—complained about the subservient role assigned to social scientists with regard to the Intergovernmental Panel on Climate Change (IPCC) and supporting programs. Wynne (1994:170), for example, argued that social science “has been subordinate to the pre-commitments and agenda of the natural sciences,” and that “[i]t either provides information to the natural sciences on human activities which perturb the natural processes, or takes the natural science predictions as given and then works out the social and economic consequences.” He continued to note a third role, which is that “social science is supposed to offer ways of educating global publics into better understanding and appreciation of the ‘real’ hazards.”

Unhappy with what they saw as their assigned roles, many social scientists took a different tack. Reflecting the postmodern ethos of the times, early sociological work on climate change tended to “deconstruct” the IPCC, climate science more generally, and climate policymaking. Such work provided valuable insight into topics ranging from the special challenges faced by different types of climate scientists (Shackley and Wynne 1996) to the North-South inequities involved in framing climate change as a “global” problem (Buttel and Taylor 1992). One result was that an apparently well-funded “Global Environmental Change Programme” of the United Kingdom’s Economic and Social Research Council (ESRC) appears to have yielded a great deal of theorizing but very little empirical research (Redclift and Benton 1994), especially on human contributions to climate change or potential impacts of such change on human societies.

Despite the obvious value of demonstrating the manner in which, for example, climate change had been constructed as a social problem (Ungar 1992), the predominantly constructivist orientation of early

¹ Molnar comments briefly on the contributions of agriculture to greenhouse gas emissions but does not list research on the “causes” of climate change in his list of key foci for rural sociology.

sociological and other social science research on climate change came under criticism (Dunlap and Catton 1994; Rosa and Dietz 1998). Critics noted, for example, that the constructivist approach inhibited sociological contributions to understanding the causes and impacts of climate change (accounting for why the ESRC program led to little empirical work along these lines) and often reflected a one-sided and politically naïve emphasis on deconstructing mainstream climate science and the IPCC. Especially troubling was the tendency of analysts to cite critiques of climate science sponsored by conservative think tanks such as the Marshall Institute in efforts to demonstrate that climate change was a “contested” issue, and more generally to ignore the powerful politico-economic interests behind such criticisms of the IPCC (McCright and Dunlap 2003).

In response, a small but growing body of work has focused on deconstructing skeptic claims challenging mainstream climate science and exposing the interests supporting and publicizing such claims (Lahsen 2008; McCright and Dunlap 2000; Oreskes and Conway 2008). The efforts of the climate change “denial machine”—a coalition of industry (especially fossil fuel corporations), contrarian scientists, and conservative think tanks, media and politicians—represent an attempt to delegitimize climate change (Dunlap and McCright forthcoming), largely by “manufacturing uncertainty” regarding climate science (Freudenburg, Gramling, and Davidson 2008). Although global warming was widely viewed as problematic in the late 1980s (Ungar 1992), these forces have had considerable success since the 1990s in deproblematizing climate change (Freudenburg 2000; McCright and Dunlap 2003) in the eyes of much of the U.S. public and many policymakers (Dunlap and McCright forthcoming; McCright and Dunlap forthcoming).

By planting doubts about the seriousness and even reality of climate change, the denial machine has managed to reduce global warming’s status as a “public issue” in C. Wright Mills’s sense. A result is that experiences of “bad weather” like droughts and extreme climate events (e.g., floods and hurricanes) are more likely experienced as “personal troubles” by farmers and others rather than as possible consequences of a carbon-based economy. Thus, in my view Molnar does not do the “climate change debate” justice, an issue addressed below.

Examining the Social Causes or “Driving Forces” of Climate Change

While several American sociologists contributed constructivist analyses of climate change, others adopted a “realist” perspective premised on the actuality of global warming and its predominantly anthropogenic

origins. The realists were also critical of natural science, but their criticism was aimed at the simplistic analyses of the human contributions to climate change, such as the societal processes generating greenhouse gas (GHG) emissions, offered by natural scientists. Key actors such as the National Academy of Sciences's (NAS's) Committee on the Human Dimensions of Global Change (HDGC) encouraged social science analyses of the "driving forces" of GHGs (Stern, Young, and Druckman 1992),² and sociologists began to respond by, for example, modifying the IPAT equation popular with natural scientists (Dietz and Rosa 1997; Rosa and Dietz 1998).

One of the most active areas in environmental sociology is research on the human drivers of global environmental change (Nagel et al. forthcoming). Not only are causes upstream relative to impacts, amelioration, and adaptation, but in claiming this topic as their domain, social scientists are asserting that they are more than handmaidens to natural science.

Sociological contributions to understanding the driving forces of climate change are multifaceted, but comparative analyses of national characteristics associated with GHG emissions and ecological impacts more generally predominate. These studies employ a range of perspectives from world systems theory (Jorgenson 2006) to human ecology (York, Rosa, and Dietz 2003) and are shedding considerable light on the relative roles of factors such as population, affluence, economic system, urbanization, land use, government form, and position in the world system in contributing to national-level emissions (see Dietz, Rosa, and York 2009 for a comprehensive review). Clearly rural sociologists, who have a history of work on relevant issues such as deforestation and land use (Rudel 2009), both nationally and internationally, are nicely positioned to make major contributions to this body of knowledge. Thus, attention to the social forces producing climate change should be added to Molnar's agenda.

The Need for a Multifaceted Approach

The realist-constructivist "wars" of the 1990s, to which analyses of climate change were contributors, have subsided, but both approaches continue to be employed.³ Although he cites Yearley's (2009) recent demonstra-

² A list of publications sponsored by the NAS's HDGC is available at <http://www7.nationalacademies.org/hdgc/HDGC%20Publications.html>.

³ Elsewhere I argue that they have evolved into two broader perspectives within environmental sociology, environmental agnosticism and environmental pragmatism (Dunlap forthcoming). While the former eschews the relativist excesses of strong constructivism, its

tion of the continued value of constructivist insights into climate change, Molnar's agenda is clearly realist-based. He is calling for rural sociologists to accept the findings and predictions of the geophysical community (and the priorities of policymakers) and then examine the impacts of impending climate change as well as study potential mitigation and adaptation strategies. I am comfortable with the realist underpinnings of Molnar's proposals. While recognizing the evolving nature of climate science, I am willing to treat it as our best indicator of "reality" and to privilege the claims of the IPCC relative to those of the denial machine. Nonetheless, I believe that more critical and constructivist approaches will be essential in analyzing the highly probable diversity of reactions to climate change among agricultural scientists, land-grant universities, and the larger agricultural community of agribusiness, policymakers, and agricultural interest groups.

As readers of this journal are aware, rural sociology has a rich tradition of examining the role of science in agriculture (Busch and Lacy 1983; Buttel 1993), paying attention to the influence of various stakeholders (Goldberger 2001) and sometimes adopting a critical stance toward agricultural science and scientists (Kloppenburg 1991). Such expertise will prove useful in broadening Molnar's agenda to include analyses of the climate debate as it pertains to agriculture, the subject of my conclusion.

Impacts, Adaptation, and Mitigation

Molnar provides a wide-ranging and insightful discussion of the potential *impacts* of climate change on agricultural and other natural-resource industries as well as on rural communities, potential adaptations that these sectors might use to cope with changing climate, and possible steps they could take to help reduce GHG emissions and thus mitigate climate change. He draws upon an array of natural and social science literature dealing with instances of problematic situations and topics such as disasters, vulnerability, and resilience (also see Kasperson, Kasperson, and Turner 2009). However, Molnar largely neglects bodies of sociological and related research that in some cases offer better guides for rural sociological engagement.

practitioners continue to problematize environmental conditions, analyzing their "constructedness" rather than their causes and effects. In contrast, while acknowledging that measures of environmental phenomena such as GHG emissions and ecological footprints may be imperfect indicators, the latter employ them in empirical analyses of their relationships with social phenomena. Yearley (2009) is an exemplar of the agnostic approach, while the numerous cross-national studies employing measures such as ecological footprints and GHG emissions as dependent variables exemplify the pragmatic approach.

Despite uncertainties within the natural science community regarding current impacts of climate change, sociologists have excellent tools for examining existing and likely impacts of changing climatic conditions as elaborated by Nagel and colleagues (forthcoming). A fundamental sociological contribution is to highlight the inequitable distribution of climate change impacts. Analyses of the likely inequitable impacts range from the community level (Harlan et al. 2006) to the international level (Roberts and Parks 2007).

A crucial development regarding climate-change impacts is the growing availability of data on climatic and other biophysical conditions employed by sociologists in innovative studies including mapping exposure to urban heat islands (Harlan et al. 2006), examining the impact of weather variability on skiing communities (Hamilton, Brown, and Keim 2007), and assessing climate's contribution to migration (Poston et al. 2009). The use of such data in geographic information systems (GIS) analyses opens up new vistas for analyzing the relationships between societal and biophysical phenomena (see, e.g., Zahran et al. 2006, 2007, 2008). Combining cutting-edge work on GIS (Downey 2006) with rural sociology's strong interest in spatial phenomena (Lobao and Saenz 2002) could yield major contributions to documenting climate impacts and their sociospatial distribution.

Analyses of efforts to *mitigate* climate change impacts, primarily by reducing GHG emissions, are proliferating rapidly, and range from quantitative analyses of national characteristics related to ratification of the Kyoto Protocol (Zahran et al. 2007) to comparative analyses of national decision making on climate policy (Fisher 2004). Within the United States, Zahran and colleagues (2008) have analyzed factors related to community participation in the "Cities for Climate Protection" campaign, and Pulver (2007) has investigated differing stances on climate change among multinational fossil fuel corporations. At a more micro level, sociologists are analyzing policymakers' perceptions of climate change (Stedman 2004), public support for climate-change mitigation policies (Dietz, Dan, and Shwom 2007), the potential of household behaviors for reducing carbon emissions (Dietz, Gardner, et al. 2009), and barriers hindering individual-level responses to climate change (Norgaard 2009). Much of this work relating to climate-change mitigation is part of the rapidly growing body of social science research on "environmental governance" to which rural sociologists are already making important contributions (Davidson and Frickel 2004; Dietz, Ostrom, and Stern 2003; Frickel and Davidson 2004).

Lastly, sociological research on *adaptation* to climate change is of necessity thin (Nagel et al. forthcoming), since it is difficult to document

unambiguous instances of populations adapting to the effects of climate change per se. Sociologists can draw upon historical research from anthropology (Orlove 2005) and current research on disasters—as noted by Molnar in his discussion of vulnerability, resilience, adaptability, and the like—to offer insights for potential adaptive strategies. Rural sociologists are well positioned to join anthropologists and others in studying populations currently being forced to adapt to long-term climate change, such as native populations in the Arctic, and those likely to be doing so soon (e.g., farmers) if IPCC estimates of global warming prove correct.

Context for Engaging with the Topic of Climate Change

Let me close by returning to the “climate debate,” because it influences the context in which rural sociology engages the subject of climate change. Especially after the 1992 Rio “Earth Summit,” both the fossil fuel industry and the U.S. conservative movement saw climate-change legislation and treaties as major threats to their neoliberal economic agendas, and mounted a vigorous campaign against the 1997 Kyoto Protocol (McCright and Dunlap 2003). A key component of the campaign was the use of contrarian scientists by industry front groups and conservative think tanks to challenge scientific evidence concerning global warming, and thus the necessity of policies to reduce carbon emissions (Dunlap and McCright forthcoming; Freudenburg et al. 2008).

Despite significant fracturing in corporate opposition to climate-change legislation (Pulver 2007), the conservative movement continues to work hard to undermine the findings of climate science and thus the need for both national and international regulations—as witness current efforts by the CATO Institute, the Competitive Enterprise Institute, and the Heartland Institute. The success of this long-term campaign is evident in the U.S. media’s tendency to portray scientific evidence of climate change as highly “uncertain” (Boykoff and Boykoff 2004) and from international surveys showing the American public to be significantly less concerned about climate change than are their counterparts in most other developed nations (Brechtin forthcoming). Indeed, recent polls find that public concern over climate change among Americans is declining, a trend that is especially pronounced among self-identified Republicans and conservatives (Dunlap and McCright 2008). The growing political polarization over climate change within the general public is dwarfed by that among political elites, as climate-change skepticism and opposition to climate policy was institutionalized in the recent

Bush administration (McCright and Dunlap forthcoming) and has become a core element of Republican opposition to the Obama administration.

This highly politicized context creates a final and crucial addition to Molnar's research agenda—examining varying interpretations of and responses to climate change within the agricultural sector and land-grant universities. Here rural sociology's tradition of critical analyses of agriculture and agricultural science will be invaluable (Busch and Lacy 1983; Buttel 1993; Goldberger 2001; Kloppenburg 1991). For example, as of this writing, the American Farm Bureau is campaigning diligently against climate-change legislation, and its president repeats skeptic talking points (Stallman 2009), while the National Farmers Union generally supports such legislation. Are there similar schisms apparent within agribusiness, and what effect will these varying interests have on the response to climate change by land-grant universities?

While land-grant institutions have a history of being responsive to societal problems, colleges of agriculture are heavily influenced by production agriculture and responded rather hesitantly to the need for sustainable agriculture (Buttel 1993). Will these institutions and colleges be in the forefront of climate-change research and action? What factors will account for the inevitable variation in responses across institutions? Similarly, faculty views of sustainable agriculture have been found to vary considerably across agricultural disciplines (Dunlap et al. 1992). Will similar disciplinary variation occur in views of climate change?

Finally, will farmers (especially in "red states") respond more to climate-change messages from universities and USDA, or to those from conservative politicians, Rush Limbaugh, and Fox News? Will they interpret problematic weather as evidence of long-term climate change, and accept that they must learn to adapt, or dismiss it as a "bad year" produced by natural cycles? Given the difficulties in demonstrating the benefits of sustainable agriculture (Carolan 2006), how can the importance of responding to climate change be conveyed convincingly to farmers?

Clearly there is much work to be done in analyzing differing views of and responses to climate change among key actors in the agricultural sector, including land-grant universities and their faculties. While the consensus over the reality and significance of global warming has grown among climate scientists, the reverse seems true for society at large. A vital role for rural sociology should be to examine the degree to which the resulting dissensus and disputes over global warming have permeated agriculture and land-grant universities, and the consequences of diverging perspectives on climate change for the development of effective mitigation policies and adaptation strategies.

In short, to respond effectively to Molnar's call for greater engagement with the subject of climate change, rural sociology must deal with the sociopolitical as well as biophysical aspects of global warming. The task is intellectually daunting, but rural sociologists would be wise to heed Molnar's call and take on the challenge.

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