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Editorial

Cool heads for a hot world – Social sciences under a changing sky

Three decades of debates related to the urgency of climate-change and the dearth of preventive and effective action to adapt to these changes have led to a growing recognition of the need for social-scientific analyses to inform public opinion, motivate decisions, and strengthen climate adaptive and mitigative capacities (IPCC, 2009; Stern, 2007; World Bank, 2010). Researchers and decision makers have come to accept that the ensemble of problems associated with a changing climate cannot be understood, analyzed, or addressed without the vital contributions of the social sciences. The heterogeneity and contested nature of climate stresses for different groups and ecosystems, debates about how to understand and communicate risks and threats associated with climate change, and the need for multiple stakeholders to join forces to craft effective responses highlight the unusually important role of social science in the analyses of climate change and potential responses to climate threats (Adger and Barnett, 2009).

Despite limited funding (NRC, 2009), social scientists have already made major contributions to thinking about climate change. These contributions include, for example, integrated assessments of risks and costs; theorizing about vulnerability, adaptation, and mitigation; institutional analyses of climate mitigation at different scales; and the extent to which climate change and responses are likely to be equitable, just, or ethically acceptable. Economics has been the most prominent contributor, perhaps because its modeling modes of inquiry and statistical analysis of global datasets resonate more readily with the approaches used by physical climate scientists. Many other social sciences, however, are actively reframing and advancing how we think about and analyze climate change. The growing number of peer-reviewed articles, journals and scholarly networks, and policy reports dedicated to the human dimensions of climate change attest to the rapid growth and increasing robustness of the field.

Indeed, with the increasing recognition that climate change is unequivocal, vulnerability widespread, and adaptation inevitable, social scientists must make more-comprehensive and engaged contributions, and take the lead in furthering the analysis of climate-change issues and identifying effective response to climate stresses at different scales, in different sectors, and for different groups of vulnerable peoples. Because the causes of vulnerability and the effects of adaptive solutions are contested and controversial, cool analytic heads are needed to reflect on comfort and well-being in a warming world. Social scientists can bring critical perspectives on cause, effect and controversy; they can engage with policy processes; and help solve the multi-faceted problems that climate change will inevitably make more visible, urgent, and complex. Governance failures are shortening the time-scales on which climate stresses will be felt; without stronger contributions from social scientists and scholars of governance, the likelihood of solving climate change problems is remote at best, and at worst nonexistent. Social scientists can productively contribute to analysis and solutions of climate change challenges through theoretical advancement, empirical research, and policy engagements.

To improve the chances for well adapted futures at least three main and intertwining research arenas must be developed: (a) theorizing vulnerability, adaptation, adaptive capacity and resilience; (b) understanding the causal structures of vulnerability, forms, causes, and effects of adaptation, and the empirical referents of both adaptation and vulnerability at different temporal, spatial, and institutional scales; and (c) understanding and informing adaptation policy (Agrawal, 2008; Lemos et al., 2007; Orlove, 2005; Ribot, 2010). There is a need to explore each of these themes along with cross-cutting issues such as the nature and role of spatial, temporal and of governance scales, institutional determinants of adaptation and adaptive capacity in different vulnerable sectors, methods to understand, characterize, and analyze vulnerability and adaptation, and the role of equity, gender and politics in vulnerability and adaptation. Studies of adaptation need to be especially attentive to scale, equity, and ethical issues because, despite the global character of climate change, its consequences are produced, experienced and responded to at the local level and disproportionately by those with the least capacity to adjust (Agrawal, 2008; Roberts and Parks, 2007; Blaikie et al., 1994; Ribot, 2010).

In theorizing vulnerability, adaptation, adaptive capacity, and resilience, the first arena of analysis, we need a better understanding of the theoretical underpinnings of adaptation practice and of the interactions between adaptation and other processes (such as conservation, development, and planning) that shape outcomes in different contexts. This includes developing and testing theories that guide inquiry into perceptions of climate change, its social and political-economic causes, the social underpinnings of its modeling and scientific analysis, its physical manifestations, the conditions that translate change into benefits and crisis, and the actions and conditions that enable productive response and enhanced security. It also includes investigations into the roles of institutions, social actors, and processes across scales that influence adaptation action in different contexts. To achieve these goals, we need to build databases, produce case studies, design robust quantitative and qualitative analytical approaches, and

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compare across the rich library of studies available in the literature focusing on local adaptation so as to build theoretical generalizations that are useful across geographies, cultures, and political systems and also relevant to more specific studies interested in individual contexts.

We need also to make better use of the broad arsenal of social theory and methodological approaches. Indeed, adequately addressing the social complexities of vulnerability and adaptation associated with differences in scales, regions, and sectors requires different kinds of knowledge from and across the social science disciplines, recourse to different analytical frameworks, and even borrowings from the biological and physical sciences. We recognize the challenges in promoting this exchange. Indeed, in climate change debates and in the social sciences, the term adaptation itself remains ambiguous. Despite a long history of adaptation studies in the fields of psychology and anthropology, its earlier uses are at best only loosely associated with the collective problems created by climate change. Further, social scientists rarely apply the term to problems other than climate change. If there are features of climate change that makes it unusually well matched to adaptation, it would be useful to articulate such features explicitly rather than assume them. Precision in language and understanding can translate into more useful and targeted analyses and interventions. Such analytic developments will advance social science theory and also provide better guidance for the decision makers at national, community and organizational levels.

To understand the empirics of adaptation scholars must observe and document adaptation action and build critical qualitative and quantitative databases to test and explore theories about vulnerability and adaptation. Efforts to address climate change and craft strategic initiatives to enhance rural and urban poor's adaptive capacity can profitably examine causes of vulnerability and historical adaptive responses, their institutional context and correlates, and the role of institutions in facilitating adaptation. Such research can also help document the ways effective adaptation is achieved and the conditions and forms of interventions likely to produce maladaptive responses and outcomes. Documenting, understanding, and learning from past strategies, and crafting interventions that strengthen historically proven collective efforts is a critical first step and potentially one of the most effective mechanisms in the multi-stranded effort to reduce the adverse acute and long-term stresses of climate change (Agrawal, 2008).

Lastly, social scientists can productively study and inform decision-making and policy processes. Social science efforts form part of a global conversation that includes citizens around the world, activists and social movements, and a variety of institutions and organizations ranging from communities to nations to international organizations. In addition to operating in empirical and theoretical registers, social science scholars of climate change can also undertake concrete engagements, seeking to inform adaptation policies, especially in less-developed regions. Social scientists can engage in fostering research-based decisions and actions that can positively change the world in which we live. Future efforts to design and implement adaptation policy will benefit from improved understanding of the effects associated with different climate hazards, levels of exposure of social, and ecological systems, and sensitivity of such systems to climate stress, and their capacity to adapt to the most egregious conditions of risk. Because climate response policies are shaped by multi-scale governance arrangements that manifest over different temporal horizons, decisions made at the global level today shape local opportunities and decisions that can have major impact on future generations and the long-term sustainability of social and ecological systems. Indeed, little is known about the how adaptation policies should take into account the nested effects, tradeoffs, and potential unintended outcomes of different adaptation options (addressed in this special issue).

In 2008, the authors of this editorial co-founded the Initiative for Climate Adaptation Research and Understanding through the Social Sciences, ICARUS, to promote the development of social science research on climate change. As our society risks a scorching from the sun, ICARUS is an appropriate cautionary tale to inspire for social-science engagement. ICARUS was given wings by his father, the great inventor, Daedalus. Despite warnings, he flew too close to the sun, melted his wax wings, and fell. But, why did ICARUS fall? It was not merely that his wax wings melted – the technical answer. Perhaps he was greedy, desiring to go as high as possible – kind of a psychological answer. We could fault ICARUS for not listening to his father – a kind of moral answer. We could blame his father for his naïve trust in his young son – a human foibles answer. Russell (1924) felt ICARUS died due to the hubris of a belief that scientific inventions would be used wisely. He feared that technology was likely to be used in the service of greed – to line the pockets of the rich – Russel's is a socio-political answer. Perhaps the root cause of the fall was that he and his father took a terrible but calculated risk because they were desperate to escape from the prison of King Minos – a political-economic explanation. Maybe, with advance planning, Daedalus could have invented the parachute, providing ICARUS a soft landing – well-adapted ending. We need cool and engaged social science reflection to identify the causes of risk and adaptive pathways forward – so we might guide society to land standing.

ICARUS (www.icarus.info) brings together researchers and practitioners to address the growing need for social-scientific contributions to address climate change. Under each of the three research arenas discussed above, ICARUS has organized a range of activities that include annual conferences, small seminars that we call writeshops, and on-going dialogues that aim to provide social scientists with the intellectual and material support to advance climate change science and practice. The current special issue grew from an ICARUS writeshop.

References

Adger, Neil, Barnett, Jon, 2009. Four reasons for concern about adaptation to climate change. Environment and Planning A 41, 2800–2805.

Agrawal, Arun, 2008. The role of local institutions in adaptation to climate change. In: Paper Presented at the Social Dimensions of Climate Change Conference, Social Development Department, The World Bank, Washington, DC, March 5–6.

Blaikie, Piers, Cannon, T., Davis, I., Wisner, Ben, 1994. At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge, London.

IPCC (Intergovernmental Panel on Climate Change), 2009. Moving toward the fifth assessment report. http://www.ipcc.ch/pdf/ar5/ar5-leaflet.pdf (accessed 12.01.11).

Lemos, M., Boyd, E., Tompkins, E.L., Osbahr, H., Liverman, D., 2007. Developing adaptation and adapting development. Ecology & Society 12 (2), 26.In: http://www.ecologyandsociety.org/vol12/iss2/art26/ (online).

NRC (National Research Council), 2009. Restructuring Federal Climate Research to Meet the Challenges of Climate Change. Committee on Strategic Advice on the US Climate Change Science Program. National Research Council of the National Academies, Washington, DC.

Orlove, Ben., 2005. Human adaptation to climate change: a review of three historical cases and some general perspectives. Environmental Science and Policy 8 (6).

Ribot, J., 2010. Vulnerability does not just come from the sky: framing grounded pro-poor cross-scale climate policy. In: Mearns, Robin, Norton, Andrew (Eds.), Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World. Washington, DC, The World Bank.

Roberts, J. Timmons, Parks, Bradley C., 2007. Climate of Injustice: Global Inequality, North-South Politics, and Climate Policy. MIT Press, Cambridge, Ch 1: Introduction: Wet Feet Marching, pp. 1–24.

Russell, Bertrand, 1924. ICARUS or The Future of Science. Lecture given at University of California, Berkeley, 11 June 1994, Transcribed by Cosma Rohilla Shalizi. http://cscs.umich.edu/~crshalizi/Icarus.html.

Stern, Nicholas, 2007. The Economics of Climate Change: The Stern Review. Cambridge University Press, Cambridge, UK.
World Bank, 2010. WDR 2010: Development and Climate Change. The World Bank, Washington, DC. , In: http://wdronline.worldbank.org/worldbank/a/c.html/world_development_report_2010.

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