Social and Political Dynamics under Intensifying Climate Change: Proposal for a Long-Term Data Collection Project

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Abstract: The grand challenge for the social and behavioral sciences and humanities is to develop better models of complex societal decision-making processes so as to help mitigate and adapt to global climate change. Climate change represents the largest collective action problem: how to get self-interested actors to cooperate for their own long-term collective good on a global scale. Research on this complex question requires data on the process of national and international responses to intensifying climate change over the next decades. Adequate data must include social, cultural, relational, institutional, and behavioral aspects at the detailed level of how agencies, organizations, and publics evaluate, mobilize, pass, and implement decisions that affect GHG outputs. The National Science Foundation should establish a global monitoring system (a social science equivalent of NEON) to collect the needed data. This database will give social scientists a common empirical foundation to break through their disciplinary silos and unlock a new cycle of conjoint research on complex response processes at a higher level of integration. The NSF-funded research on Comparing Climate Change Policy Networks (Compon) provides a good model of such an international data-gathering and hypothesis-testing project.

Meeting the climate change challenge involves both adaptation to looming disasters and mitigation of their causes by rapidly decreasing human-caused concentrations of greenhouse gases (GHG) in the global atmosphere. Without mitigation, climate disasters will intensify and eventually overwhelm efforts at adaptation. Already the developing world is seeing many refugees from areas devastated by weather-induced disasters consistent with predicted climate change effects. But the need to reduce global GHG emissions challenges strong interests and common assumptions about our dependence upon fossil fuels. Nonetheless, the geochemistry forces us to change or suffer. Effective responses will require not only new technology, but quite possibly the transformation of institutions, cultural assumptions, patterns of life, and national sovereignty. We do not know if global society can cooperate sufficiently to meet this challenge. National and global decision-making systems are complex, multi-layered processes that are only rudimentarily understood (Biermann 2007). For the social sciences, the looming threat impels trans-disciplinary research (conjoint with natural science and the humanities) to develop more synthesizing integrative models of these complex processes. Research must identify, for instance, how scientific predictions can become more integral to national and global governance. This requires not only better policy instruments, but more agreement that preventing climate change should be a priority

Global agreements, such as the Kyoto Protocol, have had marginal effects on the bottom-line: reduction in atmospheric GHG concentrations. The larger question is, *will increasing pressure from intensifying climate change-induced disasters over time improve or reduce collective mitigation responses*? The climate-change dilemma represents the largest collective action problem (Stern et al. 2002): how to get resistant, frightened, self-interested actors to cooperate for their own collective long-term good, on an unprecedented global scale. To study this question, we need, over the coming decades, to trace *how* countries and international polities respond to climate change and vary their GHG emission levels. Processes leading to such outputs are profoundly complex and, to some degree, chaotic. Influences on policy formation flow not only within, but through and around formal institutions and authorities. Economic systems, patterns of social relations, and cultural orientations, coupled with psychological reactions and geophysical vulnerabilities, all interact in this process. Once decisions are made, the same factors affect the capacity to implement them effectively. Traditionally, explaining these complex processes has generated basic theoretical questions within each discipline: in economics, for example, the incorporation of externalities; in psychology, the roots of denial; in anthropology and cultural sociology, the influence of representations of nature and science; in political science, how formal institutions channel interest groups; in political sociology, the influence of networks on decisions. In reality, complex dynamic systems incorporate all these aspects and more. So must our efforts to synthesize and integrate different disciplinary perspectives to comprehend them.

To facilitate research equal to the task, *I propose that the National Science Foundation establish a long-term global monitoring system on social and political processes of response to climate change and their effect upon GHG emissions levels.* This would be the social-

science equivalent of international meteorological and geophysical data-collection systems, such as NEON, and integrated with them. A social-data system would collect data on social, cultural, relational, institutional, and behavioral aspects of national and global responses, policy outputs and social change, and effects on GHG levels. This would proceed in a panel study of national units and global negotiations over time as climate-change disasters intensify. Together, the natural and social data would describe the dynamics of the coupled human-climate change system. Data collection methods should include media content analysis, network surveys of organizational actors who influence decisions, public values and opinion surveys, qualitative interviews with experts and organizational representatives, relevant archival statistics, and if possible, video records of news coverage and disasters. At minimum, data should be collected at two levels: national political fields and international negotiations. Including sub-national and international (regional) levels would be beneficial. NSF should make these data widely available so scholars can test different theories and hypotheses. The countries selected should include major contributors to, or sinks for, greenhouse gases and countries that vary in social, cultural, and behavioral factors thought to affect decision-making. Such factors include political institutions, patterns of political networks, types and mobilizations of interest groups and movements, cultures of nature and science, economic development levels, connections to international negotiation processes, and degrees of geophysical vulnerability. The project would involve climate scientists to identify local and regional climate-related impacts and disasters as a specific hypothesis bearing upon national acceptance of the science and priorities in policy formation. Cross-national variation in these factors permits testing of hypotheses about how different conditions affect national and global decisions and effectiveness. Thus, NSF should seek cooperation from other national science institutes worldwide. This database will give social scientists a common empirical foundation on which to form trans-disciplinary studies of the dynamics of climate-change response. Pushed by looming threats of climate change, the detailed data will foster a new cycle of conjoint research on the interactions of complex response processes, but at a higher level of synthesis and integration.

Rather than starting as one investigative project on one aspect of this complex social puzzle, with one main theoretical focus and hypothesis, this new data-gathering project should focus on more general data gathering as the basis for many more focused projects. *The project must be designed to collect data that provide a common empirical ground for conjointly integrating and testing different theoretical approaches.* Such data will permit social scientists around the world to investigate a diversity of causal hypotheses while also permitting them to work conjointly on modeling and comprehending reality as compounded of complex mixtures and integrations of these diverse points of view. This effort will foster greater cooperation among natural and social scientists and social practitioners. Designing such a project will require discussion and specification of the best common data ground. The project should become a permanent data-collection system with a coordinating center that integrates the work of social-science climate change institutes in many countries. Through the national institutes, national teams will collect, analyze, publish, and diffuse national data countrywide. Under the global coordinating center, national institutes will pool their data for to investigate cross-national and international tensions and agreements toward managing the global carbon output. This system will teach and draw in new students and researchers and circulate them on a global scale.

As an existing model for such a global data collection project, I suggest the NSF consider the Compon project.[i] This project conducts international comparative research on the social factors affecting national and global efforts to mitigate climate change. The NSF grant funds five cases (Russia, India, China, the US, the international case) and provides one month's summer salary plus a research assistant for the PI. The grant runs until March 31, 2012. In addition to cases funded by this grant, the PI has recruited over ten more national teams. Teams in Brazil, Sweden, Taiwan, South Korea, Japan, Mexico, and Greece have found their own funding. Teams for the United Kingdom, Germany, Austria, Canada, Australia, and the European Union level are seeking funding. Teams for Portugal, Hungary, Poland, and other countries are forming. Graduate students are conducting the New Zealand case and helping other national teams. The Center for International Forestry Research (CIFOR) has adopted the Compon survey instrument for REDD (Reduction in Emissions from Deforestation and Forest Degradation) issues in Bolivia, Brazil, Indonesia, and Cameroon. All teams follow common research protocols.

Compon collaborators have developed and standardized a common set of data-collection instruments and protocols: qualitative interviews, media-content analysis, and a policy network-survey instrument. The policy network method, unlike opinion surveys or studies of institutions, allows the tracing of discourse and mobilization in national polities as they manifest in relations among politically engaged organizations and their pursuit of policy outcomes. Networks among organizations constitute the "meso" level of dynamic political action between the macro (whole systems, large-scale institutions) and micro (public opinion, individual value) levels. Data collection involves two main phases: content analysis of major newspapers' framing of climate change (discourse), and a survey of 50–100 organizations, plus 30 international organizations, involved in national and international climate-change politics. In-depth interviews with experts and key individuals supplement these data. The survey focuses on the networks among organizations that indicate important political processes around climate change. The flow of scientific information, policy advice, common ideas and persuasions, collaboration in coalitions and stakeholder forums, and partisan efforts to influence policy formation all constitute analytically distinct networks. The network of vital scientific information, for example, indicates the sources of scientific information for different organizations: some draw on IPCC reports; others look to those who deny the validity of such reports. This information flows to national receptor organizations that frame it and transfer it to different, sometimes opposed, national policy coalitions. These coalitions call on differing ideas about science and nature to evaluate the idea of climate change. They put pressure on national policies and affect actual levels of GHG emissions. In sum, the Compon data provide evidence about the factors that affect national willingness and effectiveness in reducing GHG emissions.

Questions about the effects of network flows on policy formation and voluntary behavior are at the theoretical cutting-edge in the social sciences, especially in political sociology and political science. The Compon project has developed process-oriented hypotheses about the social and geophysical factors thought to affect emissions reductions, and uses these data to test the hypotheses. Despite the relatively small number of national cases (10 to 30), the method of small-N Qualitative Comparative Analysis permits this testing (Broadbent 2010). Information about the project, its cases, and hypotheses is available on the public side of our

project website, www.compon.org. Detailed information, such as research instruments and interim case reports, is on the password-protected inside website. For access, please contact Jeffrey Broadbent, broad001@umn.edu, or project RA Sarah Burridge, burri058@umn.edu.

The Compon project aims to produce empirically based advances in theory and method, and useful policy advice. Using the research community being developed by the project, it will establish a scientific-use database and global monitoring system of social-science data on climate change at national and global levels into the future. To widen its network, the Compon project has become an affiliate of the Earth Systems Governance project in the International Human Dimensions Programme on Global Environmental Change and held workshops and panels at its meetings. Continuous-content analysis of newspapers and legislative records, coupled with surveys at 3 to 5-year intervals, will enable researchers to trace the development of national and international reactions and policies as climate-change related disasters intensify over coming decades. Many young researchers are adopting our standardized method to add their own national cases.

The study of how complex social systems respond to intensifying climatic changes requires synthesis of many disciplinary perspectives and methodologies. If the NSF were to establish the proposed global data-collection system, it would facilitate a new cycle of research on the complex dynamics of human and societal responses to this global dilemma. Understanding these dynamics requires synthesizing and integrating the social and natural sciences in ways that will produce new models and understanding. The feedback loop between intensifying disasters from climate change and national and global responses over the next decades may be the most critical aspect of the long-term dynamics of coupled human and natural systems.

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