CORRESPONDENCE:

Reply to 'Broaden research on the human dimensions of climate change'

Dietz *et al.* reply — A recent Correspondence¹ in *Nature Climate Change* by Noel Castree criticized the Collection 'Energy, climate and society' (<http://www.nature.com/energyclimatesociety>) as "symptomatic of a problem" in research on the human dimensions of global environmental change. We were stimulated to respond, as in our view the Collection — jointly curated with *Nature Energy* — is indeed part of the solution he advocates. We want to encourage readers to examine the entirety of the Collection, as papers published in *Nature Energy* include contributions from many of the fields the Correspondence sees as not represented^{2–6}.

What is needed to generate useful insight on human–environment interactions is more than the inclusion of certain disciplines. A broad organization of the intellectual domain is required to attend to crucial problems of human well-being and the environment^{7,8}. Disciplines organized to address the problems of the nineteenth and twentieth centuries may not be adequate for that task. Rather, we agree with Castree that the research agenda must acknowledge and integrate the value and potential contributions from multiple sources of insight, including research in both natural and social sciences, as well as sources from outside usual definitions of science.

The social sciences can offer improved understanding of the human causes and consequences of environmental challenges, as well as subsequent responses to these challenges. However, these efforts must interact with those of the natural sciences that are aimed at understanding the physical and ecological processes and impacts of climate change⁹. The social sciences need to be informed by other sciences, and also inform them.

Scientific work is needed to provoke discussion on how to address such

challenges. Social science can help here by illuminating how and why people misunderstand climate change, analysing and informing processes of deliberation and conflict resolution, identifying those most vulnerable to climate change and affected by mitigation policies, and so on. As Castree also suggests, these are not problem domains reducible to any single disciplinary approach.

Insights from studies that may not seek generalizability about social processes can also be important. For example, work on the history of scientific debates that prefigure the ones on climate change¹⁰ and on the evolution of key ideas and normative frames, such as economic growth, can be of immense value¹¹. So too can case-based research on ways to develop and implement effective environmental policy, prepare for and reduce damage from extreme events, and resolve environmental policy conflicts. This scholarship can offer valuable clues regardless of whether particular studies meet some *a priori* definition of 'science'. Legal scholarship can also offer valuable input, and so too can the arts, humanities, and literature.

Resolving problems of energy injustice and global change requires deep thinking about values and ethics as well as about facts. Drawing a bright line between science and non-science, between various epistemologies and ontologies, or between disciplines is less productive than seeking knowledge where it can be found and contemplating on what can be learned. As Castree intimates, the 'matters of fact' that science is so good at producing only become 'facts that matter' in decision-making because of science's engagement with society. If societies include groups with diverse values and circumstances, as nearly all societies do, then the implications of facts

and their interpretation will vary across those groups.

The Collection includes papers in several of the above domains. As noted in a *Nature Energy* editorial¹², the Collection intends to illustrate the range of what environmental social science can contribute, but cannot hope to definitively cover it all. The intent of our contributions is to open doors for the social sciences in the broader climate science community and showcase some of the knowledge being developed. We hope Castree, and others, continue to build on this progress. □

References

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