



Unpacking uncertainty and climate change from ‘above’ and ‘below’

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Introduction

Uncertainty is a key factor shaping climate and environmental policy at international, national and sub-national levels. It is usually defined as a situation characterised by indeterminacies and refers to what we cannot know for certain in terms of outcomes, effects or impacts of a particular event where the probabilities cannot be calculated (Walker et al. 2003). Climatic changes are projected to cause an escalation in climatic variation coupled with increasing uncertainty as one moves from global to local scales (IPCC 2014). Examples include growing uncertainties around spatial and temporal patterns of rainfall, extreme temperatures as well as droughts, cyclones and floods. In the early days of climate science, uncertainty was often seen as challenging the authority of science itself, causing uneasiness among scientists. Recognised as a ‘super wicked problem’ or a monster that should be controlled or tamed, climate science was dominantly guided by the belief that more and better ways of knowing (i.e. better modelling) could address the uncertainty problem (Curry and Webster 2011; van der Sluijs 2005). However, in the past two decades, there has been a noticeable shift from a focus on reducing scientific uncertainty towards understanding and managing uncertainty (Schneider and Kuntz-Duriseti 2002). In the Fifth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) acknowledges that there are uncertainties that we will never know and that the best response is to understand and cope with them (IPCC 2014). This has led to the emergence of new approaches, such as robust decision-making that

recognise diverse perceptions and responses to uncertainty (IPCC 2014; Ranger and Garbett-Shiels 2011) and emphasise the importance of more bottom-up methods of climate assessment and adaptation (Conway et al. 2019). Still, as argued by several authors in this special issue, techno-managerialist approaches to control uncertainty on the part of scientists and policymakers still persist in practice. These can exacerbate the vulnerabilities of marginalised people living with climate change-related uncertainties.

Uncertainties may emanate from different sources such as incomplete knowledge systems, structural uncertainty within a model, environmental hazards or changes in the wider political economy (Swart et al. 2009). While scientists tend to focus on ‘accumulated uncertainties’ as outcomes and robustness of models, decision makers seek to balance these outcomes against their priorities, portfolios and political interests (Walker et al. 2003). Finally, as several articles in this special issue highlight, uncertainty is part and parcel of life for people living at the interface of climate change. Their livelihood and adaptation strategies are diverse, context specific and draw on local knowledge systems and may differ from the dominant prescriptions made by some bureaucratic and scientific actors.

This special issue addresses these challenges and epistemological tensions by examining the concept of uncertainty in relation to climate change from various vantage points. Its starting premise is that theorizing about uncertainty from ‘above’ by experts, modellers and policymakers needs to be complemented by how local people (rich and poor) live with, understand and cope with uncertainty in everyday settings from ‘below’. We build on the Mehta et al.’s heuristic of the ‘above’, ‘middle’ and ‘below’ to reveal differences and tensions in ways that different actors understand and experience climate change and uncertainty (see Mehta et al. 2019). The special issue focusses on the diverse discourses and practices of climate change uncertainty from ‘below’ and from ‘above’, and their interaction in diverse socio-ecological settings as well as the knowledge politics that shape and alter responses to uncertainty. The authors examine how diverse understandings can serve as a barrier or opportunity to adapt to climate

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change and also explore approaches that can help bridge different perspectives of uncertainty to advance socially just pathways of adaptation.

The articles in this special issue were initially presented at an international workshop held in New Delhi, 2016.¹ The contributions employ diverse conceptual and interdisciplinary perspectives and provide original empirical insights to examine the intersections between local understandings of climate change and politics, history, culture, livelihoods and policy across a range of scales from local to national and regional. The following cross-cutting themes offer rich perspectives on different aspects of uncertainty associated with climate change:

Climate science and decision-making

Though models and simulations have gained considerable authority in framing climate change, a growing social science literature has revealed that they are very much products of social practices, socially embedded knowledge politics and inherent power dynamics (cf Hastrup 2013; Carey 2010). Heymann (2018) examines how climate discourses in the twentieth century led to the ‘de-humanising’ of climate science, alienating it from the locally anchored experiences as it was progressively merged with abstract global modelling. Prevalent discussions focus on technicalities (e.g. variables, computing models) and quantitative reasoning that are portrayed to be beyond scrutiny from ‘outside’ actors. He argues that local experiences are fundamental to ‘opening up’ the black box of science so that the above can ‘hear’ the practices and discourses from ‘below’. Meah (2019) provides an insider’s perspective on science communication around climate uncertainty by taking the case of the UK, in particular the ‘climategate’ controversy. He argues that in situations where the scientific consensus is questioned by climate sceptics, an overemphasis on uncertainty in the climate science discourse can lead to confusion and a potential loss in confidence among the public and policymakers. Thus, scientists need to place greater emphasis on communicating aspects of science that are confidently known, including its policy-relevant scientific knowledge.

Politics and practices of uncertainty

Climate change narratives and perceptions are not merely limited to the domain of ‘the above’; they are also embedded

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within a wider political economy that is shaped by socio-economic structures and relations involving power struggles and contested interests. Thus, several authors in this issue look at how local people understand and make sense of climate-related uncertainties across a range of social and ecological landscapes. Here, the focus is on both diverse narratives and imaginaries of uncertainty as well as existing alternatives, which may be bypassed and suppressed, offering the possibilities for devising more socially just and inclusive adaptation outcomes. Mehta et al.’s study (this issue) on climatic uncertainties in three different socio-ecological settings in India underlines that uncertainty may not be a new phenomenon for the local people attuned to changing seasons, resource fluctuations or extreme events. However, climate change presents a new kind of ‘radical uncertainty’ that is potentially limiting the adaptive capacity of marginalised and poor people, especially when it interacts with wider socio-political changes (e.g. growth-driven capitalist trajectories as well as land grabs and dispossession). While the ‘above’, ‘middle’ and ‘below’ have different (and often contradictory) framings and understandings of uncertainty, the challenge is to highlight power imbalances that prevent alternative ways of valuation and epistemic diversity.

Vogel and Olivier (2018) explore the case of climate uncertainty through drought and disaster risk response in South Africa. Despite promising gains made in drought response and management in the 1990s that highlighted local people’s experiences and perspectives, they analyse how a return to an overemphasis on ‘hard science’ and technocratic management in later years has significantly hampered more holistic planning approaches that ensure more inclusive and effective coping and adaptation. This highlights the importance of critical engagement, historical learning and the opening up and broadening out of the debate to include multiple actors and diverse perspectives to advance equitable and sustainable approaches concerning drought adaptation and risk management.

Embracing uncertainty with hybrid systems of engagement

Contributors also emphasise the importance of diverse ways of engagement and hybrid approaches in order to address the intractable nature of uncertainty. Their focus is on both inherent knowledge politics as well as power relations, and the need for hybrid perspectives and interlocutors that can help bridge diverse perspectives of uncertainty. Arora (2019) situates the need for engagement in the ethics of care and shared values that should displace the ‘modernist’ fallacy of control that marginalizes alternative forms of knowing and being. He argues that instead of controlling uncertainty, one should admit to the existence of uncertainties and valorize other forms of knowing and

doing. Such care-based understandings should embrace diversity and heterogeneity that can flatten hierarchies of practice and knowledge that exists between the 'above' and 'below'.

Lyons et al. (2019) provide an empirical justification for such care-based understandings as they analyse the relationship of indigenous peoples in Great Barrier Reef Catchments in Australia with their ecological systems. They emphasise the importance of cultural values and indigenous knowledge systems in building local resilience and helping indigenous communities adapt to climatic uncertainties. They argue that agency and volition act as important constituents of communities' capacity to live with uncertainty, which is also shaped by the long colonial history of marginalisation and dispossession. The lack of inclusion and disregard for indigenous systems of knowledge in top-down planning may diminish local people's agency as well as adaptive capacity to climatic uncertainties.

Finally, Ayeb-Karlsson et al. (2019) examine the role that socio-cultural values play in the adaptive space of the 'below' in Senegal. They argue that responding to uncertainty and moving towards a space of safety is a highly differentiated process that is influenced by discursive values and emotions—and not solely a response to purely 'rational' signals (e.g. climate information). A novel approach to analyse this complex interplay between (un)certainly and (un)safety is proposed to help achieve a better understanding of these processes and illuminates issues of power that invariably influence the adaptive pathways of local people.

Conclusion

Unpacking the uncertainties associated with climate change, including its intersections with wider capitalist and socio-economic trajectories, cannot be left merely to experts but needs to include the perspectives and experiences of those people living at the forefront of these changes, and especially the most vulnerable and poor sections of society. While there are limits to local people's knowledge and agency in dealing with radical climate-related uncertainties, scientists and policymakers also need to recognise limits to their scientific knowledge and occasional lack of control. It is also important to acknowledge the political economy of uncertainty and how it can exacerbate existing vulnerabilities at local scales. Collectively, the contributions unpack the politics of climate-related uncertainty across the scales of 'above' and 'below' and demonstrate divergences in the understandings and responses to uncertainty. They highlight the complexities and power relations that underlie the science-policy nexus and concomitant decision-making frameworks, scientific communication, varied livelihood and adaptation responses as well as the politics of knowledge among diverse stakeholders and how it shapes uncertainty. All articles converge towards the understanding that a more inclusive and holistic understanding of uncertainty—which acknowledges and incorporates plural

knowledges and imaginaries, politics, culture and history—is vital and fundamental to bridging the divide between 'above' and 'below'. In sum, it is important to bring to the fore hidden and alternative perspectives in order to allow for hybrid perspectives and knowledges of uncertainty to emerge. It is these that will allow for more locally appropriate and socially just strategies of adaptation and social transformation.

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