Climate and security: evidence, emerging risks, and a new agenda

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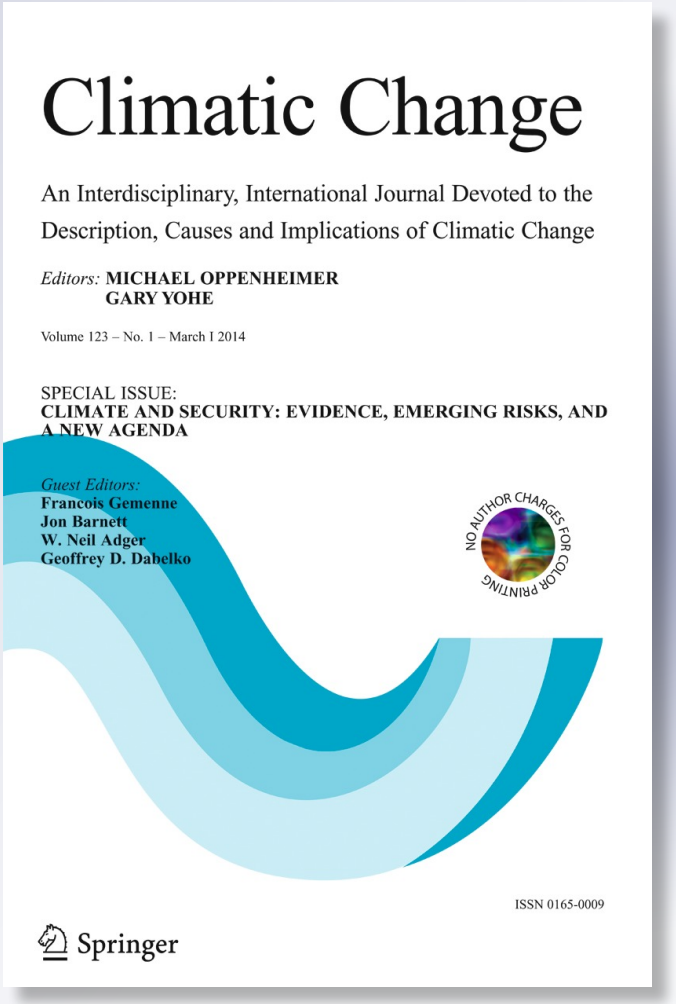

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INTRODUCTION

Climate and security: evidence, emerging risks, and a new agenda

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Abstract There are diverse linkages between climate change and security including risks of conflict, national security concerns, critical national infrastructure, geo-political rivalries and threats to human security. We review analysis of these domains from primary research and from policy prescriptive and advocacy sources. We conclude that much analysis over-emphasises deterministic mechanisms between climate change and security. Yet the climate-security nexus is more complex than it appears and requires attention from across the social sciences. We review the robustness of present social sciences analysis in assessing the causes and consequences of climate change on human security, and identify new areas of research. These new areas include the need to analyse the absence of conflict in the face of climate risks and the need to expand the range of issues accounted for in analysis of climate and security including the impacts of mitigation response on domains of security. We argue for the necessity of robust theories that explain causality and associations, and the need to include theories of asymmetric power relations in explaining security dimensions. We also highlight the dilemmas of how observations and historical analysis of climate and security dimensions may be limited as the climate changes in ways that present regions with unprecedented climate risks.

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1 Introduction

Popular accounts of climate change catastrophes often promote imagery akin to the biblical metaphor of the four horsemen of the apocalypse such that future is one of war, famine, epidemics and mass dislocation. The underlying narrative behind such a portrayal of climate change impacts is inevitable instability where natural disasters are easily attributed to wild weather or other forces of nature. Yet these dire apocalyptic visions, often portrayed in policy discourses and visual representations, are not supported by convincing empirical evidence or theories that explain causality. The tendency to oversimplify linkages and their results undercut productive scholarly and policy debates in part by obscuring complex, uncertain, yet potentially high stakes implications of climate for a wide range of social, political, and economic arenas (Barnett and Adger 2007).

This is not to say that war, conflict, famine, epidemics and migration are not real and significant for populations throughout the world. If climate change affects human suffering through these mechanisms, then this human security dimension of climate change requires a long hard look from scholars and practitioners alike. Each of the areas is, in fact, well studied. There are competing theories, explanations and approaches from across the social sciences on conflict, food security and migration. Conflict has been studied since the invention of armies and nations. Migration is core to the science of demography. The study of the causes and consequences of famine has been overturned by economic and political theories of why and how they occur, not least through Sen's (1982) treatise on the subject, which demonstrated that famines have political roots and are overwhelmingly caused by failures of entitlement to food and resources than with their absolute scarcity.

Two other factors are added to this mix. First the debate over climate change, and environmental change in general, has been cast in an environmental deterministic framing that continues a tradition of explaining social outcomes as principally driven by environmental drivers. Thus, for example, serious debate concerning how migration dynamics are affected by weather-related events has been swamped with discussions of climate refugees and estimation methods which generate, intentionally or not, large global estimates of populations at risk of being displaced (Gemenne 2011; Piguet 2013). We argue that this highlighting of the issues of human insecurity has not been matched by a sufficient engagement of the social sciences that have plausible and testable theories of how climate change can affect the security of populations. In particular, the abundant literature on the physical impacts of climate change has not been matched by a similar engagement of social sciences on the human impacts of climate change (O'Brien and Barnett 2013). Hence there is an urgent need for re-engagement of economics, political science, international relations, demography, development studies, and anthropology in assessing the causes and consequences of climate change on human security.

The role of the state in framing both climate change and its solutions is a second dimension for examination. Among some parts of the scholarly community, there is a distinct unease about the attention paid to the risks climate change poses to states through regional or global instability and resource scarcity. This concern stems from the emphasis on resources and territory, underplaying the dimensions of institutions and capacity to manage changes peacefully (Adger 2010; Barnett 2010) and from the securitization of climate change policy discourses such that solutions are skewed to those technologies and interventions that maintain the position of states themselves (Floyd 2008, 2011; Oels 2013; Wæver 2011).

Both of these factors—environmental determinism and the concern over securitization—have, we argue, hampered rigorous debate on some of the most critical dimensions of a changing future climate. Those crucial dimensions include the impact of climate changes and increased climate variability on the stability and security of populations who are already

insecure. In this paper we review the state of knowledge on security dimensions of climate change; set out the major conclusions from the series of studies in this special issue, and point to emerging issues in the agenda for sustained research in this area.

2 A world of policy rhetoric and lagging social science

Policy attention to climate change and security has been punctuated in the past decade by high-level political discourses, such as in the UN Security Council. It has also been promoted through periodic assessment by national security agencies of the roles climate change may play among the panoply of security risks facing states. This political activity has been supported by research produced by foreign policy, development, and security agencies, think tanks, and policy advocates. The analysis has taken the form of meeting reports and policy briefs (for example Dupont and Pearman 2006; WGBU 2007, 2008; CNA 2007; CSIS 2007; Funder et al. 2012; Smith and Vivekananda 2007; Carius et al. 2008; Stark et al. 2009; Rogers and Gulledge 2010; Werz and Conley 2012; Dabelko et al. 2013). This body of information has highlighted emerging issues, and has shown how security communities are framing climate change. In effect, action by policy voices has reflected and helped to create an emerging international politics of climate change and security. Two high-level debates in the United Nations Security Council, in April 2007 and July 2011, as well as the 2007 Nobel Prize for Peace awarded jointly to Al Gore and the Intergovernmental Panel on Climate Change (IPCC), have further raised attention to the security dimensions of climate change.

Until recently this politics of climate change and security had not been accompanied by a sustained research effort by scientific communities related to these fields. Much of the analysis made an implicit assumption that the anticipated changes in natural systems would cascade into critical social and national security problems. Yet, perhaps responding to the political interest in the subject, there has been a significant increase in basic research examining the phenomena of climate change and conflict, including its causes and consequences, and its ethical and political ramifications (for example Adano et al. 2012; Benjaminsen et al. 2012; Brosnan et al. 2011; Gilman et al. 2011; Kumssa and Jones 2011; McLeman 2011; Raleigh 2011; Sheffran and Battaglini 2011; Smith 2011; Sunga 2011; Verhoeven 2011; O'Brien et al. 2010; Hsiang et al. 2011; Matthew 2012; Sygna et al. 2013).

The emerging scientific literature on climate change and conflict has not led to consensus on the fundamentals of causes, mechanisms, and potential interventions. We argue that a root cause of this lack of agreement is the concept of security, which is by definition ambiguous and relative. Security studies as a field recognizes that security can be seen as a concern for national security, but also in terms of different scales. Security is manifest in a concern for global, or common, security through to a concern for individual, or human, security. The risks at these different scales can be construed quite narrowly as the risk of violent action, or quite broadly, to include risks to health, the environment, and livelihoods (Paris 2001). The issue of climate change is pertinent at all these scales of analysis and concern. Research to date has highlighted different ways climate change impacts may threaten national security and nation states, human security at individual and community levels, and global security for global scope. Climate change is most commonly framed as a threat multiplier, a driver of diverse secondary risks, such as violent conflict, political instability, population displacements, poverty, and hunger (CNA 2007).

Research from a range of disciplines applies diverse methods and theories of evidence to climate and security. This diversity in part accounts for divergent interpretations of the quality and extent of knowledge in this area. Physics, anthropology, statistics, economics,

oceanography and human geography and their associated models, scenarios, ethnographies, and surveys can all be found in the literature on climate change and security. It is the resulting debates that we highlight in the remainder of this essay and this special issue.

There are presently four key issues within this broad topic of climate change and security. First, a considerable body of research centers on whether climate change may increase the risk of violence and the potential mechanisms through which climate change may increase that risk. Notable clustered contributions include a special issue of *Political Geography* in 2007 (Nordås and Gleditsch 2007), and more recent special issue of the *Journal of Peace Research* (Gleditsch 2012). Other key articles have sought to find broad patterns and statistical associations between climate, weather and conflict at diverse scales in order to provide predictive models of likely future risks (Hsiang et al. 2011; O'Loughlin et al. 2012). There is considerable debate about the extent to which climate change may increase the risk of violent conflict, with a few studies that make confident claims (among others see Hsiang and Burke 2014 in this volume), and quite a few which find little evidence for a causal connection between climate and conflict (see for example Gleditsch 2012).

A second and related focus of investigation concerns climate change and forced migration or displacement. These links are most often framed within the context of forced migration constituting a threat to security of states and people. Much of this research is summarized and developed in the UK Foresight review on migration and global environmental change (Foresight 2011). Some research examines the possibility that climate-induced migration may increase the likelihood of violent conflict (e.g. Hartmann 2010; Raleigh 2011; Reuveny 2007). These, and many other academic analyses, conclude there is insufficient evidence to support confident statements about climate change driving migration that in turn may lead to violent conflict. Yet the idea that migration induced by climate change will lead to conflicts remains a persistent meme, repeatedly cited as a concern by NGOs, government agencies and civil society organizations (see for example WBGU 2008; Werz and Conley 2012).

Although there is much debate about the extent to which climate change may cause conflict directly or indirectly through migration, there is more agreement, if less literature, when the causality is reversed. A small number of studies converge on a finding that conflict is a powerful driver of vulnerability to climate change (eg. Barnett 2006; Lind and Eriksen 2006; Tignino 2011; Feitelson et al. 2012). Relatedly, there is increasing agreement that migration can be an important strategy for adapting to climate change (e.g., McLeman and Smit 2006; Tacoli 2009; Barnett and Webber 2010; Foresight 2011). In key policy realms, the potential role of migration as an effective adaptation to climate change risks has been recognized in the Cancún Framework for Adaptation, adopted in late 2010.

Finally, the risks climate change poses to human security are detailed in a small but largely consensual literature. A range of studies conclude, with varying degrees of evidence, that climate change poses risks to livelihoods, communities, and cultures (e.g. Barnett and Adger 2007; Lahiri-Dutt and Samanta 2007; Leary et al. 2008; Paavola 2008; Turner and Clifton 2009; Brklacich et al. 2010; Bronen 2010; Badjeck et al. 2010; Mark et al. 2010; McLeman 2011; Mideksa 2010; Oluoko-Odingo 2011; Adger et al. 2011).

Beyond these four main areas of investigation on climate change and security, there are related and newly emerging dimensions to the issue. This special issue of *Climatic Change* seeks to advance knowledge regarding these different dimensions of climate change and security. It includes a series of papers initially presented and discussed at a workshop hosted by the Institute for Sustainable Development and International Relations (IDDRI), *Sciences Po*, in Paris on May 3–4, 2012, sponsored by the Directorate for Strategic Affairs within the French Ministry of Defence, the UK Department of Energy and Climate Change, and the British Council.

These articles have since been revised and peer-reviewed for this special issue. They attempt to review the evidence that has been presented so far, to assess its robustness, and to outline the challenges ahead. They aim to make more robust the evidence base while directly engaging claims that are often made about the security risks of climate change. Together, they provide insights into aspects of climate-security nexus that have often been under-researched due to the lack of engagement in the area by the different disciplines of social science, such as sociology, anthropology, human geography or political science.

3 Contributions of this special issue

Articles in this special issue focus on four dimensions of emerging research on climate change and security. First, some papers engage with the epistemological challenges of producing knowledge about future changes in complex socio-ecological systems. Scenarios are a principal method used to explore the future in both climate change and security studies. Lewis (2014) provides an overview of the different types of scenarios used, and their strengths and limits. Many of the scenarios utilized so far have failed to account sufficiently for uncertainty, and lack clarity about the timescales and scales of change. As a result, most yield very general conclusions, with little of the specificity most needed for effective policy-making. Another common method to explore the future impacts of climate change on security is cartography, and especially hotspots mapping. Hotspots are regions of the world considered particularly vulnerable to climate impacts. This climate mapping is paired with political, economic, and social conditions to identify regions at greatest security risk. Mapping exercises seek to facilitate policy decisions by drawing policy-makers' attention to regions that appear of the most concern. The paper by de Sherbinin (2014) reviews the different approaches and data used to conduct such mapping exercises. It also raises questions regarding the limitations, usefulness, and added value compared to other methods—such as scenarios.

Second, climate change poses diverse risks to national security. These challenges include a possible increased risk of violent conflict in some countries. Such violent conflict in turn poses challenges to the security policies of neighbouring countries, to the United Nations Security Council, and to countries that contribute to peacekeeping missions. Hsiang and Burke (2014) examine the correlation between climatological changes and conflict outcomes in 50 quantitative studies, at different scales, and find a strong association between climatic changes and conflicts.

While conflict is certainly the most obvious risk to national security, other crucial elements of national security are also affected by climate change. They also include non-military threats, such as to infrastructure critical to the functioning of states such as energy and water systems, the impacts of extreme events, and the vulnerability of key sectors. King and Gulledge (2014) explore different ways in which energy security could be at risk through threats to energy systems and infrastructure. They find little evidence of direct climate impacts on energy supply, but contend that threats to energy security will come from the social instability—as identified in Hsiang and Burke (2014)—or from the effects of climate mitigation and adaptation technology choices.

Third, climate change will transform geopolitical landscapes. In particular, security issues can arise relating to conflicts or enhanced cooperation between countries around transboundary issues. Examples include shared waters and resources of the Arctic, international rivers, risks associated with an expansion of nuclear power as a climate mitigation response, or cross-border flows after extreme events. Kallis and Zografos (2014) question the simple narrative of so-called water wars, linking climate change and security via water supply

and demand. Integrating research from diverse disciplines, they show the complex interactions between water scarcity, transboundary basins, vulnerability, and conflict, and suggest that these could actually lead to increased cooperation under climate change, if precautionary no-regrets policies are taken.

While most of the literature considers how the effects of climate change need to be accounted for in security policies, the opposite relationship also needs to be examined. How will security issues affect climate policies? Security considerations will affect the way political institutions respond to climate change, and conflict-affected countries will often be more vulnerable to climate change. Matthew (2014) examines UN peace-building missions and notes that since 1948, the overwhelming majority of these missions have occurred in regions that were highly vulnerable to climate change impacts. Yet climate policies—that is, mitigation and adaptation policies—are generally excluded from peacebuilding operations, and the article offers constructive suggestions to foster this integration.

4 Ongoing challenges for a science of climate and security

This special issue highlights neglected aspects of the climate-security nexus. Doing so, it raises as many questions as it answers. First, the focus of research to date on climate change and security has been predominantly on the causes of conflict, rather than on the causes of peace. The framing of climate change as a security issue has also been a device for advocates to prompt states to address climate change more urgently and more seriously. The focus now, we suggest, should shift to understanding the climate-security nexus for what it is, rather than as a normative argument to influence mitigation policy. Thus, more emphasis needs to be put on the factors for peace and cooperation, and on the capabilities of people and institutions, rather than just on the threats and risks.

Second, while there is some evidence for a statistical correlation between climatic changes and conflicts, the field of inquiry remains weak on theories that explain the pathways by which changes in climate lead to various security problems. While there is increasing evidence that changes in climatic conditions seem to be associated with conflicts, we remain unable to provide clear explanations as to *how* this can happen. The interpretation of many studies in this area also contains considerable confusion of correlation and causation when it comes to the linkages between climate change and security. Effective strategies to avoid conflicts potentially associated with climate change require knowledge about *how* they happen, which requires theories that can *explain* the causal pathways that result in conflict.

Part of the explanation for this lack of theoretical models can be found in the disciplinary divide between qualitative and quantitative studies, as argued recently by Solow (2013). Quantitative studies, for example, show that both increases and decreases in rainfall can lead to conflict. This divergence seems impossible to explain with one single theory that would explain how changes in rainfall lead to conflict. Instead, what is needed are multiple, nuanced theories. These approaches could help us understand, for example, how rainfall increases in rangelands in sub-Saharan Africa leads to increasing communal violence among pastoralists, as opposed to how decreasing rainfall leads to increasing violent protests about water pollution in northern China. These multiple theories would put a strong emphasis on the context, showing how climate change and security interplay with each other in particular places and particular circumstances. These theories can only be built if social sciences are mobilized to study the causal processes and pathways between changes and various social outcomes.

Third, *power* remains often absent from the literature on climate and security. Vulnerability is a function of power: the power of political processes and markets to deny some groups the

freedoms and opportunities that they need to make choices in their interests and to act on those decisions, and the power of institutions to appropriate and divert processes that aim to overcome vulnerability. Vulnerability revolves around power, even at the most basic level. Individuals and communities may exhibit measurable metrics of vulnerability and exposure due to their economic and geographical marginality, yet also resist power and interventions through tenacity, strategic, and resourceful ways in which even the very destitute act in times of crisis to reduce their underlying vulnerability. Any theory that would seriously attempt to explain how climate change has a security dimension would need to place power at the heart of the analysis.

Finally, most of what we know about the relationship between climate change and security comes from the observation of patterns of the past. Given the present and projected future continued rise of greenhouse gas emissions, there is a risk of climate shifts that have no historical precedent for particular regions. In those circumstances it can be argued that over time, the insights from past adaptation strategies and crises will have declining explanatory power. So, approaches to understanding social futures under climate change are critically important, and these will challenge the social sciences.

5 Conclusions

In many parts of the world, climate change does not constitute an immediate threat to national security at present. What matters, and what may matter in the near term, is the way various institutions respond to the idea of climate change. Security communities will adapt within a security perspective to new climate realities. There is good evidence that states will react to climate change by responding to threats and risks rather than by also addressing the root causes of the problem. Yet if response is limited to security responses, fundamental underlying climate threats will remain neglected.

Governments and regions will respond to price and scarcity signals to manage their access to food, water, and energy markets, and these relationships constitute key domains of the climate and security relationship. Mitigation and adaptation policies, done poorly, exacerbate power asymmetries and dispossess vulnerable communities in ways that amplify various kinds of insecurities (Dabelko et al. 2013). Hence issues such as land use changes and changes in access to carbon stocks in forests associated with Reduced Emissions from Deforestation and Forest Degradation Projects (REDD+), the impacts of adaptation projects on communities and livelihoods, as well as land grabbing and forced migration in the name of food security, are the areas where climate responses may affect the insecurity of certain populations.

One can see the scope for climate response policies that can make conditions worse in ways that connect directly to security in its human, national, and global dimensions. Such policies would clearly be maladaptive, as they would increase the vulnerability of other systems to climate impacts (Barnett et al. 2013). But there is also scope for responses that can facilitate positive outcomes for human security, adaptation, and conflict mitigation. These efforts will need to be guided by appropriate and rigorous theories and evidence about climate change and security in particular places.

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