



DIE ERDE

Journal of the
Geographical Society
of Berlin

Advancing research on climate change, conflict and migration

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Manuscript submitted: 29 August 2018 / Accepted for publication: 14 December 2018 / Published online: 27 March 2019

Abstract

Policy makers across the entire globe have repetitively expressed concern about climate change as a trigger of mass migration and increased political instability. Recent research on both climate-conflict and climate-migration linkages has gained significant attention in the scientific and public debate. Both research fields are deeply intertwined and share some common characteristics. They also have been rapidly evolving during the past years with major achievements being made. Perhaps most importantly, an improved understanding of the role of (potential) climate change impacts in migration and conflicts has been achieved, which has been essential for moving beyond environmental determinism toward a more nuanced exploration of the interlinkages between climate, conflict and migration. Yet, significant conversations and uncertainties continue to exist, hence indicating the urgent need for further advances in these fields. Here, we debate cross-cutting and common pitfalls in both research fields and their implications for policy and research. These pitfalls include (i) insufficient attention to context factors and causal chains, (ii) underestimation of complex spatio-temporal patterns, (iii) discrepancies between quantitative and qualitative evidence, (iv) the non-consideration of adaptation strategies, and (v) a narrow spectrum of methods. We illustrate best practices and suggest ways to move the debate forward.

Zusammenfassung

Weltweit äußern Politiker*innen zunehmend Bedenken zur Rolle des Klimawandels als Auslöser für Massenabwanderung und politischer Instabilität. Die aktuelle Forschung zu Klima-Konflikt- und Klima-Migration-Links hat dabei zunehmend an Relevanz in der breiteren politischen und wissenschaftlichen Debatte gewonnen. Beide Forschungsfelder sind eng miteinander verknüpft und besitzen zahlreiche Gemeinsamkeiten. Sie haben sich in den vergangenen Jahren rapide weiterentwickelt und daher zu einem verbesserten Verständnis der Bedeutung (potenzieller) Klimawandeleffekte für Migration und Konflikt beigetragen. Diese Entwicklung ist essentiell für

Kathleen Hermans, Tobias Ide 2019: Advancing research on climate change, conflict and migration. – DIE ERDE **150** (1): 40-44



DOI:10.12854/erde-2019-411

eine Abkehr vom Umweltdeterminismus hin zu einer vielschichtigen Betrachtung der Wechselbeziehungen von Klima, Migration und Konflikt. Grundlegende Diskussionen und Unsicherheiten in diesem Forschungsfeld bestehen jedoch nach wie vor, welche die Dringlichkeit weiterer wissenschaftlicher Entwicklungen verdeutlichen. In diesem Artikel diskutieren wir Querschnittsthemen und für beide Forschungsfelder kennzeichnende Fallstricke sowie deren Implikationen für Politik und Forschung. Die aufgezeigten Fallstricke beinhalten (i) eine ungenügende Berücksichtigung von Kontextfaktoren und Kausalketten, (ii) das Unterschätzen komplexer räumlich-zeitlicher Zusammenhänge, (iii) Diskrepanzen zwischen quantitativen und qualitativen Forschungsergebnissen, (iv) die Vernachlässigung von Anpassungsstrategien und (v) ein begrenztes Methodenspektrum. Wir stellen bewährte Praktiken vor und unterbreiten Vorschläge für eine weiterführende Debatte.

Keywords climate change, conflict, migration, research gaps

1. Introduction

Policy makers in Washington, Brussels and elsewhere have repetitively expressed concerns about climate change as a trigger of mass migration and increased political instability. A supposed drought-migration-conflict link in Syria has further fuelled these debates (McDonald 2013; Ide 2018). Reacting to the increased political interest, a significant body of research on climate-conflict and climate-migration linkages (henceforth CCML) has become available (Hunter et al. 2015; Sakaquchi et al. 2017). Both research fields are deeply intertwined as climate change might increase the likelihood of civil violence with subsequent migration being a possible outcome, while migration that has been co-induced by climate-related factors can contribute to grievances and resource competition, hence increasing conflict risks (Brzoska and Fröhlich 2015).

Research on CCML has been rapidly evolving during the past years. Such progress has been the result of theoretical enhancements, in-depth field research and the availability of more high-resolution datasets. These developments have inspired increasingly sophisticated methodologies for studying CCML that challenge environmental determinism and highlight the role of (political-economic) context factors and (complex) indirect links (Neumann and Hilderink 2015; Ide 2017). Yet, despite the substantial achievements, deterministic approaches ignoring complex interlinkages still persist in research and policy. Further, significant uncertainties regarding causalities of climate, conflict and migration continue to exist. In the following, we discuss five cross-cutting deficits in both research fields, suggest ways to move the debate forward and refer to good practices.

2. Insufficient attention to context factors and causalities

The call for considering context factors in explanations of CCML is not new (e.g. Castles 2002; Barnett and Adger 2007) and major achievements towards that direction were made in the recent past (Hunter et al. 2015; von Uexkull et al. 2016). Yet, numerous prominent studies still focus predominantly – if not solely – on the question of *whether* climate change facilitates conflict or migration (e.g. Hsiang et al. 2013; Missirian and Schlenker 2017). Such a focus entails three important shortcomings: First, it could pave the way for deterministic approaches by ignoring complex and conjunctural pathways between climate change, conflict and migration. Second, as climate-conflict and climate-migration links are considered to be highly context-specific, a sole focus on the ‘whether’ question could yield negative results and hence mask a positive relationship in a specific subset of cases (where certain context factors are present). Third, in order to provide relevant policy advice for regions most vulnerable to CCML and ways to address this vulnerability, it is essential to consider the relevant contexts and causal chains.

To disentangle *whether*, as well as *how* and *when* climate change affects conflict and migration, several well-established procedures are available for cross-case studies, such as the use of interaction terms (Gray and Mueller 2012) and two-stage models (Buhaug et al. 2015). Beyond this, there is a need for well-designed, in-depth (comparative) case studies which are well suited to identify relevant pathways and vulnerabilities.

3. Underestimation of complex spatial and temporal patterns

Much of the quantitative research focuses on the area struck by climate-related extreme events such as droughts and floods and a time period one to 24 months after the event (*van Baalen and Mobjörk* 2018). However, CCML are likely to be characterised by complex spatio-temporal patterns insufficiently captured by such assumptions. Migration, for instance, could be triggered by long-term climate-related developments such as land degradation that evolve over several years. Rapid-onset disasters might trigger migration with a time lag of more than one or two years after a range of initially applied in-situ strategies are exhausted. Similarly, a drought might cause migration movements from more to less affected areas, leading to intergroup conflicts in the latter (*De Juan* 2015). The spatial overlap between the location of the drought event and the associated conflicts would hence be small.

In principle, such spatial and temporal complexity is hard to address unless multi-year and multi-level data are considered, as illustrated in a study of the influence of climate shocks on Mexico-US migration (*Nawrotzki and DeWaard* 2016). Another good example is a recent analysis on civil conflict in Africa that uses drought occurrence in the homeland of the fighting groups – rather than in the battle locations – as the independent variable (*von Uexkull et al.* 2016).

4. Discrepancy between qualitative evidence and quantitative modelling assumptions

Elaborated statistical procedures and models are the foundation for numerous prominent studies on CCML. Yet, a lack of engagement with qualitative evidence in a sustained dialogue leads to a suboptimal theoretical grounding and empirical contextualisation of quantitative analyses. For instance, a recent study found that temperature deviations in developing countries increase asylum applications to the European Union (*Missirian and Schlenker* 2017). Such a finding stands in stark contrast to a considerable number of qualitative studies, which largely agree that climate extremes tend to induce short-distance migration rather than cross-country movements (*Rigaud et al.* 2018). Against this background, concern arises that complex statistical models at best contain problematic theoretical and methodical assumptions

(such as using fixed effects instead of control variables or one-year time lags), with a change of the respective model parameters rendering the results insignificant (*Buhaug et al.* 2015). At worst, such models could ignore complex realities on the ground and promote a deterministic understanding of CCML (*Selby* 2014).

Again, these problems are far from inherent to the research field. Studies have used multi-method approaches, for example combining in-depth interviews in the region with regression analysis to study climate-conflict links (*Benjaminsen et al.* 2012). In-depth exchanges between qualitative scholars and model developers could further serve to discuss and, if necessary, refine the assumptions on which models are based. Similarly, qualitative scholars could draw on quantitative approaches to identify most-likely, least-likely or deviant cases for in-depth research (*Ide* 2017). Combining quantitative and qualitative evidence to more comprehensive assessments would also boost the ability of CCML scholars to provide advice to policy makers, who are skeptical about “anecdotal evidence” or “abstract models” alone (*Gilmore et al.* 2018).

5. Adaptation as response to climate change

There is a growing body of literature that illustrates how people being adversely affected by climate change adapt to or cope with these changes, with migration being just one among many adaptation strategies (*Wiederkehr et al.* 2018). Undoubtedly, this is one of the key developments in climate-migration studies (*Hunter et al.* 2015). Similarly, well-designed adaptation measures can reduce the conflict potential of climate change impacts. Yet, forward-looking studies, which are typically based on some sort of simulation model, tend to neglect the potential diversity of adaptation strategies and rather use a ‘keeping everything else constant’ framework, hence reinforcing a deterministic view on CCML. Dire predictions of climate change as a driver of mass migration and violence may prove inadequate when effective adaptation measures enter the picture.

Consequently, integrated approaches that are able to consider a range of climate change adaptation strategies – including migration – are needed, yet still missing. A promising way forward are scenario studies of certain regions or countries based on climate models, quantitative climate impact estimations and an in-

depth knowledge of the local context. Such studies would also be highly suitable to inform decision makers as demonstrated by the German Advisory Council on Global Change (*WBGU* 2007).

6. Broadening the spectrum of methods

While advancing the currently used methods is important, research on CCML would also benefit from broadening its spectrum of methods. So far, statistical analysis and qualitative single case studies are the most frequently used methodological approaches. The former are not free of pitfalls (as discussed above), while the latter may suffer from limited comparability and generalizability. Widening the spectrum of methods in research on CCML is hence appropriate.

Systematic meta-analyses can be a valuable tool to synthesise causal links and context factors identified as relevant in the published literature and bringing them to the attention of policy makers for identifying policy priorities (*Sakaguchi et al.* 2017). Literature-based meta-analyses have shown considerable promise for investigating human behavior in the context of climate change, yet are scarce with respect to CCML. We further advocate designing multi-site approaches for applying a consistent and comparable qualitative approach at several places, including the harmonization of underlying data collection methods, theories and concepts. Qualitative Comparative Analysis (QCA) is a promising approach to integrate quantitative and qualitative data on CCML in comparative analyses (*Ide* 2015).

When it comes to simulation approaches, agent-based models (ABMs) are promising for investigating CCML given their ability to depict individual behavior, which would complement the existing focus on structural factors. ABMs considering environment-migration linkages are still scarce and virtually lacking in the field of climate-conflict. Main reason for this is the required in-depth knowledge regarding an individual's behavior towards environmental change for deriving reliable behavior-based modeling rules. Given the major strides being made in the climate-migration-conflict field, time is ripe for further advances of ABMs, such as the representation of fully integrated socio-ecological feedbacks (*Thober et al.* 2018).

7. Conclusions

With CO₂ concentration in the earth's atmosphere rising, the number of armed conflicts on high levels, and migration flows increasing in a globalized world, CCML are an important challenge for the coming decades. Research on the issue has made significant progress in the recent years. Yet, uncertainties continue to exist. Besides, deterministic studies paying little attention to context factors, complex causal chains, questions of space and time, and adaptation processes still receive considerable attention by scholars and policy makers. This illustrates the need for further advancing our knowledge on CCML.

To move the debate forward, we advocate multi-method approaches that can draw insights and triangulate findings from qualitative and quantitative methods, while also reflecting upon underlying epistemological and ontological differences (see *Onwuegbuzi and Leech* 2005 for further discussion). In-depth (comparative) case studies can increase knowledge about causal links and actors' preferences, which can be used to design advanced statistical analyses (involving two-stage models, for example) or provide the basis for representing human decision making processes in ABMs. QCA is also well suited to trace complex causal links, including relevant context factors, with both case studies (to provide micro-level evidence) and statistical analyses (to test robustness and external validity) being suitable complements. But in-depth analyses characterized by deep familiarity with the local context are also indispensable to disentangle the complex spatial and temporal patterns through which climate change, conflict and migration might be connected.

Such enhanced analyses would provide the basis to trace complex interlinkages between climate change, conflict and migration, to identify relevant context factors, and hence to conduct elaborated scenario studies. Conducting workshops or consultations with decision makers would also increase the ability of scholars to provide advice relevant to practitioners (although critical research that is not immediately relevant for solving policy problems remains important as well). All of these advances would boost the ability of the research field to provide policy advice regarding several intertwined challenges of the 21st century.

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