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Is climate change a driver of armed conflict?

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Abstract The world is generally becoming less violent, but the debate on climate change raises the specter of a new source of instability and conflict. In this field, the policy debate is running well ahead of its academic foundation—and sometimes even contrary to the best evidence. Although comparative research on security implications of climate change is rapidly expanding, major gaps in knowledge still exist. Taken together, extant studies provide mostly inconclusive insights, with contradictory or weak demonstrated effects of climate variability and change on armed conflict. This article reviews the empirical literature on short-term climate/environmental change and intrastate conflict, with special attention to possible insecurity consequences of precipitation and temperature anomalies and weather-related natural disasters. Based on this assessment, it outlines priorities for future research in this area.

1 Introduction

A liberal peace seems to be in the making (Gleditsch 2008), with a decreasing number of armed conflicts (Gleditsch et al. 2002; Themnér and Wallensteen 2011) and lower severity of war as measured by battle-related deaths (Lacina et al. 2006; HSRP 2010). There is a long-term decline in violence, within as well as between states (Goldstein 2011; Pinker 2011). At the same time, there has been a strong increase in democracy, trade, international economic

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integration, and memberships in international organizations, as well as in international peacekeeping and mediation efforts. Figure 1 illustrates the trends in the frequency and severity of armed conflict in the past 65 years.

Financial crises, globalization, population growth, and fundamentalist ideology are widely seen as severe obstacles on the continuing road towards a less violent world. But the greatest challenge to the global liberal peace, according to an increasingly widespread view, is the threat of climate change. Fears on this score have been expressed by, e.g., the Norwegian Nobel Committee (Mjøs 2007), the United Nations Security Council (UN 2007), and US President Barack Obama (2009). Despite this rhetoric, there is little systematic evidence to date that short-term climate variability, such as prolonged droughts or unusually warm weather, has any observable effect on the general pattern of conflict in modern times.

The Intergovernmental Panel on Climate Change (IPCC) is the main source of scientific information on the causes and consequences of climate change and has had a strong influence on the agenda of the public debate. Thus far the IPCC has not made the security implications a priority issue. The Third and Fourth Assessment Reports (IPCC 2001, 2007) make scattered comments on climate change in the reports from Working Group II on «Impacts, Adaptation, and Vulnerability» (notably in the Africa chapter of AR4), but these comments are weakly founded in peer-reviewed research. By the time AR4 was published, there was some relevant literature on scarcity models of conflict that was not systematically reviewed by IPCC, but little specifically on climate change and conflict. Since then, a more directly relevant literature has emerged. The Fifth Assessment Report (AR5), scheduled for 2013–14 (IPCC 2012), will include a chapter on “Human Security” with a designated section on “Conflict.” In what follows, we review the relevant literature and discuss some priorities for future research.

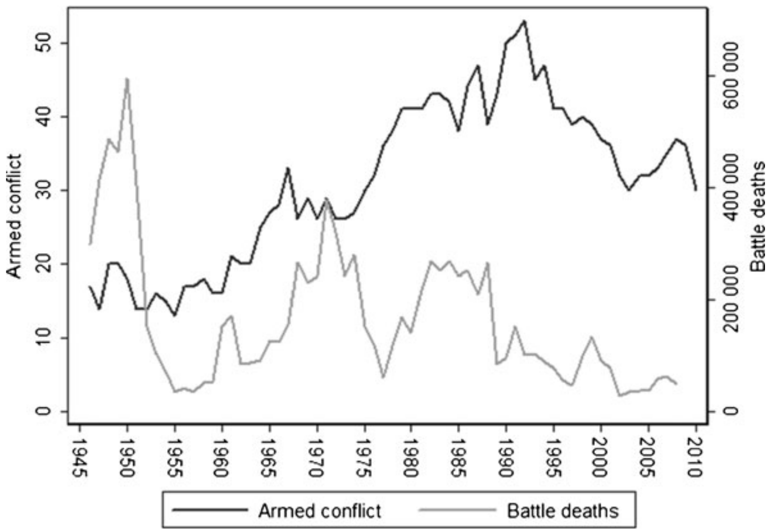

Fig. 1 Frequency and severity of armed conflict, 1946–2010. Source: UCDP/PRIO Armed Conflict Dataset, v. 4–2011 (Gleditsch et al. 2002; Themnér and Wallensteen 2011) and PRIO Battle Deaths Dataset, v. 3.0 (Lacina and Gleditsch 2005). Data, precise definitions, and sources can be found at www.prio.no/cscw/datasets and www.pcr.uu.se/research/UCDP/. The figure includes all state-based conflicts with at least 25 battle deaths in a calendar year

2 Linking climate change to conflict

Three effects of climate change (natural disasters, sea-level rise, and increasing resource scarcity) are frequently assumed to lead to loss of livelihood, economic decline, and increased insecurity either directly or through forced migration. Interacting with poor governance, societal inequalities, and a bad neighborhood, these factors in turn may promote political and economic instability, social fragmentation, migration, and inappropriate responses from governments. Eventually this produces increased motivation for instigating violence as well as improved opportunities for mobilization.[1]

In the following we review the evidence for some of these links via four contexts frequently invoked in writings on climate change and security: changes in precipitation and temperature, rising sea level, and natural disasters. We leave out the question of whether climate change could lead to more interstate conflict. The literature on resource scarcities and violence generally sees interstate conflict over these issues as a more remote possibility (Homer-Dixon 1999: 5). We have also left out a small number of studies that look at climate and conflict in a very long-term perspective (up to a millennium). The rise of the modern state, large-scale international trade, and industrialization has taken place during the last two centuries, which is a period with little change in climate averages. The focus on short-term variation in rain and temperature is partially due to data constraints as there are few other environmental indicators that are exogenous to human behavior. Besides, short-term changes do not facilitate adaptation and external intervention so any observed correlation is more likely to reflect a genuine causal relationship. Endogenous links aside, long-term effects of climate change on conflict necessarily imply a complex causal chain, the elements of which are hard to isolate and detect in a systematic, quantitative manner. One of the main projected effects of global warming is greater variability in precipitation and temperature patterns, which may lead to an increase in disaster rates (Van Aalst 2006:5; IPCC 2011).

3 Evidence

3.1 Changes in precipitation and temperature

The simple scarcity (or neo-Malthusian) model of conflict assumes that if climate change results in a reduction in essential resources for livelihood, such as food or water, those affected by the increasing scarcity may start fighting over the remaining resources. Alternatively, people may be forced to leave the area and create new scarcities when they encroach on the territory of other people who may also be resource-constrained. Barnett and Adger (2007) review a broad range of studies of both of these effects, focusing particularly on countries where a large majority of the population is still dependent on employment in the primary sector. If climate change results in reduced rainfall and higher temperature that jointly causes droughts, and reduced access to the natural capital that sustains livelihoods, poverty will be more widespread and the potential for conflict greater.

A long line of research links hot temperatures to individual aggression, including violent crime and riots. Anderson (2001) suggests that therefore global warming may increase violence. But the causal mechanism proposed in these studies (personal discomfort) is different from the scarcity thesis that is at the core of the relationship proposed in the

[1] We refer to Buhaug et al. (2010) for a more comprehensive exposition of possible causal linkages between climate change and violent conflict.

literature on climate change and armed conflict (Reuveny 2007; Burke et al. 2009) and the kind of violence is also different. Other studies that focus on individual-level behavior, drawing on relative deprivation or opportunity cost arguments, find scarcity to be associated with more violence or crime. Mehlum et al. (2006) report that in 19th century Bavaria, abundant rainfall ruined harvests which raised rye prices in turn leading to higher rates of property crime.[2] Likewise, Miguel (2005) concludes that both positive and negative extremes in rainfall increased the frequency of witch killings in a rural Tanzanian district. Using a field experiment from semi-arid Tanzania, Lecoutere et al. (2010) find water scarcity to drive conflictive behavior, particularly so for poor and marginalized households. Hidalgo et al. (2010) find that rainfall deviations as an instrument for agricultural economic shocks lead the rural poor to invade large landholdings in Brazil, and particularly so in municipalities with a highly unequal land distribution. Thus, if we were to make an inference from unorganized events with low levels of violence to organized armed conflict, we would expect worsening climatic conditions to coincide with more armed conflict.

Table 1 below provides an overview of quantitative studies of climate factors in organized violence. Each column represents a specific conflict type under study whereas each row corresponds to a proposed climate-conflict connection. The lack of consensus on empirical findings is striking. This is partly a consequence of the diversity of indicators applied although it is also in part a consequence of differences in samples, time periods, and estimation techniques.[3]

Riots and small-scale clashes are other suggested social consequences of climate change related to armed conflict. The «Arab spring» starting in early 2011 has once more demonstrated that initially peaceful demonstrations can trigger protracted and bloody confrontations, although the link to climate is unclear in this case. Hendrix and Haggard (2012) find that higher food prices in weak regimes increase the risk of urban riots. Similarly, Bohlken and Sergenti (2010), analyzing Hindu-Muslim riots in India, find negative rainfall growth to decrease economic growth which in turn increases the risk of a riot.

Several statistical studies of conflict in Africa have found social violence and communal conflict to be most likely in or following wet periods (Raleigh and Kniveton 2012; Hendrix and Salehyan 2012; Theisen 2012). The two first studies also found some increased risk following particularly dry periods, in line with a recent study by Fjelde and von Uexkull (2012) which finds drier years to be less safe. Thus, the support for the scarcity scenario is mixed. Anthropological research on cattle raids in Africa has also found death rates in years with abundant rainfall to be higher than in dry years (Witsenburg and Adano 2009; Adano et al. 2012) or in seasons with less vegetation (Meier et al. 2007). Dry periods are associated with cooperative behavior (Eaton 2008). From a climate-and-security perspective this might seem surprising as small-scale violence has been argued to be the most likely phenomenon to be affected by resource scarcity. However, pastoralist violence seems to be more driven more by tactical concerns than by resource-based grievances. Adano et al. (2012) argue from two case studies in Kenya that whether tensions are high in scarce (Maasai area) or in abundant (Marsabit district) contexts, the local groups' use of traditional as well as modern institutions are instrumental in preventing escalation into violent conflict. Using a contest success function model Butler and Gates (2012) deduce theoretically that the presence of biased property rights institutions in periods of relative rainfall abundance is crucial in determining whether Eastern African pastoralists engage in inter-ethnic violence or focus on production, but they do not test

[2] Conversely, the study suggests that rates of violent crime dropped due to a rise in beer prices.
[3] A summary table obscures the fact that not all analyses are of the same scope and rigor. However, the lack of consensus on specification issues precludes us from ranking studies according to such (yet to be established) objective criteria. We try to partially compensate for this by indicating some findings that are more recent.

Table 1 Climate factors and organized conflict—quantitative studies

Hypothesis	Civil conflict	Communal violence	Riots
Short-term rainfall deficiency increases risk	2 support, 4 none, 1 opposite = inconclusive (7)	1 support, 2 weak support, 2 none, 2 opposite = inconclusive (7)	
Short-term rainfall deficiency increases risk via economic growth	1 support, 1 (more recent) weak support, 1 (more recent) none = inconclusive (3)		1 support = inconclusive (1)
Short-term warming increases risk	"2 support, 1 none = some relationship (3)	1 mixed support = inconclusive (1)	
Short-term warming increases risk via economic growth	1 very weak support = inconclusive (1)		
Natural disasters increase risk	3 support, 2 some support, 1 (more recent) none; 1 (more recent) opposite = some relationship (7)	1 support (in Indonesia) = inconclusive(1)	
Natural disasters increase risk via economic growth	2 no support = inconclusive (1)		
Land degradation (stable levels) increase risk	2 support, 2 none, but measure questionable = inconclusive (4)		
Water scarcity (stable levels) increase risk	2 some support, 2 none, 1 opposite = at most a weak relationship (4)		
Less vegetation increases violence	1 opposite = inconclusive (1)		
Short-term fluctuations in food prices increase risk			1 study finds peaks in wheat price growth and decline to increase risk = inconclusive (1)

Civil conflict is an armed conflict between a government and an organized rebel movement, communal violence is an armed conflict between two organized groups, and a riot is spontaneous protests by (mostly) unorganized actors. The figures in each cell denote the number of studies that support, weakly support, do not support, or contradict the proposed hypothesis; total number of reviewed studies per outcome is given in parenthesis. All relationships based on a single study are characterized as inconclusive. A more detailed description of the studies included is included in an online appendix at our replication site www.prio.no/cscw/datasets this empirically. Much of this research is on pastoralist societies in drylands and it is reasonable to assume that the mechanisms at play are different from those driving civil wars. Indeed, Raleigh and Kniveton (2012) find that communal violence takes place in less-populated areas, in contrast to what is found for civil war (Theisen et al. 2011/12). Due to a lack of reliable data, there are few studies on climate factors and small-scale violent conflicts outside East Africa. One study using survey material on Indonesia concludes that villages that had suffered a natural disaster during the last 3 years were more likely to experience violent conflict (Barron et al. 2009). A study of the Mopti region of Mali finds no relationship between climatic conditions and land-use disputes (Benjaminsen et al. 2012). Rather than natural resource scarcity, they find restricted mobility for pastoralists, political negligence, and rent seeking and corruption to be at the heart of the conflict. Research on communal violence, a field still in its infancy, points to the importance of abundance as well as scarcity of resources, primarily measured as rainfall, as contributions to violence.

Given economic and organizational constraints and not least the fact that rebels are fighting a government, armed civil conflicts are quite different from individual crime and low-level violence. Statistical studies of civil conflicts globally (Esty et al. 1998; Raleigh and Urdal 2007) or in Africa (Hendrix and Glaser 2007) provide only limited support for neo-Malthusian hypotheses. For instance, Raleigh and Urdal (2007: 674) concluded on the basis of local-level data that the effects of land degradation and water scarcity were «weak, negligible, or insignificant». Moreover, for the «favorite case» of Darfur, Kevane and Gray (2008) found precipitation levels to increase from the early 1980s until 2003 when the conflict escalated. Brown (2010) corrobates this result, showing that for the same period the vegetation cover of the area increased. Likewise, Rowhani et al. (2011) found a positive association between ecosystem productivity and civil conflict areas in Eastern Africa.

Many of the early studies were inspired by Miguel et al. (2004), which presented the first systematic analysis of rainfall variability and civil war in Africa. Although this article used negative rainfall growth as an instrument for economic shocks, its conclusion that loss of rainfall increases conflict risk has immediate implications for the climate-security debate. More recently, the Miguel et al. study has come under some fire, partly due to how conflicts are coded (Jensen and Gleditsch 2009), and partly due to how climate anomalies are measured (Ciccone 2011; see also response by Miguel and Satyanath 2011). Looking at a broader set of conflicts for the past two decades, Hendrix and Salehyan (2012) found rainfall to be correlated with civil war and insurgency, but it is wetter years that are more likely to suffer from violent events. Extreme deviations in rainfall—unusually dry and wet years—are associated with all types of political conflict. "In some contrast to this, O'Loughlin et al. (2012) find anomalous wet periods to reduce the risk of violence.

A study of temperature and conflict (Burke et al. 2009) finds civil war in Sub-Saharan Africa 1981–2002 to be significantly more widespread during warmer years, concluding that civil war incidence would increase by about 50 % within 2030 on current climate emission trajectories. More recently, Buhaug (2010a) argues that this result is sensitive to three analytical decisions: estimation technique, sample period, and choice of conflict data. While the jury is still out on the methodological divide, Burke et al. (2010) now agree that temperature is unrelated to civil war in more recent years. Burke and co-authors have not responded to the third issue raised by Buhaug (2010b). A more recent study by O'Louglin et al. (2012) find much warmer than normal periods to increase the risk of violence.

Koubi et al. (2012) apply both temperature and precipitation deviations as instruments for economic growth to see if this variation in growth predicts onset of civil conflict. Unlike Miguel et al. (2004) they fail to find any relationship between worsening climate and economic performance, and find only weak support for the notion that climate driven economic shocks increase conflict risk in non-democratic settings. In a similar vein, Gizelis and Wooden (2010) find countries with poor institutions and high but stable levels of water stress to be more prone to civil conflict. All of these studies are conducted at the national level. But rainfall patterns do not follow national boundaries. In a first spatially disaggregated study of rainfall variability and armed conflict, Theisen et al. (2011/12) finds no support for a localized, short-term impact of drought on conflict.

Finally, a widely publicized article by Hsiang et al. (2011) reports civil war risk in the tropics and subtropics to be significantly higher during El Niño periods than during La Niña. The analysis reveals that the El Niño effect does not work through local variations in temperature and precipitation. While this is certainly a finding that deserves further scrutiny it makes the study less relevant in this context.[4]

3.2 Natural disasters

Global warming is predicted to increase the frequency and intensity of natural disasters. There has been a sharp increase in the number of disasters over the last 6 years,[5] although it is unclear how much of this can be accounted for by improved reporting, population growth, and shifting patterns of settlement (Guha-Sapir et al. 2011: 1). Asia is the region most heavily affected. Geological disasters like volcanic eruptions, earthquakes, and tsunamis need not concern us here, since they are unlikely to be influenced by climate change. The temporal increase in disaster frequency as shown in Fig. 2 is largely accounted for by hydrological and meteorological disasters, especially floods.

The severity of disasters, measured as the number of casualties, shows no evident time trend, presumably because of increasing coping capacity in many countries. Future economic development is likely to further increase the ability of many societies to absorb natural disasters without great loss of human life, so an increase in extreme weather events need not be accompanied by higher casualty figures.

Natural disasters are expected to exacerbate conflict risk primarily through economic loss and a weakening of government authority. Some statistical studies do indeed find the risk of conflict to be higher following natural disasters (Drury and Olson 1998; Brancati 2007; Nel and Righarts 2008). However, these findings are challenged by Slettebak (2012), who reports an opposite effect and attributes it to a tendency to unite in adversity.[6] Omelicheva (2011) finds that when state fragility is taken into account, the risk of state failure in the aftermath of a disaster is minimal or disappears. Besley and Persson (2011) find that climatic disasters do not affect growth, but increase the risk of civil war, but only so in fragile states. Another recent study, Bergholt and Lujala (2012), reaches the opposite conclusion. It finds that climatic natural disasters have a negative impact on economic growth but have no effect on the onset of conflict, neither directly nor as an instrument for economic shocks. The discrepancy between these two studies is arguably due to the former studying the incidence of civil war and disasters which could introduce endogeneity problems.

[4] That said, there is no consensus on the extent to which global climate change will impact the incidence and severity of El Niño and La Niña episodes (IPCC 2007: 780).

[5] Guha-Sapir et al. (2011: 7) define a disaster as 'a situation or event which overwhelms local capacity, necessitating a request to a national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering.'

[6] Brancati (2007) studied only earthquakes and Nel and Righarts (2008) also found stronger results for geological than for climatic disasters.

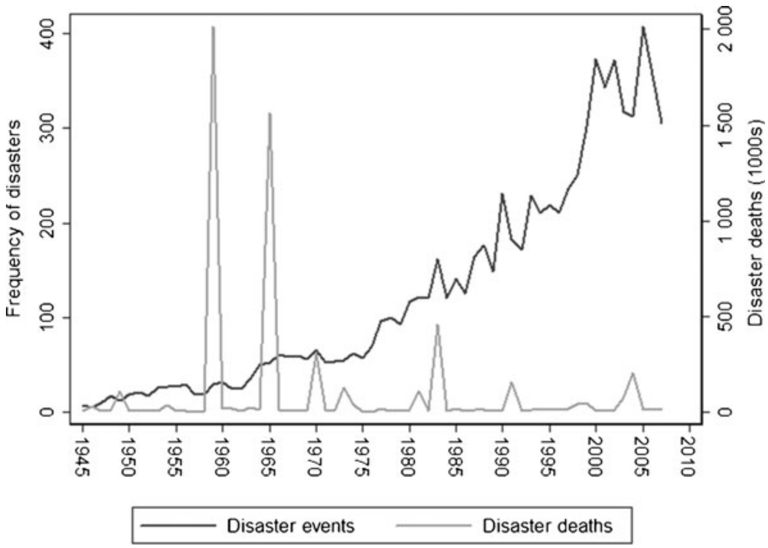

Fig. 2 Hydro-meteorological disasters since 1946. Source: EM-DAT, Centre for Research on the Epidemiology of Disasters (CRED). Data available from www.emdat.be

3.3 Sea-level change and migration

IPCC (2007, WG II: 323) forecasts a global mean sea-level rise of between 0.28 and 0.43 m within this century, depending on the scenario chosen.[7] Projections for the size of coastal populations (residing below 100 m elevation and less than 100 km from the coast) indicate that they may rise from 1.2 billion (1990 estimate) to between 1.8 and 5.2 billion by 2080 (Nicholls and Small 2002). Sea-level rise will threaten the livelihood of the populations on small island states in the Indian Ocean, the Caribbean, and the Pacific. However, a much larger number of people in low-lying areas, rural and urban, and particularly in South Asia and West Africa, may become more exposed to soil erosion, seasonal flooding, and extreme weather. Depending on the degree of protection that can be offered, this in turn may generate «climate migration.»

The nature and extent of migration in response to climate change are unknown, and whether such displacement will cause severe host-newcomer tensions is also open to debate (e.g., Nicholls and Tol 2006). Due to conceptual problems (what is an environmental migrant, and is it a useful concept?) and, consequently, lack of systematic data, the impact of environmental change on migration has not been subject to much rigorous, comparative analysis (Gleditsch et al. 2007). Studies that look at a non-random set of cases with out-migration in areas with severe environmental degradation (e.g., Reuveny 2007) provide suggestive evidence that climate change *could* trigger more human mobility. Perch-Nielsen et al. (2008: 390) modifies this view and hold that whereas natural disasters such as floods «will not likely be a major mechanism» driving migration, but rather temporary displacement, sea-level rise will have a stronger effect. Moreover, although climate change may increase the motivation for migrating, it may at the same time reduce the mobility capacity (Foresight 2011). Thus, the net impact remains unknown, and the main effect of climate

[7] More recent estimates tend to be higher. Grinsted et al. (2009) project sea-level to rise between 0.9 and 1.3 m within the twenty-first century, based on the A1B scenario.

change on migration is likely to be indirect by affecting economic and social variables that already drive migration. Yet, the state of research in this area is too patchy to draw general conclusions about likely future implications of climate change on migration and conflict. Accordingly, we see this as one of the most important (but also challenging) priorities for future research on security implications of climate change. The recent Foresight (2011) report on migration is an important step in the right direction.

4 Uncertainty, assumptions, and research priorities

Despite recent progress in forecasting (e.g., Goldstone et al. 2010; Hegre et al. 2013), social scientists are still poorly equipped to predict rare events like conflict. Climate change is just one of many areas where policy prescriptions are dependent on more successful efforts at prediction (Schneider et al. 2010). In order to improve our understanding of where, when, and how climate change may generate instability and conflict, several challenges should be addressed. Here, we will briefly discuss four research priorities that relate mostly to the quantitative empirical literature, though we acknowledge that a number of important challenges remain also within case-based research and more theoretical work, including scenario building and other non-statistical forecasting techniques

First, we need to develop a better understanding—and empirical modeling—of plausible indirect links between environmental variability and change and armed conflict. To date, most research on the security effects of climate change are limited to investigating direct associations despite the fact that the literature on resource scarcity and violence (Homer-Dixon 1999) as well as that on climate change and conflict (Buhaug et al. 2010) point to the importance of mediating factors. The only mechanism linking climate change to conflict that has been assessed concerns economic growth (Bergholt and Lujala (2012); Koubi et al. 2012). This is mainly due to considerable disagreement or lack of knowledge on the intermediate linkages between likely consequences of climate change and violent conflict as well as data constraints. One of the most frequently mentioned yet critically understudied topics is the effect on migration and its social consequences including conflict. The comprehensive Foresight report (2011) concluded that climate change will likely trigger out-migration from vulnerable regions and amplify current urbanization trends. With regards to the effect migration may have on violent conflict, its conclusions are very modest and focus far more on how conflicts make populations vulnerable to environmental adversity, concluding that «Overt conflict between migrants and established residents remains the exception rather than the rule» (ibid: 114). Long-term economic development is arguably another important mechanism. While the discussion above has shown that there is mixed evidence on the effect of climatic shocks via economic growth on civil conflict, rainfall variability is found to decrease growth in SSA (Barrios et al. 2010) and higher temperature to harm exports from poor countries (Jones and Ohlken 2010). However, much less is known about longer term growth and development, partially because over the longer-term it is harder to single out the unique effect of climate factors. Nevertheless, we know that low economic development is highly correlated with conflict (Hegre and Sambanis 2006) and the potential indirect effects of climate change on conflict through development should therefore be high on the agenda for future research. In order to gain more insight into possible processes connecting climatic factors and violent conflict, such as migration and economic development, high-quality case studies are still much in need for future theory development.

Second, more work needs to be put into the geographical disaggregation of the effects of climate change since these effects will not follow national boundaries. Along the same lines, identifying the most vulnerable groups of societies and evaluating their potential for armed mobilization is an inherent challenge. Actors and agency tend to be vaguely portrayed, or outright ignored, in the relevant empirical literature. Similarly, abnormal timing and intensity of precipitation (and temperature) can be just as devastating for subsistence based livelihoods as annual aberrations from the norm (see Mortimore 1998). Although the IPCC scenarios point to a 90 % likely increase in short-term variability, only a handful of conflict studies have taken this insight into account (Hidalgo et al. 2010; Raleigh and Kniveton 2012; Theisen 2012; Theisen et al. 2011/12; Witsenburg and Adano 2009). However, it is much more challenging to determine the proper spatial and temporal scale for indirect effects than for direct effects. For instance, to assess whether national aggregates or sub-national indicators are the most appropriate in studying the effect of drought on food prices requires assessing the degree of integration of local food production in the national and international market (among a host of other factors).

Third, focus should be on the poorer parts of the world, where the adaptive capacity is low today. Some countries in the developing world now have high economic growth rates and are likely to be in a position to absorb greater changes 50 years from now. Therefore, particular attention needs to be paid to countries that are not only poor but also stagnating.

Finally, we need to go beyond severe, state-based violence considered in most statistical studies to date. Much of the case study literature refers to intergroup or one-sided violence, but this has hardly been tested in large-n studies. Unfortunately, the spatial and temporal coverage of these types of conflict data are still limited, so improved data collection is a priority.

5 Conclusions

Given the potential range and scope of consequences of climate change, it is not surprising that there is widespread concern about its security implications. In part, this concern has been directed at raising awareness about «environmental security» in a broad sense. Climate change will have many serious effects, particularly transition effects, on peoples and societies worldwide. The hardships of climate change are particularly likely to add to the burden of poverty and human insecurity of already vulnerable societies and weak governments. However, the use of such wider concepts of security must not stand in the way of a focused effort to analyze empirically the possible link between environmental change and violent conflict. Given the lack of consensus for a climate-conflict link,[8] simply assuming such a link may lead peacemaking astray. This can eventually also undermine the credibility of the IPCC and the efforts to reach a consensus of knowledge about human-made climate change and a concerted global effort at mitigation and adaptation. The climate-conflict discourse can also be exploited by actors who want to escape responsibility (Salehyan 2008). Indeed, the expressed view of the Khartoum government is that the Darfur conflict has its roots in environmental factors exogenous to the regime.

Finally, what if the academic community were to conclude that climate change has a trivial impact on armed conflict risk? Does it matter? It matters a great deal for the credibility of climate change research. It is an abuse of the precautionary principle to promote low-probability hazards to major threats. For adaptation to climate change, clarifying the conflict effects may also be important. Preventing armed conflict is likely to require countermeasures that are different than preventing biodiversity loss. For the need to mitigate the effects of

[8] Several earlier summaries of the extant literature (Bernauer et al. 2012; Gleditsch 2012; Scheffran et al. 2012) point in the same direction.

climate change, however, the effects of climate change on conflict probably matter very little. There are many other reasons to reduce the human impact on the climate and to prevent global warming from getting out of hand.

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