II. Weather-related disasters and violent conflict

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One of the consequences of climate change is an increase in extreme weather events such as droughts, floods, heatwaves and storms.[1] Many of these events lead to destruction and death. The study of weather-related disasters has recently become more prominent as a way to analyse potential links between climate change and violent conflict. The study of the social consequences of disasters seems particularly promising as a means to increase knowledge about structural conditions, conflict dynamics and specific mechanisms linking weather-related disasters and violent conflict.[2] The environmental consequences of extreme weather-related disasters (i.e. floods and droughts) do not differ in principle, and the stresses placed on the social and political fabric of affected societies by weather-related disasters are more immediate than the slow-onset consequences of climate change.

A number of important studies on the link between weather-related disasters and violent conflict were published in 2016, which have added new findings and theories to the literature on this topic. However, as is the case with the studies on the climate–conflict link in East Africa presented in section I of this chapter, evidence of a link between weather-related disasters and violent conflict remains contested in the literature. Based on a general assessment of the findings, much seems to depend on the case in focus, the technicalities of the chosen method and the interpretations of the relative weight of climate change-related factors in relation to other factors.[3] The strongly diverging views of the role a drought in north-eastern Syria between 2007 and 2011 played in the onset of the civil war in Syria, which began in the spring of 2011, highlight this complexity. While some see the drought, ensuing income losses suffered by the local population and the migration from north-eastern Syria to other parts of the country as crucial factors leading up to the protests against the Syrian Government, others dismiss this narrative as unconvincing.[4] They argue that for the population who rose in opposition to the government, the economic effects of the drought had few consequences and, furthermore, that the opposition's main

[1] Stott, P. A. et al., 'Attribution of extreme weather and climate-related events', *WIREs Climate Change*, vol. 7, no. 1 (Jan. 2016), pp. 33–41.

[2] Most of the literature on the relationship between disasters and violent conflict also considers geological events, particularly earthquakes. With respect to their effects, earthquakes are generally similar to weather-related disasters, but the main focus in this section is on weather-related disasters.

[3] Buhaug, H., 'Climate–conflict research: some reflections on the way forward', *WIREs Climate Change*, vol. 6, no. 3 (May/June 2015), pp. 269–75.

[4] Gleick, P. H., 'Water, drought, climate change, and conflict in Syria', *Weather, Climate, and Society*, vol. 6, no. 3 (July 2014), pp. 331–40.

concerns were political repression as well as the regime's violent reaction to the opposition's demands for more rights and freedom.[5]

This section aims to contribute to the growing body of literature which argues that both the structural conditions of societies, such as poverty and the fragility of institutions, and the dynamics of conflicts need to be at the centre of the analysis of the links between climate change and violent conflict.[6] As is also argued in section I, conflicts are shaped by human agency based on people's material capabilities as well as their perceptions of differences with other people in terms of interests, goals and values. Major changes in natural environments through climate change are likely to alter such perceptions. However, the outcomes of the complex social and political processes that are set in motion by environmental change are not determined.

Seen from this perspective of conflict analysis, the prime challenge of research on the effects of climate change on violent conflict is to identify the circumstances under which environmental change is likely to lead to violent conflict and where it is likely to be managed peacefully.[7] An important tool for such an analysis is the search for mechanisms that drive the dynamics of conflict beyond single cases. In order to contribute to this effort, this section focuses on a discussion of some of the most deadly weather-related disasters between 2000 and 2016, and their relation to violent conflict, with the goal of identifying important mechanisms. Before embarking on this discussion, it is important to first provide some background information on recent weather-related disaster patterns as well as a selected overview of the current academic literature on the link between weather-related disasters and violent conflict.

Weather-related disasters

There have been numerous highly destructive weather-related disasters in the 21st century. While 2016 was far from being a record year for weather-related disasters, data from the year does serve to illustrate the destructiveness of such events. The Emergency Events Database (EM-DAT) maintained by the Centre for Research on the Epidemiology of Disasters recorded a global total of 257 weather-related disasters in 2016. Combined, these disasters caused more than 6000 deaths and affected more than

[5] Fröhlich, C., 'Climate migrants as protestors? Dispelling misconceptions about global environmental change in pre-revolutionary Syria', *Contemporary Levant*, vol. 1, no. 1 (Apr. 2016), pp. 38–50.

[6] Buhaug (note 3); Ide, T. and Scheffran, J., 'On climate, conflict and cumulation: suggestions for integrative cumulation of knowledge in the research on climate change and violent conflict', *Global Change, Peace & Security*, vol. 26, no. 3 (2014), pp. 263–79.

[7] Scheffran, J. et al., 'Climate change and violent conflict', *Science*, 18 May 2012, pp. 869–71.

Table 8.1. Weather-related disasters, by disaster type, 2016 and 2000–16

	2016			2000–16		
Disaster type	No. of events	Estimated total deaths (in thousands)	Estimated total no. of people affected (in millions)	No. of events	Estimated total deaths (in thousands)	Estimated total no. of people affected (in millions)
Drought	14	0	356	293	21	1 347
Extreme temperatures	9	>1	1	369	161	94
Flood	145	4	12	2 790	93	1 462
Landslide	13	>1	>1	313	14	4
Storms	67	2	6	1 705	193	556
Wildfire	9	>1	>1	198	1	3
Total	**257**	**6**	**375**	**5 668**	**483**	**3 466**

Source: Centre for Research on the Epidemiology of Disasters (CRED), Emergency Events Database (EM-DAT), accessed 10 Apr. 2017, <http://www.emdat.be>.

375 million people.[8] Floods were the most frequent weather-related disasters in 2016, while droughts affected by far the largest number of people (see table 8.1).

Between 2000 and 2016 flood was the most frequent type of weather-related disaster. More people were affected by floods than by droughts during the period, while storms, followed by extreme temperatures, were the weather-related disasters most frequently responsible for deaths.

The single most deadly weather-related disaster so far in the 21st century is the tropical cyclone Nargis, which originated over the Indian Ocean and hit the coast of Myanmar on 2–3 May 2008 (see table 8.2). Tropical cyclones were also responsible for several other major disasters in 2000–16, notably in Bangladesh, Haiti and the Philippines. Among the other subtypes of disasters recorded in EM-DAT, heatwaves stand out as having particularly high death tolls. The death tolls for heatwaves in 2000–16 were significantly higher than even the most devastating floods and droughts in that period, although floods and droughts affected comparatively large numbers of people.[9]

[8] All data on disasters used in this section comes from the Centre for Research on the Epidemiology of Disasters' Emergency Events Database (EM-DAT), the largest and most comprehensive publicly available global database (as of 10 Apr. 2017). Events are included in the database when 1 of the following 4 criteria is fulfilled: (*a*) 10 or more people dead; (*b*) 100 or more people affected; (*c*) declaration of a state of emergency; or (*d*) a call for international assistance. EM-DAT has no data for people affected by heatwaves. See EM-DAT Data Entry Guidelines, <http://www.emdat.be/guidelines>. EM-DAT records all kinds of disasters, classifying them into several groups and types. This section uses the term 'weather-related disasters' as aggregate for the EM-DAT types of climatological, hydrological and meteorological events.

[9] E.g. more than 300 million people were affected by several floods and storms in Bangladesh, China and India in 2000–16.

Table 8.2. The 10 most deadly weather-related disasters, 2000–16

	Location (country)	Disaster subtype	Estimated total deaths (in thousands)	Estimated total no. of people affected (in millions)
May 2008	Myanmar	Tropical cyclone	138	2.4
July–Aug. 2003	France, Germany, Italy, Portugal, Spain, others	Heatwave	68	..
June–Aug. 2010	Russia	Heatwave	56	..
Feb. 2010–Nov. 2011	Somalia	Drought	20	4
Nov. 2013	Philippines	Tropical cyclone	7	16
June 2013	India	Flood	6	0.5
Nov. 2007	Bangladesh	Tropical cyclone	4	9
May–Aug. 2010	China	Riverine flood, landslide	4	134
Sep. 2004	Haiti	Tropical cyclone	3	0.3
June–Aug. 2015	France	Heatwave	3	..

.. = data unavailable or not applicable.

Source: Centre for Research on the Epidemiology of Disasters (CRED), Emergency Events Database (EM-DAT), accessed 10 Apr. 2017, <http://www.emdat.be>.

Differentiating the general evidence

In the past decade research beyond single cases has produced a wide range of outcomes in analyses of correlations between weather-related disasters and different types of violent conflict. For instance, Nel and Righarts detected a statistically significant link between weather-related disasters and the onset of intrastate armed conflict, a finding which was contradicted in an analysis by Slettebak that used the same data but in a different model, resulting in the finding of a decrease in the incidence of armed conflict after weather-related disasters.[10] Nardulli, Peyton and Bajjalieh investigated the link between weather-related disasters and political violence, confirming a statistically positive relationship.[11] A study by Ghimire, Ferreira and Dorfman investigated a global data set of major floods over the period 1985–2009, and found a statistically significant link between migration induced by weather-related disasters and the intensity of violent conflict.[12] Salehyan and Hendrix, on the other hand, found that there was a lower incidence of political violence after

[10] Nel, P. and Righarts, M., 'Natural disasters and the risk of violent civil conflict', *International Studies Quarterly*, vol. 52, no. 1 (Mar. 2008), pp. 159–85; and Slettebak, R., 'Don't blame the weather! Climate-related natural disasters and civil conflict', *Journal of Peace Research*, vol. 49, no. 1 (Jan. 2012), pp. 163–76.

[11] Nardulli, P. F., Peyton, B. and Bajjalieh, J., 'Climate change and civil unrest: the impact of rapid-onset disasters', *Journal of Conflict Resolution*, vol. 59, no. 2 (Mar. 2015), pp. 310–35.

[12] Ghimire, R., Ferreira, S. and Dorfman, J. H., 'Flood-induced displacement and civil conflict', *World Development*, vol. 66 (Feb. 2015), pp. 614–28.

droughts than after good harvests with sufficient water availability.[13] They argue that this is a consequence of the pacifying effects of droughts, such as the lack of resources for organizing violence.

Important research published in 2016 has been supportive of confirming a link between weather-related disasters and violent conflict under certain conditions. For instance, while they found no general link between droughts and armed conflict, von Uexkull and colleagues detected a significant statistical correlation between the two variables when minority groups were excluded from political participation and were also dependent on agriculture for income.[14] The correlation was more pronounced for pre-existing armed conflict, which increased in intensity, than for the onset of armed conflict. The authors interpreted this result as supporting the proposition that pre-existing conflicts magnify the consequences of weather-related disasters.[15] A different approach was taken by Schleussner and colleagues.[16] They found that the outbreak of armed conflicts followed weather-related disasters considerably more often than is to be statistically expected in cases where there is a high degree of ethnic fractionalization within a country. If that condition was absent, disasters were not related to the onset of armed conflict in a systematic way.

Beyond these major recent contributions, research has identified a number of conditions that shape the links between weather-related disasters and violent conflict. In line with broader conflict research, they point to the importance of (*a*) structural factors, such as income per head, population density and the availability of certain marketable natural resources; and (*b*) the dynamic processes of contention, during which perceptions about differences among people develop into open conflict and ultimately violence.[17] A striking, and frequently referenced, example illustrating the importance of conflict dynamics is that of the tsunami of 26 December 2004, which devastated long coastal stretches adjacent to the Indian Ocean. Although the tsunami was the consequence of a geological event rather than an extreme

[13] Salehyan, I. and Hendrix, C. S., 'Climate shocks and political violence', *Global Environmental Change*, vol. 28 (Sep. 2014), pp. 239–50.

[14] von Uexkull, N. et al., 'Civil conflict sensitivity to growing season drought', *Proceedings of the National Academy of Sciences*, vol. 113, no. 44 (Nov. 2016), pp. 12 391–96.

[15] This is a general finding of studies considering the effects of armed conflict on the human consequences of disasters. See e.g. Harris, K., Keen, D. and Mitchell, T., *When Disasters and Conflict Collide: Improving Links Between Disaster Resilience and Conflict Prevention* (Overseas Development Institute: London, Feb. 2013).

[16] Schleussner, C.-F. et al., 'Armed-conflict risks enhanced by climate-related disasters in ethnically fractionalized countries', *Proceedings of the National Academy of Sciences*, vol. 113, no. 33 (Aug. 2016), pp. 9216–21.

[17] Blattman, C. and Miguel, E., 'Civil war', *Journal of Economic Literature*, vol. 48, no. 1 (Mar. 2010), pp. 3–57; and Ward, M. D., Greenhill, B. D. and Bakke, K. M., 'The perils of policy by p-value: predicting civil conflicts', *Journal of Peace Research*, vol. 47, no. 4 (July 2010), pp. 363–75.

weather event, there are clear correlations between the effects of these types of disasters.

Death tolls caused by the tsunami were particularly high on the Indonesian island of Aceh and in Sri Lanka.[18] Both areas were marked by armed conflict at the time. In Aceh, the Free Aceh Movement (Gerakin Aceh Merdeka, GAM) rebel organization had been fighting for independence since 1976. In Sri Lanka, a ceasefire and fragile but promising peace process had put a halt to a two-decade-long bloody civil war between the rebel Liberation Tigers of Tamil Elam (LTTE) and the Sinhalese-dominated government.

Despite the similar structural conditions of the armed conflicts—rebel groups purporting to fight for the rights of disadvantaged minorities in poor areas—the effects of the tsunami were dramatically different in each case. In Aceh, peace talks between representatives of the government and the GAM were quickly brought to a successful conclusion. Major factors that made peace possible were the degree of devastation, which made it obvious that rebuilding would be a major task (and hardly possible while the armed conflict was ongoing), the weakening of the GAM, and the willingness of both sides to compromise. In Sri Lanka, the handling of the aftermath of the tsunami contributed to a deterioration in the peace process, violent clashes, terrorist attacks and ultimately the resurgence of fully fledged fighting in January 2008. In contrast to the Aceh case, external assistance became a bone of contention, with the LTTE claiming that the government was withholding and manipulating external support, using it to prop up its own forces and weaken the LTTE. The government, while denying such claims, hardened its stance in the peace process, particularly after a new, more nationalist president was elected in late 2005. Terrorist attacks by the LTTE were then used by the government as justification for the resumption of fighting. A weakened LTTE was militarily defeated by May 2009.

In addition to highlighting the importance of local conflict dynamics, the comparison of the two cases points to the management of external assistance as another essential factor; it fostered cooperation among the actors in Aceh but was a source of conflict in Sri Lanka. Beyond what can be presented here, the existing academic literature on links between weather-related disasters and violent conflicts hints at a number of structural factors and conflict dynamics that help to explain why disasters can be linked to the onset or intensification of armed violence in some circumstances but not in others. The following subsection briefly investigates a selection of weather-related disasters and examines some of the lessons to be drawn in

[18] For a brief summary of the relevant literature see Rüttinger, L. et al., *A New Climate for Change. Taking Action on Climate and Fragility Risks* (Adelphi/International Alert/Woodrow Wilson International Center for Scholars/European Union Institute for Security Studies: Berlin/London/Washington, DC/Paris, 2015), p. 39.

each case with respect to links between such disasters and violent conflict. The cases selected are among the most deadly weather-related disasters of the 21st century so far. They have also been discussed in the relevant literature. While this sample is not large or diverse enough to be representative of all recent weather-related disasters, it helps to illustrate the multiple and varying effects disasters can have on violent conflict.

Selected cases

Tropical cyclone Nargis, Myanmar (May 2008)

Tropical cyclone Nargis in Myanmar in May 2008 had the highest death toll of all weather-related disasters between 2000 and 2016. While Nargis was a severe tropical cyclone, the magnitude of its toll on human life was also linked to social and political factors. The main area hit by the storm, the Irrawaddy delta, is densely populated. Few preventive measures had been taken to reduce the vulnerability of the population. The extent of the destruction overwhelmed the meagre capacities of the government, which at the time was still reluctant to accept foreign assistance. Officially, the Government of Myanmar claimed that allowing foreign aid workers to enter the country would lead to organizational chaos. However, it is likely that it also feared the potential political consequences of opening the country to outside influences.

At the time of the disaster there were several ongoing armed conflicts in Myanmar. However, although there were some reports of an increase in violence in the Irrawaddy delta in the aftermath of Nargis, overall levels of violence decreased, despite the large-scale destruction and displacement of people.[19] The main political opposition pointed to the poor handling of the crisis by the government as further proof of its incompetence but was disinclined to take up arms. This reflected the main opposition's largely peaceful approach, even in the face of severe repression, such as during the 'Saffron Revolution' of 2007, which involved widespread protests led by Buddhist monks.[20]

Although Cyclone Nargis did not provoke a violent internal reaction in Myanmar, it might still have sparked armed violence from external sources. Some voices in the international community judged the Government of Myanmar's obstruction of external assistance in the immediate aftermath to be a grave violation of human rights requiring the international community

[19] Based on the data on battle-related deaths published by the Uppsala Conflict Data Program (UCDP), which primarily reflects conflicts in the north-east of the country, away from the area hit by the cyclone. UCDP, 'Myanmar (Burma)', [n.d], <http://www.ucdp.uu.se/#country/775>.

[20] Bünte, M., 'Myanmar's protracted transition', *Asian Survey*, vol. 56, no. 2 (Mar./Apr. 2016), pp. 369–91.

to react forcefully. One prominent proponent of such a view was the French Minister of Foreign Affairs, Bernard Kouchner, who argued that the United Nations Security Council should authorize the use of force if the government continued to obstruct external assistance. The initiative did not progress because the Government of Myanmar increased its level of cooperation with international aid agencies within a few days and because other members of the Security Council did not signal support for such action.[21] While the likelihood of the Security Council authorizing military action to enforce external disaster assistance is low, the likelihood of unilateral action is significantly higher. In the United States, for instance, the idea of using military force in cases of humanitarian contingencies has received considerable attention.[22]

Taking a longer perspective on the effects of the Government of Myanmar's handling of the disaster, it is difficult to state with any certainty whether the government's actions contributed to the political transition in Myanmar that began in 2009. However, the strong international critique of its initial response to the disaster, including by its close ally China, increased the ruling military regime's international political isolation. At the same time, the absence of international action beyond verbal condemnation of the regime may have alleviated security concerns among senior members of the armed forces in Myanmar.[23]

Heatwaves in the northern hemisphere (June–August 2010)

In contrast to most of the other major weather-related disasters in 2000–16, the heatwave and lack of precipitation in the northern hemisphere in 2010 primarily affected wealthy developed nations. The impact on human life was particularly acute in Russia and Western Europe, but China and the USA, among others, were also affected. While only Russia suffered a large number of deaths from extreme temperatures, the heatwave had far-reaching consequences. It reduced the production of various crops, particularly in the central region of Russia, which, along with parts of China, was also badly affected by bush fires. Prices of agricultural products increased significantly in Russia in 2010 and there were major concerns about food security. This led to the Russian Government to introduce a variety of measures, including a ban on grain exports.[24] In addition, reduced production of grain in Russia

[21] Junk, J., 'Testing boundaries: Cyclone Nargis in Myanmar and the scope of R2P', *Global Society*, vol. 30, no. 1 (Jan. 2016), pp. 78–93.

[22] Brzoska, M., 'Climate change and military planning', *International Journal of Climate Change Strategies and Management*, vol. 7, no. 2 (May 2015), pp. 172–90.

[23] Roberts, C., 'Myanmar, Cyclone Nargis and regional intermediaries', eds M. Sakai et al., *Disaster Relief in the Asia Pacific: Agency and Resilience* (Routledge: Abingdon, 2014), pp. 86–101.

[24] Wegren, S. K., 'Food security and Russia's 2010 drought', *Eurasian Geography and Economics*, vol. 52, no. 1 (May 2013), pp. 145–56.

and other countries contributed to a large rise in the global prices for grain and certain other agricultural products.[25]

Some authors have pointed to the global rise in food prices as a crucial factor in the Arab Spring, which commenced in Tunisia in late 2010 and gained regional momentum in early 2011.[26] While plausible in principle, this line of reasoning needs to be put into perspective. First, the Arab Spring began in Tunisia as a protest against bureaucratic arbitrariness, political repression and widespread corruption, issues that were also the main concerns of demonstrators in other countries in the region. Second, heavy government subsidies on major staple foods, such as bread, held down prices in most of the countries touched by the Arab Spring—food prices rose only marginally in Tunisia, for instance, in 2010 and early 2011. However, in Egypt, where the government had previously cut subsidies, food prices did rise. Despite the fact that the government held down local grain price rises to about one-third of the global increase, the higher prices probably contributed to growing discontent with an already unpopular government.[27] Thus, while the situation in late 2010 and early 2011 was ripe for major political protest in many countries in the region, at least in one country, Egypt, the rise in food prices caused by the heatwave of 2010, when added to existing grievances, allowed the spark of protest coming from Tunisia to ignite a more widespread uprising.[28]

Drought in East Africa (2010–11)

East Africa experienced a severe drought in 2010 and 2011, causing much hardship, particularly in southern Somalia, a region already marked by more than two decades of civil war. As discussed in section I of this chapter, pastoralists in the region suffered the most. The large scale of the humanitarian consequences of the drought was partly due to the civil war in Somalia, which has been ongoing since the late 1980s. The civil war not only led to increased vulnerability among the population to adverse environmental conditions, but also reduced the availability and extent of humanitarian assistance to those affected. More than half a million people fled to neighbouring countries, predominantly Ethiopia and Kenya, which were

[25] Food and Agriculture Organization of the United Nations (FAO), Food Price Index, <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>.

[26] Johnstone, S. and Mazo, J., 'Global warming and the Arab Spring', *Survival: Global Politics and Strategy*, vol. 53, no. 2 (Apr./May 2011), pp. 11–17.

[27] Cincotta, R., 'High food prices an unlikely cause for the start of the Arab Spring', NewSecurityBeat, 7 Apr. 2014.

[28] Johnstone, S. and Mazo, J., 'Global warming and the Arab Spring', eds C. E. Werrell and F. Femia, *The Arab Spring and Climate Change: A Climate and Security Correlations Series* (Center for American Progress/Stimson/Center for Climate and Security: Washington, DC, Feb. 2013), pp. 15–22. For a dissenting view see Tertrais, B., 'The climate wars myth', *Washington Quarterly*, vol. 34, no. 3 (June 2011), pp. 17–29.

also suffering from drought. Armed violence in Somalia rose sharply at the beginning of 2010 when compared with the previous year, before falling to a much lower level by the end of 2010.[29]

One of the consequences of the drought was a change in the balance of forces and patterns of fighting in Somalia. An increase in troop strength of the African Union Mission in Somalia (AMISOM) was authorized in October 2010 to restore order and facilitate the delivery of humanitarian assistance.[30] At the same time, the main rebel group in Somalia, al-Shabab, was weakened by the exodus of people and the scarcity of resources. Thus, AMISOM troops in cooperation with domestic forces supporting the Transitional Federal Government gained territory beginning in late 2010, including in the capital Mogadishu, which they largely controlled by August 2011.[31] Al-Shabab's position was further weakened when, in October 2011, Kenya independently sent forces into Somalia. Facilitated by external military support, the Transitional Federal Government in Somalia has continued to expand its territorial control since 2011. However, as of early 2017, it had still not taken complete territorial control of the country.

Despite the provision of major humanitarian assistance to the region by the international community, the large inflow of refugees from Somalia in 2010–11 was a burden for neighbouring countries, primarily for Kenya, which hosted large refugee camps. Increased infiltration by al-Shabab militants into Kenya following its military intervention in Somalia heightened security threat perceptions in Kenya, culminating in an attack on a major shopping centre in Nairobi in September 2013.[32]

The drought in 2010–11 affected conflict and security in East Africa and exacerbated the increasingly difficult situation faced by many people in the region. However, it could be argued that in Somalia the reaction to the disaster by neighbouring countries helped to improve the conditions for political consolidation and the prospects for peace. By contrast, the stresses placed on Kenya by the disaster led to a worsening of the security situation.

Tropical cyclones in the Philippines (December 2011, December 2012 and November 2013)

The Philippines has a long history of conflict across its three main island groups—Luzon, Visayas and Mindanao. Severe tropical cyclones are also a frequent occurrence. Two armed conflicts stand out: (*a*) the fighting between government forces and various Moro Muslim rebel groups on the southern

[29] Armed Conflict Location and Event Data Project (ACLED), 'Country Report: Somalia', Apr. 2013.

[30] African Union, Peace and Security Council, 245th meeting, 'Communiqué', PSC/MIN/1(CCXXXXV), 15 Oct. 2010.

[31] Armed Conflict Location and Event Data Project (note 29).

[32] Armed Conflict Location and Event Data Project, 'Regional Report: Kenya', Dec. 2013.

island of Mindanao; and (*b*) the insurgency by the National Democratic Front (NDF) led by the Maoist Communist Party and its New People's Army (NPA), which, while geographically widespread, has a regional stronghold in the Visayas.

The Moro rebellion has passed through several phases, marked by surges in violence, negotiation processes and splits among rebel groups.[33] Another round of negotiations began in early 2011 between one of the main armed groups—the Moro Islamic Liberation Front (MILF)—and the government. This led to a framework agreement in October 2012 and a comprehensive peace agreement in March 2014. The peace process remained on course in 2016, despite violent activity by some smaller armed groups that had splintered off from the MILF. Neither the peace process nor the level of violence seems to have been influenced by two devastating tropical cyclones that hit Mindanao in December 2011 and December 2012. Moreover, there were no notable violent incidents in the aftermath of the cyclones, despite the large-scale destruction. The provision of extensive external humanitarian aid, with the cooperation of the MILF, may have helped to stem the outbreak of violence. The aid was partly provided by international organizations which shifted their resources from supporting the peace process to humanitarian assistance.[34]

A peace process between the NDF and the government began in 2011. Numerous meetings, and some armed attacks, have taken place since then but, as of early 2017, the two sides have not come to a formal agreement. Cyclone Hainan, one of the most devastating tropical cyclones ever recorded, caused catastrophic destruction in the Visayas group of islands in November 2013 (see table 8.2). Unlike the MILF, the NPA did not cooperate with the delivery of humanitarian relief and post-disaster assistance, highlighting the differences in the state of the ongoing peace processes in the Philippines.[35]

Four mechanisms linking weather-related disasters and violent conflict

Among the various mechanisms—in the broad sense as defined in section I of this chapter—that emerge from quantitative and case-study research on

[33] Plank, F., 'Not enough pieces of the cake? The Moro National Liberation Front (MNLF) in the Mindanao Final Agreement', *Asian Security*, vol. 11, no. 2 (2015), pp. 154–77.

[34] Bernath, A., 'Klimakatastrophen, Vertreibung und Gewalt: eine makro-qualitative Untersuchung sowie eine Einzelfallstudie über den Zusammenhang von umweltbedingten Bevölkerungsbewegungen und gewaltsamen Konflikten' [Climate disasters, displacement and violence: a macro-qualitative study as well as an individual case study on the context of environment-related population movements and violent conflicts], PhD dissertation, University of Hamburg, 2016.

[35] Walch, C., 'Collaboration or obstruction? Rebel group behavior during natural disaster relief in the Philippines', *Political Geography*, vol. 43 (Nov. 2014), pp. 40–50.

the links between weather-related disasters and violent conflict, four seem to be of particular importance, either because they are found in many cases or because they overlap several processes linking weather-related disasters and violent conflict.[36] The four key mechanisms are: (*a*) competition over scarce assets and resources; (*b*) failure of conflict management institutions; (*c*) social-coherence building; and (*d*) acceleration of transformation. The first two mechanisms highlight the potential for weather-related disasters to lead to conflict, the third emphasizes the opportunity for cooperation arising from such conflict, and the fourth focuses on the wide-ranging transformative nature of the relationship between weather-related disasters and conflict.

Competition over scarce assets and resources

Weather-related disasters destroy lives and economic assets. Typically, they lead to worsening livelihood conditions (recognized as a mechanism in section I). In what is sometimes called the 'resource conflict paradigm', weather-related disasters are assumed to increase competition among people and social groups over a reduced resource base, in turn leading to violent conflict where resource competition is particularly intense.[37] Migration (another mechanism identified in section I) also occurs as a consequence of many weather-related disasters and is often seen as contributing to resource competition. The empirical evidence, including from the cases discussed above, lends qualified support to the importance of competition over scarce resources in linking weather-related disasters and violent conflict. Furthermore, the links between weather-related disasters and violent conflict arise primarily in countries with low levels of average income, such as in the case of Somalia mentioned above.

Failure of conflict management institutions

The potential for resource conflict following a weather-related disaster is strongly linked to ethnic, political and social divisions among the affected populace combined with weak institutions or other means of managing conflicts peacefully or containing them through repression. Weather-related disasters have the potential to exacerbate social and political divisions, leading to conflict. In some cases the stresses placed by weather-related disasters on pre-existing societal divisions can be used by the elite to gain a political advantage (identified as an important mechanism in section I). Where there

[36] For a detailed differentiation of various types of impacts of disasters see United Nations Development Programme (UNDP), Bureau for Crisis Prevention and Recovery, *Disaster–Conflict Interface: Comparative Experiences* (UNDP: Geneva, 2011), pp. 15–23.

[37] For a general critique see De Soysa, I., 'The comfortable lie? Another look at natural resource scarcity and armed conflict', ed. P. Dauvergne, *Handbook of Global Environmental Politics*, 2nd edn (Edward Elgar: Cheltenham, 2012), pp. 125–45.

are stronger institutions, however, even major resource shortages are less likely to trigger violent conflict, as in the case of Myanmar.

Social-coherence building

Sociologists and psychologists have diagnosed that compassion among and with victims often drives social relations during and after disasters.[38] Thus, instead of assuming that weather-related disasters will divide societies, some authors have argued that they can lead to increased solidarity and social cohesion.[39] Furthermore, weather-related disasters can help to build political cooperation and encourage disputing parties to favour non-violence and conflict resolution, as in the cases of the tsunami in Aceh and the tropical cyclones that hit Mindanao. In a broader analysis of peacemaking diplomacy, Kreutz found that disasters increase the likelihood that parties agree on ceasefires.[40] The brief case study on the Philippines discussed above also provides some limited support for this mechanism.

Acceleration of transformation

The final mechanism identified here, acceleration of transformation, is on a different level from the previous three. Under this mechanism, disasters are seen in the broader perspective of social and political change that is occurring all the time. In comparison with the three mechanisms already discussed, the acceleration of transformation mechanism is both less specific to weather-related disasters and conceptually more open in terms of the potential consequences of such disasters. It focuses on the social dynamics that follow disasters. Major disasters are social shocks that may have varying consequences for the different social and political groups and generations and genders affected. Thus, not only might they create new or intensify existing conflicts, but they may also open wider spaces for societal transformation, including the transformation of earlier conflicts, whether violent or not.[41] A major disaster can be a window of opportunity for a change in societal relations, such as gender relations and institution building. The case of Myanmar mentioned above could be interpreted in this way. However,

[38] Drabek, T. E., *Human System Responses to Disaster: An Inventory of Sociological Findings* (Springer-Verlag: New York, 1986).

[39] Kelman, I., *Disaster Diplomacy: How Disasters Affect Peace and Conflict* (Routledge: Abingdon, 2012); and Walch, C., *Conflict in the Eye of the Storm: Micro-dynamics of Natural Disasters, Cooperation and Armed Conflict* (Uppsala University: Uppsala, 2016).

[40] Kreutz, J., 'From tremors to talks: do natural disasters produce ripe moments for resolving separatist conflicts?', *International Interactions*, vol. 38, no. 4 (2012), pp. 482–502.

[41] Birkmann, J. et al., 'Extreme events and disasters: a window of opportunity for change? Analysis of organisational, institutional and political changes, formal and informal responses after mega-disasters', *Natural Hazards*, vol. 55, no. 3 (Dec. 2010), pp. 637–55.

disasters can also destroy stable social relations, as indicated by the more pessimistic mechanisms.[42]

All four mechanisms can claim plausibility and illustrative examples. Their main differences concern assumptions about pre-disaster levels of cohesion or conflict, and the stability of social orders and institutions, as well as the extent and direction of social and political change resulting from a weather-related disaster. Reducing vulnerability and increasing resilience are important in limiting the consequences of disasters. Local capacities and willingness to react to disasters in conflict-sensitive ways shape the immediate links between disasters and violent conflict.

However, as the examples discussed above show, the effects of weather-related disasters often have consequences that extend far beyond their immediate local impact. The consequences of Cyclone Nargis in Myanmar and the drought in Somalia unfolded over several years. Moreover, it appears that the increase in food prices caused by the heatwave in Russia and elsewhere in 2010 may have at least partially contributed to the Arab Spring in North Africa and the Middle East, although this particular causal chain should be treated with caution. Neither resource scarcity nor social fragmentation will necessarily only occur where and when the weather-related disaster hits. Reverberations of disasters over time and space can make distant, divided and fragile societies vulnerable to violence.

Furthermore, weather-related disasters now occur in a globalized political and humanitarian context. In most of the cases mentioned above, humanitarian and development assistance—either by local and national institutions or, where their capacities were not sufficient, international organizations—were of major importance; this was the case in the Philippines, for example. Where international assistance was obstructed, such as in Myanmar or Somalia, the international community reacted, including through forceful means (as in Somalia) or through the consideration of such means (as in Myanmar).

Conclusions

Climate change will continue and, as it does so, the likelihood is that the number and intensity of extreme weather events attributable to it will increase. However, this need not lead to a higher number of weather-related disasters or victims of disasters in future years. Disaster risk reduction has become a major focus of national and international investment (as indeed has disaster relief). Disaster risk reduction has already been shown to have some effect in stabilizing the number of major disasters as well as the number of

[42] Birkmann, J. et al., 'Framing vulnerability, risk and societal responses: the MOVE framework', *Natural Hazards*, vol. 67, no. 2 (June 2013), pp. 193–211.

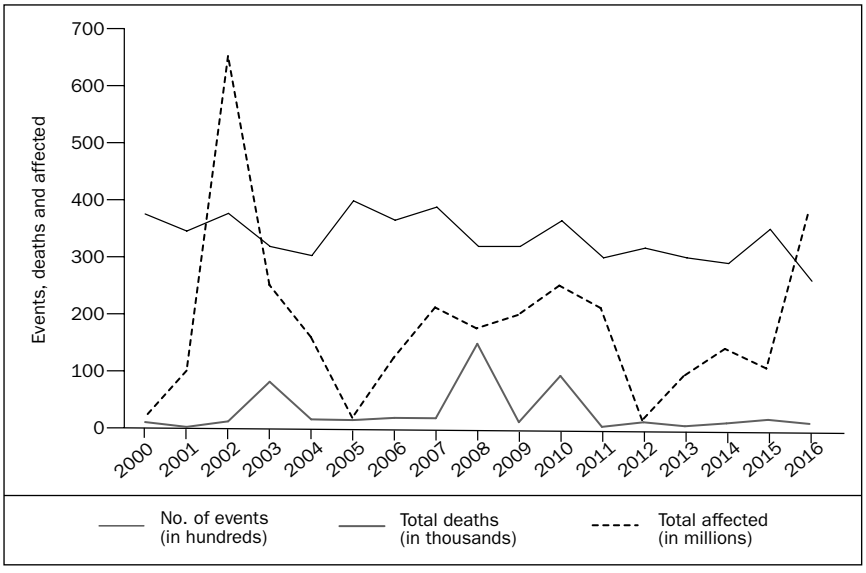

Figure 8.1. Weather-related disasters, 2000–16

Note: The elements presented provide useful trend indicators, despite differences in orders of magnitude.

Source: Centre for Research on the Epidemiology of Disasters (CRED), Emergency Events Database (EM-DAT), accessed 10 Apr. 2017, <http://www.emdat.be>.

deaths (see figure 8.1).[43] However, in a world of growing populations and settlements in vulnerable areas, more needs to be done through an integrated approach to disaster and conflict risk.[44] More resources will be needed for disaster risk reduction and post-disaster assistance, as also recognized in the commitments made as part of the 2016 World Humanitarian Summit.[45] The 2016 Paris Agreement adopted at the 21st Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC) in December 2015 marked a major breakthrough in this context, recognizing as it does 'loss and damage' associated with the adverse effects of climate change as a standalone concept in addition to the concept of adaptation to the risks arising from climate change (Article 8).[46] This should lead to additional finances

[43] United Nations Office for Disaster Risk Reduction (UNISDR), *Global Assessment Report on Disaster Risk Reduction: Making Development Sustainable, The Future of Disaster Risk Management* (UNISDR: Geneva, 2015), pp. 43–48.

[44] Mobjörk, M. et al., *Climate-related Security Risks: Towards an Integrated Approach* (SIPRI/Stockholm University/Swedish Institute of International Affairs: Stockholm, Oct. 2016).

[45] World Humanitarian Summit, 'Commitments to action', 8 Sep. 2016.

[46] Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC), opened for signature 22 Apr. 2016, entered into force 4 Nov. 2016, <https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf>.

for compensation for losses resulting from climate change as well as to more support for contingency plans to deal with high-impact weather events.[47]

Weather-related disasters are likely to put the social and political fabric of societies under increasing stress in the future. Whether such stress will lead to more violent conflict depends not only on local structural conditions and conflict dynamics, but also on interaction with the outside world. There is much space for agency, at both local and global level, to reduce the risk that extreme weather events become weather-related disasters and that such disasters lead to violent conflict.

[47] United Nations Framework Convention on Climate Change, 'Approaches to address loss and damage associated with climate change impacts in developing countries particularly vulnerable to the adverse effects of climate change', [n.d.], <https://unfccc.int/adaptation/workstreams/loss_and_damage/items/6056.php>.