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# Catastrophes, Confrontations, and Constraints

## How Disasters Shape the Dynamics of Armed Conflicts

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## **5 Armed Conflicts in the Aftermath of Disasters: Key Findings**

This chapter summarizes and analyzes the key insights derived from the comprehensive case study evidence presented in the previous chapter. It also contextualizes the findings within wider debates on peace and conflict, disasters, climate change, environmental stress, and security. To do so, the chapter proceeds in three steps. First, I present summary statistics on armed conflict dynamics in the aftermath of disasters. Second, I conduct a qualitative comparative analysis (QCA) to identify which conditions or combinations of conditions can explain why disasters affect conflict dynamics in some cases but not in others. The final part of the chapter disentangles the different pathways connecting disasters to either conflict escalation or de-escalation.

### **General Findings and Their Implications**

#### **Armed Conflict Escalation, De-escalation, and Continuation**

Within the analytical framework of this book, disasters can interact with armed conflicts in three broad ways: they can, in combination with other factors, facilitate conflict escalation or conflict de-escalation or have no impact on conflict dynamics. As indicated in figure 5.1 later in the chapter, in 50% of the cases studied here, disasters did not shape armed conflict dynamics in any meaningful way. The reasons for this can be multifold, but often include one or several of four factors.

First, other military, political, and economic drivers of conflict dynamics can be more important than the disaster. Long-standing grievances and exclusions rather than the floods in the same year drove the conflict escalation in Nepal in 1996, for example. Similarly, a rapid intensification

of the conflict in Baluchistan coincided with the 2005 earthquake, but long-planned offensives by the Pakistani military were the main reason for higher conflict intensity. Likewise, the conflict between the Philippine government and the Communist Party of the Philippines / New People's Army (CPP/NPA) de-escalated in 1991 and 1992 owing to a more accommodative policy by the newly elected president and a (related) rift among CPP members, rather than Tropical Storm Thelma. This reinforces the claim of Katherine J. Mach and colleagues (2019: 194) that compared with environmental and climatic factors, "other conflict drivers are much more influential." In the 18 cases where disaster had an impact on armed conflict dynamics, they interacted with (often more important) non-disaster-related factors.

Second, disasters do not shape armed conflict dynamics if they occur far away from the areas relevant to the conflict. The latter includes territories that are contested between the parties, serve as hideouts and recruitment bases for rebels, or provide important military or economic support to the government. In the sample studied in this book, such a "distance effect" is most pronounced for the 2006 Yogyakarta earthquake in Indonesia (more than 2,000 kilometers from civil-war-ridden Aceh) and the Sakhalin Island earthquake in Russia (around 6,500 kilometers from the armed conflict in Chechnya).

Third, if the disaster does not strain the resources of the conflict parties significantly, an impact on conflict dynamics is unlikely. This might be the case because massive external aid provides relief, because the disaster's impacts are too limited to pose a serious challenge to the conflict parties, or because the rebels and/or the government do not feel committed to provide relief to the disaster-affected populations. Despite its devastating impacts, the 1997 Qayen earthquake did not affect Iran's powerful military apparatus (around 650,000 active personnel), particularly when compared with the People's Mujahideen Organisation (MEK) rebels (10,000 fighters at maximum). Another example is the 1998 Rustaq earthquake in the case study "Afghanistan 1998: Remote Earthquakes Did Not Shape Conflict Dynamics" in chapter 4. Neither the government nor the insurgents devoted many resources to assist the survivors and rebuild the disaster-ridden area. Finally, external funders covered up to 80% of the direct reconstruction costs related to the 1992 Flores earthquake in Indonesia.

Fourth, the inability of a conflict party to exploit opportunities, draw on popular grievances, or send costly signals related to the disaster also makes

conflict escalation implausible. After the 2003 Boumerdès earthquake, for instance, the Algerian government faced massive grievances and had to re-direct considerable amounts of resources and security personnel to the affected area. However, by that time, the Group for Preaching and Combat (GSPC) rebels had lost popular support, maintained only a minimal presence in northern Algeria, and were unable to benefit from the situation. This also indicates that the effect of one disaster impact (grievances) can be canceled out by another impact (constraints). When it comes to conflict de-escalation, the government has little incentive to negotiate with very weak rebel groups in the wake of a disaster, and the infrastructure of such groups is often too limited to be seriously affected by an extreme event. Examples of this include the United Liberation Front of Assam (ULFA) after the 2007 floods in India, Sendero Luminoso after the 2007 Peru earthquake, and the Philippine Abu Sayyaf Group after Typhoon Bopha in 2012.

Of the remaining 18 cases, 50% display evidence for armed conflict escalation linked to the disaster, while I find evidence for a disaster-related de-escalation in the other 50% of cases. Seven of the nine escalation cases display rather strong evidence for a disaster-conflict link, as do seven of the nine de-escalation cases, while in the remaining four cases, the disaster-conflict link was either indirect or relatively minor (see table 5.1 and figure 5.1). This is an important finding in at least two respects.

On the one hand, my analysis indicates that major disasters facilitated armed conflict escalation in one of four cases (see figure 5.1). This is in line with claims that disasters can trigger a change in large-scale, complex systems and can therefore have important security implications (Gawronski and Olson 2013). Indeed, several studies find that disasters increase the risk of armed conflict onset (e.g., Gleick 2014; Ide et al. 2020; Nel and Righarts 2008) and incidence (Arai 2012; Ghimire and Ferreira 2016; von Uexkull et al. 2016). The relatively frequent association of disasters with conflict escalation indicates that such security concerns should also include conflict intensity.

This also has implications for wider debates. Given that climate change increases the frequency and intensity of disasters (IPCC 2018), a warmer world is likely characterized by more spikes in armed conflict intensity. Such spikes, in turn, accelerate infrastructure destruction, increase human insecurity, add credibility to irreconcilable narratives of the other party as evil, complicate access for humanitarian aid providers, and further increase

**Table 5.1**

Overview of cases, conflict dynamics, and detected disaster impacts.

Case	Dynamic	Impact
Afghanistan 1998	None	None
Afghanistan 2008	None	None
Algeria 2003	None	None
Bangladesh 1991	Escalation	Costly signal
Bangladesh 2007	De-escalation	Constraints
Burundi 2005–2006	De-escalation	(Constraints)
Colombia 1999	Escalation	Opportunity
Egypt 1994	Escalation	(Grievances)
India (Andhra Pradesh & Orissa) 1999	Escalation	Opportunity
India (Assam) 1998	Escalation	Opportunity, (grievances)
India (Assam) 2007	None	None
India (Kashmir) 2005	De-escalation	Constraints, image cultivation
Indonesia 1992	None	None
Indonesia 2004	De-escalation	Constraints, image cultivation, (solidarity)
Indonesia 2006	None	None
Iran 1990	None	None
Iran 1997	None	None
Myanmar 2008	De-escalation	Image cultivation
Nepal 1996	None	None
Pakistan 2005	None	None
Pakistan 2010	De-escalation	Constraints
Pakistan 2015	None	None
Peru 2007	None	None
Philippines 1990	Escalation	Opportunity
Philippines 1991	None	None
Philippines 2012	None	None
Philippines 2013	None	None
Russia 1995	None	None
Russia 2010	None	None
Somalia 1997	De-escalation	Constraints
Somalia 2010–2011	De-escalation	Constraints
Sri Lanka 2004	Escalation	Grievances, (costly signal)
Tajikistan 1992	Escalation	(Opportunity)
Thailand 2004	None	None
Turkey 1999	De-escalation	(Solidarity), (image cultivation)
Uganda 1999–2001	Escalation	Opportunity

*Note:* Parentheses in the “Impact” column indicate that the impact was indirect or played only a minor role.

disaster vulnerability (Mena and Hilhorst 2021). At the same time, we have to conceive disasters not just as a result of climate change but also of multiple structural inequalities and problematic trends, such as poverty, exclusion, corruption, urbanization, and poorly designed institutions (Formetta and Feyen 2019; Wisner et al. 2004). Measures to promote inclusivity, improve education systems, and reduce poverty and inequality could hence have positive effects not only in their respective domains but—if properly designed (Ide 2020a; L. Peters 2021)—also on disaster risk reduction and armed conflict risks.

On the other hand, a considerable proportion of cases (25%) in my sample experienced an armed conflict de-escalation linked to a major disaster (see figure 5.1). So far, debates have revolved prominently around whether disasters (or climate change or resource scarcity) amplify armed conflict risks or not, with the third possibility of decreased conflict risks being almost entirely ignored. Only the research on disaster diplomacy (Kelman 2012)—which is largely marginalized in wider debates on environmental or climate security—and a few statistical analyses (De Juan et al. 2020; Slettebak 2012; Tominaga and Lee 2021) address this shortcoming.<sup>1</sup> This “conflict bias” indicates “an ontology of social relations as inherently agonistic” (Barnett 2019: 930) as it excludes the possibility of more peaceful social relations in the aftermath of disasters.

Such a conflict-focused ontology is problematic for several reasons. It reduces our knowledge of peaceful reactions to extreme events and environmental stress, and even of peace processes in general. Scholarship in the fields of peace and conflict studies (Bright and Gledhill 2018), international relations (Diehl 2016), and environmental security (Ide 2018) has been widely recognizing this insufficient attention to peace (when compared with conflict). As a consequence, researchers are less capable of providing policy advice on how to restore (and sustain) peace in disaster-ridden contexts. In the worst case, geopolitical imaginations of looming mass migration and violence in the face of climate change could justify militarized policies to keep refugees out and ensure autocratic state stability in the Global South (Dalby 2020; Hartmann 2014). These considerations, along with the significant

1. The literature on environmental peace building is another example of research focusing on the impact of environmental issues on conflict de-escalation and peace (Ide, Bruch, et al. 2021; Johnson et al. 2020). However, environmental peace-building scholars have so far paid little attention to disasters.

number of disaster-related conflict de-escalation cases in my sample, highlight the importance of complex approaches that overcome conflict-centered ontologies and account for a range of conflictual and peaceful outcomes (S. Ali 2007; Peters and Kelman 2020; Scheffran et al. 2012b).

Before discussing relevant pathways between disasters and conflict (de-) escalation, let me briefly address a wider issue related to data reliability. Concerns about the validity and representativity of information on armed conflicts are not new. Political incentives to over- or underreport conflict events (e.g., in order to exaggerate or play down a threat) as well as challenges to gather data in remote or highly insecure regions (Eck 2012; Hendrix and Salehyan 2015; Ide and Scheffran 2014) fuel these concerns. In my analysis, I first classified all 36 cases as disaster-related escalation, de-escalation, or no change of conflict intensity based on quantitative data on fatalities. Afterward, I revisited those classifications in the light of qualitative evidence. When comparing both sets of data, the overall picture does not change tremendously: when relying just on quantitative evidence, de-escalation would be considered more widespread (13 cases as compared with 9 when considering qualitative insights). To a lesser extent, the same is true for escalation (11 vs. 9 cases), while no change of conflict dynamics would be a less prominent category (12 vs. 18 cases).

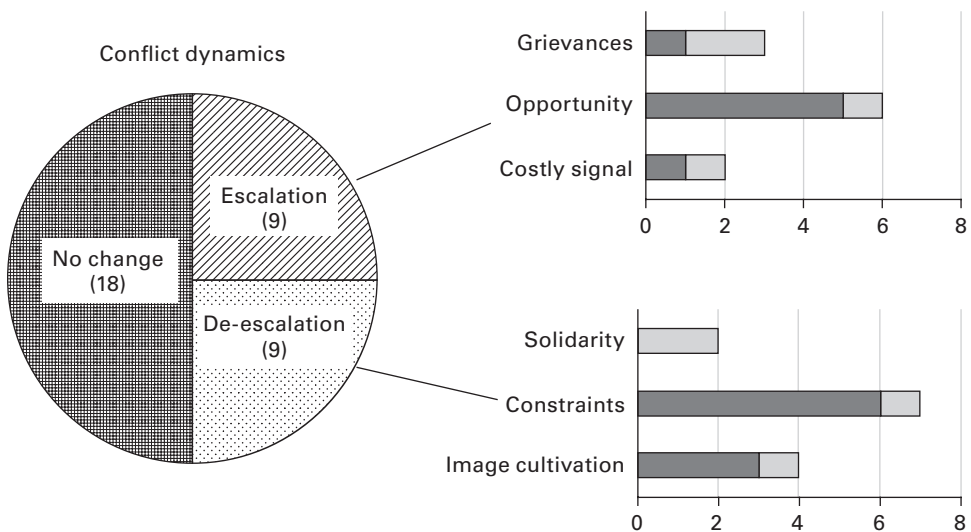
That said, one should keep in mind that based on quantitative data alone, 13 cases—or more than 36% of the sample—would be classified incorrectly. These include four false positives for armed conflict escalation, five false positives for de-escalation, three false negatives for escalation, and one completely wrong classification.<sup>2</sup> My results are hence a reminder of the importance of qualitative information when checking the validity of quantitative data and quantitative analyses. The triangulation of quantitative and qualitative information is a key strength of the methodological approach underlying my study.

2. False positives for escalation (disaster-related escalation indicated by quantitative data but not confirmed by the case studies): Nepal 1996, Pakistan 2005, Russia 1995, and Thailand 2004. False positives for de-escalation: India (Assam) 2007, Indonesia 2006, Pakistan 2015, Philippines 1991, and Russia 2010. False negatives for escalation (disaster-related escalation indicated by case studies but not quantitative data): India (Andhra Pradesh, Orissa) 1999, India (Assam) 1998, and Uganda 1999–2001. Wrong classification: Somalia 2010–2011 (indicated as escalation by quantitative data, but de-escalation by qualitative data).

Next, I discuss the six potential impacts of disasters on (or pathways connecting disasters to) armed conflict dynamics outlined in chapter 2 in the light of the empirical evidence from the 36 case studies. This discussion is structured along the three relevant theoretical approaches: motive, strategy, and communication (figure 5.1 provides a visual summary).

**Motive**

The first thing to note is the relatively weak analytical power of the motive approach: disaster-related grievances played a major role for armed conflict escalation only after the 2004 tsunami in Sri Lanka (where costly signals were a relevant factor as well). Grievances were of minor causal relevance in Egypt during the 1994 floods (where political decisions were key drivers of violence escalation) and in Assam after the 1998 floods (where the opportunity pathway has higher explanatory power). On first look, this finding is surprising given that grievances after disasters can be intense—for example, the protests against the government’s disaster preparation and response in the cases of Algeria 2003, Egypt 1994, Pakistan 2015, Peru 2007, and Turkey 1999 (see chapter 4). The grievance pathway is also very prevalent in



**Figure 5.1** Overview of the armed conflict dynamics and disaster impacts detected (light gray bars indicate that disaster impacts played only an indirect or minor role).



existing theoretical accounts of disasters and conflict risks (e.g., Nel and Righarts 2008; Pfaff 2020).

However, as Sara McLaughlin Mitchell and Elise Pizzi (2021: 588) argue, “it is not clear that these grievances necessarily result in violent conflict.” This links to the general arguments that grievances are simply too widespread (and resistance against powerful state actors too difficult) to account for changes in armed conflict risks (Fearon and Laitin 2003). The case evidence presented here as well as that of other studies on the issue (Apodaca 2017; Ide, Rodriguez Lopez, et al. 2021; Koubi et al. 2021) suggests that if a disaster is (perceived to be) mismanaged or aid is (perceived to be) distributed in an unfair way, people will protest. But there is little reason to believe that from there they take the personally risky and morally problematic route of supporting or joining an armed group. Those grievances relevant to conflict escalation are usually tied to long-standing divides that facilitate mobilization, such as political and economic marginalization of ethnic groups (Buhaug et al. 2014).

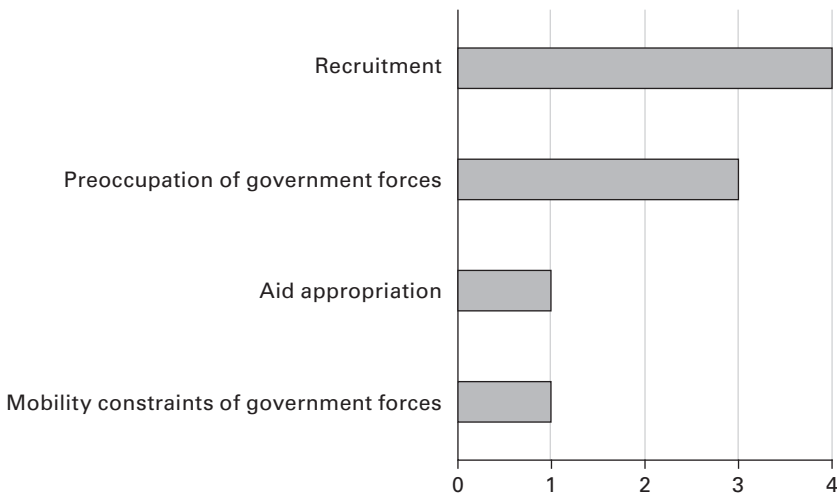
Likewise, increased solidarity after disasters has little impact on wider conflict dynamics. On the one hand, spikes of empathy and cooperation in the face of a shared threat (or challenge) certainly do occur. For example, rebel groups announced cease-fires to allow local populations and external supporters to cope with the disaster in Afghanistan after the 1998 earthquake, in the Philippines after the Luzon earthquake in 1990 and Typhoon Haiyan in 2013, and in Turkey after the 1999 earthquake. Intense local-level cooperation occurred in the aftermath of the 2004 tsunami in Indonesia and Thailand, the 1999 cyclone in India (Andhra Pradesh and Orissa), the 2005 earthquake in India (Kashmir), and the 2015 heat wave in Pakistan. But these instances of cooperation were too short-lived and localized to have had a significant impact on the dynamics of armed conflicts, which are deeply embedded in discursive structures of negative othering and mutual antagonism (Bar-Tal 1998; Kaufman 2001). This underscores Ilan Kelman’s (2012: 131) finding that “disaster diplomacy tends to display few and limited success” in transforming conflict dynamics, particularly once the acute post-disaster phase is over.<sup>3</sup>

3. This is corroborated by earlier findings from disaster sociology (Quarantelli and Dynes 1976) and civil war studies (Kreutz 2012).

**Strategy**

The strategy approach has the highest explanatory power in the sample under study. A change in opportunity structures related to the disaster plays a causal role in six of the nine conflict escalation cases, and in five of them, the disaster-conflict link was strong. The cases come from a diverse set of countries and include fast- as well as slow-onset disasters (see table 5.1). Several recent studies indicate that disasters increase armed conflict onset risks through a change in opportunity structures rather than by increasing grievances (Ide et al. 2020; Salehyan and Hendrix 2014). The case studies presented in the previous chapter confirm this finding for conflict intensity.

What opportunity structures change, exactly, and for whom? Rebel groups benefited in all six cases of opportunity-related conflict escalation from the disaster (see figure 5.2). They were able to recruit more followers in four cases (India [Andhra Pradesh and Orissa] 1999, India [Assam] 1998, Philippines 1990, Tajikistan 1992), to exploit the occupation of government security forces (and resources) with disaster relief in three cases (India [Andhra Pradesh and Orissa] 1999, Colombia 1999, Philippines 1990), to appropriate disaster-related aid in one case (India [Andhra Pradesh and Orissa] 1999), and to exploit the limited mobility of government troops in one case as well (Philippines 1990). Uganda from 1999 to 2001 is an outlier



**Figure 5.2**  
Disaster-related opportunities for rebel groups.

case, as the drought did not provide strategic advantages to the Lord's Resistance Army (LRA); instead, in combination with the loss of its bases in Sudan, it forced the group to loot larger amounts of food, hence increasing civilian casualties.

These patterns are remarkable in at least four regards. First, disasters very rarely provide opportunities for government troops to escalate the conflict. Second, a disaster usually has to affect several aspects of the strategic environment in order to open favorable windows of opportunity for rebel groups. This might be due to the considerable strength of state security forces<sup>4</sup> and could be one reason opportunity-driven conflict escalation is rather rare (6 out of 36 cases): disasters frequently affect opportunity structures but are not significant enough (or are significant in different ways) to give insurgents a relevant advantage vis-à-vis the government. Third, and relatedly, in none of the six cases did the rebels gain a significant long-term advantage over the government because of the disaster. Hence, we should put claims that climate change and disasters increase the risk of state failure or government overthrow under critical scrutiny.

Fourth, scholars frequently identify the inflow of additional aid as a potential link between disasters and armed conflicts—for instance, because the aid can be diverted for military purposes or because terrorist groups target aid workers (Kikuta 2019; Paul and Bagchi 2016). This coincides with quantitative evidence that foreign aid inflow increases levels of violence (Jadoon 2018; Nemeth and Mauslein 2020). However, in the sample studied here, rebels appropriated disaster-related aid in a conflict-relevant way in only a single case (and in no case did the government benefit militarily from receiving such aid). A potential explanation for this is offered by Oscar Becerra and colleagues (2014): while official development aid increases on average by 18% after large disasters, it is barely significant when compared with the affected country's overall economy and typically covers only 3% of the damage done by the disaster. Given that the conflict parties can divert only a fraction of this already rather small amount of aid, they are unlikely to benefit substantially from disaster-related aid.

The constraints pathway—the result of pairing the de-escalation outcome with the strategy approach—likewise has a high explanatory value.

4. This is true even in many so-called failed or fragile states (Call 2008).

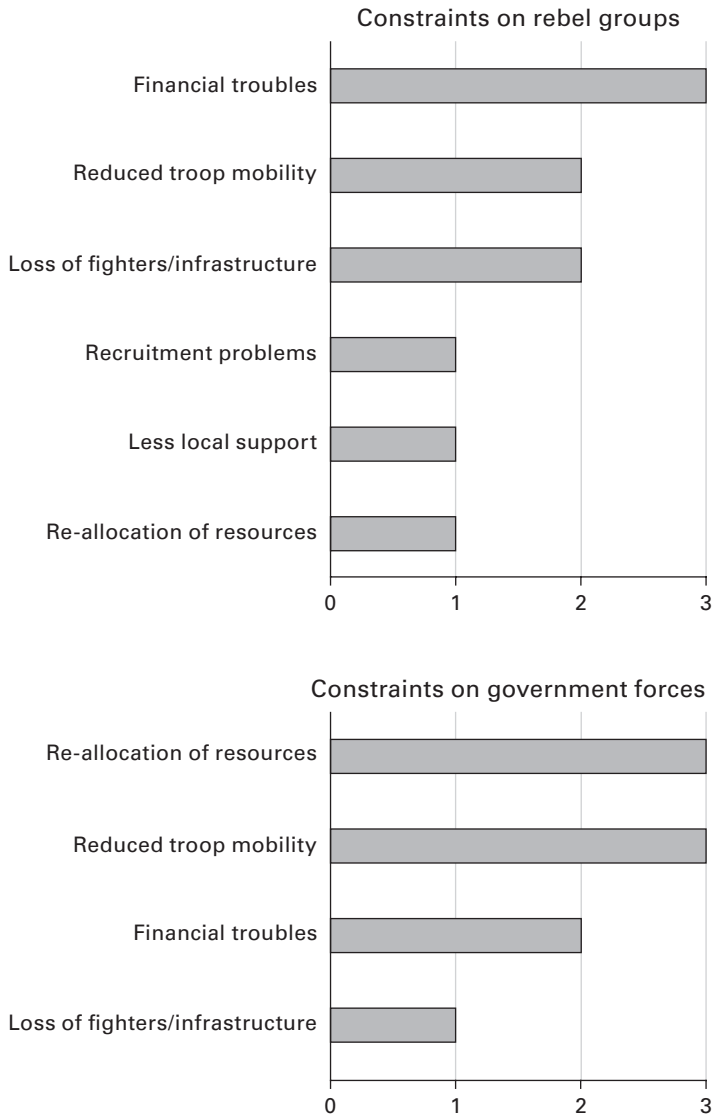
It explains seven out of the nine de-escalation outcomes, and the disaster-conflict links are strong in six of those cases. Consequently, the strategy approach explains 13 out of 18 changes in conflict dynamics after disasters overall.

A disaster imposed serious constraints on the government in five cases and on the rebels in six cases. At least when it comes to the ability to maintain fighting activities and military infrastructure, it thus seems that disaster has an effect on rebels that is equal to or worse than that for state forces. This echoes Michael Brzoska's (2018: 325) claim that "major disasters reduce the capabilities of rebels to escalate violence" and Colin Walch's (2018b) analysis of how typhoons temporarily weakened the CPP/NPA rebels in the Philippines. At the same time, this finding challenges what one may call a state bias in research and policy discussions on disaster-conflict links. Analyses of cases as diverse as Mali (Mbaye 2020; Vivekananda et al. 2019), Sudan (Ban Ki-moon 2007; Welzer 2012), and Syria (Femia and Werrell 2017; Werrell et al. 2015) suggest that disasters fuel state weakness and fragility. They do so by igniting communal tensions over resources, reducing taxable incomes, and over-stretching the already strained resources of the state by necessitating relief operations, among others. By contrast, the adverse impacts of disasters on groups that challenge the state—while far from uncommon—are not taken into account.

Which constraints affect conflict parties in the aftermath of disasters? As illustrated by figure 5.3, in three cases, rebels suffered from financial trouble inflicted by the disaster, mostly because of a loss of revenue options and because a deprived local population can provide less support (Burundi 2005–2006, Pakistan 2010, Somalia 1997). This constraint is most common in the sample, which supports recent quantitative evidence suggesting that rebel groups strongly reliant on natural resource extraction are more likely to collapse following rapid-onset disasters (Tominaga and Lee 2021). To quote Idean Salehyan and Cullen Hendrix (2014: 240–241),

Violence becomes easier to sustain when resources are available and looting becomes more profitable. Militant organizations do not grow their own food, but depend on voluntary or coerced contributions from the population. Drought depresses rural incomes via reduced agricultural production making it more difficult to find willing donors.

Further relevant constraints for rebels include limited troop mobility due to infrastructure destruction or the territory becoming inaccessible



**Figure 5.3**

Disaster-related constraints on armed conflict parties.

(Pakistan 2010, Somalia 1997), the loss of fighters and infrastructure due to the disaster (India [Kashmir] 2005, Indonesia 2004), and a reduced ability to recruit from a population that is preoccupied with the disaster response (Burundi 2005–2006). In line with the literature on rebel governance (Florea 2020), there is also evidence that if rebel groups control territory, they engage in disaster response efforts, and the population expects them to do so. After the Kashmir earthquake in 2005, jihadi groups redirected resources toward relief efforts, while the mismanagement of the 2010–2011 drought reduced local support for al-Shabaab in Somalia.

The most frequent disaster-related constraints for the government side are the involvement of military and security forces in the response efforts (Bangladesh 2007, Burundi 2005–2006, Pakistan 2010) and limited troop mobility due to the havoc caused by the disaster (Bangladesh 2007, Pakistan 2010, Somalia 1997). Also relevant are the loss of revenues from a disaster-ravaged economy, making it harder to sustain the armed conflict (Burundi 2005–2006, Somalia 1997), and the loss of fighters and military infrastructure (Indonesia 2004) (see figure 5.3). It is worth noting that in all cases where disasters posed significant constraints on government forces, the respective state either was very weak or had only a limited presence in the disaster-affected region. While weak statehood is commonly conceived as a factor increasing environmental and climate conflict risks, this shows that weak states struck by a disaster can be less capable of inflicting violence, at least temporarily. This ties in well with Jan Selby and Clemens Hoffmann's (2014) claim that the climate-conflict literature often assumes that strong states are able to guarantee order and prevent violence, while ignoring the at times excessive amounts of violence conducted by state actors.

Analyzing the instances of conflict escalation and de-escalation covered by the strategy approach reveals an interesting pattern. In three out of four cases where only the government suffered strong adverse impacts and the rebels hence increased their relative strength due to the disaster,<sup>5</sup> fighting intensity increased, and this increase was driven by more rebel attacks. The only exception to this is Bangladesh after Cyclone Sidr (2007), where a combination of military weakness, little popular support, and at least some disaster impacts on rebel capabilities prevented the Purbo Banglar

5. These cases are Colombia 1999, Philippines 1990, and Tajikistan 1992.

Communist Party–Janajuddha Faction (PBCP-J) from capitalizing on the government weakness.

By contrast, in five of the six cases where both rebels and government forces were negatively affected by a disaster, the conflict intensity decreased,<sup>6</sup> as both parties lacked the capabilities to sustain the fighting at previous levels. Uganda 1999 is the exception to this pattern, as the LRA rebels increased violence against civilians to extract more resources and recruit fighters in a more adverse strategic environment.

In two of the three remaining cases, no conflict party suffered strong adverse impacts, but the rebels benefited from increased recruitment and financing opportunities vis-à-vis the government, allowing them to escalate the conflict (India [Andhra Pradesh and Orissa] 1999, India [Assam] 1998). In Somalia 2010–2011, only the rebels suffered from adverse disaster impacts. The Transnational Federal Government lacked the resources to exploit al-Shabaab's weakness during the drought prior to the increase of international support in late 2011, resulting in conflict de-escalation.

Overall, this suggests that if disasters negatively affect the capabilities of the government only, armed conflict intensity is likely to increase, whereas if both rebels and governments suffer from the disaster, conflict intensity tends to decrease. If the rebels face more adverse impacts of the disaster, further developments depend on the capacity of the government to exploit this weakness. This finding suggests that humanitarian relief delivery and conflict mediation efforts are most promising in the aftermath of disasters that negatively affect both conflict parties. By contrast, such efforts are less promising and even outright dangerous (in the event rebels are able to loot aid) if the government bears the brunt of the disaster impacts.

### Communication

In this study, the communication approach has slightly higher explanatory power than the motivation approach but is clearly weaker than the strategy approach. Overall, the communication approach can account for six changes in conflict dynamics. In four of those cases, the respective disaster-conflict link is rather strong (see figure 5.1). However, one should note that while scholars have long identified the communicative function of

6. These cases are Burundi 2005–2006, India (Kashmir 2005), Indonesia 2004, Pakistan 2010, and Somalia 1997.

violence (e.g., Boyle 2009; Hoffman and McCormick 2004), this book provides the first explicit application of this approach to the field of disaster-conflict interlinkages, or even to environmental security research more broadly. Compared with the more common motivation- and strategy-based approaches, evidence for the communication approach might therefore be underreported in the literature on which the case studies rely.

Costly signal is the least prevalent impact of disasters on armed conflict dynamics. It played a minor role in the escalation of the Sri Lankan civil war after the 2004 Indian Ocean tsunami. Both the Liberation Tigers of Tamil Eelam (LTTE) rebels and the government faced pressures to demonstrate their strength and determination in the post-disaster period, and they did so by staging additional attacks. Bangladesh after Cyclone Gorky (1991) is the only occasion where costly signaling is a major, and simultaneously the only, pathway connecting a disaster to conflict escalation. In this case, specific local memories about disaster-related grievances and the Bangladeshi independence in 1971 combined with fears of the government that the cyclone could catalyze similar developments in the Chittagong Hill Tracts. This resulted in heavier government repression against civilians to convey a warning to the local population.

The communication approach scores better in regard to conflict de-escalation, where four instances of image cultivation occurred. Remarkably, all four cases are characterized by considerable international media attention: the 2004 Indian Ocean tsunami in Indonesia, as it affected many internationals and attracted large amounts of aid; Cyclone Nargis in Myanmar, because of controversies about international aid delivery; the 2005 Kashmir earthquake, owing to the wider geopolitical context characterized by the India-Pakistan rivalry and the war on terror<sup>7</sup> and the 1999 Marmara earthquake, owing to the prominent role played by Turkey in European political discussions<sup>7</sup> at the time. Furthermore, the first three disasters are among the four deadliest events in my sample,<sup>8</sup> while the Marmara earthquake had grave economic impacts and also a high death toll (17,127), hence attracting further international attention. This makes sense from a theoretical

7. Most discussions were in regard to Turkey's potential membership in the European Union and the future of the Kurdistan Worker's Party (PKK) conflict.

8. Indonesia 2004 saw 165,708 disaster-related casualties, Myanmar 2008 saw 138,366 casualties, and India 2005 saw 74,647 casualties (combined number for the Indian and Pakistani side).



point of view: the more media outlets, foreign governments, and international (non-governmental) organizations focus on a conflict zone, the stronger the incentives for conflict parties to limit violence and cultivate their image. As outlined by research on rebel diplomacy, particularly groups involved in separatist conflicts have incentives to present themselves as politically capable and responsible actors (Huang 2016).

One might assume that because rebel groups are usually weaker than the government and more reliant on international support, they are also more likely to engage in image cultivation (Bob 2005). But contrary to this expectation, three rebel groups (the Free Aceh Movement [GAM] in 2004, Kashmir insurgents in 2005, and the PKK in 1999) as well as two governments (of Myanmar in 2008 and of Indonesia in 2004) engaged in image cultivation in the face of disasters. Particularly since Pakistani state agencies (most notably the Inter-Services Intelligence [ISI]) influenced the decision of the Kashmir insurgents to restrain from violence, this suggests that both government and insurgent actors engage in conflict de-escalation to send a message to broader audiences. This is particularly noteworthy when considering that with the exception of the Kashmir insurgents, none of the respective conflict parties depended heavily on international support to perpetuate their struggle. However, one should keep in mind that these insights are derived from a rather small sample of cases that attracted extraordinary amounts of international attention.

The case studies indicate that patterns of violence as communication after disasters differ with regard to which audience is addressed. Fighting escalation as a costly signal was mainly directed at domestic audiences: the population of the Chittagong Hill Tracts, the Sri Lankan government, and the LTTE. By contrast, when armed groups restrained from using violence to cultivate their image, they usually were addressing an international and more diffuse audience.<sup>9</sup> This makes sense from a strategic point of view. Parties to a civil war usually have no opportunities to pressure international constituencies by using extensive violence. Therefore, they tend to “play the good guy” and de-escalate the conflict to convince a global public of their benign nature. This very logic underpins practices of human rights

9. Some specific addressees could be identified, however, such as the United States in the case of the 2005 Kashmir earthquake or China during Cyclone Nargis in Myanmar 2008.

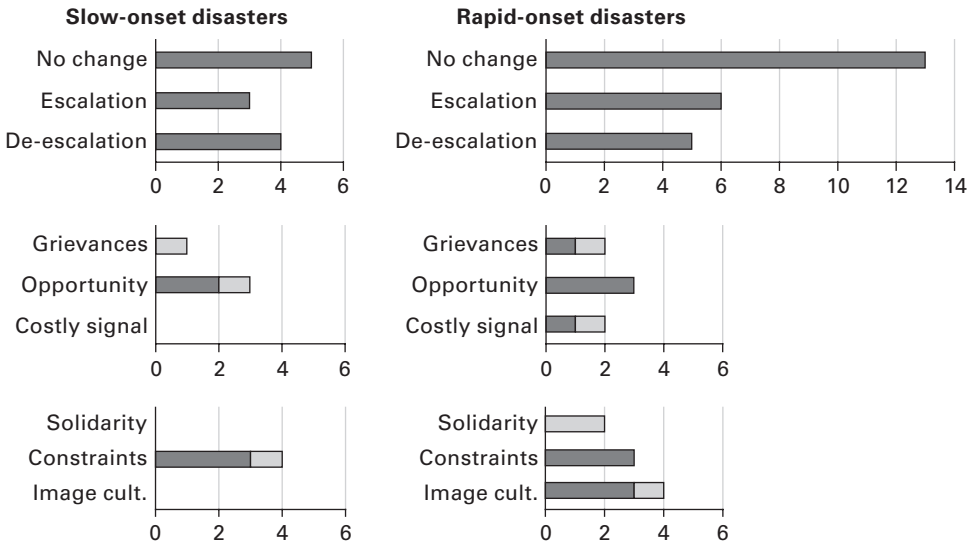
monitoring and “naming and shaming” by NGOs and international organizations (Bob 2005; Risse et al. 2013). By contrast, hostile conflict parties or civilian populations with which armed groups have a tense relation are unlikely to react positively to such restraint. Therefore, the groups have to—and are usually able to—resort to costly signals to convey a message.

Finally, it is worth underscoring that armed groups do not just react to a strategic environment that is “out there” in a rational manner. Rather, they also act on socially constructed perceptions and discourses that align only loosely with material realities (see also Ide 2016; Jabri 1996). The Bangladeshi government’s concerns about Cyclone Gorky catalyzing a broad pro-independence sentiment in the Chittagong Hill Tracts, for example, were grossly exaggerated. Likewise, governments and rebel groups have agency and are not just constrained by structural factors. Cyclone Gorky in Bangladesh 1991 and the Indian Ocean tsunami in Sri Lanka 2004 were devastating events and accompanied by a large amount of international attention and support. Yet unlike in Indonesia 2004 or India (Kashmir) 2005, the majority of the involved actors decided to escalate fighting regardless of the implications for their reputation.

### Disaster Types and Conflict Dynamics

Researchers and practitioners often distinguish between slow-onset disasters, which unfold over weeks, months, or even years, and rapid-onset disasters, which occur abruptly and (almost) instantaneously. Droughts are a good example of a slow-onset disaster, while earthquakes are rapid-onset events. Different types of disasters might have different impacts on conflict dynamics. Rapid-onset events, for instance, leave societies less time to prepare, which can result in fewer grievances (as the event seems “natural” and beyond political control) but stronger adverse impacts. Slow-onset events might provide conflict parties and their constituencies with more time to prepare for and cope with the disaster, but they also require the investment of resources or the suffering of adverse impacts over sustained time periods (Koubi et al. 2021; Lee et al. 2022; Mitchell and Pizzi 2021).

In order to account for these arguments, I classify all cold spells, droughts, and heat waves in the sample as slow-onset disasters, and all cyclones, earthquakes, and tsunamis as rapid-onset disasters. For floods, I determine for



**Figure 5.4**

Overview of disaster impacts on conflict dynamics by disaster type (light gray bars indicate that disaster impacts played only an indirect or minor role).

each individual case whether the event has a slow or rapid onset. Figure 5.4 compares key findings for both disaster types.

My sample contains 24 rapid-onset disasters and 12 slow-onset disasters. When it comes to determining whether disasters had an effect on armed conflict dynamics, slow-onset disasters facilitate conflict escalation (three times) and de-escalation (four times) almost equally. The same is true for rapid-onset disasters (six escalations and five de-escalations). However, while no change in conflict dynamics accounts for 42% of all cases in the slow-onset sample, this pattern is more prevalent (54%) in the group of rapid-onset events. This is a surprising finding given that most of the literature considers rapid-onset disasters to be more relevant for armed conflict risks (e.g., Nardulli et al. 2015; Nel and Righarts 2008).<sup>10</sup>

Several potential explanations for this finding exist. Floods, which are most often associated with mobility limitations (an important constraint

10. One should note, however, that arguments for a greater relevance of rapid-onset events are mostly derived from studies on conflict onset and incidence, and that several studies find an association between drought and conflict (e.g., Couttenier and Soubeyran 2013; Maertens 2021; von Uexkull et al. 2016).

on armed groups; see figure 5.3), are almost always considered slow-onset events in this study.<sup>11</sup> This is a disputable decision as floods normally unfold in a matter of days or weeks. If all floods are considered rapid-onset disasters, the percentage of no-impact cases in the slow-onset (3 out of 6) and rapid-onset (15 out of 30) samples is exactly the same. Alternatively, one can argue that disaster impacts like financial troubles, the reallocation of resources for disaster purposes, and recruitment problems (see figures 5.2 and 5.3) are more severe if they are present over longer periods of time. In the Philippines, for instance, the Maoist rebels were quickly able to continue their operations after Typhoon Haiyan in 2013, while the PALIPEHUTU-FNL had a hard time coping with 13 months of drought in Burundi in 2005 and 2006.<sup>12</sup> The finding that slow-onset disasters are more frequently related to changes in conflict dynamics definitely requires further attention.

When considering how disasters affect conflict dynamics, there are very few differences when it comes to the motivation and strategy approaches. The opportunity and constraints pathways are prevalent among slow- and rapid-onset disaster cases, while grievances and particularly solidarity have limited explanatory power.

The performance of the communication approach (comprising the costly signal and image cultivation pathways) shows strong variation across the sub-samples. It covers only one case (8%) of a slow-onset disaster. Among the rapid-onset disasters, by contrast, the communication approach can explain seven cases (29%), hence narrowly defeating the strategy approach (six cases). Image cultivation is the most frequent pathway in the rapid-onset sample (four cases). This finding does not change fundamentally when all floods are considered rapid-onset events.<sup>13</sup>

How can we make sense of this? When it comes to the escalation of violence, conflict parties like the government of Bangladesh (1991) or the government of Sri Lanka and the LTTE (2004) fear quick changes or a

11. Only Egypt 1994 is considered a rapid-onset flood.

12. PALIPEHUTU-FNL is the Party for the Liberation of Hutu People–National Liberation Forces.

13. In this case, the communication approach applies to 0 out of 6 slow-onset cases but to 6 out of 30 rapid-onset cases. The image cultivation pathway (four cases) is almost as common as the constraints pathway (five cases), but the costly signal pathway (two cases) is outperformed by the opportunity pathway (five cases).

reputation of being weakened after rapid-onset disasters and hence deploy violence to send a message. During slow-onset events, signaling strength is less urgent and can be achieved by other, less costly means. Moreover, rapid-onset disasters often cause immediate and widespread destruction, resulting in considerable national and international attention. This provides a clear incentive for the conflict parties to limit the use of violence. “In contrast to that, in the shadow or the periphery of the public interest, remain slow-onset disasters which involve incremental and cumulative debilitation” (Porfiriev 2015: 187). Slow-onset events hence provide a less supportive context for image cultivation.

### When Do Disasters Have an Impact on Conflict Dynamics?

It still remains to be explained why disasters have an impact on conflict dynamics in some cases but not in others and why the outcome is sometimes escalation and sometimes de-escalation. To do so, I draw on the method of QCA as outlined in chapter 3. QCA, like all other methods, has to deal with problems related to limited diversity. Applied to my study, this means that while there is a large number of factors potentially relevant for disaster-conflict links, not all of them can be tested simultaneously with a limited number of cases (36). Otherwise, there is a risk of model overfit and unreliable results (Achen 2005; Marx and Dusa 2011).

I therefore employ a two-stage procedure (see chapter 3 for details). In the first stage, I analyze the conditions under which disasters have any type of impact on armed conflict dynamics. Subsequently, in stage 2, I investigate why some of those cases experience an escalation of fighting dynamics, while in others, fighting intensity declines. This allows me to test a smaller set of variables that are more closely tied to the outcome in each step.

So why do disasters trigger a change in conflict dynamics (for better or worse) in some cases but not in others? I first analyze potential necessary conditions for an impact of disasters on conflict dynamics (*impact*). As discussed in further detail in chapter 3, I focus on structural conditions that make a country more sensitive to disaster impacts on conflicts: *pov-erty* (indicated by a high under-5 mortality rate), a strong dependence on the primary or agricultural sector (*agridep*), and a democratic political system (*democracy*). In addition, the analysis includes three more dynamic, disaster-related factors: the geographical coincidence between the disaster-affected area and the armed conflict zone (*overlap*), whether at least one

**Table 5.2**Necessity analysis for disaster having an impact on conflict dynamics (*impact*)

Condition	Consistency	Necessary ( $\geq 0.9$ )
adverse	0.83	No
agridep	1.00	Yes
aid	0.67	No
democracy	0.67	No
overlap	0.72	No
poverty	0.89	Almost

conflict party experienced significant adverse impacts due to the disaster (*adverse*), and the inflow of large amounts of foreign *aid* in the year after the disaster occurrence.

Table 5.2 reports the results of the necessity analysis.<sup>14</sup> Using the commonly accepted consistency threshold of 0.9 (Mello 2021), the analysis shows that agricultural dependence is a necessary condition for impact, while poverty is almost a necessary condition (see box 5.1 for details on the interpretation of QCA results).

Table 5.3 summarizes the results of the truth table analysis for sufficient conditions. These findings do not change when running a wide range of robustness tests (see the online appendix on the MIT Press website), and all paths have a perfect consistency of 1.00, well above the recommended threshold of 0.8 (Mello 2021; Schneider and Wagemann 2010). The three paths can be read as follows:

1. The simultaneous presence of agricultural dependence, adverse impacts of the disasters on at least one conflict party, and a democratic political system is sufficient for a disaster to affect conflict dynamics.
2. The combination of agricultural dependence, an overlap between the conflict area and the disaster area, and a non-democratic political system is sufficient for *impact*.
3. The combination of high poverty rates, an overlap between the conflict area and the disaster area, and a non-democratic political system is sufficient for *impact*.

14. In crisp set QCA (csQCA), the consistency scores for the presence and absence (–) of a condition add up to 1.00. I therefore report only the higher of the two scores in the tables. In table 5.2, for instance, the score for *aid* would be 0.33.

**Table 5.3**  
Results of the sufficiency (truth table) analysis for *impact*

Path #	1	2	3
Path	agridep * adverse * democracy	agridep * overlap * ~democracy	poverty * overlap * ~democracy
Consistency	1.00	1.00	1.00
Raw coverage	0.56	0.33	0.33
Unique coverage	0.56	0.00	0.00
Cases covered	<u>Bangladesh 1991</u> <u>Bangladesh 2007</u> <u>Burundi 2005–2006</u> <u>Colombia 1999</u> <u>India (Kashmir) 2005</u> <u>Indonesia 2004</u> <u>Pakistan 2010</u> <u>Philippines 1990</u> <u>Sri Lanka 2004</u> <u>Turkey 1999</u>	Egypt 1994 Myanmar 2008 Somalia 1997 Somalia 2010–2011 Tajikistan 1992 Uganda 1999	Egypt 1994 Myanmar 2008 Somalia 1997 Somalia 2010–2011 Tajikistan 1992 Uganda 1999
Solution	agridep * (adverse * democracy + overlap * ~democracy) + poverty * overlap * ~democracy → impact		
Consistency	1.00		
Coverage	0.89		
Cases not covered	India (Andhra Pradesh, Orissa) 1999, India (Assam) 1998		

\*=and +=or →= sufficient for underlined=case is only explained by this path.

All three solution paths contain one condition indicating a high vulnerability to disasters. This is agricultural dependency in paths 1 and 2, and poverty in path 3. Disasters tend to affect the agricultural sector more strongly than manufacturing or service provision, owing to harvest failures. Likewise, people working in the primary sector usually have less access to social security services. States relying on the agricultural sector to raise tax revenues will be negatively affected by a disaster that destroys harvests (Aryal et al. 2020). Poverty reduces the amount of resources and time that households and states can spend on disaster preparation and recovery. Poor people are therefore more likely to be exposed to, die from, and unable to recover from disasters (Winsemius et al. 2018), and poor states have limited capabilities to provide disaster relief and reconstruction support (Al-Dahash et al. 2019). In line with this, agricultural dependence is a perfect necessary condition and poverty is an almost necessary condition (see table 5.2), again highlighting how important disaster vulnerability is for disaster-related changes in conflict dynamics.

**Box 5.1**

## Interpreting QCA Results

QCA studies the relationship between (combinations of) conditions and an outcome. Following established conventions, I use + to indicate a logical OR, \* to indicate a logical AND, → to indicate a relationship of sufficiency, and ← to indicate a necessary condition.

QCA results are called solutions, and individual configurations of conditions within the solutions are called paths. The solution displayed in table 5.3, for example, consists of three paths, each of which is sufficient for the outcome (or rather a subset of the outcome cases).

Solutions and paths come with two primary measures of fit.

Coverage indicates how many cases with a certain outcome in the sample are explained by the solution (similar to the coefficient size in quantitative studies). In the crisp-set variant of QCA used here, a coverage of 0.8 indicates that 80% of the outcome is explained by the QCA. The raw coverage tells us the total amount of cases (relative to all outcome cases) that are covered by a path, while the unique coverage tells us the number of cases that are covered only by this path (and not contained in any other path). While no threshold for coverage exists, values below 0.6 indicate a rather low explanatory power of the solution (Legewie 2013).

Consistency indicates whether a QCA solution is free of contradictions and necessary or sufficient for the outcome. It measures the fit between the empirical data and the assumed set-theoretic relationship (and thus bears some resemblance to the significance measure in statistical analyses). If, for example, a combination of conditions is present in 10 cases and 9 of those display the outcome, the consistency of this path/solution would be 0.9 in a crisp-set (cs) QCA. The commonly accepted threshold for consistency is 0.9 for a necessary condition and 0.75 to 0.8 for sufficient conditions.

When reading a solution, terms in brackets are resolved first, followed by logical ANDs, and finally logical ORs.

It is plausible that in cases with a higher vulnerability to extreme events, disasters are more likely to shape armed conflict dynamics. In general, high levels of agricultural dependence and poverty increase the risk of food insecurity after a disaster. Researchers have associated food insecurity with increased conflict risks (e.g., due to grievances and recruitment opportunities [Koren and Bagozzi 2016]) but also with lower conflict risks (e.g., because of logistical challenges for the conflict parties [Landis 2014]). More specifically, a high disaster vulnerability can lead to



- intense grievances by seriously affected groups unable to cope with the disaster and disappointed about a lack of state or rebel support, as in Egypt 1994 or Somalia 2010–2011;
- disaster-related cooperation owing to the scale of the challenge posed by the disaster, as in Indonesia 2004 or Pakistan 2015;
- reduced fighting and revenue-generating capabilities by state forces and insurgents, as in Colombia 1999 or Somalia 1997, but also enhanced opportunities for recruitment among deprived groups, as in India (Andhra Pradesh and Orissa) 1999 or Tajikistan 1992; and
- increased domestic and/or international attention, hence making the (non-)use of violence as communication by armed groups more likely—for instance, to signal continued determination and capacity to fight (as in Sri Lanka 2004) or to portray oneself as a benign actor (as in Turkey 1999).

High disaster vulnerability is only one part of the story, however.

Each of the three solution paths displayed in table 5.3 also contains a condition indicating that the disaster has a direct impact on either one conflict party, both conflict parties, or the strategic environment in which they operate. Path 1 contains the most direct measure of this: adverse impacts of the disaster on at least one conflict party. Paths 2 and 3 include an overlap between the disaster-affected area and the region in which the fighting took place. This is likely to go along with at least some disaster effects on the troops stationed in this area. Such an overlap can also result in changes to the physical environment that groups have to take into account (e.g., destroyed infrastructure, flooded roads) or in impacts on the population with which government forces and rebels interact (e.g., stronger grievances, increased cooperation, impoverishment).

These direct and indirect effects of the disaster on the groups in conflict can influence the dynamics of ongoing conflicts because they result in

- a need to react to sentiments of the local population, such as frustration about the government's disaster response (as in India [Assam] 1998) or reduced feelings of hostility and threat (as in Indonesia 2004);
- opportunities to capitalize on the disaster-induced weakness of an opponent to stage additional attacks (for instance, in Colombia 1999 or the Philippines 1990) but also severe constraints on military activities (for instance, in Bangladesh 2007 and Burundi 2005–2006); and

- (perceived) shifts in power between the conflict parties that motivate the state or rebels to send a costly signal about their military capability (as in Bangladesh 1991 and Sri Lanka 2004) but also to restrain from using violence to gain (international) public support (as in Indonesia 2004).

Theoretical considerations and case study evidence therefore strongly indicate that the interaction of (1) disaster vulnerability (as expressed by *agridep* and/or *poverty*) and (2) a disaster impact on the conflict parties (as indicated by *adverse* and/or *overlap*) results in a change of conflict dynamics. Furthermore, the case studies have identified a large distance between the conflict and disaster areas as well as the disaster not straining the resources of the conflict parties as important explanations for a non-impact of disasters on conflict dynamics.

The findings also align well with other recently published studies. Regarding vulnerability, Nina von Uexkull (2014) finds that droughts increase the risk of civil war incidence in areas with high agricultural dependence. Likewise, analyses suggest that low levels of human development (another indicator of poverty) increase armed conflict risks in the aftermath of climate-related disasters (Ide et al. 2020). When it comes to disaster impacts on conflict parties, the disaster studies literature has shown how large-scale disasters can overstretch government resources (Cooper and Block 2006; Noy 2009). But Colin Walch (2018b) has also pointed out that disasters limit rebel groups' recruitment efforts, while Yasutaka Tominaga and Chia-Yi Lee (2021) provide evidence that disasters deprive insurgents of funding sources.

A third factor present in all three solutions is democracy, either as a present condition (path 1) or as an absent condition (paths 2 and 3). Theoretically, this is not implausible. Researchers associate democracy with lower vulnerability to disasters because leaders have electoral incentives to invest in disaster mitigation and relief spending to win support among a broad group of voters. Autocratic leaders, by contrast, may provide disaster support only to those constituencies crucial for them staying in power, such as urban populations or regions with strong local leaders backing the regime (Keefer et al. 2011; Lin 2015; Sen 1983). High levels of democracy could therefore be associated with lower post-disaster grievances and well-developed state capacities, among others, while the absence of democracy could result in public discontent and (temporary) state weakness.

However, there are three problems with this interpretation. First, more recent studies suggest that democracy decreases disaster vulnerability only in states with high institutional quality, and might even lead to worse disaster impacts in countries characterized by high levels of corruption and government failure (Persson and Povitkina 2017). In my sample, few states are characterized by high institutional quality (at least relative to members of the Organisation for Economic Co-operation and Development [OECD]). Second, there is very little evidence in the case studies that the (non-)democratic nature of a political system is causally linked to conflict (de-)escalation after disasters.<sup>15</sup> Third, there is no clear empirical association between path 1 (where democracy is present) and conflict de-escalation or between paths 2 and 3 (where democracy is absent) and conflict escalation. Contrary to the expectations, conflict escalation after disasters is slightly more common in democratic countries.<sup>16</sup>

Another potential interpretation relates to the U-shaped relationship between democracy and armed conflict. While highly democratic states are able to mediate grievances before they erupt violently (not least because non-violent forms of action to achieve political goals are available, such as elections or organizing demonstrations), highly autocratic states can effectively repress any form of opposition. States with mixed political systems (so-called anocracies) have neither adequate democratic mechanisms nor strong repressive capacities in place, making them more vulnerable to armed violence (Hegre et al. 2001). But again, there are problems with this interpretation. The U-shaped relationship has high explanatory power when it comes to conflict onset, but it tells us very little about the relationship between democracy and conflict dynamics (Trinn and Wencker 2021). Furthermore, the qualitative case studies still reveal no evidence of a link between the presence or absence of democracy and a disaster impact on conflict dynamics. As a consequence, I consider the presence of *democracy* and *~democracy* in the QCA solution as an artifact of the data and not as indicating a causal relationship.

15. Contrary to theoretical assumptions, massive grievances about the disaster response occurred in democracies like Colombia (1999), the Philippines (2013), and Sri Lanka (2004), while authoritarian states like Iran (1997) and Russia (2010) handled the disasters rather well (and the Russian government even increased its popularity).

16. Path 1 (containing *democracy*) covers six escalation and four de-escalation cases (60% escalation rate), while paths 2 and 3 (containing *~democracy*) cover three escalation and three de-escalation cases (50% escalation rate).

Overall, the QCA indicates that a high level of disaster vulnerability in combination with a disaster effect on one or both conflict parties is an important (and quasi-sufficient) condition for a change of armed conflict dynamics after a large-scale disaster. This conjunction of disaster vulnerability and disaster impacts on conflict parties is present in 20 cases of my sample, 17 of which display a significant conflict (de-)escalation (resulting in a consistency score of 0.85). By contrast, it is present in only 1 of the 16 cases without a change in conflict dynamics (see box 5.2 for further details). The coverage of this conjunction is hence 0.94.

**Box 5.2**

## Changes in Conflict Dynamics: Contradictory and Unexplained Cases

There are three contradictory cases that display a combination of high disaster vulnerability and an impact of the disaster on at least one conflict party, yet no significant change in conflict dynamics: India (Assam) 2007, Iran 1990, and Pakistan 2005.

In the latter two cases, there was no overlap between the disaster area and the conflict area, but the respective earthquakes had a clear negative effect on the state owing to high economic losses and a preoccupation of the military. However, given the overwhelming strength of the Irani and Pakistani military apparatus as compared with the very weak Kurdish Democratic Party of Iran (KDPI) and Baluchistan Liberation Army (BLA) rebels, these disaster impacts were negligible. In India (Assam) 2007, the floods did not affect either conflict party but did overlap with the conflict area. However, the ULFA was considerably weakened and in no position to react to the floods in a meaningful way. In fact, then, all three cases are characterized by the absence of a relevant impact of the disaster on at least one conflict party, and hence in line with the identified solution (see chapter 4 for further details).

There is one unexplained case that experienced a significant change in conflict dynamics yet no impact of the disaster on one or both conflict parties: India (Andhra Pradesh, Orissa) 1999. Again, this outlier is caused by the way the conditions are calibrated rather than by a deviation from the causal pattern indicated by the QCA. Although the cyclone did not affect the area in which fighting took place, it caused tremendous devastation in an area in which the People's War Group (PWG) was present and engaged in education and recruitment activities. This allowed the rebels to recruit followers from among the disaster victims and divert a part of the incoming aid. In other words, despite a lack of geographical overlap and adverse effects on a conflict party, the 1999 cyclone facilitated conflict escalation by benefiting the Naxalite insurgents.

### Escalation or De-escalation after a Disaster?

For the second stage of the QCA, I reduce the sample to the 19 cases where disasters had an impact on armed conflict dynamics and ask, Why do disasters facilitate conflict escalation in some cases but de-escalation in others?

As discussed in chapter 3, I expect these outcomes to be far more driven by dynamic factors related to the disaster impact and the conflict parties' decisions, and consequently include fewer structural conditions in the analysis. The latter conditions include the presence of a capable state with an effective government bureaucracy and a large military (*capablestate*) as well as the rebels having only very limited military strength, financial resources, and territorial control (*weakrebels*). The more dynamic conditions are a dependence of the rebel group on the disaster-affected population for supplies, shelter, and recruitment (*rebeldependence*); perceptions of an *unfair* distribution of disaster impacts, relief, and reconstruction support; a significant adverse impact of the disaster on the capabilities of the government (*impactgovernment*) or rebels (*impactrebels*); and a large inflow of international *aid* after the disaster.<sup>17</sup>

Tables 5.4 and 5.5 show that there is no necessary condition for armed conflict escalation and only one almost necessary condition for de-escalation: an adverse impact of the disaster on the government. This supports initial expectations that a disaster-related conflict (de-)escalation only occurs in certain contexts characterized by a complex combination of conditions.

Tables 5.6 and 5.7 summarize the truth table analyses for sufficient conditions for both armed conflict *escalation* and *de-escalation*. Both solutions are robust to a number of alternative operationalizations (see the online appendix), have a perfect consistency (1.00), and are characterized by a high coverage of 0.78.

The solution for *escalation* consists of two paths that can be verbalized as follows:

1. The absence of perceptions of unfairness related to the disaster in combination with the absence of adverse disaster impacts on the rebels is sufficient for an escalation of the armed conflict.

17. While 7 conditions are too many for a sample of 19 cases (Marx and Dusa 2011; Mello 2021), I run several truth table analyses with different combinations of conditions and report the model that fits the empirical data best and is robust to alternative specifications.

**Table 5.4**

Necessity analysis for a disaster facilitating armed conflict *escalation*

Condition	Consistency	Necessary ( $\geq 0.9$ )
aid	0.67	No
capablestate	0.78	No
impactgovernment	0.67	No
~impactrebels	0.78	No
rebeldependence	0.78	No
unfair	0.56	No
~weakrebels	0.78	No
democracy	0.67	No

**Table 5.5**

Necessity analysis for a disaster facilitating armed conflict *de-escalation*

Condition	Consistency	Necessary ( $\geq 0.9$ )
aid	0.67	No
~capablestate	0.67	No
impactgovernment	0.89	Almost
impactrebels	0.78	No
rebeldependence	0.78	No
~unfair	0.67	No
weakrebels	0.33	No
democracy	0.67	No

2. The simultaneous presence of perceived unfairness, the rebels' dependence on the disaster-affected population, and a capable state is sufficient for conflict escalation.

In the first path for *escalation*, the absence of adverse disaster impacts on rebel groups is the key factor. All three cases covered by the path saw no perceptions of unfair disaster preparation, relief, and reconstruction measures, but the absence of these perceptions played no causal role. In both Philippines 1990 and Tajikistan 1992, the earthquake/floods undermined livelihoods, hence facilitating recruitment efforts by the insurgents that could offer impoverished people a salary. However, this was contingent on the rebel groups being in a position to increase their recruitment of followers. The insurgents could only do this, in turn, because, despite some geographical overlap of the conflict and/or recruitment area with the disaster-affected area, they themselves were not strongly affected by the disaster.

**Table 5.6**  
Sufficiency analysis for armed conflict escalation

Path #	1	2
Path	~unfair * ~impactrebels	unfair * rebeldependence * capablestate
Consistency	1.00	1.00
Raw coverage	0.33	0.44
Unique coverage	0.33	0.44
Cases covered	<u>Bangladesh 1991</u> <u>Philippines 1990</u> <u>Tajikistan 1992</u>	<u>Egypt 1994</u> <u>India (Andhra Pradesh) 1999</u> <u>India (Assam) 1998</u> <u>Sri Lanka 2004</u>
Solution	~unfair * ~impactrebels + unfair * rebeldependence * capablestate → escalation	
Consistency	1.00	
Coverage	0.78	
Cases not covered	Colombia 1999, Uganda 1999–2001 (see box 5.3)	

\*=and +=or →= sufficient for underlined= case is only explained by this path.

In the case of the Philippines 1990, the rebels benefited from the government forces' preoccupation with disaster-related tasks and limited mobility, while they themselves hardly suffered from such disaster impacts. In the case of Bangladesh 1991, the government was also weakened by the disaster and concerned that the insurgents were keen and capable to exploit this weakness. As a result, government forces intensified violence against civilians to send a message to the broader population in the Chittagong Hills. Grievances (or their absence), by contrast, played no role for conflict escalations.

The logic behind this path implies that the disaster changes the balance of power in favor of the rebels (although the government forces are overall still more powerful), either for real or at least in the eyes of some key actors. This causes either an increase in attacks by insurgents trying to exploit this opportunity or more violence by government forces trying to deter rebels from capitalizing on their (perceived) advantage. Obviously, this path is strongly tied to the strategy and communication approaches, and particularly to the opportunity and costly signal impacts. The path is also well in line with qualitative evidence (presented above) that in the context of the opportunity pathway, it is mostly the rebels escalating violence after the government suffers adverse impacts from the disaster. These patterns also

**Box 5.3**

## Conflict Escalation: Unexplained Cases

Two cases remain unexplained by (and hence decrease the coverage of) the solution for armed conflict escalation (see table 5.6).

Colombia 1999 clearly belongs to path 1. The government was temporarily yet severely weakened by the Quindío earthquake. The Revolutionary Armed Forces of Colombia (FARC), by contrast, experienced few negative impacts from the disaster and hence aimed to use this opportunity by scaling up its attacks. The condition *unfair* was present in this case, which excluded Colombia 1999 from path 1 during the truth table analysis. However, as explained above, the absence of grievances related to unfair disaster impacts and relief is not causally relevant for this path. This is particularly so in Colombia, where the insurgents were hardly present—and certainly not active—in the regions where inhabitants expressed disaster-related grievances.

Uganda 1999–2001 is a bit of an outlier case in the whole sample as the LRA reacted to adverse disaster impacts on its capabilities with an upscaling of forced extraction, looting, and violence against civilians. Yet, there is a fit with the logic underlying path 2. In their struggle against a capable government, the rebels depended on the drought-affected population to supply them with recruits and resources (e.g., food). In this case, the condition *unfair* (which was absent) is functionally equivalent to another condition (that was present): lack of popular support. Because the LRA could not draw on increased grievances (and hence increased support) by the population to sustain its war against a capable government (particularly during a drought and the associated stress), it had to raid civilians in order to secure resources and (forcibly) recruit fighters (see chapter 4 for further details).

bear some resemblance to the results of a recent study by Tackseung Jun and Rajiv Sethi (2021), who find that ancient Korean kingdoms weakened by extreme weather events faced more frequent invasions.

Before I discuss the second path, two intertwined issues are worth highlighting. First, conflict escalation in the aftermath of disasters is less about the absolute weakening of one actor (usually the government side) but rather about a relative change of power and capabilities between the conflict parties. This aligns with bargaining theory, which expects that armed conflict parties react to sudden shifts of the balance of power with increased violence to maintain (or regain) their relative position (Kikuta 2019). Second, and related, disasters might cause a security dilemma in which the relative gains of one group are perceived as security threats by another



(competing) group (as in Bangladesh 1991), even when the first group has no intention or capacity to capitalize on this gain (Herz 1950; see also Kahl 2006: 44–50). This underscores the importance of qualitative and constructivist research on environmental security issues able to take such intersubjective perceptions into account.

The second path for conflict escalation after disasters covers the cases where rebels strongly depend on the disaster-affected population for recruitment, supplies, or hideouts. At the same time, this population is aggrieved due to unfair and/or insufficient disaster preparation, relief, or reconstruction by government actors. As a consequence, the rebels scale up their attacks, either because they benefit from increased support by the population (e.g., in terms of information, support, or manpower) or because they feel they must act on behalf of their aggrieved constituencies (the ethnic, political, or social group in whose name they were fighting). In fact, in all four cases covered by this path, the rebels were a driving force of the conflict escalation (and in all but Sri Lanka 2004, the government did not initiate additional attacks). This increase in rebel attacks is met by a capable state able to stand up to the challenge and retaliate (even in the face of a major disaster), hence causing an increase in battles and battle-related deaths.

My findings are in line with the wider literature on civil war highlighting that rebel groups—particularly if they emerge from, are connected to, or depend on the local population—can act on behalf of the grievances shared by this population (Ottmann 2017; Sorens 2011). One can thus conceive the armed insurgents, at least to some degree, as a principal acting on behalf of their constituency or agent (Miller 2005). Research suggests, for instance, that droughts increase conflict prevalence even if the drought does not hit the conflict area but rather the region inhabited by the group on whose behalf the rebels claim to fight (von Uexkull et al. 2016).

Strategic incentives furthered the escalation of violence in two of the four cases covered by path 2. In India (Assam) 1998 and India (Andhra Pradesh and Orissa) 1999, the disasters facilitated rebel recruitment. In the latter case, the PWG could also loot aid and benefit from the occupation of government forces with disaster relief. Communication played a role only in Sri Lanka 2004, where LTTE rebels increased attacks to send a message about their military capabilities not being weakened by the disaster. In all four cases, the disaster resulted in significant anti-government sentiments

on which the rebels could partially capitalize (or even feel they had to act on). Consequently, this path is more closely tied to the motivation approach and particularly the grievances impact. However, in line with their general high relevance, opportunities (for rebel groups) play a considerable role for this path as well.

The solution for armed conflict de-escalation facilitated by a large-scale disaster is summarized in table 5.7. The two paths it contains read as follows:

1. An adverse impact of a disaster on the rebels in conjunction with the absence of a capable state is a sufficient condition for *de-escalation*.
2. The simultaneous presence of an adverse impact of the disaster on the government forces and a weak rebel group is sufficient for disaster-related conflict de-escalation.

Both paths are complementary as they are underpinned by the same logic. One conflict party is weakened by the disaster (rebels in path 1 and government forces in path 2), and the other conflict party is not capable of exploiting this weakness, either because the government has a low capability (path 1) or because the rebels are very weak (path 2). In six of the nine de-escalation cases, the disaster had adverse impacts on both conflict parties,<sup>18</sup> hence reducing their capability to continue fighting at pre-disaster levels, at least in the short to medium term. This finding for *de-escalation* is strongly driven by the strategy approach and in particular the constraints impact, which is present in six of the seven cases covered by the QCA solution and eight of the nine de-escalation cases (Myanmar 2008 is the notable exception, characterized only by the impact of image cultivation). This result is further corroborated by qualitative evidence (presented above) that if both conflict parties are adversely affected by a disaster, conflict intensity tends to decline.

Despite their functional equivalence, there are some differences between the two paths. For the second path (*impactgovernment\*weakrebels*), the communication approach is more important, as it is present in two out of three cases (by contrast, the communication approach is present in only two of the five cases covered by path 1). Likewise, the role of the government in reducing fighting intensity is more pronounced in path 2. In Bangladesh 2007 and Myanmar 2008, the government forces drove the conflict

18. These cases are Burundi 2005–2006, India (Kashmir) 2005, Indonesia 2004, Myanmar 2008, Pakistan 2010, and Somalia 1997.

**Table 5.7**  
Sufficiency analysis for armed conflict de-escalation

Path #	1	2
Path	impactrebels * ~capablestate	impactgovernment * weakrebels
Consistency	1.00	1.00
Raw coverage	0.56	0.33
Unique coverage	0.33	0.22
Cases covered	<u>Indonesia 2004</u> Myanmar 2008 <u>Pakistan 2010</u> <u>Somalia 1997</u> <u>Somalia 2010</u>	<u>Bangladesh 2007</u> <u>India (Kashmir) 2005</u> Myanmar 2008
Solution	impactrebels * capablestate + impactgovernment * weakrebels → de-escalation	
Consistency	1.00	
Coverage	0.78	
Cases not covered	Burundi 2005–2006, Turkey 1999 (see box 5.4)	

\*=and +=or →= sufficient for underlined= case is only explained by this path.

de-escalation. The rebels restrained their activities in Kashmir 2005, but this move was encouraged by Pakistani state actors that provided funding and shelter to the insurgents. In path 1, by contrast, government forces (4) and rebels (4) drive conflict de-escalation equally often.

Taken together, this indicates that when a disaster hits a vulnerable area where a weak rebel group is present, high levels of international attention cause the government forces to restrain violence in order to cultivate their image. This communication logic is best exemplified by the cases of India (Kashmir) 2005 and Myanmar 2008. It is also partially true for the case of Indonesia in path 1, where the GAM rebels already struggled before the tsunami, while the inflow of international observers and aid was massive. All three disasters are also rapid-onset events, providing additional support for the finding that the image cultivation impact is more relevant for rapid-onset disasters as they attract more attention.

While already important for path 2, the strategy approach (and particularly the constraints pathway) is dominant in path 1, as it is present in four of the five de-escalation cases. The only outlier is Myanmar 2008, which is the only case also explained by path 2. In 60% of the cases covered by path 1, constraints on the rebels is the only causal link between disasters

**Box 5.4**

## Conflict De-escalation: Unexplained Cases

While the solution presented in table 5.7 is free of contradictions (and hence has a perfect consistency), it cannot account for two conflict de-escalation cases (resulting in a coverage of 0.78).

Burundi 2005–2006 was characterized by a disaster-induced weakening of the PALIPEHUTU-FNL rebels but the presence (rather than absence) of a capable state. However, one can argue that a certain weakness of the government was still present. The drought significantly affected the capability of the state (with a relative GDP loss of 3.8%, among other effects). Furthermore, the disaster struck the northern regions of the country, where control of the government apparatus was low compared with other parts of Burundi. Hence, the government forces were unable to exploit the disaster-induced weakness of the insurgents. The case thus fits path 1 very well.

When it comes to Turkey after the 1999 earthquake, the disaster-conflict link is rather indirect, with solidarity and image cultivation having played minor roles for the armed conflict de-escalation. Here, the disaster affected a capable state but not a weak rebel group—a pattern that does not fit either of the two paths. There is some resemblance, however, to the communication approach discerned in path 2. The PKK leadership expressed solidarity with the affected communities and used this to both justify its retreat into Iraq (which was rather driven by the capture of its leader) and improve its image among the international community (see chapter 4 for more information).

and armed conflict de-escalation. In line with this, in all cases covered by path 1, the rebels are dependent on the local population for support, making an adverse impact of the disaster on their capabilities even more plausible. The government forces, in turn, usually did not have the capability to exploit this weakness.

The findings for de-escalation confirm that disaster can lead to a decline in armed conflict risks by weakening governments as well as rebel groups. This has two important implications for the literature on environmental conflicts and climate security. First, contrary to one-sided narratives about environmental-conflict links, disasters can also decrease armed conflict intensity. Second, climate change and disasters not only and not necessarily facilitate state fragility (although this happens sometimes) but also put significant pressure on the resources and capabilities of insurgents.

## Summary

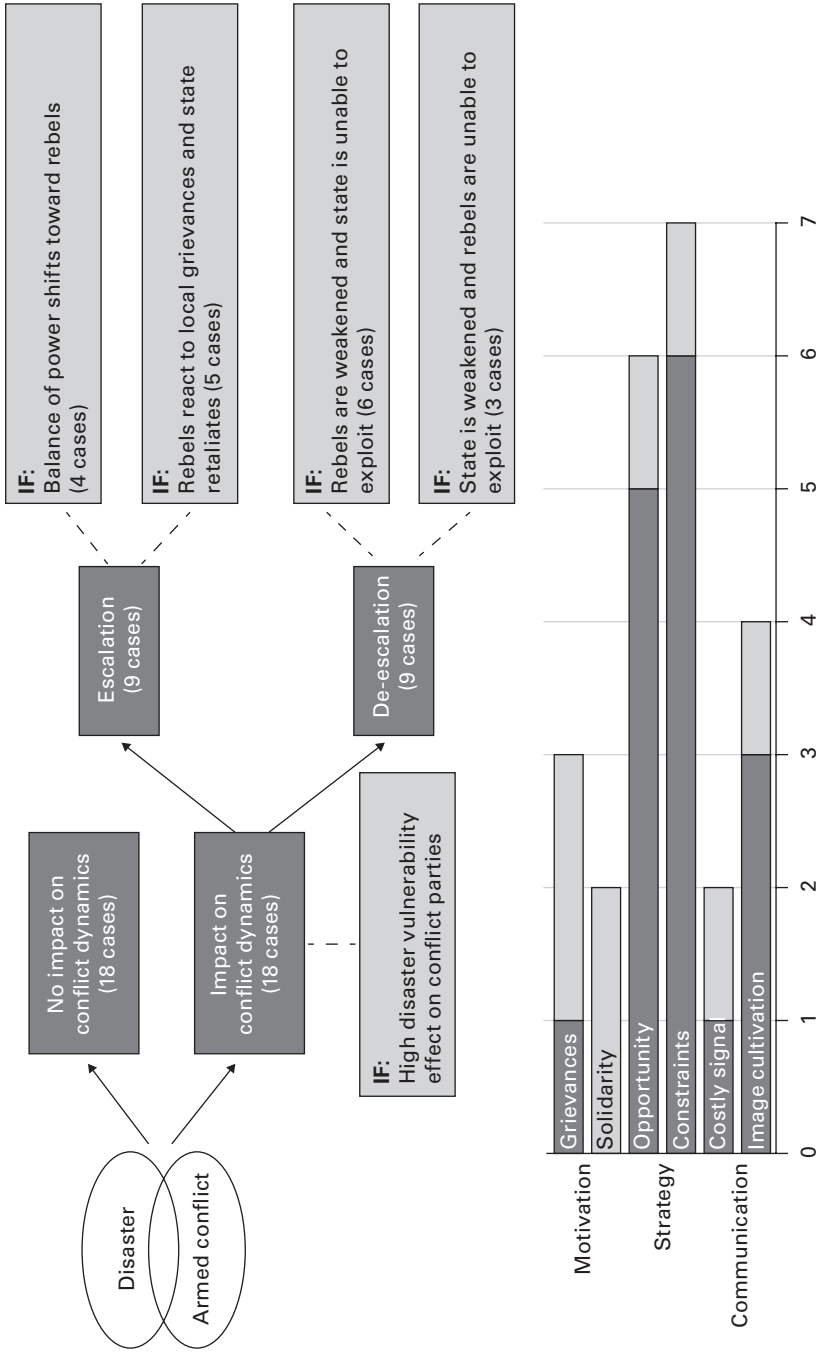
This section briefly summarizes the main empirical insights presented in the chapter. A more detailed discussion of how the results inform research and policy is provided throughout this chapter and also in the conclusion.

Figure 5.5 visualizes several key insights. To start with, the links between disasters and armed conflicts are far from deterministic or unidirectional. In 50% of the cases in my sample, disasters had no relevant impact on the dynamics of armed conflicts, while conflict escalation (25%) and de-escalation (25%) are equally prevalent. This suggests that disasters—and by extension, climate change, food insecurity, and resource scarcity—can contribute to reduced conflict risks and that any impact of environmental factors on conflict dynamics is dependent on (complex combinations of) scope conditions. That said, large-scale disasters are associated with higher conflict intensity in one of four cases in my sample. Disasters are neither the only nor usually the most important drivers of changes in armed conflict dynamics. Rather, they intersect with a broad range of political and economic developments.

The upper part of figure 5.5 provides information on the conditions (or contextual factors) for conflict (de-)escalation after disasters.

My analysis suggests that two factors need to be present simultaneously for disasters to have an impact on armed conflict dynamics (for good or bad): a high vulnerability to disasters (which is also a necessary condition) and a relevant impact of the disaster on at least one conflict party. In the absence of one or both of these conditions, local populations, rebels, and state forces do not operate in a context where disasters make them reconsider their attitudes and strategic considerations regarding the armed conflict.

But why do disasters facilitate conflict escalation in some cases and de-escalation in other cases where both a high vulnerability and impacts on one or both conflict parties are present? Two conjunctions of conditions explain an increase in armed conflict intensity. Either the rebel group remains largely unaffected by the disaster and exploits a disaster-induced weakening of government forces, or the rebel group intensifies its activities in reaction to the grievances of the disaster-affected population, which is met by resistance of a capable state. Conflict de-escalation, by contrast,



**Figure 5.5**  
Overview of the empirical argument.

occurs when one conflict party is weakened by the disaster and the other side is unable to exploit this weakness, either because of a lack of capacities or because it is under the close scrutiny of an international audience. Furthermore, fighting intensity usually declines if both conflict parties suffer negative impacts from a disaster. The level of democracy and the inflow of international aid are causally irrelevant for conflict (de-)escalation in the wake of disasters.

Rather than focusing on contextual factors, the lower part of figure 5.5 focuses on the causal pathways connecting disasters and armed conflict dynamics. It shows that changes in the strategic environment account for most disaster-conflict intensity links, by providing either opportunities for or constraints on the conflict parties. When it comes to conflict escalation, rebel groups frequently benefit from increased recruitment opportunities or a preoccupation of government forces with disaster-related tasks. Relevant constraints that cause conflict de-escalation include financial troubles, reduced troop mobility, and a re-allocation of resources to disaster relief.

Armed conflict parties also frequently use violence as a form of communication after disasters, mostly to cultivate their image (usually among an international audience) by refraining from the use of violence. This pattern is far more relevant for rapid-onset than for slow-onset events. The use of increased violence to send a costly signal (usually to domestic actors) is much rarer. Likewise, the motivations of the local populations play only a minor role. Disaster-related grievances mattered in some cases and also occur as a relevant condition in one escalation path. Post-disaster solidarity, by contrast, is usually too limited and short-lived to affect conflict dynamics.

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