VIOLENT ERUPTIONS:
NATURAL DISASTERS, WAR, AND PEACE

by

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DEDICATION

For Allie

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ABSTRACT

Natural Disasters, War, and Peace

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Do natural disasters increase the prospects for peace or do they exacerbate civil war? Do these events generate either of these outcomes systematically? Under what conditions? This dissertation addresses these questions in a comprehensive investigation of natural disasters' effects on the trajectory of civil conflict. In so doing, this dissertation aims to increase both theoretical and practical understanding regarding the relationship between environmental phenomena, the state, and war. As a growing body of scientific evidence links global climate change to increases in the frequency and severity of climatic disasters, and as these "natural" disasters occur disproportionately in countries already prone to civil conflict, such knowledge is pressing. I argue that natural disasters act as exogenous shocks that create opportunities for violent political mobilization. These opportunities arise from the human security and livelihood costs disasters impose, and the perceived injustices generated over post-disaster re-distributions of wealth. Corrupt and discriminatory political institutions aggravate these effects, and further enhance the capacity of anti-state challengers to coerce,

co-opt, and induce public cooperation. The outcome can both perpetuate civil conflict and increase the level of violence within it. However, I suggest that mobilization opportunities similar to those disasters create for insurgents are also available to state military forces waging counterinsurgency. Because the military often takes the lead in responding to and assisting with disaster events, especially in conflict-contested areas, and because the methods employed during these actions mirror counterinsurgency tactics, military forces can exploit these opportunities to heighten public support and cooperation. In the following chapters, I test these arguments with both quantitative and qualitative techniques. I find that disasters' effects on the trajectory of conflict can act as a double-edged sword; these events can heighten insurgents' capacity to challenge the state, but they also counter it because they create opportunities for both the state and insurgent groups to mobilize civilian cooperation and support.

CHAPTER 1: INTRODUCTION

Voltaire asserted: "Men argue, nature acts." An apt paraphrase would read: "Nature acts upon people's arguments." On December 26, 2004, a magnitude M9.2 earthquake roiled the Indian Ocean seafloor. The ensuing tsunami killed 250,000 people in eleven countries. Sri Lanka and Indonesia, two of the hardest-hit states, lost a combined estimate of 200,000 people, with over 1 million displaced. The disaster captivated global attention, both because of its magnitude and because the most devastated regions within each of these states were already mired in civil conflict.

The Sri Lankan civil war began in 1983 as a separatist war of independence among insurgents in the Tamil speaking north and the Sinhalese-dominated government in the south. Intermittent fighting between the government and the Liberation Tigers of Tamil Eelam raged over the next two decades. The combatants agreed to an internationally mediated ceasefire in 2002. Though hostilities began to re-escalate in late 2003, the tsunami presented a key opportunity to bolster the peace process. It was not to be. In the following year, disputes over the sharing and dispensation of relief aid preceded a ceasefire collapse, renewed hostilities, and conflict escalation.

The Indonesian separatist conflict somewhat paralleled the Sri Lankan civil war. The Gerakan Aceh Merdeka (GAM) had since 1976 fought for autonomous rule of the Aceh region of Northern Sumatra. As in Sri Lanka, grievances arising from the politics of identity and representation and human rights abuses drove the struggle. Also, like Sri Lanka, combatants agreed to a tentative ceasefire in 2002. However, in a departure from the Sri Lankan conflict, this agreement would not persist through the disaster. The deal dissolved in 2003 following mutually acrimonious complaints over misinterpretation of agreement specifics. Following dissolution and prior to the tsunami, tensions reignited. The Indonesian military amplified its military campaign

and the five thousand strong GAM force actively resisted. Yet, whereas the year following the tsunami witnessed the Sri Lankan conflict's escalation from brokered ceasefire to full-blown civil war, the Indonesian government and GAM signed a lasting peace agreement eight months following the disaster. Scholars, practitioners and the news media lauded the agreement as a triumph for "disaster diplomacy" (Enia 2008; Bauman, Paul, and Ayalew 2007).

This anecdote illustrates larger questions regarding the relationship between environmental hazards and the dynamics of civil conflict. Do natural disasters increase the prospects for peace or do they sharpen insurgency? Do disasters, the scarcities they create, and the mobilization opportunities they provide increase the risk of violence or do they generate cooperative behavior among antagonistic populations that can ultimately diminish violence? Do they do any of these things systematically? This dissertation addresses these questions through a comprehensive investigation of disasters' effects on the duration of civil conflict and the incidence of violence within it. In so doing, this dissertation aims to increase both theoretical and practical understanding regarding the relationship between environmental phenomena, the state, and war. As a growing body of scientific evidence links global climate change to increases in the frequency and severity of climatic disasters, and as these "natural" disasters occur disproportionately in countries already prone to civil conflict, such knowledge is pressing.

Existing scholarship is divided over the implications that disasters might pose for conflict. On the one hand, literature in environmental security suggests that demographic and environmental changes that expedite degradation and generate scarcities of vital natural resources can increase conflict risk (Goldstone 1997, 2002; Homer-Dixon 1999; Homer-Dixon and Blitt 1998; Baechler 1998) When scarcity facilitates intra-state and cross-border migration, declining state capacity and legitimacy, economic decay, and agricultural failure, conflict can follow (Kahl 2006; Reuveny

2007). Natural disasters can impose episodes of severe resource scarcity. They can facilitate rapid, large-scale population dislocation. Disasters can also necessitate significant resource expenditures for relief and reconstruction, and lay waste to infrastructure and military hardware, all of which can diminish a state's capacity to suppress violence (Nel and Righarts 1998). Poorly handled disasters can diminish regime legitimacy (Goldstone 2001). They can severely degrade local environmental conditions, decimate an affected region's capacity to grow food and diminish local economic production. If environmental degradation and resource scarcity increase the risk of conflict, then disasters can be a crucial cause (Olson and Drury 1997; Bhavnani 2006; Brancati 2007; Nel and Righarts 2008; Hsiang et al. 2011).

On the other hand, not all agree that scarcity in general, or disasters in particular, should encourage conflict. Insights from neo-classical economics and the "resource curse" literature suggest that rather than scarcity, resource abundance is more likely to generate conflict, because abundance can generate struggles over resource distribution among competing groups (Ross 2004a, 2004b). Others argue that simple scarcity arguments are over-determined. If scarcity predicts conflict, then why does the relationship between these variables exhibit so much spatial and temporal variation (Salehyan 2008)? Sociological research suggests the crises these hazards create can encourage pro-social behavior among disparate groups (Fritz 1961, 1996). The importance of cultural and social variations diminishes in the face of a common external threat. A disaster victim identity can emerge that eclipses identity and ethnicity distinctions that might otherwise aggravate inter-group hostilities. In political science and geography, the "disaster diplomacy" literature examines cases where disasters' aftermath created space for diplomatic interaction among hostile nations (Kelman and Koukis 2000; Kelman 2006, 2012). Recent quantitative work on civil conflict substantiates these insights, finding empirical evidence that

disasters can also reduce the risk of intra-state violence (Slettebak 2012).

In short, prior scholarship is split regarding the implications that natural disasters pose for inciting or pacifying conflict. I suspect that the contradictions in previous research, as well as the divergent outcomes that followed the Indian Ocean tsunami, illustrate the duel consequences that disasters can have on the trajectory of civil conflict. Natural disasters act as exogenous shocks that create opportunities for violent political mobilization. These opportunities arise from the human security costs disasters impose, and the perceived injustices generated over post-disaster redistributions of wealth. Corrupt and discriminatory political institutions magnify these effects, which further enhances the capacity of anti-state challengers to coerce, co-opt, and induce public cooperation. The outcome can increase violence and perpetuate civil conflict. However, I suggest that the same mobilization opportunities that disasters create for insurgents are also available to government militaries waging counterinsurgency. Because the military often takes the lead in responding to and assisting with disaster events, especially in combat-contested areas, and because the methods employed during these actions mirror counterinsurgency tactics, military forces can capitalize on these opportunities to increase public support and cooperation. Thus, disasters' effects on the trajectory of conflict can act as a double-edged sword; they can heighten insurgents' capacity to challenge the state, but also counter it because they create opportunities for both the state and rebel groups to mobilize civilian cooperation and support.

I derive this argument from three disparate bodies of literature: human security and livelihoods, social justice and decision-making theory, and social movement studies and rebel recruitment. First, human security literature identifies variations in environmental vulnerability—why disasters are more likely to affect certain populations than others and among these populations why some are less able to recover. Human security, vulnerability, and livelihood capacity are

important because they shape the incentive structures that individuals possess to engage in or refrain from participating in conflict. Second, research into the psychology of social justice identifies how politics that reinforce political and economic marginalization and inequality motivate individuals to participate in conflict, why similar environmental shocks can elicit distinct reactions from similarly affected communities, and why the transparency, inclusiveness, and fairness of state relief allocation can matter for grievance formation equally as much, if not more, than the overall amount of aid allocated. Finally, literature in civil conflict and rebel recruitment explains how groups can capitalize on the political opportunities disasters create to pursue their broader objectives for armed conflict. This literature illustrates how the political strategies that groups employ to recruit and gain support, as embodied in the motivations of a group's members and supporters, can influence a group's capacity to wage combat.

DEFINING DISASTERS

In this dissertation I define natural disasters as "humanitarian disasters associated with…natural hazard event[s]" (Pelling and Dill 2010, 23). A common disaster typology categorizes disasters based on their impact speed, "rapid-" and "slow onset:" Rapid onset disasters (floods, fires, tsunamis, earthquakes, storms, volcanic eruptions) impose immediate resource scarcities and necessitate abrupt population dislocation. Slow onset disasters (droughts and extreme bouts of temperature) also diminish resource access and reduce production capacity, however whether or not to migrate can be more often a function of choice than necessity, as droughts and famine do not destroy houses (Reuveny 2007). I examine both disaster types in this dissertation. I devote greater empirical attention to rapid onset disasters because the destructive nature of these events, the immediacy of their impact, and prior empirical research all suggest that they pose greater risks to

conflict (Nel and Righarts 2008; Brancati 2007). Nevertheless, I test this assumption empirically in the following chapters.

CHAPTER OUTLINE

Chapter 2 provides an overview of the literature that addresses the relationship between environmental phenomena and war, outlines the parameters of my theoretical argument, and identifies five hypotheses that are amenable to empirical testing. Chapters 3 - 5 constitute the empirical chapters. My dissertation draws upon both quantitative and qualitative methodologies to analyze disaster's effects on the trajectory of armed civil conflict. In Chapter 3, I conduct a panel analysis of the effects natural disasters' effects on the incidence of violence within civil conflict. If disasters do indeed generate motives and incentives for individuals to participate, then Chapter 3 should reveal the extent of this effect. In Chapter 4, I extend the investigation to conduct an event history analysis of disaster's effects on conflict duration. If the results from Chapter 3 indicate that disasters increase the risk of violence in conflict, then a key implication of this finding is that conflicts in disaster-prone states should last longer, all things equal. In both Chapters 3 and 4, I also test the extent that exclusive and discriminatory political institutions condition disasters' effects. I argue that disasters' impact is likely to be the most pronounced in these states because a key impact of political exclusion—the inability to access public goods and support—increases both the human security costs that disasters impose and the motives and incentives that discriminated individuals possess to overturn the status quo.

In Chapter 5, I conduct a quantitative and qualitative case study on disasters and civil conflict the Philippines. This research design enables me to test whether my argument holds at the sub-national level in a crucial case country at the global forefront of both disaster vulnerability and

prevalence of armed civil conflict. As of this writing, there are an estimated nine active insurgent groups operating in the country. The qualitative section of this chapter draws data from the country's largest and longest tenured, the Communist Party of the Philippines-New People's Army (CPP-NPA), to reveal the causal mechanisms that connect the independent and dependent variables employed in prior chapters. In this section, I provide an overview of disasters, disaster vulnerability, and the Philippine state's institutional architecture for disaster response. I then analyze how local political actors apply patronage and clientelism to subvert these institutions for political and economic gain at the expense of the marginalized and vulnerable. Finally, I consider the effects these factors on the CPP-NPA's capacity to recruit new members and mobilize public support.

In the quantitative section of Chapter 5, I gauge the extent that the mechanisms that enable the CPP-NPA to recruit and gain public support also enable the group to boost its capacity to wage violence against the Armed Forces of the Philippines (AFP); whether this effect holds for other groups operating in the country; and, whether disasters also enable the AFP to boost its capacity to wage violence against insurgents. In this section, I draw insurgent data from the AFP, and from the four largest insurgent groups operating in the country: the separatist groups, the Moro Islamic Liberation Front (MILF) and the Moro National Liberation Front (MNLF); the terrorist group, Abu-Sayyaf; and the revolutionary group, the Communist Party of the Philippines-New Peoples' Army (CPP-NPA). In contrast to the rough, country-level data used in Chapters 3 and 4, these data measure the rate of attacks per unit of analysis, and enable disaggregation of the attacking actors (government or insurgent forces).

Finally, I conclude this work in Chapter 6. I review the findings, explore avenues for future research, and discuss the implications of this work in light of the policy concerns they illuminate.

CONTRIBUTIONS

This research has important implications for both theory and policymaking. My dissertation theoretically develops both environmental security and civil conflict literatures in at least four ways. First, I suggest that environmental security scholars should make greater attempts to move beyond popular debates that question whether or not resource scarcity causes armed conflict and toward a greater understanding of both the contextual conditions that explain variations in scarcity's relationship with violence and how scarcity enables actors with an interest in violence to mobilize. My work addresses both of these points. I develop and empirically test a theory that articulates why disasters are more likely to produce violence in some places than others, how natural disasters enable armed groups to co-opt or coerce civilian support, and the role that these actions play in shaping both insurgent and incumbent military success. Second, my dissertation is the first to analyze the effects that disasters can have for both conflict incidence and duration. Prior analyses limit theoretical and empirical treatment to examining disasters' effects only on conflict onset, with minimal attention to how these episodes can contribute to understanding why intractable conflicts persist. Third, I suggest that environmental security scholarship pays insufficient attention to the role that political institutional structures play in influencing the relationship between scarcity and conflict. I counter the criticism that the scarcity-conflict nexus is over-determined through an examination of how and why corrupt and discriminatory political institutions can motivate and incentivize violence in times of extreme scarcity. Finally, I integrate insights from three disparate, but well-founded bodies of literature—human security, social justice and decision-making theory, and rebel recruitment—to analyze the impact that environmental hazards have on the risk of conflict. This inter-disciplinary approach enables me to theoretically develop this issue as it relates to both groups and individuals and provides a more robust

understanding of these relationships. On the individual level, articulating the effects that disasters and disaster politics can have on both motives and incentives enables me to move beyond debates that question whether "greed" or "grievances" are more important for explaining decisions to participate in conflict. On the group level, assessing groups' strategies to capitalize on the political opportunities disasters create can explain variations in disasters' effects on the incidence and duration of conflict.

This research also has important practical implications for policymaking. First, in analyzing natural disasters' effects on civil conflict, this work addresses the U.S. Defense Department's inclusion of environmental security concerns such as natural disasters, rising scarcity, and the implications of climate change in the Quadrennial Defense Review—a document that outlines to the US Congress key strategic priorities in coming years (US Dept. of Defense 2010). Natural disasters embody the most extreme form of environmental insecurity, yet the mechanisms linking disasters to civilian mobilization are poorly understood (Pelling and Dill 2006; Nel and Righarts 2008. Brancati 2007). With frequent disasters in conflict countries like Pakistan, Somalia, the Philippines, India, Bangladesh, and elsewhere, this topic is critically important. Second, examining the role that political institutions play in mediating disasters' impact on conflict risk can produce insights into appropriate measures to resolve these issues. If correct, these findings would indicate that governance quality could alleviate the dangers that episodic resource scarcity imposes because governance can improve vulnerable populations' capacity to both adapt to disaster threats and recover from them.

CHAPTER 2: NATURAL DISASTERS, POLITICS, AND CIVIL CONFLICT

The threats natural disasters pose are greater now than at any time in history. Recent climatic trends coupled with population growth and developments in environmentally unsustainable habitats have increased disasters' strength and magnitude. Policymakers have equated natural disasters with terrorism (Pearce 2009). Governmental defense agencies such as the Pentagon now routinely prioritize natural disasters as national security threats in strategic planning (Gjelten 2009). A primary concern is that disasters and the resource scarcity they produce will heighten the risk of civil conflict among beleaguered populations. The actual risk however, is a topic of some debate. Prior work has labeled natural disasters a cause of both peace and war; they can limit conflict risks, but they can also increase them (Akcinaroglu, DiCicco, and Radziszewski 2007; Bhavnani 2006; Brancati 2007; Nel and Righarts 2008; Slettebak 2012). Given this issue's importance, these claims warrant closer inspection. Are policymakers justified in equating disasters with national security threats? Do disasters increase the risk of war? Or, are disasters more likely to facilitate peace among rivals as hostilities diminish in the face of common threats? This dissertation analyzes these questions. Specifically, it examines the impact that natural disasters can have on both the duration of civil conflict and the incidence of violence within it. While other studies have examined natural disasters' effects on the onset of conflict—the risk that new conflicts will begin—none have explored in depth how these events shape dynamic processes in conflicts already underway. This omission is surprising because many of the most conflict-prone countries in the world are also among the most environmentally vulnerable. Assessing the extent that these processes are causally connected can thus be a boon

to both scholars and policymakers who seek to understand why the complex emergencies that result from the intersection of human and natural crises can produce varying outcomes.

I argue that the contradicting conclusions in prior work partially reflect the divergent effects that disasters can have on the incidence and duration of conflict. On the one hand, natural disasters can generate motives and incentives for individuals to participate in conflict when they diminish human security and generate anti-state grievances. Motives and incentives can create opportunities for anti-state challengers to enhance civilian cooperation and recruitment, which can boost their capacity to challenge the state. On the other hand, disasters also create opportunities for the state to enhance legitimacy through competent relief efforts and for military forces to boost their capacity to challenge insurgent threats in disaster-affected areas, which can enhance counterinsurgency efforts. This argument indicates that disasters can act as double-edged swords; they can heighten the risk of insurgency, but also counter it because they create opportunities for both the state and insurgent groups to mobilize civilian cooperation and support. Two interrelated factors, a population's political status and its vulnerability to environmental threats, should partially shape the magnitude of disasters' effects, which can in turn influence the outcome. Vulnerability is the combination of a population's environmental exposure and its recovery capacity. Vulnerable communities are often the most likely to experience a disaster and the least capable of recovering from them. Thus, vulnerability should shape the nature of an individual's incentives to participate in conflict post-disaster. Political status concerns a population's level of access to and sway over governmental decision-making, which can also determine access to public goods necessary for comprehensive relief and reconstruction of livelihoods. Political exclusion both exacerbates and is exacerbated by environmental vulnerability, and can influence an individual's motives for participating in

conflict as well as the opportunities that external actors—insurgents or the state—possess to mobilize them.

In the following sections, I review the literature on natural disasters and the environmental dimensions of civil conflict, elaborate my argument, and develop testable hypotheses.

THEORETICAL PERSPECTIVES

Civil wars frequently occur in states highly vulnerable to natural disasters. Since 2000, there have been between 29 to 37 civil conflicts occurring in any given year (Gleditsch et al 2002). During the same time period and in these same countries, natural disasters have affected over one billion people and killed more than a million (EMDAT CRED). Disasters are also increasing in frequency. Since 1980, the annual number of disasters has more than quadrupled (EMDAT CRED). Figure 2.1 visualizes this trend; it displays the temporal distribution of the number of rapid- and slow onset natural disasters and the number of civil conflicts that have occurred annually from 1946-2006.[1]

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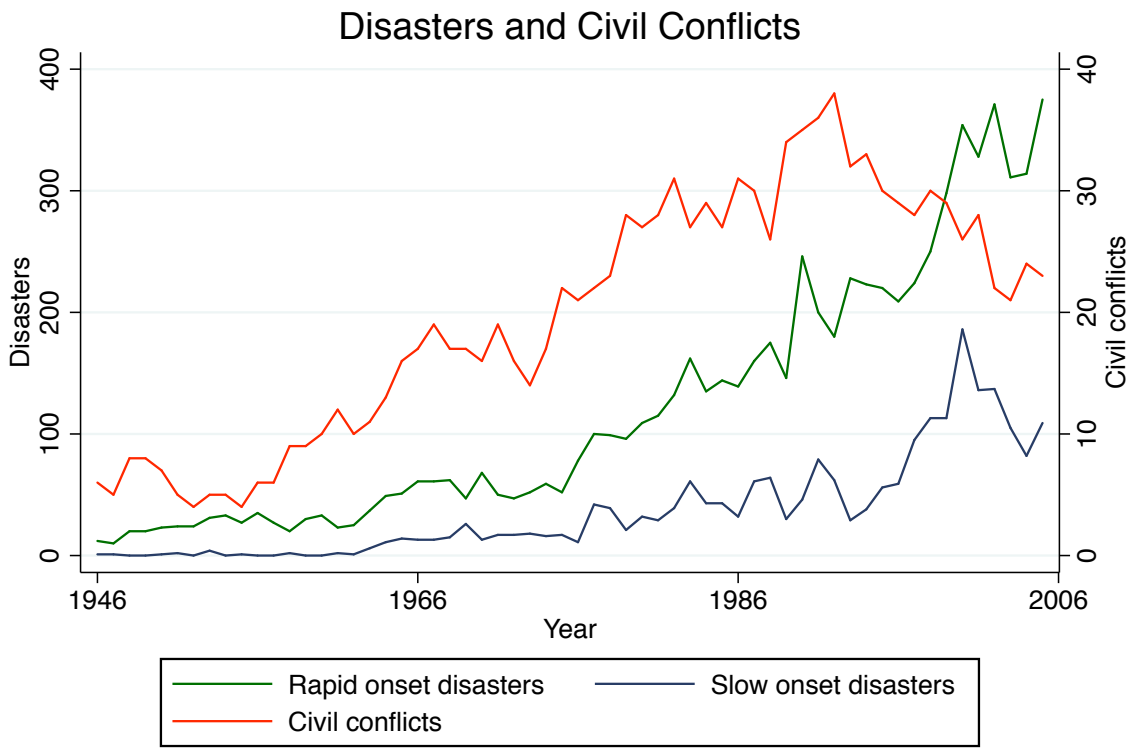
[1] Data for Figure 2.1 taken from EMDAT CRED, and from Gleditsch et al. 2002.
[2] For example, rural Pakistanis spend an average of 46% of annual income on food. Even small changes in the purchasing power/food ratio can have dramatic impacts on food access. (“Annual Income Spent on Food” 2011)
[3] Data for Figures 2.2-2.4 taken from EMDAT-CRED.

[4] [illegible]

FIGURE 2.1



As Figure 2.1 indicates, there appears to be some overlap with respect to these processes, however causal patterns remain in doubt. On one hand, natural disasters might amplify pre-disaster political trends, which in conflict-prone countries can exacerbate war (Pelling and Dill 2010; Olson and Gawronski, 2003). Natural disasters provide armed groups an opportunity to gain popular support and generate recruits (Shefner 1999). Predatory groups can boost membership when they co-opt or coerce vulnerable victims to support them (Beardsley and McQuinn 2009; Humphreys and Weinstein 2008). Activist groups can gain legitimacy and enhance bargaining power vis-à-vis the state when they execute functions of governance in crisis situations (Enia, 2008). Governmental failures can facilitate these efforts when corruption and ineptitude stimulate grievances among the population. Furthermore, government expenditures for relief efforts and infrastructure repair coupled with reductions in tax revenue diminish resources

available for conflict suppression. These revenue losses can embolden insurgent groups and enhance their relative combat capacity. Increased insurgent membership and support combined with declining state power can strengthen insurgency and prolong war.

On the other hand, research has also found that disasters can transform conflict trajectories and promote peace (Kreutz 2013). Case studies have found that disasters can encourage diplomatic interaction, or "disaster diplomacy," among rivals (Kelman 2012). This dynamic can occur in both international and domestic contexts. Internationally, Akcinaroglu, DiCicco, and Radziszewski (2011) argue that the hardships incurred following an earthquake in Turkey in 1999 facilitated rapprochement with rival Greece. Domestically, disaster-induced devastation can generate common bonds over shared hardships, a "community of sufferers" or "therapeutic community," that enables diverse populations to transcend prior grievances (Fritz 1996; Slettebak 2012). This outcome can result from solidarity and cooperation that emerge during relief and reconstruction work, and through the efforts of international mediators and civil society groups that pursue peace through political socialization and dialogue promotion (Pelling and Dill 2006; Le Billon and Waizenegger 2007; Renner and Chafe 2006). If these insights are correct, then rather than aggravating conflict and violence, disasters might encourage peace among rival factions.

Disasters might also precipitate peace when they strengthen the state's capacity to suppress conflict (Enia 2008). Well-handled disaster relief can boost government legitimacy, which can diminish support for subversion (Tierney 2007). Performing disaster relief services can increase and legitimize state military penetration into insurgent-populated areas, which can facilitate intelligence gathering and provide military relief providers an opportunity to gain local support. Even in absence of comprehensive relief operations, international aid payments can

enhance conflict suppression capabilities when they generate windfall revenue for governments. Foreign disaster relief agencies and non-governmental organizations frequently allocate goods and capital through government channels. Because these resources are transferable and often provided in haste and without preconditions, governments in war-torn states can use them to finance counterinsurgency and supply troops (de Waal 1991). Heightened military capacity can increase government bargaining and combat strength, which can enhance a state's ability to suppress violence and conflict.

Just as theoretical expectations diverge, empirical work is also at odds. Prior analyses have assessed the effects of disasters and climatic changes on the incidence of civil conflict and political violence. Conclusions are contradictory. For example, A 2009 analysis published in Proceedings of the National Academy of Sciences (PNAS) demonstrates that rising temperatures will increase the risk of civil conflict in Sub-Saharan Africa, eclipsing any effects that democratization and economic growth have in this region. The article projects that by 2030 we should see a 54% increase in armed conflicts in Africa producing an additional 393,000 battle deaths (Burke, et al 2009). The following year a PNAS rebuttal contradicts these claims, finding that: "…climate variability is a poor predictor of armed conflict…African civil wars can be explained by generic structural and contextual conditions" (Buhaug 2010, 16477).

Additional studies are equally contradictory. An article in Nature finds that the El Niño/Southern Oscillation, which affects the strength and frequency of climatic phenomena, "may have had a role in 21 percent of all civil conflicts since 1950" (Hsiang, Meng, and Cain 2011, 438). Another study finds that climatic shifts—extreme hot and cold spells—have had a positive and statistically significant effect on a range of human crises throughout history, including war, migration, famine, and disease epidemics (Zhang et al. 2011). Similarly, Brancati

(2007) finds that strong earthquakes striking densely populated areas in poor states provoke violence among affected populations. Nel and Righarts (2008) display similar findings with all "rapid onset" natural disasters. In contrast, Bergholt and Lujala (2012) find no relationship between disasters and the risk of civil conflict. Slettebak (2012) finds the incidence of climate-related natural disasters and civil conflict to exhibit an inverse relationship—more frequent disasters actually lower the risk of violence. Similarly, Kreutz (2013) finds that disasters create "ripe moments" that can relax hostilities and encourage peace in separatist conflicts.

These empirical contradictions partially reflect theoretical debates over the role the natural environment plays in facilitating violence and war. Environmental security scholars tend to prioritize the effects that physical factors such as environmental degradation and scarcity of subsistence resources can have on the risk of violence (Homer-Dixon 1999; Homer-Dixon and Blitt 1998; and Baechler 1999). Resource scarcity can result from any combination of population growth, resource degradation, and skewed resource distribution—what Homer-Dixon calls demand-induced, supply-induced and structural scarcity, respectively (Homer-Dixon 1999). These factors can function independently or interact to increase the risk of conflict. Scarcity also increases the risk of conflict when it limits a state's ability to suppress violence. Rising scarcity can heighten demands that society places on the state while reducing the state's capacity to provide public goods. When states cannot counter these risks through social welfare provision or increases in social control, conflict can result. Kahl (2006) argues that the strain "demographic and environmental stress" places on states can create conditions that resemble a security dilemma in international relations. In absence of strong state capabilities, actors' attempts to secure their own welfare can create incentives for others to pursue violence against them. The state can also exploit scarcity to initiate violence. In this scenario, rising scarcity can create

incentives for elites in power to engineer "top-down" conflicts to protect their own self-interests (Kahl 2006).

Critics of this work have argued studies that attempt to link physical scarcity with conflict tend to over-simplify and over-determine the relationships under study at the expense of potentially crucial intervening factors. In contrast, work in political ecology shifts analytical focus away from physical scarcity and towards the politics of resource distribution and governance. Social, political, and economic inequalities can exacerbate disparities in environmental vulnerability that both result in and result from greater environmental exposure. Some, by virtue of their position within existing social and political hierarchies, are more vulnerable to environmental threats than others and less capable of recovering from them. Environmental crises like natural disasters reinforce this vicious cycle, enhancing marginalization and exclusion, which in turn can increase the risk of instability and war. A key insight for political ecologists is that resource scarcity and environmental degradation are manifestations of deeper structural imbalances rather than primary causal agents. This "…structural violence can beget direct physical violence", when groups rise up to challenge unfair resource distribution, or when powerful actors use violence against marginalized groups in attempts to maintain hierarchical patterns of resource allocation and governance (Raleigh 2010, 73).

Although scholars have criticized political ecology studies for "…a high degree of indeterminacy and under-specification," and "...very little conceptual elaboration," political ecologists are correct in emphasizing the importance of politics and political exclusion in determining the social effects of adverse environmental changes (Kahl 2006, 25). Indeed, a key finding presented in this dissertation is that discriminatory politics and the vulnerability these

relationships create can increase the magnitude of disasters' effects on civil conflict. However, whereas environmental security research can be criticized for over-emphasizing the risks that physical scarcity poses, political ecologists are prone to discount it altogether (Kahl 2006, 24). As this study also suggests, extreme physical scarcity can be crucial to explaining the link between disasters and conflict because it can shape both the incentives that individuals possess to participate as well as armed groups' capacity to coerce, co-opt, and attract new membership and support.

This dissertation employs a theoretical framework that emphasizes the costs natural disasters and disaster politics can impose on the human security and livelihoods of vulnerable populations and the opportunities these losses create for armed groups to mobilize disaster victims. In so doing, it adopts insights from both political ecology and environmental security studies to isolate causal processes. In line with environmental security scholarship, this approach acknowledges that under certain conditions, physical scarcity can shape the proximate incentives that individuals face when choosing to join armed groups, including economic benefits, diminished opportunity costs of participation, and increased costs of non-participation. However, similar to political ecology studies, this framework also recognizes that the politics surrounding natural disasters is pivotal in evaluating both the strength and magnitude of their impact on those affected, as well as the grievances these events generate among the population. In this capacity, a focus on human security and livelihood vulnerability and the politics that surround these factors can facilitate a move beyond questions over whether scarcity causes conflict, and towards a greater understanding of the contextual conditions that link scarcity, politics, and war.

In the following sections, I elaborate my arguments and derive empirically testable hypotheses.

NATURAL DISASTERS AND CIVIL CONFLICT

Collier et al. (2009) argue: "where a rebellion is feasible, it will occur." Natural disasters can increase the feasibility of conflict when they generate motives and incentives among the marginalized and vulnerable and create opportunities for violent mobilization. I draw on three bodies of literature: human security and livelihoods, social justice and decision making, and social movement studies and rebel recruitment, to support this contention. First, human security and livelihood literature provides insight into how disasters can shape incentive structures. Reduced human security and livelihood capacity diminish the opportunity costs of conflict and heighten vulnerability to coercion and inducement. Second, research into the psychology of social justice informs motives. This literature explains how disasters, the politics surrounding them, and the quality of the institutions that address their effects, can generate motives for individuals to join or support armed groups. Finally, literature in social movement studies and rebel recruitment illustrates how groups can capitalize on the opportunities disasters provide to pursue their political agendas.

Natural Disasters, Human Security, and Vulnerability

Natural disasters do not affect all populations equally, even when these populations live within a proximate geographical location. The threats that disasters pose exhibit an inverse relationship with a household's level of human security, or the capacity of individuals or groups to acquire "safety from such chronic threats as hunger, disease, and repression" and "protection from sudden and hurtful disruption in the patterns of daily life" (UNDR 1994, p. 23; See: Ohlsson 2000 and Barnett and Adger 2007 for links to conflict). An individual's livelihood strategy: the "…activities undertaken to translate resources—whether environmental or human—into a means

for living at the group or individual level," determines the degree of human security they possess (Matthew, Halle, and Switzer 2002, 15–16). Ohlsson (2000) calls livelihoods the "missing link" between "…poverty and environmental factors to conflict" (3). He argues that the speed with which livelihood losses occur condition the risks they pose. Rapid losses generate greater risk of conflict because large numbers of newly unemployed young men are susceptible to the motives and incentives that can facilitate armed intra-state violence (Ohlsson 2000; Urdal 2006). Disasters rapidly diminish livelihoods. They can raze places of residence and work and destroy the value of and access to environmental resources. The effects limit income-generating opportunities and enhance a population's level of social, economic, and political marginalization.

Disasters can threaten livelihoods, but a household's level of environmental vulnerability determines the threat's magnitude and consequences. Vulnerability is the combination of environmental exposure and a household's capacity to cope with environmental threats (Deligiannis 2012). The likelihood that an individual will experience an environmental hazard—proximity to a floodplain or habitation on a degraded slope, for example—conditions environmental exposure. The opportunities individuals possess to adapt to environmental hazards and the larger social, political, and economic factors that shape and constrain these opportunities determine coping capacity. Wealth and an individual's ability to diversify their means of production can increase a household's capacity to cope with disaster because individuals can use savings to purchase food and provide shelter during the emergency period, and because the ability to adapt production or livelihood strategies can facilitate recovery. Thus, the most impoverished and the least capable of livelihood adaptation are the most vulnerable; they are the most likely to experience disasters and the least capable of recovering from them.

As Sen (1981) argues even relatively minor disasters (for example, localized flooding in

rural areas) can generate human security crises among vulnerable populations when they limit food accessibility. This effect can persist regardless of the disaster's impact on a nation's overall food supply. Disasters often cause localized infrastructural damage, which can diminish agricultural and economic production capacity and limit local market access. The resulting income and asset value collapses among those affected can increase the purchasing power/food ratio, which for vulnerable communities can be overwhelming.[2] To make matters worse, if a disaster does (or is expected to) affect local food supplies, then merchants and suppliers can hoard stocks, which drives up prices. Simultaneous price increases and asset value collapses can produce devastating consequences and facilitate severe subsistence crises even in times of national abundance.

The points outlined above become evident when one examines the global distribution of natural disaster effects over the past 60 years. Figures 2.2-2.4 display the spatial distribution of rapid- and slow onset disasters, and the combination of the two, respectively, from 1946-2005.[3] The countries in these maps are shaded according to the average annual percentage of the population that natural disasters have affected during this period. Figure 2.2 represents "rapid onset" natural disasters, which include: floods, fires, tsunamis, earthquakes, storms, and volcanic eruptions. Figure 2.3 represents slow onset natural disasters, which include droughts and bouts of extreme temperatures. Figure 2.4 displays the combination of rapid- and slow onset disasters. The data in each of these maps are distributed evenly into quartiles. As these figures indicate,

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[2] For example, rural Pakistanis spend an average of 46% of annual income on food. Even small changes in the purchasing power/food ratio can have dramatic impacts on food access. ("Annual Income Spent on Food" 2011)

[3] Data for Figures 2.2-2.4 taken from EMDAT-CRED.

disasters' effects tend to occur disproportionately in poor and developing countries across Africa, South, Southeast, and East Asia, and Latin America. These countries are the most susceptible to disaster partially as a result of unfortunate geography, but most certainly because they posses large numbers of vulnerable, impoverished, and exposed citizens.

FIGURE 2.2

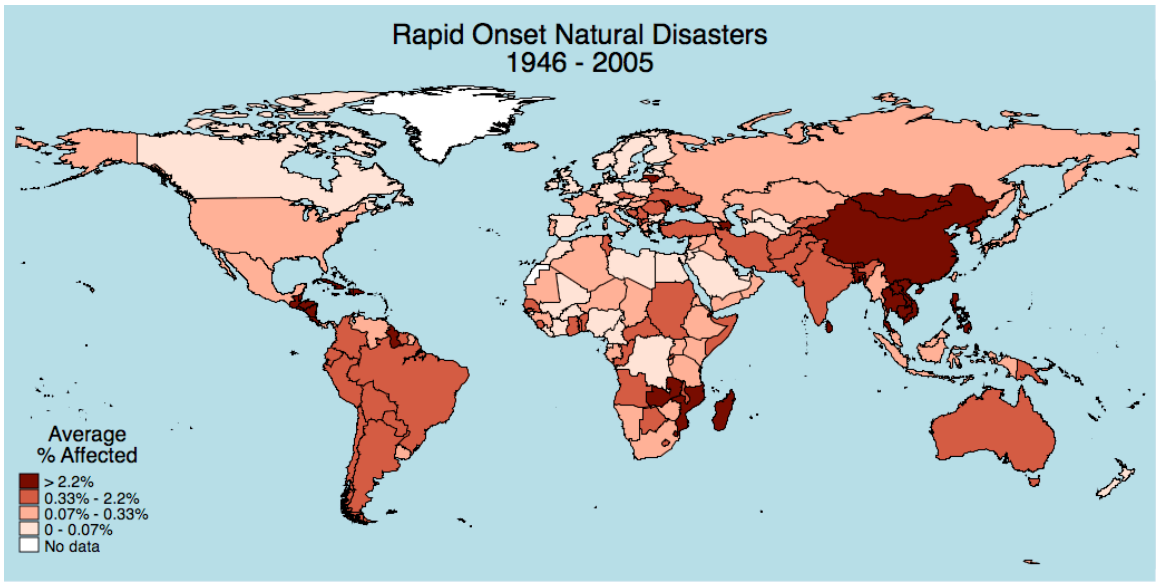


FIGURE 2.3

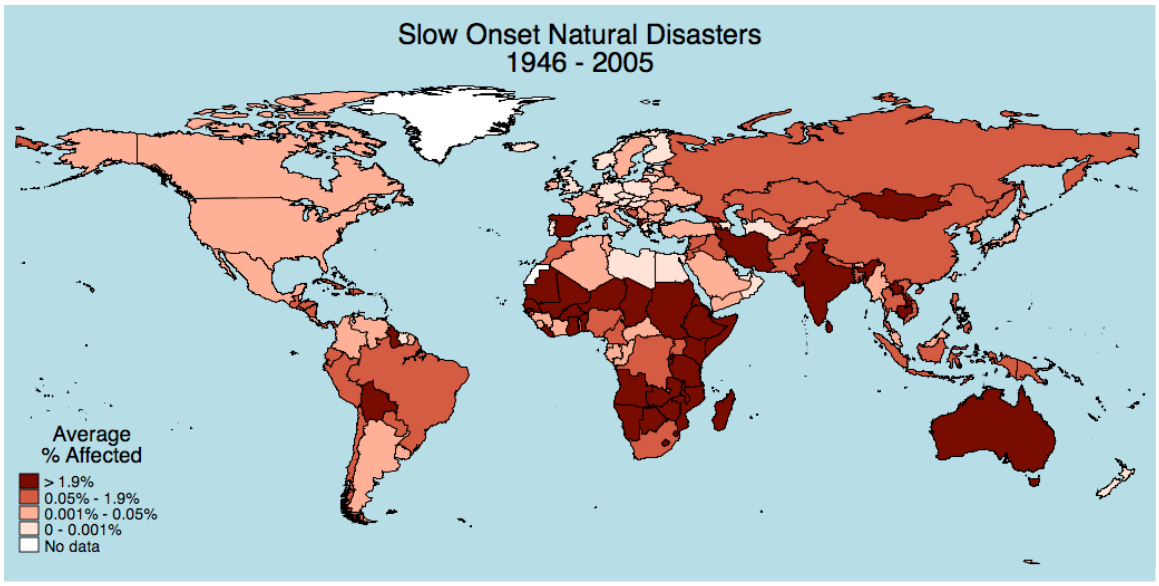
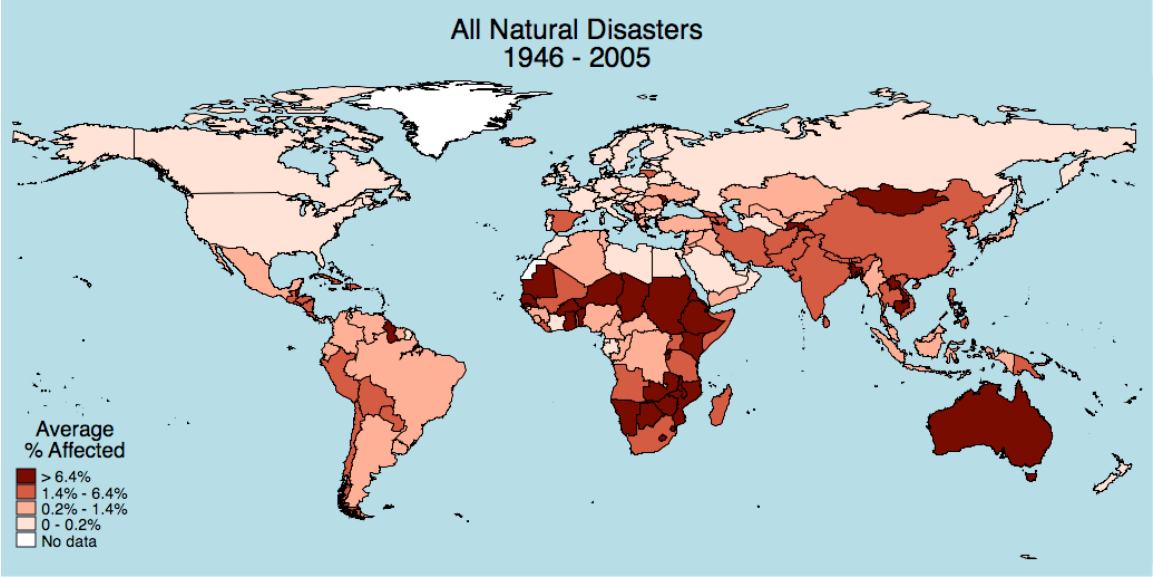


FIGURE 2.4



Vulnerability and the food and livelihood shocks that can follow natural disasters are crucial to understanding how these events can influence civil conflict because vulnerability shapes an individual's incentives to participate. Given the inherent collective action difficulties in waging insurgency, generating participation is no small feat. Insurgency requires tremendous mobilization efforts to gain mass and momentum, and joining a war effort can be costly relative to abstention (Lichbach 1995). Natural disasters can enable groups to overcome collective action problems when they increase the costs of non-participation and reduce the opportunity costs of insurgency. Prior scholarship supports the view that when abstention costs exceed participation costs, people tend to join or support armed groups in conflict. Kalyvas and Kocher (2007) argue that in war-torn states, abstaining can sometimes be more costly than participating because the security threats non-aligned individuals confront—violence and lack of access to vital information—can be higher than those faced by insurgents. The effects of these costs can fuel insurgent recruitment. Justino's (2009) work on the micro-foundations of insurgent support

corroborates this view. She argues that both poverty and a high risk of experiencing violence in conflict increase the likelihood that a household will join or support an armed group to protect their current economic status.

Disasters increase the costs of conflict abstention because the insecurity they create minimizes individuals' capacity to protect themselves and their families against the violence and banditry that predominate in war-torn societies. This insight can be especially true for highly destructive disasters, as losing one's house and property can dramatically increase exposure. Similarly, natural disasters can also decrease the opportunity costs of participation when they limit livelihood alternatives. The result increases the relative value of selective incentives—food, shelter, protection, and social support—that armed groups can offer (Justino 2009; Lichbach 1995; Collier and Hoeffler 2004). In certain cases insurgent groups act as agents of the very violence they can offer protection against. Forcibly conscripting disaster victims or restricting disaster aid to coerce allegiance can enable armed groups to capture new recruits. In Somalia, Al Shabab inhibits disaster relief provider access to disaster victims. This group kidnaps teenagers from relief camps and murders those that attempt to flee to Kenya ("Somalia: Famine Helps Al-Shabab" 2011). Ironically, journalists report that these strategies heighten recruitment and civilian collaboration both because group support is a favorable alternative to violent targeting, and because high food prices and insurgent-imposed restrictions on relief aid distribution enable the group to exchange food for membership and support ("UN: Al-Shabab" 2011).

Natural Disasters, Social Justice, and Grievance Formation

Disasters can generate incentives for individuals to participate in conflict. Disasters can also motivate participation when the politics of resource redistribution that follow these events

foments anti-state and inter-group grievances among disaster victims.

Disasters provoke grievances when they create or catalyze individuals' perceptions of social injustice. Justice is elusive because what constitutes fair play can vary; however, a vast body of research suggests that: "justice is central to people's evaluations of social situations" (Tyler and Blader 2003, 349). Cross-cultural experiments validate this proposition. Researchers find that when assigned the role of "dictator," actors in a dictator game often allocate resources equitably, not out of self-interest, but out of a sense of fairness. Similarly, recipients tend to reject "dictators'" offers that do not meet expectations of fairness, even if it means that they receive nothing in return (Bardsley 2008). Experiments have also shown that humans are not the only animals who care about justice. Capuchin monkeys refuse to participate in experimental games when they witness other monkeys receiving relatively greater rewards for similar efforts (Brosnan and de Waal 2003).

Social justice concepts should apply prominently to political institutions that render resource allocation decisions in times of crisis. If victims believe the state gives them a fair deal given situational constraints, then they are less likely to harbor grievances that might persuade them to engage in or support subversive activities. Two types of political decisions matter in this context: those that can facilitate a disaster and those that manage its consequences. First, when citizens believe that corrupt or discriminatory political decisions cause or aggravate a disaster, these events can motivate perceptions of social injustice and can act as focal points for anti-state groups to mobilize citizens. For example, in the Philippines and Peru, taxing and violently targeting multi-national logging and mining firms has gained the New People's Army and the Shining Path popular support and political traction both because evidence suggests that these firms collude with local politicians to gain lucrative contracts, and because their actions aggravate

degradation that can increase the magnitude and frequency of local landslides and flooding in nearby communities (Zenn 2012).

Second, disaster management decisions might generate perceptions of social injustice that legitimize dissent if people believe that the relief allocation process is corrupt; that authority figures withhold goods; or that they provide relief according to political patronage, ethnic affiliation, or other non need-based criteria. The 1972 earthquake in Managua, Nicaragua enabled the Sandinistas to rise from a minor group to revolutionary force when claims of Somoza's aid misappropriation resonated with the general public (Olson and Drury 1997). The Sandinistas mobilized civilians and built a powerful political organization off accusations that Somoza enriched himself and his family from the considerable international relief aid that flooded the country. This corruption, combined with the thousands of newly impoverished citizens the earthquake created, empowered the Sandinistas to violently oust Somoza from power in 1979.

Perceptions of social injustice should be especially acute when individuals believe that corrupt decisions are intended to confer harm to disaster victims. Psychological research suggests that individuals' intent attributions can shape their motivation for retributive justice, or vengeance (Darley and Pittman 2003). Different stages of intent attribution produce successively greater levels of outrage. Accidents lead to low levels of outrage and little need for punishment. Negligence leads people to demand compensation to return the victim to the state she was in prior to the crisis. Negligence in this sense might equate with governmental mismanagement of disaster relief resources, a lack of capacity to provide aid, bureaucratic inefficiencies, etc. Intentional harm fosters the highest level of moral outrage and creates the desire for vengeance (Darley and Pittman 2003). Intentional harm can result from policies that withhold state aid, limit non-state aid provider's access to affected areas, or increase a disaster's severity. During the Ethiopian famine of

1984-85, the Mengistu regime's decisions to withhold food aid from rebel-controlled areas and divert relief resources to military spending enabled the Eritrean People's Liberation Front (EPLF) and the Tigrayan People's Liberation Front (TPLF) to increase these groups' support among the peasantry.

> The fundamental reason for [the TPLF and EPLF military victories] is that the governmental strategy of using famine as an element of war so deeply alienated the peasantry that they turned in increasing numbers to the rebel fronts…Between 1984 and 1987, the number of TPLF fighters rose three-fold and the front was turning away volunteers (de Waal 1991, 208-209).

The result of Mengistu's decision to use food as a weapon of war was to generate outrage sufficient to mobilize peasants to join the TPLF and EPLF to counter the Derg's repression. These injustices, coupled with extreme scarcity and human insecurity that the famine produced, enabled the TPLF and EPLF to turn the tide of war in their favor and ultimately prevail.

Although psychological research on social justice centers primarily on the individual, similar insights can apply to the group. In civil conflict studies, scholars have found group-level resource inequalities—"horizontal inequalities"—to be a key driver of political violence (Østby 2008; Østby, Nordas, and Rød 2009; Stewart 2000, 2002, 2008). Feelings of relative deprivation drive intergroup antagonisms that can create mobilization opportunities for elites. The shared nature of grievances among group members facilitates this process because a common social identity can resolve collective action problems that arise from unfamiliarity and distrust among individuals (Olson 1965; Lichbach 1995). Natural disasters can dramatically exacerbate horizontal inequalities when they damage one group's economic assets more powerfully than another; when corrupt, inequitable or inadequate relief aid distribution favors one group over another; or when a post-disaster restructuring of assets—land tenure rights, for example—

increases the political and economic power of one group relative to another (Le Billon and Waizenegger 2007; Wisner, et al. 2004). The result can amplify grievances and increase the salience of social identities rooted in political marginalization and exclusion, which in turn can lend traction to those who seek to overturn the status quo through violence.

Natural Disasters, Groups, and Mobilization

If disasters can generate motives and incentives for individuals to participate in conflict, then disasters create opportunities for groups with an interest in violence to mobilize them, which in conflict states can fuel violence and prolong war.

Insurgent groups attract members and supporters in roughly three ways: coercion, inducement, and co-option (Weinstein 2007; Kalyvas 2006). Natural disasters enhance opportunities for insurgent recruitment in each of these cases. Coercion entails the use of intimidation or force to gain compliance. Following a disaster, groups can force conscription or actively restrict disaster victims from accessing necessary subsistence goods. The human security crises that disasters impose weaken individuals' capacity to resist these demands. Following the 2004 tsunami in Sri Lanka, Tamil rebels conscripted scores of orphaned and homeless children. In some cases rebel soldiers forcibly removed children from victims' families. In others they relied on promises of aid and social support to attract them (Becker 2005). In both cases, these actions enabled militant groups to boost ranks, wage violence, and prolong war.

Inducement concerns a quid pro quo—providing goods and services in exchange for membership and support (Olson 1965; Lichbach 1995). Following a disaster, inducement can be coercive if vital subsistence goods are offered only as club goods. Inducement does not require that groups actively prohibit victims from acquiring basic resources, but that they offer theirs only in

exchange for cooperation. Following the 2010 floods in Pakistan, journalists reported that the Taliban to offered relief goods only to those who would swear allegiance to the group (Porges 2010; Shah 2010). Although there was no report available that suggested the group forcibly conscripted victims, the dire situation that these victims faced following governmental mismanagement of disaster relief activities offered the group considerable leverage to demand allegiance in exchange for supplies.

Finally, co-option entails persuasion and assimilation. Co-option is about "soft power," goal alignment, or "…getting others to want the outcomes that you want." Soft power "…co-opts people rather than coerces them (Nye 1990)." Co-option can include assisting with reconstruction duties in inaccessible communities and goods and services dispensation based on victims' need and groups' capacity to give rather than as quid pro quo. For insurgents, generating civilian trust through co-option can bolster attempts to politically indoctrinate and strategically frame a disaster's causes and consequences to suit an insurgent group's political purposes. In this capacity, disasters can become "focusing events" which can provide traction to groups advocating political change (Birkland 1998). The result can enable insurgents to increase the prominence of perceived injustices, crystallize the identity of the agents of injustice, and elevate expectations of the probability of successful redress through collective action. [4] These actions can also enable insurgent groups to increase legitimacy and demonstrate governing capacity, which lend ideological weight to group rhetoric and encourage goal alignment.

[4] These insights are prominent in the social movement literature. See for example: McAdam, McCarthy, and Zald 1996; Tilly 1978; McCarthy and Zald 1977.

Political Marginalization and Exclusion

Natural disasters can produce motives and incentives to fight, which can facilitate violent mobilization. However, not all populations are equally vulnerable to disaster, nor are they equally as likely to succumb to the overtures of violent actors. I argue that the extent that a state's political institutions exclude or marginalize certain segments of the population can act as a primary mediating factor (Kahl 2006; Theisen, Holtermann, and Buhaug 2012).[5] Political exclusion occurs when political institutions impede citizens from governmental representation and influence over governmental decision-making. These factors are important because they can shape one's capacity to access public goods and services, which can be crucial in determining both disaster vulnerability and recovery capacity (Cutter 1996; Wisner, et al 2004; Amarasiri de Silva 2009; Raleigh 2010). Politically excluded communities tend to be more vulnerable because of their relative impoverishment, and because they lack the power to influence political institutions that make decisions that can facilitate disaster—for example, land management agencies that provide logging or mining contracts that increase flood risk in marginalized downstream communities. Similarly, because of their relative insignificance to national political agendas, and particularly in the developing world, the state's limited resources and uneven governance capacity, marginalized and excluded communities are the least likely to receive relief assistance post-disaster and the least capable of institutionally challenging grievances that might arise over a disaster's causes and consequences. The outcomes that follow can reinforce cycles of poverty and exclusion and can exacerbate resource inequalities among social groups, both of

[5] Notably, Theisen, Holtermann, and Buhaug (2012) do not find the combination of drought and political exclusion to robustly predict conflict in Africa. However, these authors only examine the impact that rainfall variations can have on conflict onset, without attention to how these variations might shape conflict incidence or duration.

which can facilitate public support for rebel entrepreneurs seeking to overturn the status quo. This dynamic can persist both internationally and domestically. Geopolitically marginalized populations are less likely to receive international crisis assistance from wealthy states (Fielden 1998). Following the fall of the Soviet Union, geopolitical realignments undercut international aid support from non-communist countries to Afghan refugee populations in Pakistan's Northwest Frontier Province. The result of this realignment and loss of aid support, and the humanitarian crises they caused likely fueled conflict in the region for years to come (Fielden 1998).

Domestically, a population's social identity can heavily influence political status (Bolin 2010; Strolovitch, Frymer, and Warren 2006). Amarasiri de Silva (2009) argues that social identity played a key role in Ampara district, Sri Lanka following the 2004 Indian Ocean tsunami. Not only did the minority Muslim population face greater tsunami exposure relative to the politically dominant Tamils in Ampara, but Muslims' exclusion from decision-making and aid implementation processes largely deprived this population of relief aid access. The result enhanced the Muslims' marginalization and intensified ethnic divisions in the region.

These dynamics are not confined to developing states. When Hurricane Katrina struck New Orleans, the city's impoverished and largely African American population not only experienced the brunt of the storm's effects, they also fared the worst in reconstructing livelihoods after the waters receded. Perceptions of racial discrimination and ineptitude during the disaster relief process fueled the popular discontent embodied in Kanye West's statement: "George Bush doesn't care about black people", and were heavily divided along racial lines. A Pew research poll found that 66% of blacks (compared to 17% of whites) believed that the government's disaster response would have been faster and more comprehensive if they had

been white (Strolovitch et al 2006; “Huge Racial Divide Over Katrina” 2005). Similarly, 71% of blacks stated that Katrina revealed the pervasiveness of racial inequality in the country, while 56% of whites asserted the opposite (“Huge Racial Divide Over Katrina” 2005).

These conjectures suggest that rather than encouraging peaceful interaction among disparate groups, disasters and disaster politics can drive deeper wedges between them, especially between marginalized and politically dominant segments of the population. The hardships that arise from unequal resource allocation and access should heighten vulnerability and livelihood challenges, exacerbate social grievances, strengthen identities arising from these shared misfortunes, and lend greater momentum to those seeking political change. The result can facilitate collective action. For example, Benjaminsen (2008) argues that the Malian government’s refusal to address socioeconomic grievances among the marginalized Tuaregs as well as its embezzlement of international disaster relief aid during devastating droughts in the late 1980s, amplified perceptions of injustice among the Tuareg population. The turning point that facilitated conflict came when migrants, trained in warfare and exposed to revolutionary discourses, returned from Libya and Algeria to mobilize co-ethnics and foment rebellion. Thus, high levels of political marginalization, the adverse effects of environmental instability and disaster, and the efforts of groups motivated to gain regional independence combined to result in protracted civil war (Benjaminsen 2008; See also: Douma 2006).

Kahl (2006), and Theisen, Holtermann, and Buhaug (2011) make similar points regarding a population’s political status. Kahl (2006) argues that the combination of ethnic cleavages within society, exclusive political institutions, and significant “demographic and environmental stress” can facilitate violent intra-state conflict as institutional exclusivity precludes institutional redress of grievances, while declining resource access and rising populations encourages violent

inter-group competition. However, while Kahl is correct in illustrating the importance of political status in this process, the loosely defined concept of "demographic and environmental stress" make it difficult to isolate the specific processes at work, and even more difficult to test his model's implications. I move beyond this approach to identify how natural disaster events can act as exogenous shocks that create specific political opportunities for both insurgents and the state to wage violence, and thus prolong war. In a similar thread, Theisen et al. (2011) also argue that political status should shape the interaction between adverse environmental changes and conflict; however, they fail to generate empirical support for their hypothesis. I suspect this failure stems in part from the fact that they explore not how environmental changes shape the trajectory of existing conflicts, but how they affect the likelihood of new ones. Given that the most vulnerable populations might also be the least capable of accessing the resources necessary to mobilize for collective action, it is somewhat unsurprising that they find little relationship. Rather than revisiting whether or not scarcity causes conflict, I move this literature forward by examining the conditions under which the resource scarcity disasters produce enable actors with an interest in violence to mobilize those affected.

Hypotheses

The above discussion argues that natural disasters can prolong conflict and increase the incidence of violence within it. Disasters generate motives and incentives for individuals to participate in conflict, and most crucially, provide groups with an opportunity to exploit them. These processes should produce the greatest impact among the politically marginalized and excluded. Taken together, these insights generate the following four testable hypotheses:

H1: Natural disasters are more likely to increase the incidence of violence in conflict, rather than decrease it.

H2: Natural disasters are more likely to increase the duration of conflict, rather than reduce it.

H3: Natural disasters are more likely to increase the incidence violence in conflict in states that de facto or de jure exclude certain segments of the population from political participation.

H4: Natural disasters are more likely to increase the duration of conflict in states that de facto or de jure exclude certain segments of the population from political participation.

Counterinsurgency and Conflict Suppression

The argument outlined above rests on the expectation that disaster-weakened and aggrieved populations are susceptible to mobilization from elites or insurgent groups. In theory, insurgents should be the most capable of exploiting a disaster's consequences because they typically possess the most intimate access to affected populations, and because the notion that status quo changes will improve victims' lot or remedy a perceived injustice can be an easy sell. This should be especially true for politically marginalized groups. However, there is reason to suspect that the mobilization opportunities available to insurgents might, at least in part, also apply to state military forces waging counterinsurgency.

In most states, the military is the institution most capable of and most readily called upon to provide disaster relief, particularly during the emergency phase of the crisis. The military usually possesses the most proficient hardware and personnel, can implement the swiftest response times during crises, and works within a command and control hierarchy highly efficient at executing relief missions (Cuny 1989). In some cases, militaries works hand-in-hand with other government agencies and with non-governmental workers to provide relief. In other situations, especially those

that occur in dangerous, conflict-affected, or inaccessible terrain, the military acts alone. When a disaster occurs in conflict-contested territory, the military is the only institution capable of accommodating the security risks that relief provision might entail, and often already possesses units on the ground able to respond rapidly to those affected.

I suspect that the same opportunities that insurgents possess to co-opt, coerce, or induce disaster victims are also available to state military forces. First, if strategies of co-option through disaster-relief provision provide opportunities for insurgents to indoctrinate victims against the state, then providing relief and reconstruction as a mechanism to win "hearts and minds," might also enable the military to generate trust and bolster local support of military institutions and campaigns (Hall and Cular 2010). This support can in turn reinforce civilians' attachment to the state, motivate compliance with military personnel, and increase civilian willingness to counter rebel threats. Indeed, disaster relief as co-option parallels population-centric counterinsurgency doctrine (COIN). The US Army's and Marine Corps' official Counterinsurgency Field Manual 3-24 states: the "focus of counterinsurgency is the people: provide for the people, protect the people, and convince the people of their government's legitimacy" (US Counterinsurgency Field Manual). Each of these points can easily apply to disaster relief provision. Indeed, Webster (2010), a scholar and retired military officer, argues: "…disaster relief is counterinsurgency, only no one is shooting at you (yet)" (Webster 2010, 1).

For states and state military forces, combining disaster relief with COIN should increase military success because this strategy can reinforce an individual's attachment to the state and legitimize local military presence. A key insight in the social justice literature addresses how interpersonal interactions with authority figures create or diminish perceptions of social injustice (Tyler 1988, 1994; Tyler and Huo 2002). Interpersonal interactions concern the extent that

authority figures respect civilians' concerns during an interaction and the quality of interpersonal treatment. These factors are important because they convey identity information that indicates the level of respect that authority figures bestow on group members and the extent to which authorities respect individual rights (Tyler and Blader 2003). Treatment that conveys respect and social recognition can reinforce group attachment and encourage compliance. Psychological research suggests "…people's willingness to cooperate with their group especially cooperation that is discretionary in nature-flows from the identity information they receive from the group, …[which] emanates from evaluations of the procedural fairness experienced in the group" (Tyler and Blader 2003, 353). This point implies that the greater the effort military institutions apply to winning hearts and minds during disaster relief, the more they can shape individuals' attachment to a state-centered identity. Conversely, unjust treatment can lead individuals to feel that they offer little value to the group, which can foster anger and frustration and encourage dissent.

Providing disaster relief can legitimize military presence in affected communities and generate civilian trust in military. During routine counterinsurgency missions, military presence can engender feelings of distrust among local populations because the "identification problem"—the inability to differentiate insurgents from civilians—can increase the risk that soldiers will commit indiscriminate violence (Kalyvas 2006). However, when a disaster strikes, victims often welcome military presence to facilitate relief and reconstruction. This process can enhance trust among locals, which can facilitate military penetration into insurgent controlled territory (Webb 1996, 289). Increased trust can augment counterinsurgency efforts because trusting civilians can provide military intelligence and should be more capable of resisting insurgent infiltration (Gentile 2009). Anecdotal evidence suggests that disaster relief as COIN can produce intended effects. For example, following the 2010 floods in Pakistan, a Pakistani

flood victim recalls the effects military disaster relief distribution on people's attitudes: "The army rescued us from flooded areas by helicopters and boats and gave us food, shelter, everything. People's thinking about the army was so bad but today, our thinking is so changed" (McGivering 2010).

Second, beyond motivating popular support, disasters also enable military forces to induce and coerce into compliance the populations they strike. Paying off local informants for tips on insurgents is a common feature of counterinsurgency. Indeed, just as the British did in Malaya, the United States has relied on precisely these techniques during its operations in both Afghanistan and Iraq (Long 2006). In this context, we should expect the greater the level of deprivation of affected populations, the cheaper such information is for counterinsurgents to purchase. Berman et al. (2011) make this point regarding the relationship between unemployment and insurgent violence. They argue that we might expect insurgent violence to decline as unemployment rises because individuals without access to alternative means of income generation should be willing to accept less for providing information than they might otherwise. Thus more information can be purchased within a fixed budget. I suspect the same mechanism might also hold in the wake of a natural disaster. A sudden decrease in livelihoods coupled with rising vulnerability enable military forces to purchase more information on insurgents, which should increase the state's capacity to counter insurgent threats.

Taken together, these insights yield the fifth hypothesis:

H5. Natural disasters can enable state military forces to counter insurgent threats.

CONCLUSION

This chapter argues that disasters can produce diverging effects on the risk of conflict. Disasters can generate motives and incentives to participate in conflict, which can provide opportunities for insurgents to mobilize them. However, disasters can also enable states to bolster legitimacy and state military forces to enhance counter-insurgency efforts. Disasters, the politics surrounding them, and the strategies that combatants employ to mobilize victims are central to this process. This work poses both theoretical and policy implications: First, I argue that disasters can create prospects for both war and peace because they create opportunities for combatants to shape the nature of their relationship with civilians. This insight provides a corrective to environmental security scholars that underestimate that states can exploit scarcity to boost legitimacy and counter insurgent threats. Second, I place disaster events at the heart of the analysis, which enables me to address a key, but understudied, dimension of the relationship between climate change and conflict. Disasters are exogenous shocks that impose episodes of extreme scarcity. However, I argue the speed with which they occur and the destruction they can impose can shape political opportunities in ways long-term trends, such as Kahl's (2006) "demographic and environmental stress," cannot. Third, I apply novel theoretical insights from social justice and decision-making literature to elaborate my argument. Social justice provides a more sound understanding of the mechanisms that can generate grievances among disaster-affected populations than other commonly asserted mechanisms such as relative deprivation, because its analytic focus on decision-making processes and experience in interpersonal interactions, rather than distributional outcomes, offers insight into why similar levels of scarcity can elicit distinct social responses. Finally, I combine statistical analyses with a detailed case study to identify both the mechanisms at play and to test their generalizability. To date, scholars have conducted very little research on

the connections between disasters and war. However, if climate change results in the severe weather patterns climatologists anticipate, such knowledge is pressing. From a policy perspective, if disasters enable regime challengers to mobilize civilians, then policymakers in disaster and conflict prone countries should marshal considerable resources toward minimizing the vulnerability of at-risk populations. Additionally, if corrupt and discriminatory political institutions magnify the risk that a disaster will fuel and prolong war, then institutional reform and the introduction of strong institutional oversight mechanisms might produce the opposite effect.

CHAPTER 3: NATURAL DISASTERS, POLITICAL EXCLUSION, AND VIOLENCE IN CIVIL CONFLICT

In July 2010, record-breaking monsoon rains inundated Pakistan, flooding the Indus River Valley. The resulting disaster submerged one fifth of Pakistani territory, killed two thousand people, and affected twenty million. The floods destroyed more than five thousand miles of road and railway and 2.6 million acres of cropland. Homes, businesses, fields, and towns remained under water for months following the rain's end (Scott 2011; "Pakistan Floods" 2010). During recovery operations, journalists and aid workers reported that Islamic militant organizations, including Lakshar-e-Taiba, the Taliban, and members of the Haqqani Network, were providing disaster relief aid to beleaguered victims in some of the hardest-hit locations. When the news media received word of these actions, strategic concerns dominated headlines: "Pakistan floods: Islamic fundamentalists fill state aid void"; "Terrorists Capitalize on Pakistan's Floods"; and "Taliban Tap Pakistan Flood Misery to Enlist 50,000 Men!" (Porges 2010; Shah 2010; "Taliban…" 2010). The flood's impact on these groups' strength and political legitimacy, as well as counterinsurgency efforts to subdue Islamic militancy, conflict, and violence in the region remain unclear (Radu 2010).

Should we expect the opportunities the floods provided to strengthen Islamic militant groups' military and political clout and prolong civil strife? Can natural disasters exacerbate violence and conflict in other war-torn states? Or, might disasters provide opportunities for peace when conflicting groups cooperate to overcome shared threats? This chapter addresses the extent that disasters systematically generate either of these outcomes—peace or instability—through an

investigation into disasters' effects on the incidence of violence in civil conflict. In so doing, this chapter provides an empirical test for Hypotheses 1 and 3 (H1 and H3) outlined in Chapter 2:

> H1: Natural disasters are more likely to increase the incidence of violence in conflict, rather than decrease it.
>
> H3: Natural disasters are more likely to increase the incidence violence in conflict in states that de facto or de jure exclude certain segments of the population from political participation.

In brief, I find a distinct positive association between slow- and rapid onset disasters and conflict (H1). Rapid onset disasters are the most dangerous, and produce the greatest substantive impact on conflict risk. Slow onset disasters exhibit a positive and statistically significant relationship with conflict in some model estimations, however with less substantive impact. Furthermore, discriminatory states—those that exclude population groups from effective political representation and access—have a greater risk of conflict following natural disasters than non-discriminatory or ethnically homogenous states (H3).

DATA AND VARIABLES

In order to test H1 and H3, I have compiled a cross-national, time-series dataset of 154 countries from 1946-2005. The dataset covers all country/years for which there were comprehensive data available.

Dependent Variable

Conflict, the dependent variable in this chapter, is dichotomous and captures the incidence of civil conflict in a given country/year. I employ data for this variable from two sources: First, I draw data for the primary conflict variable from the well-known Armed Conflict Dataset

compiled by Uppsala Conflict Data Program (UCDP) at Uppsala University and the Peace Research Institute Oslo (PRIO). UCPD/PRIO defines conflict as "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths (Gleditsch et al, 2002)." The dataset covers all armed conflicts occurring between 1946 and 2005 that meet or exceed the annual battle death threshold, thus making it highly applicable to this analysis.

Second, I employ a secondary conflict variable, "Ethnic Conflict," to assess the robustness of H3. Ethnic Conflict captures the incidence of violence in conflicts in which at least one of the major parties consists of an identifiable ethnic group. The Research Front End (RFE) International Conflict Research compiled the data for Ethnic Conflict from three source datasets: The UCDP/PRIO dataset, Cunningham et al (2009), and Wucherpfennig et al (2012). This variable is also binary and spans 1946-2005.

Key Independent Variable

"Disaster" is the key independent variable in this analysis. I code Disaster according to the event's impact speed. "Rapid onset" disasters occur quickly, often with little warning, and include: floods, fires, storms, earthquakes, and volcanic eruptions. In contrast, "slow onset" disasters occur over a comparatively extended period of time and include droughts and bouts of extreme temperature. Prior literature exploring the relationship between disasters and conflict has found that rapid onset disasters tend to produce a much greater impact on conflict risk than their slow onset counterparts. The differences are most likely a function of the type and level of destruction they produce (Brancati, 2007; Nel and Righarts, 2008). Rapid onset disasters can

destroy property and often necessitate immediate relocation, both of which can generate tensions that might fuel political violence. In line with these findings, I expect rapid onset disasters to generate a greater impact on the incidence of conflict violence than slow onset disasters.

I draw data for Disaster from an extensive cross-national disaster dataset collected by the World Health Organization Collaborating Center for the Epidemiology of Disasters (EMDAT CRED), which provides the most comprehensive and accessible disaster data available. According to EMDAT CRED, disasters are registered when they meet any one of the following criteria: 1) Ten or more people reported killed. 2) One hundred people reported affected. 3) Declaration of a state of emergency. 4) Call for international assistance.

I operationalize Disaster in two ways: First, I record the number of people natural disasters affect as a percentage of a country's total population in a given country/year. Disasters "affect" people when they necessitate "…immediate assistance during a period of emergency," and include those that are displaced or evacuated (EMDAT CRED 2013). I employ this approximation as the primary disaster variable because it gauges the magnitude of disaster impact. In contrast, prior analyses have relied on count variables that register the number of country/year disasters (Brancati 2007; Nel and Righarts 2008; Slettebak 2012). I adopt the count variable as a secondary approximation in an attempt to evaluate the robustness of the primary measure. However, I argue that the results of models run using the count variable should be interpreted with a degree of caution. Treating all disasters as equal in magnitude can limit interpretation because a single earthquake killing 250,000 people, as did the 1976 Tangshan earthquake in China, should have much larger social, political and economic ramifications than three incidents of flooding that kill no one. Yet using a count variable would gauge the latter as the greater threat.

Political Exclusion

I assess whether a population's political status can shape the effects of a disasters impact on the incidence conflict violence (H3). In this chapter I employ "Discrimination" as an approximation of political exclusion. Discrimination is a dichotomous variable that registers one if a state possesses certain population groups that are excluded from meaningful political participation and zero otherwise.[6] Discrimination gauges ethnic discrimination and exists when ethnic groups "…are subjected to active, intentional, and targeted discrimination with the intent of excluding them from both regional and national power" (Wimmer, Min, and Cederman 2009b, 4). States are coded as discriminatory when elite representatives of these groups are excluded from participating in the central government. Discrimination can be both formal and informal. Formal, or de jure, discrimination signifies the existence of legal impediments to government access and government positions to groups that speak a distinct language, belong to a particular religious group, or display similar physical characteristics. Informal discrimination is non-institutionalized, but nevertheless effective and deliberate exclusion from government access by those that hold power. Non-discriminatory states, in contrast, can be either politically inclusive multi-ethnic democracies, or ethnically homogenous states of any government type (Wimmer, Min, and Cederman 2009a).

I access data for the Discrimination variable from the Ethnic Power Relations Dataset (EPR)(Wimmer, Min, and Cederman 2009a). Wimmer et al. 2009a compiled surveys of regional and country experts in order to classify and code ethnic-groups' political power and access in 155 states from 1946-2005. For the purposes of this study, the EPR data possess key advantages

[6] I also experimented with an alternative calculation of Discrimination that gauges the percentage of a state's population that is discriminated. This calculation did not alter the substantive findings of the analysis. I include the results using the dichotomous measure primarily because they facilitate probability predictions.

over other sources. First, the EPR data gauges actual political discrimination among groups, which can determine access political power and public goods, a crucial component in H3. Second, this dataset provides comprehensive spatial and temporal coverage during the period under study, which makes it useful for inclusion in a civil conflict duration analysis. However, a tradeoff is that these data only include ethnic groups in the dataset if the group possesses a national-level spokesperson or advocacy organization, or if a group is the target of intentional political discrimination (Wimmer, Min, and Cederman 2009b, 2). This is potentially problematic because it likely under-reports a state's de facto level of political discrimination. It is easy to imagine a scenario where isolated communities possess no national advocate, nor are the targets of active discrimination, but are nevertheless politically marginalized and vulnerable. Similarly, these data only measure discrimination as a result of ethno-political cleavages, while ignoring other types of discrimination such as class and gender. Nevertheless, in under-reporting political discrimination, this variable can constitute a lower bound. If the true level of political discrimination is greater, then the true effects on the likelihood of conflict violence might also be greater than this analysis reports.

I include Discrimination in the analysis in two ways. First I include Discrimination as a control variable in order to assess whether disasters can increase the risk of violence in conflict despite discriminatory politics. Prior work demonstrates that discriminatory states posses a greater risk of armed rebellion than politically inclusive or ethnically homogenous states (Wimmer, Cederman, and Min 2009a). Rebellion can occur because the lack of power to influence state decision-making or access state resources can generate motives and incentives among excluded groups to upend the status quo. The shared beliefs, values, and experiences that

constitute social identity groups facilitate collective action among members. If this is true, then Discrimination might affect conflict duration regardless of a disaster's impact.

Second, I use Discrimination to assess H3, which states that disasters should generate the greatest impact on conflict violence in states that formally or informally exclude groups from meaningful political participation, all things equal. In order to model this relationship, I interact Discrimination with Disaster then compare the predicted probabilities of the interaction term with the Disaster variable in models that do not include an interaction.

Control Variables

I do not expect natural disasters to instigate conflict in a society that is not already conflict prone to some degree. Nevertheless, there are several competing explanations that might hold greater causal weight than disaster impact.

I include "GDP/capita" (logged) to account for the level of economic development in a given country/year. In prior work, per capita GDP consistently demonstrates a robust and negative relationship with conflict onset, and is thought to be a primary determinant for a state's propensity to experience civil violence (Collier and Hoeffler 1998; Hegre et al., 2001; Sambanis 2002). One study found civil conflict to be five times more likely in middle-income countries and fifteen times more likely in low-income countries, than high-income countries (Collier and Hoeffler, 1998). I include this variable to account for the possibility that impoverishment and low economic development might be driving violence independent of Disaster. In reality, GDP/capita is often included as a catchall for multiple development-related factors in a state.

"Population" (logged) measures a state's population in a given year, and accounts for the possibility that states with larger populations might also more likely to experience conflict all

things equal. Prior work supports this notion, finding a robust relationship between population size and conflict (Dixon, 2009; Hegre and Sambanis, 2006). Indeed, as Slettebak (2012) discusses at length, at least three mechanisms might account for this relationship: First, the more people in a state, the greater the number of potential insurgents. Second, larger populations create greater challenges for governments to control, thereby increasing the risk that potential insurgencies can gain traction before the state has the opportunity to stop them. Finally, larger populations tend to be more diverse, often containing multiple distinct identity groups. This group-level heterogeneity can generate greater opportunity for violence to erupt than in smaller, more homogenous states. Indeed, in replicating an earlier disaster/conflict study (Nel and Righarts 2008), which did not control for population size, Slettebak (2012) discovers that adding a population variable to the regression equation diminishes the significance of the effects of climatic disasters on the outcome. Slettebak argues that this result obtains because the disaster variable in question absorbs the effects of population size, which can lead to an overestimation of climatic disaster's effects on conflict risk. The disaster variable was a count variable calculated in a manner similar to the count variable I employ in this analysis as a robustness check. Arguably, this argument is less relevant to my primary Disaster variable because this approximation accounts for population size in its estimation. Population data is adapted from Slettebak (2012), who originally drew data from Banks (2009).

I include two variables that gauge a state's physical geography, and that prior work has found to have significant effects on the risk of conflict. First, "Rough Terrain" captures the "proportion of the country that is mountainous according to the codings of geographer A. J. Gerard" (Fearon and Laitin, 2003 p. 81). Second, "Noncontiguous State" is a dichotomous variable that measures whether or not a state possess a territory that is physically separated from

the capital city by at least a 100 km body of water or by a landmass. Both of these variables might increase the risk of conflict because state power can be more difficult to project in these environments. The difficulties involved in policing mountains or far-flung territory present insurgents with a greater opportunity to initiate and prolong violence against the state. Fearon and Laitin (2003) initially included these variables in their 2003 study; Slettebak (2012) later updated and extrapolated them beyond Fearon and Laitin's original time series. I draw data from Slettebak (2012).

"Oil Exports" is a dichotomous variable that captures whether a state receives a minimum of one-third of its export revenues from fossil fuel exportation. Prior work has shown that states heavily dependent on fossil fuel rents tend to be more conflict prone, all things equal. Fearon and Laitin (2003) find that this dependence more than doubles the odds that war will occur in a given decade. Oil rents decrease the necessity for the state to build strong internal revenue generating institutions, which can result in overall bureaucratic weakness and diminished state capacity. Furthermore, the promise of controlling oil wealth increases the value for state challengers to capturing state institutions. Weak state institutions coupled with strong financial incentives to overturn the status quo likely fuel this risk. I draw data on Oil Exports from Slettebak (2012).

I adopt three dichotomous variables to account for political factors that that might influence conflict risk. First, "New State" captures whether or not a state is in its first or second year of membership in the international system. Fearon and Laitin (2003) find that the odds that a civil war will begin are 5.25 times higher during this time period. This finding most likely results from the fact that new states have not had time to build strong institutional capacity, thereby making them more susceptible to capture by potential challengers. Second, "Political Instability" accounts for changes in political regimes as reflected in a three or more point shift in

the Polity IV regime index in the three years preceding a given country/year. Similar to New State, I include Political Instability to capture regime changes that can destabilize political institutions, thereby making conflict more likely. Finally, "Democracy" indicates whether a state possesses democratic political institutions. I draw data on the first two variables from Slettebak (2012), and the third from the well-known Polity IV index (Marshall and Jaggers, 2009).

"Ethnic Fractionalization," derived from the well-known ethno-linguistic fractionalization index, gauges the probability that two randomly chosen people in a given state hail from the same ethnic group. This variable approximates a state's ethnic diversity, which might increase the likelihood that group-level grievances develop into civil conflict. I draw data from Slettebak (2012), who in turn extrapolated time-series data from Fearon and Laitin (2003).

Finally, I include a control variable to account for the effects of time. A key difficulty in time-series analysis lies in the possibility that observations are temporally related, such that the occurrence of prior events significantly affects the likelihood of future events. This is especially the case in studies that attempt to explain the incidence of conflict, as what occurs in the preceding year should bear significantly on the incidence of conflict in the following years. To mitigate the possibility of serial autocorrelation, , I include a lagged dependent "Prior Conflict." I expect this variable to be strongly and significantly related to the outcome.

Tables 3.1a and 3.1b provide the correlation matrix and descriptive statistics, respectively, for all the variables under analysis.

TABLE 3.1A: CORRELATION MATRIX OF KEY VARIABLES

	Conflict violence	Ethnic violence	Rapid onset (pop. avg.)	Slow onset (pop. avg.)	Rapid onset (count)	Slow onset (count)
Conflict violence	1					
Ethnic violence	0.75	1				
Rapid onset (pop. avg.)	0.04	0.06	1			
Slow onset (pop. avg.)	0.03	-0.01	0.01	1		
Rapid onset (count)	0.14	0.16	0.17	-0.01	1	
Slow onset (count)	0.15	0.19	0.11	0.27	0.32	1
Discrim. (binary)	0.18	0.18	-0.01	-0.05	0.01	-0.03
GDP/capita (ln)	-0.09	-0.05	0.01	-0.04	0.23	0.06
Population (ln)	0.20	0.23	0.06	-0.07	0.49	0.24
Rough terrain	0.13	0.10	0.02	-0.09	0.16	0.00
Non-contiguous (binary)	0.08	0.06	-0.02	-0.05	0.27	0.03
Oil	0.04	0.03	-0.04	-0.05	-0.03	-0.03
New state	0.01	0.00	-0.02	-0.01	-0.04	-0.04
Ethnic Fractionalization	0.19	0.18	-0.03	0.09	0.02	0.20
Democracy	-0.06	-0.03	0.01	-0.04	0.18	0.03
Political instability	0.11	0.07	0.03	0.01	-0.01	0.03

	Discrim. (binary)	GDP/capita (ln)	Pop. (ln)	Rough terrain	Non-contiguous	Oil
Discrimination (binary)	1					
GDP/capita (ln)	-0.08	1				
Population (ln)	0.16	0.10	1			
Rough terrain	0.20	-0.14	0.24	1		
Non-contiguous (binary)	0.06	0.19	0.39	0.07	1	
Oil	-0.02	0.11	-0.03	-0.02	-0.04	1
New state	-0.02	-0.12	-0.07	-0.02	-0.02	0.00
Ethnic Fractionalization	0.05	-0.24	0.08	-0.03	-0.09	0.03
Democracy	-0.10	0.48	0.09	-0.08	0.29	-0.15
Political instability	0.08	-0.14	0.04	0.06	-0.05	-0.01

	New state	Ethnic Fract.	Democracy	Political instability
New state	1			
Ethnic Fractionalization	0.04	1		
Democracy	-0.01	-0.22	1	
Political instability	-0.02	0.08	-0.11	1

TABLE 3.1B: SUMMARY STATISTICS

	N	Mean	Std. Dev.	Min	Median	Max
Conflict violence	7116	0.164	0.371	0	0	1
Ethnic violence	7111	0.099	0.299	0	0	1
Rapid onset (pop. avg.)	7108	0.005	0.029	0	0	0.883
Slow onset (pop. avg.)	7108	0.015	0.087	0	0	1
Rapid onset (count)	7116	0.956	2.349	0	0	34
Slow onset (count)	7116	0.298	0.738	0	0	11
Discrimination (binary)	7116	0.358	0.479	0	0	1
GDP/capita (ln)	6554	7.294	1.454	3.332	7.243	10.603
Population (ln)	6554	9.200	1.404	5.517	9.089	14.081
Rough terrain	6554	2.206	1.389	0	2.442	4.421
Non-contiguous (binary)	6554	0.182	0.386	0	0	1
Oil (binary)	6554	0.137	0.344	0	0	1
New state (binary)	6554	0.012	0.108	0	0	1
Ethnic Fractionalization	6554	0.385	0.287	0.001	0.322	0.925
Democracy (binary)	6554	0.368	0.482	0	0	1
Political instability (binary)	6554	0.136	0.343	0	0	1

MODELS AND ANALYSIS

I employ maximum likelihood estimation, a series of logistic regressions, to determine the relationship between natural disasters and the incidence of conflict. I run all regressions with country-clustered robust standard errors to account for the possibility of unobserved unit-specific heterogeneity. I also experimented with two-way fixed effects estimators in all of the regressions, however due to a lack of within-group variation among many of the units, fixed effects results in significantly diminished sample sizes. Nevertheless, a fixed effects estimation does not substantially alter the robustness of the results. All variables are lagged one year to account for potential endogeneity.

The analysis proceeds in three stages: First, I test the extent that rapid- and slow onset natural disasters affect the incidence of conflict in year t+1 (H1). Second, I test whether political exclusion condition natural disasters' effects (H3). To do this, I re-run all models with an interaction term, "Disaster*Discrimination," included in the regression equation. If disasters are a robust predictor of conflict in discriminatory states, then I expect to the interaction term to

yield positive and statistically significant results. I also test the extent that Disaster or Discrimination independently drives the interaction terms' effects through a series of predicted probability estimates.

Finally, I run a series of models with an alternative dependent variable, "Ethnic Conflict," in order to evaluate the statistical robustness of H3. As previously mentioned, Ethnic Conflict is registered as such when an identifiable ethnic group constitutes at least one of the major parties in a civil conflict. Although this variable does not capture political status, the literature commonly cites grievances arising from group-level economic inequalities and actual (or perceived) political discrimination as a primary source of ethnic violence (Stewart 2000, 2005, 2008, 2009; Østby 2008; Langer 2005) Indeed, Østby (2008) notes: "Inequalities that coincide with ethnic cleavages may enhance both grievances and group cohesion among the relatively deprived and thus facilitate mobilization for conflict." Thus, Ethnic Conflict can serve as a useful approximation of political exclusion, and can bolster the results of the models run with the interaction term: Disasters*Discrimination.

Results and Discussion

Tables 3.2 and 3.3 presents the results for regressions run with rapid- and slow onset disasters, respectively, on the outcome variable: Civil Conflict. Models 1, 2, 9, and 10 include the primary population-averaged Disaster variables, while Models 3, 4, 11, and 12 include the alternative count variables. As these tables illustrate, the rapid onset Disaster variable generates a positive and strongly significant effects in Models 1, 2, 3, and 4. In contrast, the slow onset Disaster variable only yields positive and statistically significant results in Models 11 and 12, those including the disaster count variable. This finding indicates that these events do indeed have

meaningful effects on the probability of conflict, and thus provides strong support for H1. These findings also demonstrate that rapid onset disasters are more likely to increase the risk of conflict than their slow onset counterparts.

TABLE 3.2: LOGIT ANALYSIS: RAPID ONSET DISASTERS AND CIVIL CONFLICT

	Model 1	2	3	4	5	6	7	8
Disaster* Discrimination					7.08** (3.58)	6.51** (2.96)	0.06 (0.05)	0.05 (0.05)
Rapid Disaster (Pop. Avg.)	3.08** (1.54)	2.70** (1.36)			-0.10 (2.84)	-0.03 (2.34)		
Rapid Disaster (Count)			0.06** (0.02)	0.08*** (0.02)			0.04* (0.03)	0.06** (0.03)
Discrimination (bi)	0.51*** (0.19)	0.55*** (0.16)	0.54*** (0.19)	0.56*** (0.16)	0.47** (0.20)	0.52*** (0.16)	0.47** (0.22)	0.50*** (0.17)
GDP/capita	-0.07 (0.05)		-0.09 (0.06)		-0.06 (0.06)		-0.09 (0.06)	
Population	0.15** (0.07)		0.11* (0.07)		0.15** (0.06)		0.11 (0.07)	
Rough Terrain	0.08 (0.06)		0.07 (0.06)		0.09 (0.06)		0.07 (0.07)	
Non-contiguous	0.08 (0.23)		0.05 (0.23)		0.09 (0.23)		0.04 (0.23)	
Oil Exports	0.26 (0.21)		0.26 (0.21)		0.25 (0.21)		0.25 (0.22)	
New State	1.20*** (0.37)		1.17*** (0.37)		1.19*** (0.37)		1.17*** (0.37)	
Ethnic Fractionalization	0.98*** (0.29)		0.95*** (0.29)		0.99*** (0.29)		0.94*** (0.29)	
Democracy	0.03 (0.24)		0.01 (0.24)		0.02 (0.24)		0.001 (0.24)	
Political Instability	0.21 (0.17)		0.22 (0.17)		0.20 (0.17)		0.20 (0.16)	
Prior Conflict	4.74*** (0.21)	4.85*** (0.17)	4.74*** (0.21)	4.82*** (0.17)	4.75*** (0.21)	4.85*** (0.17)	4.73*** (0.22)	4.81*** (0.18)
Constant	-5.17*** (0.61)	-3.55*** (0.13)	-4.64*** (0.63)	-3.61*** (0.13)	-5.15*** (0.60)	-3.53*** (0.13)	-4.59*** (0.63)	-3.59*** (0.13)
N (clusters)	6554 (153)	7108 (154)	6554 (153)	7116 (154)	6554 (153)	7108 (154)	6554 (153)	7116 (154)
Pseudo R^2	0.58	0.56	0.58	0.56	0.58	0.56	0.58	0.56

Country-clustered robust standard errors in parentheses. ***p > .01, **p > .05, *p > .1

TABLE 3.3: LOGIT ANALYSIS: SLOW ONSET DISASTERS AND CIVIL CONFLICT

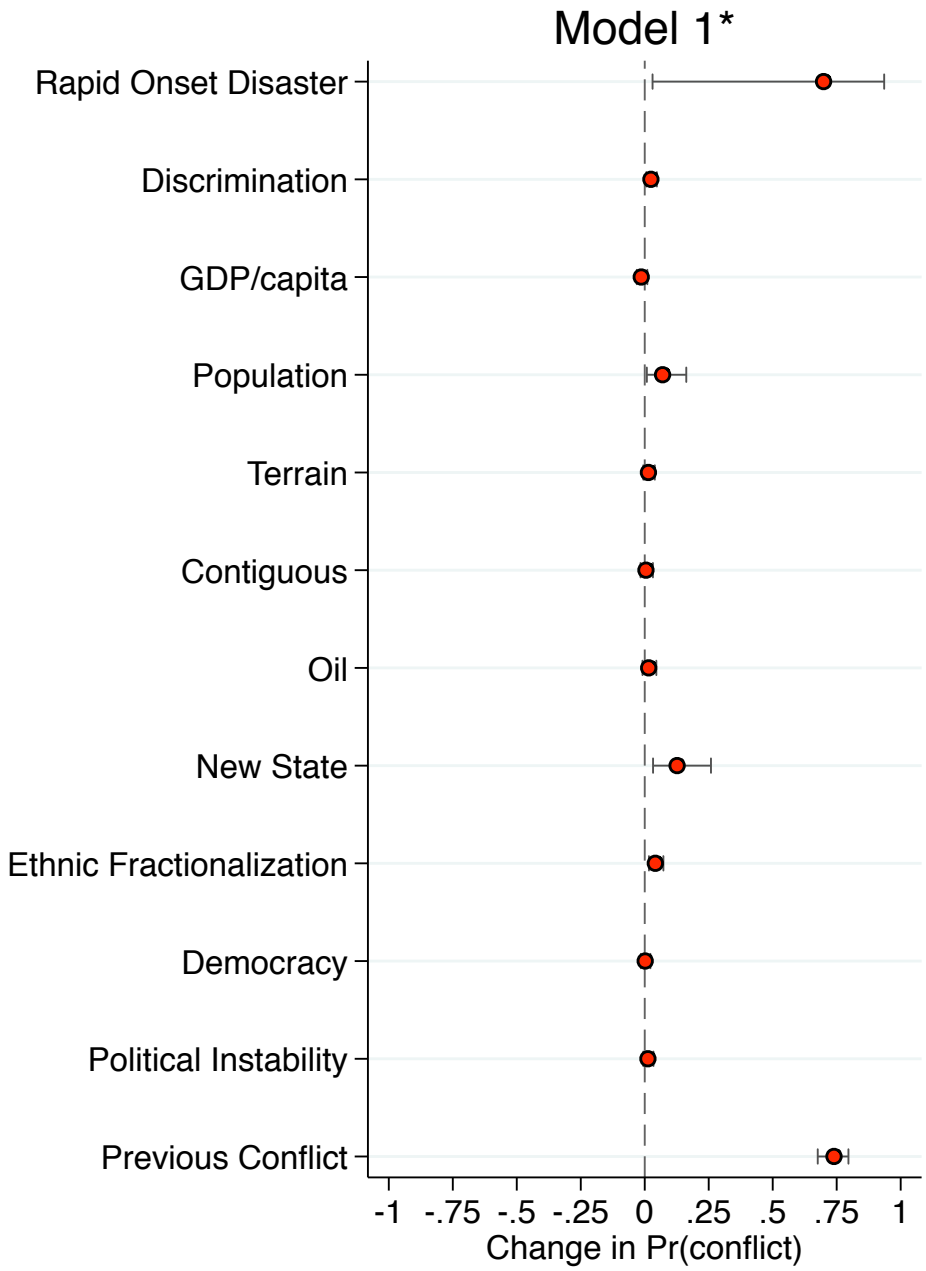
	Model 9	10	11	12	13	14	15	16
Disaster* Discrimination					-2.22 1.78	-1.99 (1.26)	0.09 (0.16)	-0.20 (0.16)
Slow Disaster (Pop. Avg.)	0.72 (0.66)	0.36 (0.50)			1.09 (0.68)	0.74 (0.46)		
Slow Disaster (Count)			0.19** (0.08)	0.26*** (0.08)			0.15 (0.11)	0.35*** (0.1)
Discrimination (bi)	0.52*** (0.19)	0.56*** (0.16)	0.53*** (0.19)	0.57*** (0.16)	0.54*** (0.20)	0.58*** (0.16)	0.50** (0.21)	0.65*** (0.16)
GDP/capita	-0.07 (0.06)		-0.08 (0.06)		-0.06 (0.06)		-0.08 (0.06)	
Population	0.16** (0.07)		0.13** (0.07)		0.16** (0.07)		0.13** (0.07)	
Rough Terrain	0.09 (0.07)		0.09 (0.07)		0.09 (0.07)		0.09 (0.07)	
Non-contiguous	0.07 (0.23)		0.11 (0.23)		0.06 (0.23)		0.11 (0.23)	
Oil Exports	0.25 (0.21)		0.26 (0.22)		0.26 (0.21)		0.25 (0.22)	
New State	1.20*** (0.37)		1.21*** (0.37)		1.23*** (0.37)		1.21*** (0.37)	
Ethnic Fractionalization	0.94*** (0.29)		0.86*** (0.28)		0.95*** (0.29)		0.87*** (0.28)	
Democracy	0.03 (0.24)		0.03 (0.23)		0.04 (0.24)		0.03 (0.24)	
Political Instability	0.22 (0.17)		0.21 (0.17)		0.23 (0.17)		0.20 (0.16)	
Prior Conflict	4.74*** (0.21)	4.85*** (0.17)	4.73*** (0.21)	4.80*** (0.17)	4.74*** (0.21)	4.85*** (0.17)	4.73*** (0.21)	4.81*** (0.18)
Constant	-5.3*** (0.61)	-3.5*** (0.13)	-4.9*** (0.60)	-3.6*** (0.12)	-5.3*** (0.62)	-3.6*** (0.13)	-4.9*** (0.60)	-3.7*** (0.12)
N (clusters)	6554 (153)	7108 (154)	6554 (153)	7116 (154)	6554 (153)	7108 (154)	6554 (153)	7116 (154)
Pseudo R^2	0.58	0.56	0.58	0.56	0.58	0.56	0.58	0.56

Country-clustered robust standard errors in parentheses. ***p > .01, **p > .05, *p > .1

Figures 3.1 and 3.2 present a more substantive picture of the relationship between rapid onset disasters and the incidence of civil conflict. These figures display the predicted probabilities of conflict when each variable in Models 1 and 3, moves from its mean to its maximum values, holding all other variables constant.[7] These probabilities were calculated using the Clarify program in STATA, and were each run with one thousand groups of simulated parameters. The dots represent point estimates and the lines, 95% confidence intervals. In substantive terms, a disaster that affects approximately 87% of the average state's population (the difference between the mean and the maximum) increases the risk that a conflict will occur by approximately 74%, all things equal. Similarly, a state that experiences roughly thirty-three rapid onset natural disasters experiences an approximately 25% increase in the risk of conflict. As these figures demonstrate, shifting Disaster from its mean to the maximum has a greater substantive effect on the probability of conflict than all other variables except a conflict occurring in the previous year, all else equal. This result holds for the population-averaged and count estimations of Disaster.

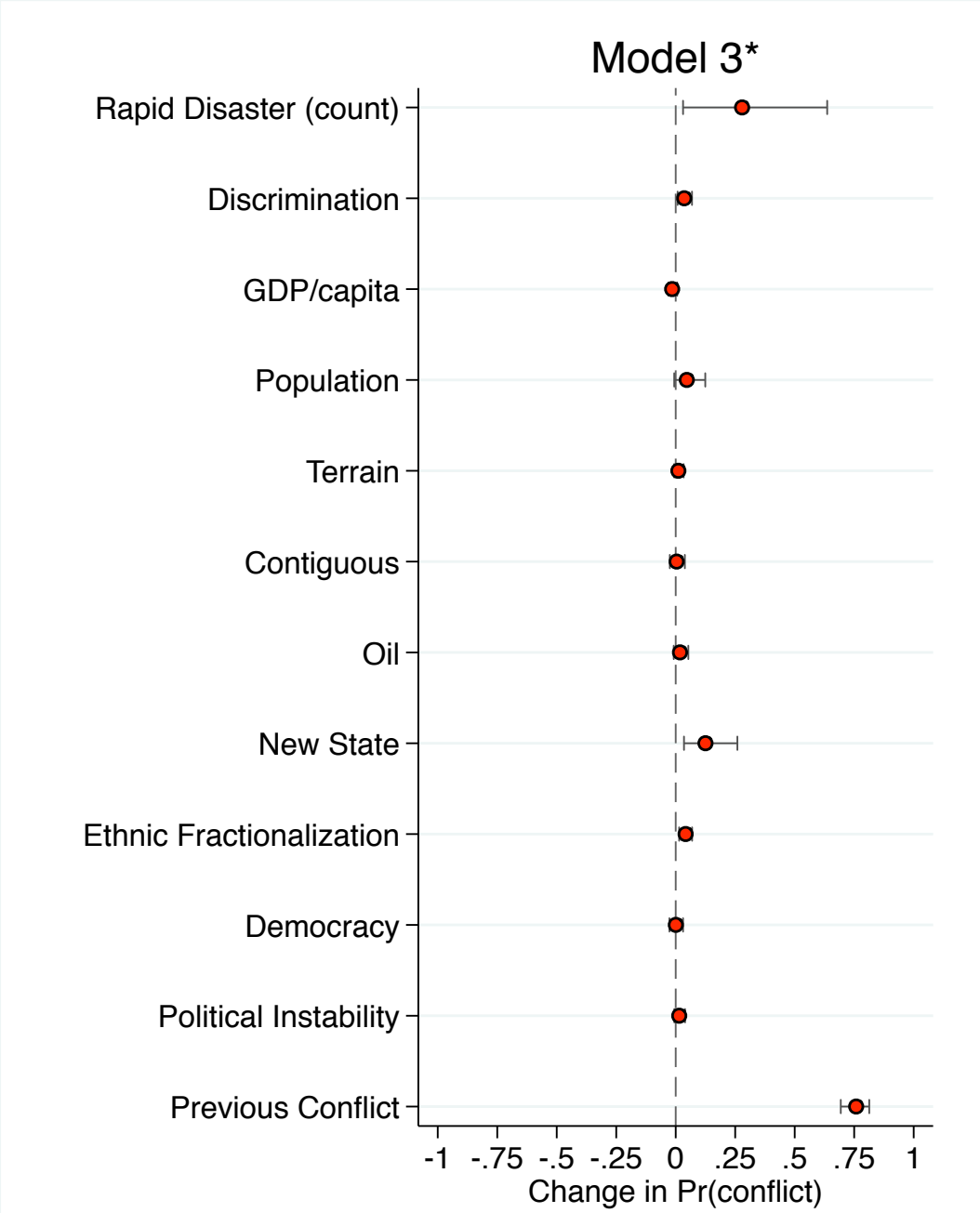
[7] Binary variables are changed from their mode to maximum values.

FIGURE 3.1: CHANGES IN PREDICTED PROBABILITY OF CONFLICT



*Mean --> Max values; 95% CIs

FIGURE 3.2: CHANGES IN PREDICTED PROBABILITY OF CONFLICT



*Mean --> Max values; 95% CIs

These findings partially contradict those of Slettebak (2012), as of this writing the most recent and comprehensive analysis of the disaster/conflict relationship. As mentioned previously, Slettebak (2012) finds that climatic disasters produce an insignificant or even negative effect on conflict probability, whereas I find rapid onset disasters to generate a positive and strongly significant effect. Three reasons might account for the disparity: First, Slettebak analyzes disasters' effects on conflict onset. The difference between conflict onset and conflict incidence is consequential. By definition, conflict onset can only occur at the outset of a civil conflict, or when conflict reignites after an extended period of conflict inactivity. In contrast, incidence registers as an event every year the battle death threshold surpasses (for these data) twenty-five deaths. For example, regarding onset, a conflict that lasts from 1991—2002, as did the civil war in Sierra Leone, would register as a one in 1991 and zeros thereafter in the dataset. The data do not differentiate between wars lasting one year and wars lasting 20. In contrast, incidence would register as a one in the dataset for every year the conflict is ongoing. Incidence measures recurring violence, while onset measures war initiation. I suggest that it is much more reasonable to expect natural disasters and other environmental phenomena to contribute to the incidence of conflict violence, rather than the onset of civil war, as the results are more likely to capture the actions of groups that seek to mobilize disaster-affected populations. It is somewhat less realistic to expect a population struggling to recover from disasters' effects to overcome the collective action challenges associated with rebellion. Second, Slettebak ignores geological phenomena (earthquakes and volcanic eruptions) in his analysis. This is somewhat puzzling considering that these events tend to carry some of the greatest destructive power of all natural disasters. Indeed, Brancati (2007) finds a positive and significant relationship between earthquakes and conflict. I include geologic phenomena as a component of Disaster. Finally, because Slettebak (2012) codes

his variable according to the source of the disaster (climate), rather than its onset speed, he includes droughts in his variable. As Table 3.3 indicates, these phenomena appear to have much less robust effects on the outcome than the rapid onset disasters in Table 3.2. I argue that coding disasters according to their impact speed is more theoretically sound, as the driver of natural disasters' effects on the risk of conflict is much more likely to be a function of their destructive power than their particular source.

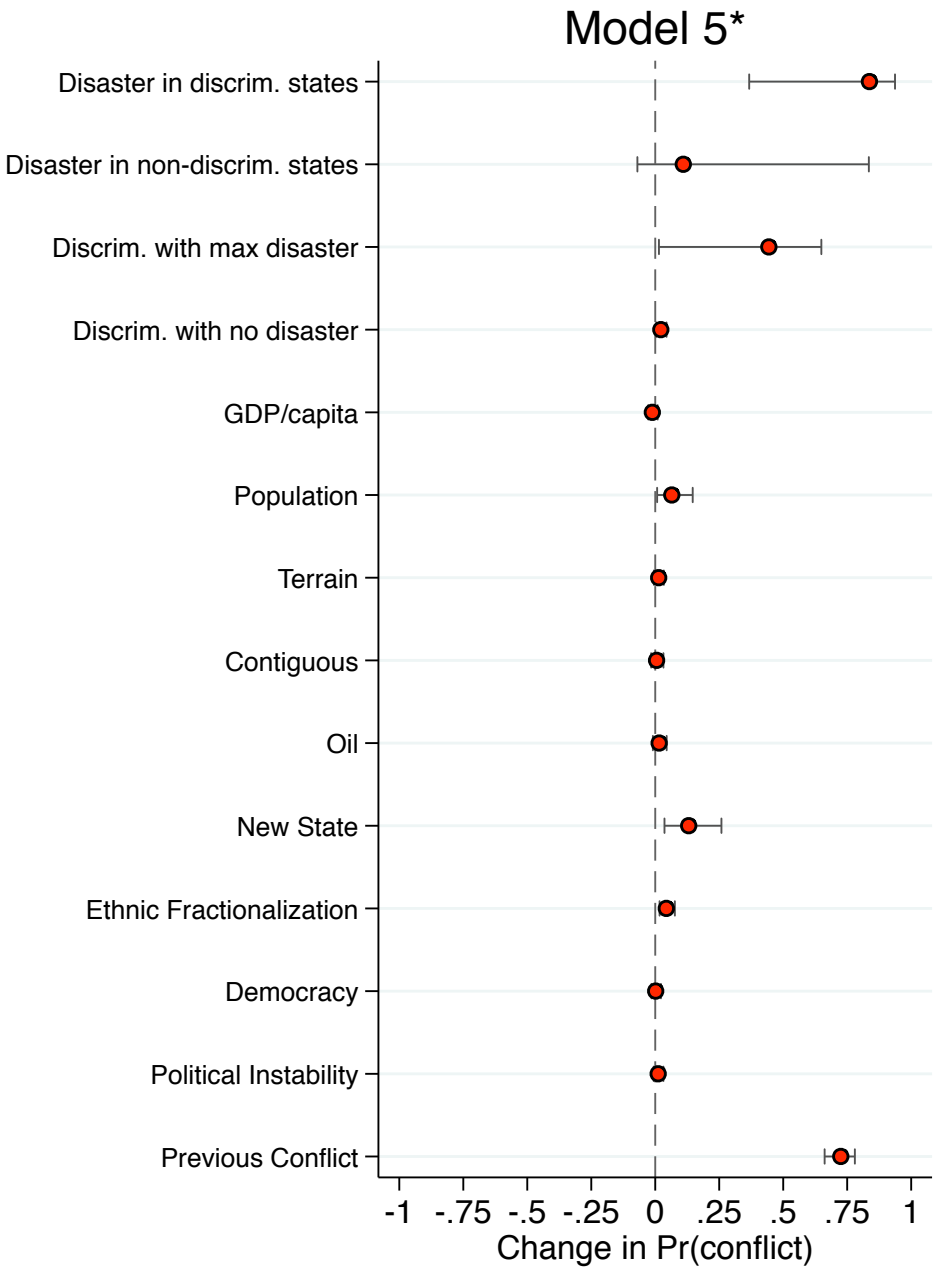
Disasters and Discrimination

Turning to the effects of the interaction term, Disasters*Discrimination, Table 3.2 provides some support for H3, that Disasters are likely to have more powerful effects on the incidence of conflict in discriminatory states. Models 5 and 6, those that include the population averaged rapid onset Disaster variables, indicate a positive and statistically significant relationship with the outcome. However, Models 7 and 8, those that include the count variables, fail to achieve significance. With respect to slow onset natural disasters, the Disaster term in Models 9 and 10 and the interaction terms in Models 13-16 all fail to achieve statistical significance. Thus, as with the models presented earlier, rapid onset disasters are likely to have a greater impact on conflict than their slow onset counterparts.

Figure 3.3 illustrates the substantive effects of the interaction term in Model 5, Disaster*Discrimination, on the predicted probability of conflict as each variable moves from its mean (mode) to its maximum value. The first four variables display four distinct scenarios of the interaction term. I employed this technique to visualize the relative effects of Disaster vs. Discrimination in order to see which of the two lower-order terms generates stronger effects on the outcome in the interaction. The first variable displays Disaster's effects in discriminatory

states; the second, Disaster's effects in non-discriminatory states; the third, Discrimination's effects with Disaster at its maximum; and the fourth, Discrimination's effects with Disaster at its minimum. As Figure 3.3 indicates, Disaster clearly conveys a much stronger effect in the interaction than Discrimination, and Disasters in discriminatory states generate the strongest effects on conflict probability of any variable in the model except for conflict in the preceding year.

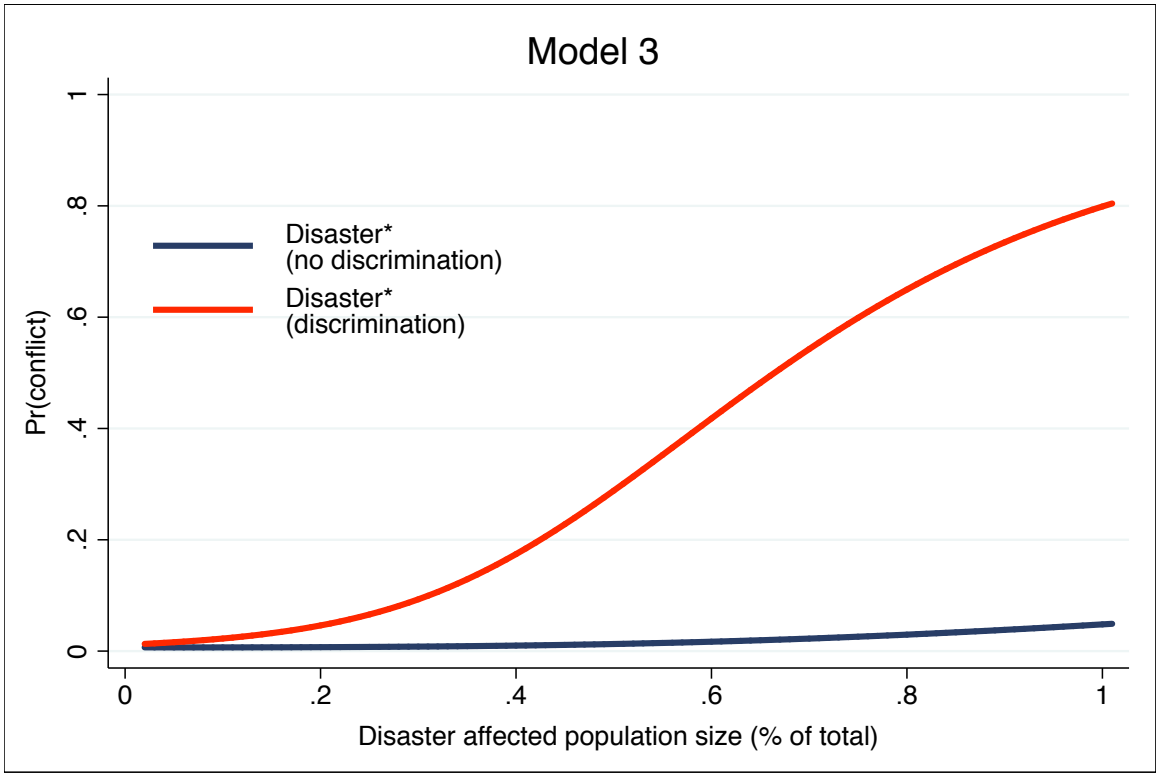
FIGURE 3.3: CHANGES IN PREDICTED PROBABILITY OF CONFLICT



*Mean --> Max values; 95% CIs

Figure 3.4 provides an alternative visualization of the relative effects of natural disasters in the interaction term in Model 3. This figure displays the marginal effects of natural disasters on the predicted probability of conflict over a range of the size of a state's population that disasters affect, holding all other variables at constant values. This figure illustrates two key points: First, rapid onset natural disasters can have much greater effects in discriminatory states than in non-discriminatory states; and second, larger disasters produce a stronger impact on the probability of a conflict than smaller disasters.

FIGURE 3.4: MARGINAL EFFECTS RANGE PLOT



Robustness Check: Ethnic Conflict

Table 3.4 displays the results of regressions run on Ethnic Conflict. I report these models as a check on the statistical robustness of H3. Rather than interacting Disaster with Discrimination, I substitute Ethnic Conflict as a dependent variable. As discussed previously, I justify this approximation by noting that a key reason why ethnic groups fight concerns group-level economic, social, and political inequalities that often manifest in the form of discrimination among those that hold power and those that do not.[8] Additionally, a key part of my overall argument is that natural disasters facilitate group-level mobilization, which in turn is crucial for the overcome the collective action challenges of conflict participation. Therefore, this variable can serve as useful approximation of the relationships I seek to capture.

The results in Table 3.4 largely corroborate the prior statistical analyses in this chapter. The (rapid onset) Disaster variable in Models 17, 18, and 20 all demonstrate positive and statistically significant relationships with the outcome. The results for the (slow onset) Disaster variable in Models 23 and 24 also demonstrate positive and significant relationships with the outcome.

[8] See: Stewart, 2008, for a comprehensive review and multi-dimensional analysis of the effects of group-level inequalities on identity-based conflicts.

TABLE 3.4: LOGIT ANALYSIS: NATURAL DISASTERS AND ETHNIC CONFLICT

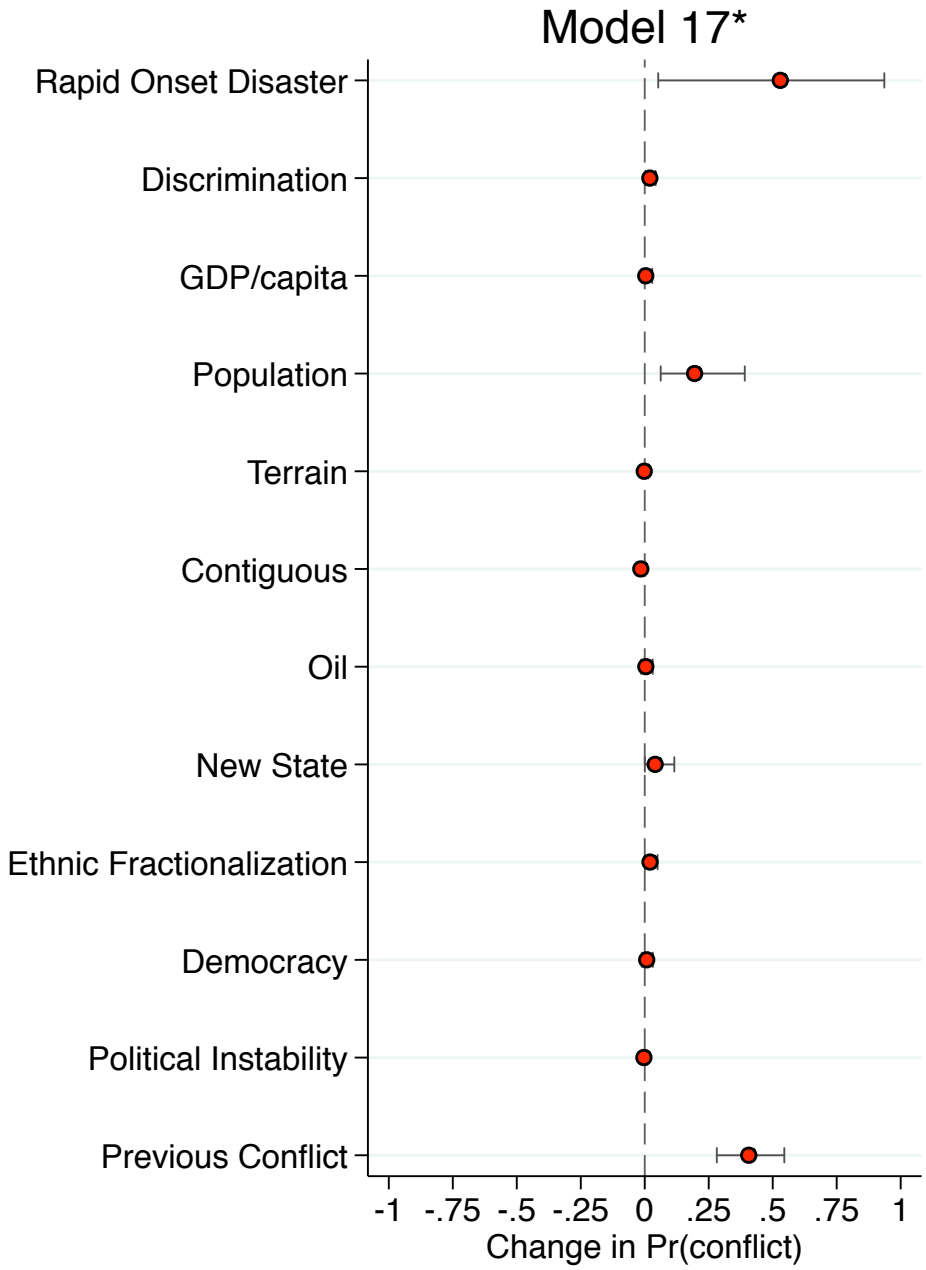
Variables	Model 17	18	19	20	21	22	23	24
Rapid Disaster (Pop. Avg.)	4.58*** (1.68)	4.92*** (1.60)						
Rapid Disaster (Count)			0.01 (0.05)	0.10** (0.05)				
Slow Disaster (Pop. Avg.)					-2.06 (1.29)	-0.99 (0.89)		
Slow Disaster (Count)							0.24** (0.11)	0.43*** (0.11)
Discrimination (bi)	0.79** (0.34)	0.86*** (0.32)	0.79** (0.34)	0.86*** (0.31)	0.76** (0.34)	0.84*** (0.32)	0.82** (0.34)	0.91*** (0.31)
GDP/capita	0.03 (0.12)		0.02 (0.12)		0.03 (0.12)		0.01 (0.12)	
Population	0.49*** (0.11)		0.49*** (0.13)		0.51*** (0.11)		0.45*** (0.12)	
Rough Terrain	-0.05 (0.14)		-0.06 (0.14)		-0.07 (0.14)		-0.05 (0.14)	
Non-contiguous	-0.93** (0.47)		-0.95** (0.48)		-0.95** (0.47)		-0.89* (0.48)	
Oil Exports	0.12 (0.44)		0.10 (0.45)		0.07 (0.44)		0.12 (0.46)	
New State	1.00** (0.49)		0.99** (0.49)		0.97** (0.49)		1.03** (0.49)	
Ethnic Fractionalization	1.17* (0.61)		1.14* (0.61)		1.20** (0.61)		0.99* (0.60)	
Democracy	0.33 (0.41)		0.32 (0.41)		0.30 (0.41)		0.32 (0.41)	
Political Instability	-0.18 (0.28)		-0.16 (0.28)		-0.16 (0.28)		-0.16 (0.28)	
Prior Conflict	4.09*** (0.29)	4.13*** (0.23)	4.08*** (0.29)	4.08*** (0.23)	4.11*** (0.29)	4.14*** (0.23)	4.07*** (0.30)	4.06*** (0.23)
Constant	-9.72*** (1.49)	-4.52*** (0.24)	-9.67*** (1.60)	-4.59*** (0.24)	-9.80*** (1.52)	-4.46*** (0.24)	-9.25*** (1.51)	-4.66*** (0.23)
N (clusters)	6554 (153)	7108 (154)	6554 (153)	7111 (154)	6554 (153)	7108 (154)	6554 (154)	7111 (154)
Pseudo R^2	.50	0.46	0.50	0.46	0.50	0.46	0.50	0.47

Country-clustered robust standard errors in parentheses. ***p > .01, **p > .05, *p > .1

Figure 3.5 provides a picture of the substantive effects of rapid onset natural disasters on the probability of ethnic conflict. I generated this plot in precisely the same manner as the prior plots. The results largely corroborate those listed above. Taken together, these findings lends

strong support to both Hypotheses 1 and 3, that natural disasters can increase the incidence of conflict, and that disasters should have the greatest effects in states that politically discriminate against portions of their population.

FIGURE 3.5: CHANGES IN PREDICTED PROBABILITY OF CONFLCIT



*Mean --> Max values; 95% CIs

Control Variables

The effects of the control variables in this analysis demonstrate a high level of consistency across all model specifications. Discrimination displays a positive and statistically significant effect on the outcome in every single model in which it is included. This finding corroborates a large body of research that finds horizontal inequalities and ethno-political discrimination to be an important risk factor in predicting civil war (Stewart 2008; Wimmer et al. 2009a). Two reasons for this might be that political discrimination against entire social groups both provides motives and incentives for individuals to fight, and enables insurgent groups to overcome the collective action problems associated with waging rebellion. GDP/capita failed to achieve statistical significance in any of the models. This is surprising because prior work has consistently found low per capita GDP to be one of the most robust predictors of conflict. One reason for this disparity might be that the effects of Discrimination and the effects of Disaster capture the potential effects of GDP/capita, as states that discriminate against portions of their population and those that experience the greatest population effects of natural disasters tend to be disproportionately low and middle income. This finding suggests that any future analyses that attempt to explain the incidence of conflict would do well take into account both environmental factors such as natural disasters and the inclusive character of a state's political institutions, as omitting them might lead to false conclusions regarding the effects of economic development. Population demonstrates a remarkably consistent positive and significant effect on conflict across models. This finding provides strong support for prior work (Dixon, 2009; Hegre and Sambanis, 2006; Slettebak 2012) and indicates that Slettebak (2012) is correct in his criticism of Nel and Righarts (2008) for omitting this variable from their analysis. Of the two variables in this chapter that gauge a state's physical geography, only Non-contiguous, which accounts for lack of contiguity of a

state's territory, demonstrates a statistically significant effect on conflict. Surprisingly, Non-contiguous has a negative and significant relationship with Ethnic Conflict in Models 17, 19, 21, and 23. This finding contradicts the expectation that possessing far-flung territory increases the risk of conflict via increased opportunity to wage violence. One reason for this, particularly in predicting ethnic conflict, might be that familiarity and proximity breed contempt. When geographical barriers such as land and water separate groups, there exist fewer opportunities to develop the inter-group animosity that can fuel ethnic violence. Oil Exports fails to achieve significance in any of the model specifications, indicating that if indeed fossil fuel revenue dependence does generate a "resource curse" that can fuel civil conflict, then more precise measurements are required to capture it. As expected, New State demonstrates a positive and significant relationship with the outcome across models, which suggests that new states can face overwhelming challenges in developing stable institutions capable of deterring civil conflict. Ethnic Fractionalization also demonstrates a positive and significant relationship with conflict. This finding supports the notion that rather than promoting tolerance among groups, high levels of ethnic diversity can create opportunities for elites to foment inter-group antagonisms to support their own self-interests. Finally, as expected, one of the most powerful predictors that a conflict will occur in year t is that conflict occurs in year t-1.

CONCLUSION

To briefly re-cap, this chapter reports the results of empirical tests for H1 and H3, which concern the relationship between natural disasters and disasters and discriminatory politics on the incidence of conflict. The evidence I present in this chapter provides robust support for each of these hypotheses. These findings lend credibility to the argument that disasters can generate

both motives and incentives for conflict, particularly in states with discriminatory political institutions. The human security costs that disasters produce coupled with the grievances and social injustices that follow the state's failure to address a disaster's effects can create key opportunities for groups with an interest in pursuing violence against the state. In the next chapter, I examine whether these same insights can extend to explaining the duration of existing conflicts. If the arguments cited above are correct, the there is strong reason to believe that they should.

CHAPTER 4: NATURAL DISASTERS, POLITICAL EXCLUSION, AND THE DURATION OF CIVIL CONFLICT

While Chapter 3 finds support for the hypothesis that natural disasters and political exclusion can predict the incidence of violence within a civil conflict, Chapter 4 examines the possibility that disasters might also prolong conflicts. This chapter employs event history analysis to examine the impact that natural disasters have on the duration of 321 civil conflicts in 96 countries between 1946-2005. In doing so, it provides an empirical test for hypotheses 2 and 4 (H2 and H4).

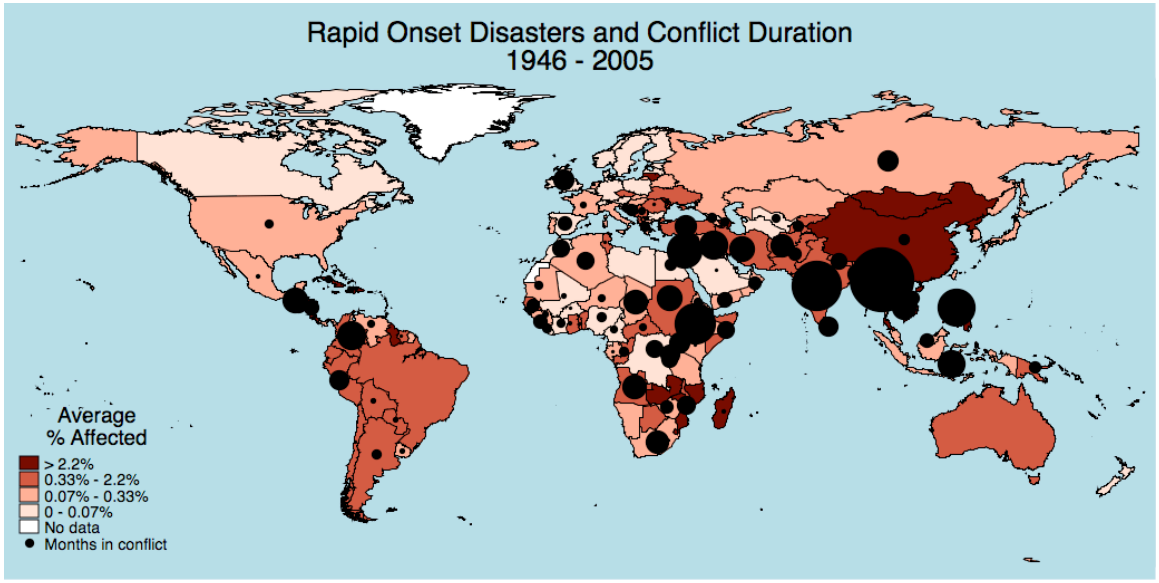
> H2: Natural disasters are more likely to increase the duration of conflict, rather than reduce it.
>
> H4: Natural disasters are more likely to increase the duration of conflict in states that de facto or de jure exclude certain segments of the population from political participation.

The empirical results in this chapter yield support for these hypotheses. Specifically, I find that natural disasters systematically increase the duration of civil conflicts, and stronger disasters confer more powerful effects. I also find that natural disasters produce the greatest impact on conflict in states that (formally or informally) exclude groups from meaningful political participation. Furthermore, the type of disasters a state experiences matters in terms of their effects on the outcome. While rapid onset disasters demonstrate robust relationship with prolonged war across models, I find less support for a significant relationship between slow onset disasters and conflict duration. Slow onset disasters do appear to significantly affect the duration of conflict in some of the model estimations; however these results are not as robust as those attained

with rapid onset disasters

Figure 4.1 displays the spatial distribution of rapid onset natural disasters and the duration of civil conflicts from 1946-2005 (the period under study).[9] As with the maps presented in Chapter 2, countries are shaded according to the average annual percentage of people that disasters affect during this time period. The circles on this map represent civil conflicts and increase in size relative to the number of months spent in war from 1946-2005. As this figure indicates, there appears to be significant overlap between these processes, particularly across much of Africa, Central and South America, and Southeast Asia.

FIGURE 4.1



However, more sophisticated are required to test whether these apparent correlations represent actual causal relationships. This chapter addresses this concern. In the following sections, I detail

[9] Data for Figure 4.1 taken from EMDAT CRED and Gleditsch et al. 2002.

the data and variable selection, methodology, results, and a discussion of the findings' significance.

DATA AND VARIABLES

To test the hypotheses listed above, I have compiled a dataset spanning 321 conflicts occurring from 1946-2005. The data set includes all civil conflicts during this period for which there were comprehensive data available.

Dependent Variable

The dependent variable in this analysis captures conflict duration in months. [10] I draw data from Uppsala Conflict Data Program's (UCDP) Conflict Termination Dataset, and include all civil conflicts beginning on or after January 1st, 1946, the year in which UCDP begins their data collection (Kreutz 2010). As mentioned in Chapter 3, UCDP defines conflict as a "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of at least one is the government of a state, results in at least 25 battle-related deaths" (Gleditsch et al. 2002). Conflict termination occurs when a conflict's battle death threshold falls below 25 battle-related fatalities for one year. The 22 conflicts still ongoing on as of December 31, 2005 were right-censored.

[10] Conflicts lasting less than one month were rounded to one month.

Key Independent Variable

"Disasters" constitutes the key independent variable in this analysis. As discussed in Chapter 2, I divide Disasters into two sub-categories according to the speed with which they occur: "slow onset" and "rapid onset", in order to analyze whether a disaster's impact speed and type of destruction it causes can influence the outcome.

As in Chapter 3, I draw data on Disasters from the World Health Organization Collaborating Center for the Epidemiology of Disasters (EMDAT CRED), which provides the most comprehensive cross-national data source on natural disasters and their effects. According to EMDAT CRED, a disaster is coded as such when it meets any of the following criteria: "1) 10 or more people reported killed. 2) 100 or more people reported affected. 3) Declaration of a state of emergency. 4) Call for international assistance" (EMDAT CRED 2013).

To operationalize Disasters, I measure the percentage of a state's population that disasters affect in the country/year in which a civil conflict occurs. Disasters "affect" people when they necessitate "…immediate assistance during a period of emergency," and include those that are displaced or evacuated (EMDAT CRED 2013). For multi-year conflicts, I average these annual percentages over the total number of years a conflict lasts. Data limitations necessitate that I use yearly disaster totals (rather than monthly). Because I measure conflict duration in months and disaster totals in years, I round up the averages. For example, I would average a state's disaster-affected population percentage over two years for a conflict lasting longer than one year but less than two. Out of 321 total conflicts, 203 experience rapid onset disasters and 151 experience slow onset disasters during their tenure.

As in Chapter 3, I also employ a disaster count variable to assess the robustness of analyses run on population-averaged variables. This variable reports the average number of

disasters that occur annually during a civil conflict, and includes both slow- and rapid onset disasters. I employ this variant of Disasters primarily because prior analyses have used similar measures (Brancati, 2007; and Nel and Righarts, 2008; Slettebak, 2012). However, though this variable can be useful to assess statistical robustness, it is less useful as a primary measure because it cannot capture disaster magnitude. This fact can obfuscate results because many smaller disasters that affect relatively few people would register as having a greater impact than one large earthquake that affect many.

Political Exclusion

I evaluate whether political status can influence disasters' effects on conflict duration (H2). As in Chapter 3, I employ "Discrimination" to approximate a population's political exclusion. I draw data on Discrimination from the Ethnic Power Relations Dataset (Wimmer, Min, and Cederman 2009a). In this chapter, I code Discrimination as a dichotomous variable, measuring one if a state discriminates and zero if not.[11] Out of 321 conflicts in the dataset, 167 are fought in discriminatory states. I take measures of Discrimination in the year prior to conflict onset.

In this chapter, I use Discrimination in two ways: First, I incorporate Discrimination as a control variable to assess whether natural disasters can affect conflict duration despite discriminatory ethno-political configurations. As mentioned in the previous chapter, prior work demonstrates that discriminatory states tend to be at a greater risk of conflict than non-discriminatory or authoritarian states, ceteris paribus. If this is true, then Discrimination might also prolong the duration of conflicts already underway.

[11] I also experimented with a discrimination variable that gauges the percentage of a state's population that is discriminated against, rather than as a dichotomous measure. These calculations produce highly similar effects on the outcome, further increasing confidence in the robustness of the models.

Second, I use Discrimination to assess H4, which states that disasters should generate the most powerful effects on conflict duration in states in discriminatory states, all things equal. I employ two techniques to model this relationship. First, I interact Discrimination with Disasters to assess the extent that Discrimination conditions the effects that disasters can have on conflict duration. This technique is particularly useful because it enables cross-model comparison. If H2 is correct, then the interaction term's effects should be larger than those of the lower-order Disasters term in the same model with no interaction. Second, as a robustness check, I run independent regressions on discriminatory states only to assess whether the effects disasters have on conflict duration in discriminatory states differs from that of the full sample.

Control Variables

I include a range of control variables that prior analyses have found to affect conflict duration. I employ variables that capture country-level characteristics, state capability to suppress conflict, and geographic features that can facilitate insurgency. Unless otherwise specified, I take measures of each variable in the year prior to conflict onset.

"New State," a dichotomous variable, indicates whether a state has joined the international system in the two years prior to conflict onset. Because governments in new states might not possess the capacity to defeat insurgents quickly, and because these governments might be more likely to face internal challenges, new states might possess a greater risk of protracted war (Fearon and Laitin 2003). I take data on New State from the Correlates of War project's data on state system membership (Correlates of War Project 2011).

"Democracy" indicates whether a conflict state possesses a democratic system of governance. On one hand, research suggests that democracies can be more willing to offer

concessions to violent challengers than autocracies, which can result in shorter wars (Stephan and Chenoweth 2008). On the other hand, Lyall (2010) finds no systematic differences between democracies and autocracies with respect to war duration. In light of these contradicting results, I remain agnostic as to Democracy's likely effects. I take data from the Polity IV dataset. I code a democracy dichotomously when a country scores higher than six on Polity's 21-point scale.

"Cold War" indicates whether a conflict begins prior to the Cold War's end in 1989. Wars fought during the Cold War might be systematically longer than wars fought after its end because of the risk that the United States and Soviet Union fuel smaller civil conflicts as proxy wars.

Scholars have found that stronger states possess a greater capacity to wage counterinsurgency and suppress violence than weaker states (DeRouen and Sobek 2004). Stronger states possess greater military and revenue-generating capacity, which can facilitate counterinsurgency. I therefore include "State Capability" to account for the possibility that stronger states experience shorter internal wars. [12] I take State Capability data from the Correlates of War project's Composite Index of National Capabilities, which constructs an index from the size of a state's army, military expenditures, energy consumption, population size, and iron production levels. Higher index values equates to more capable states.

[12] I also include two additional measures of state capacity in sensitivity tests: "GDP per capita" and "Military Personnel." Wealthier states might possess greater resources to wage counterinsurgency than poorer states, which can result in shorter wars. Furthermore, states with larger militaries might possess greater capacity to fight than militarily weaker states. Because neither variable demonstrates significant results, and neither alters the effects of the key variables of interest, I do not include them in the final analysis.

I incorporate four control variables that assess the extent that geographic features affect conflict duration. [13] I adapt each of these variables from Buhaug et al. (2009). First, rough mountains and forested terrain can increase the ability of militarily weaker insurgents to wage guerilla campaigns, and diminish the state's capacity to suppress them (Fearon and Laitin 2003). I include "Mountains" and "Forests" (both logged), which measure the percentage of conflict territory that mountainous and forested terrain, respectively, cover. Second, I include "Distance," which measures the absolute distance (logged) between a state's capital and the center of conflict activities. Longer distances can provide insurgents with relative military advantages that can prolong war because state power can be costly to project. Finally, I include a dichotomous variable that indicates whether a conflict zone lies adjacent to or crosses an international border. Insurgent capacity to cross borders for recruitment and regrouping can enhance insurgent fighting capacity and can prolong war.

Tables 4.1a and 4.1b provide the correlation matrix and descriptive statistics, respectively, for each variable under study.[14] Table 4.1a indicates no significant danger of autocorrelation. As Table 4.1b indicates, values for the rapid onset population-averaged variable range from zero to a maximum of 21.29%, with a mean of .56% affected. The rapid onset count variable ranges from a minimum of zero to a maximum of 24 average annual disasters, with a mean of 1.88. The slow onset population-averaged variable ranges from a minimum of zero to a

[13] In model sensitivity tests, I include measures that gauge insurgents' access to natural resources that can fund conflict operations: "Oil," "Gemstones," and "Drug Cultivation." Theoretically, a greater access to lootable resources should increase insurgents' ability to challenge the state. However, because none of these variables affect the robustness of the variable of interest, and because including these measures results in significantly diminished sample size, I omit them from the final models.

[14] Though I employ non-logged Disaster variables in the model, logging them has no effect on the results of the analysis. I use the non-logged variables to facilitate interpretation.

maximum of 99.34% with a mean of 0.64% affected, while the slow onset count variable ranges from a minimum of zero to a maximum of 11 with a mean of 2.46.

TABLE 4.1A: CORRELATION MATRIX OF KEY VARIABLES

	Rapid Disasters (pop)	Slow Disasters (pop)	Rapid Disasters (count)	Slow Disasters (count)	Discrimination
Rapid Disasters (pop)	1				
Slow Disasters (pop)	-0.02	1			
Rapid Disasters (count)	0.43	-0.02	1		
Slow Disasters (count)	0.29	0.13	0.67	1	
Discrimination	-0.15	0.00	-0.06	-0.12	1
Cold War	-0.14	0.00	-0.29	-0.29	-0.01
New State	-0.06	-0.02	-0.12	-0.11	-0.01
Democracy	0.21	0.01	0.38	0.28	-0.19
State Capacity	0.16	-0.05	0.49	0.31	-0.08
Mountains (ln)	0.04	-0.07	0.20	0.05	0.05
Forests (ln)	0.08	-0.08	0.18	0.14	0.05
Distance	0.07	-0.03	0.40	0.28	0.03
Borders	-0.05	0.01	-0.02	0.07	0.09

	Cold War	New State	Democracy	State Capacity	Mountains
Cold War	1				
New State	0.03	1			
Democracy	-0.07	0.04	1		
State Capacity	-0.02	-0.07	0.22	1	
Mountains (ln)	0.02	0.08	0.05	0.08	1
Forests (ln)	0.01	0.06	0.17	0.18	0.08
Distance	-0.15	-0.03	0.17	0.40	0.19
Borders	-0.06	-0.04	0.00	0.00	0.21

	Forests	Distance	Borders
Forests (ln)	1		
Distance	0.22	1	
Borders	0.04	0.32	1

TABLE 4.1B: SUMMARY STATISTICS

	N	Mean	Std. Dev.	Min	Median	Max
Rapid Disasters (pop)	321	0.56	1.65	0	0.01	21.29
Rapid Disasters (count)	321	1.88	3.13	0	0.5	24
Slow Disasters (pop)	321	2.46	10.21	0	0	99.34
Slow Disasters (count)	321	0.64	1.20	0	0	11
Discrimination	321	0.52	0.5	0	1	1
Cold War	321	0.55	0.5	0	1	1
New State	321	0.06	0.23	0	0	1
Democracy	321	0.21	0.4	0	0	1
State Capacity	321	0.01	0.03	0	0	0.13
Mountains (ln)	313	2.94	1.44	0	3.38	4.62
Forests (ln)	313	2.63	1.68	0	3.14	4.62
Distance	313	5.37	1.76	1.61	5.75	8.12
Borders	313	0.69	0.46	0	1	1

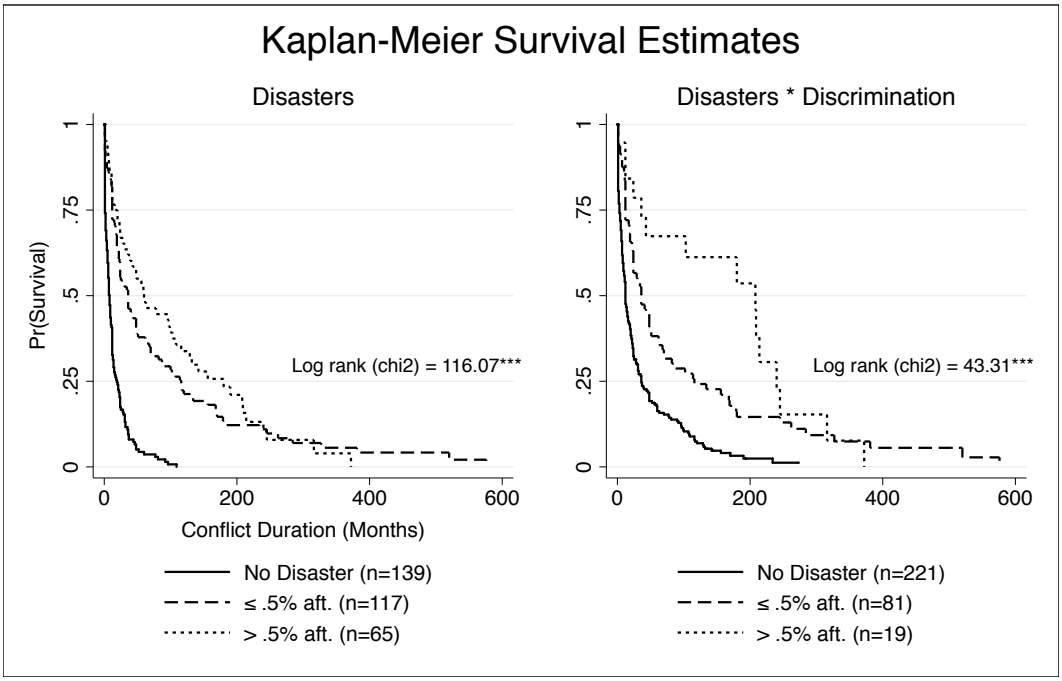
MODELS AND ANALYSIS

I employ event history analysis to analyze the relationship between natural disasters and the duration of civil conflict. Event history analysis assesses time dependence, or the time it takes for a given event to occur. The event in this analysis is conflict termination, and the time is the duration of civil conflict (in months). I employ a Weibull regression, a parametric model of time dependence often employed to capture conflict duration. I run all regressions with country-clustered shared frailty terms to capture unobserved country-specific heterogeneity (Box-Steffensmeier and Jones 2004; Blossfeld, Golsch, and Rohwer 2007). I experimented with additional parametric estimations including Gompertz, Log-Logistic, and Log-Normal models, however in each model specification, the Weibull regressions provides the most efficient estimation—the lowest Akaike Information Criterion (AIC) score—relative to the alternatives.

Figure 4.2 indicates preliminary support for both hypotheses tested in this chapter. This figure displays Kaplan Meier survival estimates for the effects of rapid onset Disasters and the interaction of rapid onset Disasters*Discrimination. To calculate these estimates, I divided the full sample of civil conflicts into three groups based on their experience with rapid onset

disasters. Group one, denoted by the solid line, contains conflicts in states that did not report experiencing a rapid onset disaster during the course of a conflict. Group two, denoted by the dashed line, contains conflicts in states that report rapid onset Disasters values at or below the mean disaster score of approximately .5% average affected per year; while Group three, the dotted line, represents conflicts in states with rapid onset Disasters values greater than the mean. As this figure indicates, disaster-affected states possess a statistically significantly greater risk of protracted conflict than states that experience no disaster during conflict, and stronger disasters tend to confer greater effects. This figure also provides compelling visual evidence that rapid onset disasters in discriminatory states heighten the risk that a conflict will survive to time t to a greater degree than in non-discriminatory states.

FIGURE 4.2: KAPLAN-MEIER SURVIVAL ESTIMATES



Results and Discussion

Tables 4.2 and 4.3 report the results of the regression analyses that analyze Disaster's effects on the full sample of conflict cases. Table 4.2 reports results with rapid onset disasters, while Table 4.3 reports results with slow onset disasters. The numbers reported within each table are hazard ratios and their accompanying standard errors. A baseline hazard ratio value of one indicates that the variable in question has no bearing on the time to event failure (conflict termination). The covariates' effects increase relative to their hazard ratios' distance from one. Variables with ratio values greater than one decrease conflict duration, while variables with ratio values less than one prolong it.

The results in Table 4.2 provide strong evidence that rapid onset natural disasters increase the duration of civil conflict (H2), as the Disasters variable in Models 1 – 4 demonstrate a strong and robust affect on the outcome. Estimations employing both the population-averaged and count variations of the key independent variable report strongly statistically significant relationships in the expected direction.

Table 4.3 presents the results of models run with the Disasters variable that captures slow onset natural disasters. While the relationships in Models 9 – 12 are not as robust as those that test the effects of rapid onset disasters, slow onset disasters do appear to have a strong and significant effect on conflict duration in models eleven and twelve, those that employ the Disasters count variable. However, as mentioned previously, one must interpret models employing count variables with a degree of caution because these terms cannot account for disaster magnitude.

TABLE 4.2: WEIBULL REGRESSION: RAPID ONSET NATURAL DISASTERS AND CONFLICT DURATION

	Model 1	2	3	4	5	6	7	8
Disasters* Discrimination					0.56*** (0.10)	0.60*** (0.11)	1.07 (0.08)	1.06 (0.07)
Rapid Disasters (Pop. Avg.)	0.75*** (0.07)	0.77*** (0.06)			0.93 0.08)	0.95 (0.09)		
Rapid Disasters (Count)			0.82*** (0.03)	0.83*** (0.03)			0.79*** (0.05)	0.80*** (0.04)
Discrimination	0.57*** (0.11)	0.61*** (0.11)	0.64** (0.12)	0.66** (0.13)	0.72 (0.15)	0.75 (0.15)	0.58** (0.13)	0.61** (0.12)
Cold War	0.60*** (0.09)	0.67*** (0.09)	0.46** (0.08)	0.53*** (0.08)	0.64*** (0.10)	0.72** (0.10)	0.46*** (0.07)	0.53*** (0.08)
New State	0.54** (0.16)	0.66 (0.19)	0.48** (0.14)	0.60* (0.17)	0.49** (0.15)	0.59* (0.18)	0.47** (0.14)	0.59* (0.17)
Democracy	0.70 (0.16)	0.66** (0.14)	0.804 (0.18)	0.76 (0.16)	0.70 (0.16)	0.65* (0.15)	0.82 (0.18)	0.78 (0.16)
State Capability	1.07 (0.05)	1.01 (0.04)	1.09* (0.05)	1.05 (0.04)	1.05 (0.05)	1.00 (0.04)	1.10 (0.052)	1.05 (0.04)
Mountains	0.92 (0.06)		0.98 (0.06)		0.91 (0.06)		0.97 (0.06)	
Forests	1.11* (0.07)		1.10 (0.07)		1.12* (0.07)		1.10 (0.07)	
Distance	0.70*** (0.04)		0.72*** (0.05)		0.71*** (0.05)		0.71 (0.05)	
Borders	0.55*** (0.10)		0.47*** (0.08)		0.52*** (0.09)		0.47 (0.09)	
Constant	1.19 (0.47)	0.16*** (0.03)	1.20 (0.47)	0.18*** (0.04)	1.03 (0.41)	0.15*** (0.03)	1.27 (0.51)	0.19*** (0.04)
N (clusters)	313 (95)	321 (96)	313 (95)	321 (96)	313(95)	321(96)	313 (95)	321 (96)
Likelihood ratio chi2	96.53***	31.04***	106.69***	45.17***	107.00**	39.62***	107.50***	45.89***
Log-likelihood	-546.91	-592.90	-541.83	-585.83	-541.67	-588.61	-541.42	-585.47
Shape parameter P	0.89 (0.04)	0.77 (0.04)	0.90 (0.04)	0.78 (0.04)	0.90 (0.04)	0.79 (0.04)	0.91 (0.04)	0.78 (0.04)

*Hazard Ratios (Standard Errors): ***p > .01, **p > .05, *p > .1

TABLE 4.3: WEIBULL REGRESSION: SLOW ONSET NATURAL DISASTERS AND CONFLICT DURATION

	Model 9	10	11	12	13	14	15	16
Disasters* Discrimination					0.99 (0.02)	0.100 (0.02)	0.89 (0.18)	0.84 (0.16)
Slow Disasters (Pop. Avg.)	1.00 (0.01)	1.00 (0.01)			1.01 (0.01)	1.00 (0.01)		
Slow Disasters (Count)			0.63*** (0.06)	0.63*** (0.06)			0.65*** (0.08)	0.67*** (0.08)
Discrimination	0.59*** (0.11)	0.62*** (0.11)	0.60*** (0.12)	0.63*** (0.11)	0.60*** (0.12)	0.62*** (0.11)	0.63** (0.14)	0.69* (0.14)
Cold War	0.64*** (0.09)	0.71** (0.10)	0.46*** (0.07)	0.52*** (0.08)	0.63*** (0.09)	0.71** (0.10)	0.46*** (0.07)	0.52*** (0.08)
New State	0.62 (0.19)	0.75 (0.22)	0.53** (0.16)	0.64 (0.18)	0.62 (0.19)	0.75 (0.22)	0.53*** (0.16)	0.64 (0.18)
Democracy	0.67* (0.15)	0.62** (0.13)	0.73 (0.16)	0.66** (0.14)	0.67* (0.15)	0.62** (0.13)	0.72 (0.16)	0.65** (0.14)
State Capability	1.07 (0.05)	1.01 (0.04)	1.06 (0.05)	1.01 (0.04)	1.07 (0.05)	1.01 (0.04)	1.06 (0.05)	1.00 (0.04)
Mountains	0.93 (0.06)		0.93 (0.06)		0.93 (0.06)		0.93 (0.06)	
Forests	1.08 (0.07)		1.11* (0.07)		1.08 (0.07)		1.11* (0.07)	
Distance	0.70*** (0.04)		0.70*** (0.04)		0.70*** (0.04)		0.70*** (0.04)	
Borders	0.55*** (0.10)		0.56*** (0.10)		0.55*** (0.10)		0.56*** (0.10)	
Constant	1.08 (0.40)	0.15*** (0.03)	1.42 (0.55)	0.19*** (0.04)	1.08 (0.40)	0.15*** (0.03)	1.41 (0.55)	0.19*** (0.04)
N (clusters)	313 (95)	321 (96)	313 (95)	321 (96)	313 (95)	321 (96)	313 (95)	321 (96)
Likelihood ratio chi2	83.29***	18.90***	105.49***	44.46***	83.42***	18.91***	105.87***	45.26***
Log-likelihood	-553.53	-598.97	-542.43	-586.19	-553.46	-595.97	-542.24	-585.79
Shape parameter P	0.87 (0.04)	0.76 (0.04)	0.92 (0.04)	0.80 (0.04)	0.87 (0.04)	0.76 (0.04)	0.92 (0.05)	0.80 (0.04)

*Hazard Ratios (Standard Errors): ***p > .01, **p > .05, *p > .1

Disasters and Discrimination

Models 5 – 8 and 13 – 16 in Tables 4.2 and 4.3, respectively, report the results of statistical tests that assess the relationship between natural disasters, political discrimination and conflict

duration (H4). These models include an interaction term Disasters*Discrimination to test the extent that Discrimination can condition natural disasters' effects. The interaction term in Models 5 and 6, those that employ the population-averaged rapid onset Disaster variable, both report a statistically significant relationship with conflict duration in the expected direction. Furthermore, these variables' effects are larger than those of the Disaster variable in Models 1 – 4, as the hazard ratios fall farther below the baseline of 1. Although the interaction term, rapid onset Disasters*Discrimination, fails to achieve statistical significance in Models 7 and 8, additional testing discussed below further increases confidence that the hypothesized relationship holds. In contrast, none of the variables gauging the interaction between slow onset disasters and discrimination achieve statistical significance across Models 13 – 16. However, the hazard ratios in for the interaction term in these models are in the expected direction.

In addition to models that include the interaction term, I also run regressions on data for discriminatory states only as a check on the robustness of the original findings. The results for these tests appear in Table 4.4, which includes both rapid- and slow onset disasters. These estimations further bolster the evidence presented in Table 4.2 that finds rapid onset disasters to have more powerful effects in states that politically discriminate against portions of their population. However, these results also partially contradict the findings regarding slow onset disasters because the Disaster term in Models 23 and 24 yields a strong and significant impact on the outcome in the expected direction. Nevertheless, despite Models 23 and 24, on balance the evidence does not support a strong relationship between slow onset disasters and conflict duration.

TABLE 4.4: WEIBULL REGRESSION: NATURAL DISASTERS AND CONFLICT DURATION IN DISCRIMINATION STATES

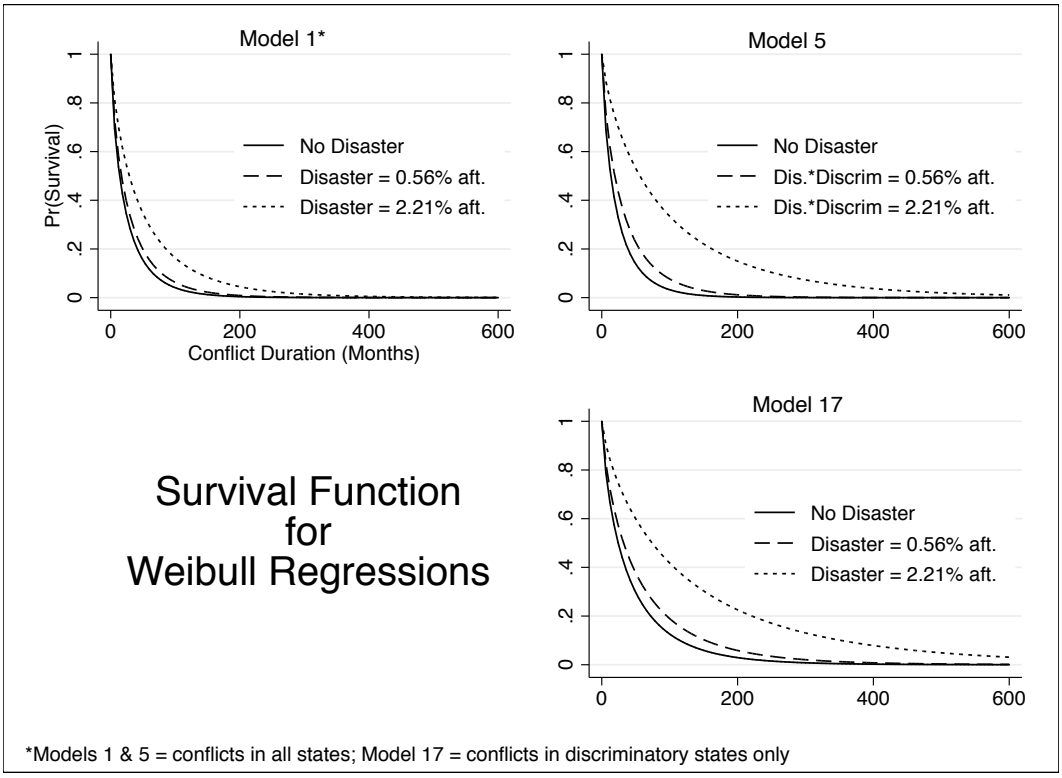
	Model 17	18	19	20	21	22	23	24
Rapid Disasters (Pop. Avg.)	0.55*** (0.09)	0.68*** (0.085)						
Rapid Disasters (Count)			0.85*** (0.05)	0.90*** (0.03)				
Slow Disasters (Pop. Avg.)					1.0 (0.01)	1.0 (0.01)		
Slow Disasters (Count)							0.58*** (0.10)	0.63*** (0.11)
Cold War	0.59*** (0.12)	0.71** (0.12)	0.43*** (0.09)	0.57*** (0.10)	0.55*** (0.11)	0.65** (0.11)	0.41*** (0.09)	0.52*** (0.10)
New State	0.68 (0.29)	0.85 (0.32)	0.80 (0.34)	0.90 (0.34)	0.99 (0.42)	1.05 (0.39)	0.94 (0.41)	0.92 (0.35)
Democracy	0.34*** (0.12)	0.36*** (0.10)	0.40*** (0.14)	0.38*** (0.11)	0.33*** (0.11)	0.36*** (0.10)	0.33*** (0.12)	0.32*** (0.09)
State Capability	1.02* (0.06)	1.03 (0.03)	1.06 (0.07)	1.06** (0.03)	1.07 (0.06)	1.05 (0.03)	1.02 (0.06)	1.03 (0.04)
Mountains	0.90 (0.07)		0.99 (0.08)		0.95 (0.07)		0.94 (0.08)	
Forests	1.13* (0.08)		1.07 (0.09)		1.05 (0.08)		1.09 (0.09)	
Distance	0.75*** (0.06)		0.75*** (0.07)		0.71*** (0.06)		0.73*** (0.07)	
Borders	0.56*** (0.13)		0.48*** (0.12)		0.62** (0.15)		0.57** (0.14)	
Constant	0.52 (0.27)	0.08*** (0.02)	0.67 (0.38)	0.10*** (0.02)	0.62 (0.33)	0.08*** (0.02)	0.79 (0.45)	0.11*** (0.03)
N (clusters)	163 (47)	167 (47)	163 (47)	167 (47)	163 (47)	167 (47)	163 (47)	167 (47)
Likelihood ratio chi2	68.90***	42.05***	56.3***	33.38***	46.86***	24.44***	58.26***	35.25***
Log-likelihood	-272.63	-294.55	-278.91	-298.87	-283.66	-303.44	-277.95	-297.94
Shape parameter P	0.90 (0.06)	0.77 (0.05)	0.89 (0.06)	0.75 (0.05)	0.86 (0.06)	0.74 (0.05)	0.91 (0.06)	0.78 (0.06)

*Hazard Ratios (Standard Errors): ***p > .01, **p > .05, *p > .1

Figure 4.3 provides a visual comparison of the relationship between (rapid onset) Disasters and conflict duration on the one hand, and Disaster, Discrimination, and conflict duration on the other. Figure 4.3 reports the predicted survival functions for Models 1, 5, and 17, respectively. The first plot displays the effects that rapid onset disasters have across the full range of cases (Model 1). The second plot displays the effects of the interaction term, Disaster*Discrimination (Model 5), while the last plot displays Disasters' effects in the Discrimination states subset. Within each plot, the Y-axis displays the predicted probability of survival, or the probability that an event will survive beyond time t, which is indicated (in months) on the x-axis. Each plot displays three lines. The solid line denotes the probability of conflict survival at t given no disaster occurs. The dashed line displays this probability in states with the Disaster variable set to the mean (.56% affected), while the dotted line represents a one standard deviation increase above the Disaster mean (2.21% affected). All other predictor variables are held to their central tendency. Two things are clear from these graphs: First, stronger disasters increase the probability that conflicts will survive beyond time t in both the full data set (Models 1 and 5) and in discriminatory states (Model 17). Second, the effects that disasters have on conflicts in discriminatory states are significantly greater than those in the full model.

Taken together, these findings provide significant evidence for H4, that disasters can have the greatest impact in states that discriminate against portions of their population. The implication is that the character of a state's political institutions can be crucial to gauging the impact natural disasters and the effects they produce have on the duration of civil conflict.

FIGURE 4.3: SURVIVAL FUNCTIONS



Robustness Checks: Natural Disasters and "Major Wars"

As a check on the robustness of the relationship between disasters and war, I test whether their effects on conflict duration are an artifact of a conflict's size and severity. The results presented in prior models treat all conflicts as equal in magnitude; however, there is reason to believe that lower-intensity wars might possess distinct characteristics that separate them from large-scale conflicts. Indeed, an often-cited claim in the environmental security literature is that if environmental phenomena do shape the risk of conflict, than this risk should primarily be confined to lower-intensity conflicts (Hendrix and Salehyan 2012; Meier, Bond, and Bond 2007). An example of this type of conflict might include the low-level inter-group violence that regularly occurs between pastoralists and agriculturalists in East Africa. To account for the

possibility that the effects presented above are artifacts of low-level conflict, I rerun all models on a subset of "major conflicts." UCDP defines major conflicts as those that meet or exceed 1000 battle deaths in a single year. In this chapter, I categorize a conflict as "major" if it meets this threshold at least once during the conflict's tenure. Table 4.5 reports the results. The first two models in the table (Models 25 and 26) assess rapid and slow onset disasters' effects on the full sample set; the second two (Models 27 and 28) assess the effects of the interaction term: Disaster*Discrimination; and the final two models (Models 29 and 30) report Disasters' effects in discriminatory states only.

The results of these regressions are similar to those run on the full sample with two important exceptions: First, rapid onset Disasters appear to affect the outcome only in discriminatory states, as the strong and statistically significant effects of the interaction term in Model 27 and the Disaster variable in Model 29 indicate. Thus while the effects of Disaster might apply more strongly to lower-intensity conflicts, the combination of natural disasters and political discrimination can strongly affect the duration of conflict regardless of a war's size. This result suggests that political discrimination is indeed a key factor in shaping the environmental dimensions of conflict, and provides additional support to H4

Second, the interaction term in Model 28, which examines the product of slow onset disasters and discrimination, indicates a weakly significant relationship with shorter conflicts. This result suggests that slow onset disasters might actually shorten (rather than prolong) major wars in discriminatory states. One reason for this might follow from the type of impact slow onset disasters impose and the geographic distribution of their effects. Droughts tend to produce the greatest impact on crop production, and their impact tends to be spread over a much broader geographic space than their rapid onset counterparts. Diminished capacity to produce crops over

a wide area can hinder the ability of rebel groups to conduct operations because these groups often rely on local resources to feed soldiers. In contrast, rapid onset disasters, which, for all but the largest events, tend to be more concentrated, generate more localized insecurities. These insecurities can provide an opportunity for rebel recruitment without hindering groups' overall capacity to fight.

TABLE 4.5: WEIBULL REGRESSION: NATURAL DISASTERS AND CONFLICT DURATION IN MAJOR WARS

	ALL MAJOR WARS				DISCRIMINATION STATES	
	Model 25	26	27	28	29	30
Disasters* Discrimination			0.002*** (0.01)	1.61* (0.43)		
Rapid Disasters (Pop. Avg.)	1.02 (0.07)		1.06 (0.07)		0.001*** (0.003)	
Slow Disasters (Pop. Avg.)		1.04 (0.06)		0.67 (0.17)		1.01 0.07)
Discrimination	0.13*** (0.09)	0.12*** (0.08)	0.07*** (0.05)	0.09*** (0.06)		
Cold War	0.51 (0.24)	0.50 (0.22)	1.18 (0.59)	0.45* (0.20)	0.78 (0.46)	0.44 (0.29)
New State	1.18 (0.66)	1.27 (0.70)	1.24 (0.67)	1.09 (0.62)	0.49 (0.38)	0.25 (0.21)
Democracy	0.07*** (0.04)	0.06*** (0.04)	0.04*** (0.02)	0.09*** (0.05)	0.05** (0.06)	0.10** (0.11)
State Capability	1.03 (0.07)	1.04 (0.07)	0.90 (0.07)	1.05 (0.07)	0.91 (0.10)	0.10 (0.11)
Mountains	0.76* (0.13)	0.75* (0.12)	0.69** (0.12)	0.78 (0.12)	0.62* (0.16)	0.75 (0.17)
Forests	1.27 (0.23)	1.32 (0.25)	1.85*** (0.37)	1.36 (0.26)	1.66** (0.38)	1.33 (0.38)
Distance	0.55** (0.13)	0.53*** (0.12)	0.60** (0.14)	0.51*** (0.11)	0.39*** (0.12)	0.33*** (0.09)
Borders	1.35 (0.52)	1.30 (0.47)	0.67 (0.29)	1.17 (0.44)	0.73 (0.48)	2.46 (1.42)
Constant	4.33 (5.03)	5.29* (4.92)	2.10 (2.30)	5.97* (5.50)	1.56 (2.82)	2.46 (5.60)
N (clusters)	50 (15)	50 (15)	50 (15)	50 (15)	31 (10)	31 (10)
Likelihood ratio chi2	35.64***	36.07***	48.11***	39.64***	34.11***	25.47***
Log-likelihood	-70.62	-70.40	-64.38	-68.61	-34.24	-38.57
Shape parameter P	1.15 (0.14)	1.17 (0.14)	1.31 (0.16)	1.21 (0.15)	1.62 (0.24)	1.71 (0.20)

*Hazard Ratios (Standard Errors): ***p > .01, **p > .05, *p > .1

Additional Checks

Finally, as an additional robustness check, I run regressions on variables that measure the percentage of people that disasters affect and the number of disasters that occur in the year preceding conflict onset. The utility of this calculation follows from the potential for endogeneity in the prior estimations, as civil conflict itself might increase a population's vulnerability to disaster. However, because these estimates likely under-reports disaster incidence in conflict states to a much greater degree than the primary measures, and because they provide a less realistic gauge of the relationships I attempt to assess, I only report results derived from former measures. Nevertheless, models employing the alternative estimation did not change the substantive findings in this study.

Control Variables

Turning to the effects of the control variables, as expected, Discrimination demonstrates negative and significant effects on the duration of conflict independent of natural disasters. These results are strongly robust, and persist across all models. These findings demonstrate that not only can Discrimination predict war, as indicated in Chapter 3, but that this variable can also explain why wars persist. Cold War also appears to significantly prolong civil conflict and is insensitive to most of the various model specifications. This finding provides evidence that the United State's and Soviet Union's efforts at waging proxy conflicts during the Cold War, primarily through small arms provision to warring factions, had powerful effects in enabling rival factions to continue fighting. New State demonstrates weak statistical significance in a few of the models presented, and its effects occur in the expected direction. Thus, conflicts that begin in the first two years of a states membership in the international system tend to be longer than

otherwise. New States do not appear to have a large impact on the duration of conflict, as this variable only achieved statistical significance in a few of the models presented in Table 4.2. Surprisingly, Democracy demonstrates robust and significant positive effects on the duration of civil conflict across most model specifications, including major wars. Where Democracy fails to achieve statistical significance, it still retains the same directionality of effects. This finding corroborates research by Lyall (2010) who argues, despite contradictory prior research, that there is no a priori reason to suspect that democracies should "cut and run" in the face of "casualty averse publics, accountable leaders, and free media" (167). State Capability, as expected, demonstrates a negative relationship with conflict duration, however the results are only weakly significant in few of the model specifications. This result provides modest support for prior work that finds that strong states possess greater capacity to subdue opposition, and thus fight shorter wars. However, its sensitivity to various model estimations suggests that other factors possess greater explanatory power. Interestingly, the first two geographic variables, Mountains and Forests, display contradictory results. The Mountains variable, which measures the roughness of terrain in conflict zones, can prolong conflict, particularly for major civil wars. However, despite conventional wisdom that forested terrain can hide and protect insurgents, Forests displays a negative relationship with conflict duration, and achieves statistical significance in several of the models presented. One reason for this might be that despite the potential to provide cover, the state can parcel and harvest forests or collect tax revenue from timberland owners to fund counterinsurgency. Though rebel groups have reportedly engaged in illegal logging to fuel their campaigns, the effort involved in smuggling timber might not pay off in terms of their capacity to win or prolong conflict. The final two geographic controls, Distance and Borders, which measure, respectively, the distance between the state capital and the conflict zone center, and

whether or not rebel territory abuts an international border, both produce highly significant and positive effects on the outcome across many of the models presented. These results provide substantial support to prior work that finds the farther a state must project its power and the easier it is for rebels to retreat across a border, the more intractable civil conflicts can be.

CONCLUSION

This analysis tests the effects that natural disasters can have on the duration of civil conflict. It finds that not only can disasters prolong war, but also that discriminatory political institutions can increase the magnitude of their effects, as disasters appear to have a greater impact on conflict duration in discriminatory states. I suggest that this finding holds because disasters and the politics that surround them diminishes human security and livelihood capacity, which can increase the relative costs of conflict non-participation, the relative benefits of participation, and can generate opportunities for armed groups to mobilize those affected. This argument is enhanced by the idea that the ability to gain political representation and access public goods, a crucial determinant of vulnerability, condition's disaster's impact. This research provides a complement to scholars such as Nel and Righarts (2008) and Brancati (2007) who find a relationship between disasters and political violence. It also complements work from Barnett and Adger (2007), Ohlsson (2000), and Raleigh (2010) who argue, respectively, that human security and the capacity to pursue livelihoods are fundamental to explaining the persistence of armed civil conflict, and that political relevance is a crucial determinant of livelihood vulnerability. In the next chapter, I employ more refined quantitative data to assess the impact that disasters can have within a single state, as well as to explore in more detail whether the mechanisms I claim are driving the processes discussed previously actually hold in a crucial country case.

CHAPTER 5: DISASTERS AND CIVIL CONFLICT IN THE PHILIPPINES

On January 1st, 2011, a cold front triggered heavy rains over the central and southern portions of the Philippines. The ensuing floods, landslides, and storm surges killed 110 people and affected over 2 million across 27 provinces. Two devastated provinces, Northern Samar and Sorsogon, are highly contested battlefronts in a four-decade civil war fought between the Armed Forces of the Philippines (AFP) and the New People's Army (NPA), a Marxist insurgent group and U.S. -designated foreign terrorist organization. Rather than use this chaotic period to amplify its military campaign, the NPA ordered guerilla units in these regions to provide disaster aid to beleaguered victims and engage a temporary ceasefire with the AFP so military relief providers could do the same ("CPP Orders NPA Fighters…" 2011).

This behavior is not unusual. The NPA and the AFP regularly cease fighting to provide assistance to disaster victims. These actions are however, puzzling. Why would combatants in conflict place themselves at risk to provide disaster relief aid in contested areas? Anonymity is generally thought to be an insurgent group's primary resource because it limits the state's capacity to locate and neutralize guerilla fighters. Yet providing disaster relief places insurgents at risk because it can expose their identities to military units working in affected areas. Similarly, government aid convoys traveling in remote regions can make easy and appealing targets. Relief goods can sustain insurgencies. Successful ambushes can reinforce rebel solidarity and increase a group's strength vis-à-vis the state. Does the NPA and AFP's behavior represent true diplomatic interaction—"disaster diplomacy?" Or, are these actions simply attempts to augment future military campaigns with civilian support? Can natural disasters encourage peace? Do they

prolong war?

Chapter 5 addresses these questions. It builds upon theoretical and empirical insights in prior chapters to trace the ways in which disasters have shaped the trajectory of civil conflict in the Philippines (RP), a country that the Center for Research on the Epidemiology of Disasters, a World Health Organization collaborating center in Brussels, regularly ranks as one of the most disaster prone countries in the world (EMDAT CRED). In this chapter I employ both qualitative and quantitative techniques to advance the analysis, which should increase both the depth (mechanism identification) and breadth (generalizability) of the findings.

First, I conduct a case study of the impact that natural disasters and the politics that surround them have had on the conflict associated with the Communist Party of the Philippines-New People's Army (CPP-NPA), the longest-running active insurgency in the country. I begin with an overview of natural disasters and vulnerability in the Philippines, and the state's institutional architecture for disaster response. I then discuss how endemic corruption within these institutions engenders political marginalization and exacerbates population vulnerability, which in turn provides opportunities for the CPP-NPA to generate public support and build recruitment for their revolutionary campaign. Whereas data limitations restricted empirical tests in Chapters 3 and 4 to quantitative measures that approximate political status as group-level ethnic discrimination, this case study identifies the political discrimination that arises from corruption and patronage politics. Expanding the concept beyond ethnic discrimination and ethno-political violence should increase the argument's theoretical leverage. Furthermore, in analyzing the processes that enable CPP-NPA to exploit disasters' causes and consequences to expand operations, this study illustrates a key mechanism connecting the independent and dependent variables employed in prior chapters.

Second, I employ quantitative techniques to assess the generalizability of a key finding in the case study—that disasters can increase the risk of violence and conflict—across all four major insurgencies in the country, including: Moro Islamic Liberation Front (MILF), Moro National Liberation Front (MNLF), and the Abu Sayyaf Group (ASG), as well as the CPP-NPA. In this section, I test natural disasters' impact on the incidence of violence in these conflicts through a large-N statistical analysis at the Philippine province level from 1999-2007. To maintain continuity with prior chapters, I employ a similarly constructed primary independent variable that measures the percentage of the population that disasters affect in a given province/year. However, in a departure from Chapters 3 and 4, which rely on dichotomous measures of violence at the state level, or count variables of conflict duration (in months) at the conflict level, respectively, I employ a dependent variable that measures the rate of violent incidents that occur between government and insurgent forces. The data are divided according to the actor (rebel or government) that initiates violence. This disaggregated data enables me to test whether disasters have distinct effects on the likelihood of government and insurgent violence against the respective other. Actor-disaggregated data also enables me to test Hypothesis 5 (H5), which suggests that disasters not only bolster insurgent capacity to fight, but also boost the state's capacity to counter rebel threats.

I draw empirical evidence for this chapter from a series of interviews, primary data gathered from RP government archives, and participant observation obtained during five months of in-country fieldwork during 2011 and 2012. In total, I conducted 65 interviews with local policymakers, governmental and NGO disaster relief workers, clergy, current and former

insurgents, and military personnel, in disaster and conflict affected areas of the country.[15] I also collected primary quantitative data on natural disasters in the Philippines from the headquarters of the Natural Disaster Risk Reduction Management Council Headquarters (NDRRMC), the inter-agency governmental body responsible for disaster relief coordination, response, and data collection; and from the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA), the Philippine governmental agency that delivers weather forecasts and advisories and collects meteorological, climatological and astronomical data.

This chapter's findings build upon work presented in previously in this dissertation. The quantitative evidence I present suggests a robust correlation between the occurrence of destructive natural disasters and the incidence of both rebel- and government-initiated violence in civil conflict. This evidence tracks well with work presented in Chapters 3 and 4, and lends strong support to my argument that rather than increasing the likelihood of cooperation, disasters and the effects they produce tend to exacerbate conflict among antagonists, which can both prolong war and increase violence within it. This evidence also provides support for H5, that disasters not only present opportunities to insurgents, but also to state forces in waging counterinsurgency.

The qualitative evidence reported in the case study suggests direct links between disasters and civil conflict in the Philippines. I argue that two primary mechanisms facilitate this process: First, natural disasters diminish human security and limit the livelihood capacity of vulnerable citizens, and have resulted in a continuous cycle of destitution, impoverishment, and insecurity. Poverty and an inability to maintain livelihoods can diminish the opportunity costs of conflict participation, and can generate incentives for disaster victims to pursue extra-legal means of

[15] Interviews were conducted in Metro Manila, in Leyte, Southern Leyte, Northern Samar, Eastern Samar, Western Samar, and Albay provinces, and in Cagayan de Oro and Illigan Cities.

income-generation. Second, the politics of disasters and disaster relief distribution in the Philippines increases political and economic marginalization and exacerbates socio-economic inequality of those affected, which can elevate human security costs and generate profound anti-state grievances. Evidence suggests that the combination of these factors—incentives and motives—enables the CPP-NPA to mobilize new recruits and increase civilian cooperation through relief assistance provision and targeted propaganda campaigns. The resulting effects prolong and intensify civil conflict in the Philippines, and directly counteract the Armed Forces of the Philippines' (AFP) counterinsurgency efforts. This evidence also tracks well with findings presented in earlier chapters regarding the effects that disasters can have in politically discriminatory states.

I divide this chapter into four sections: First, I provide an overview of natural disasters, population vulnerability and the Philippine state's institutional framework for disaster response. Next, I discuss the ways in which institutional corruption and patronage politics at the local level subvert this process to reinforce the political power of local political elites, and in turn marginalize certain segments of the population. I then analyze how the intersection of these phenomena—disasters and political marginalization—creates opportunities for insurgent groups to mobilize the vulnerable and aggrieved to perpetuate civil conflict in the country. Finally, I discuss quantitative tests and results that assess the generalizability of these mechanisms to other conflicts in the Philippines.

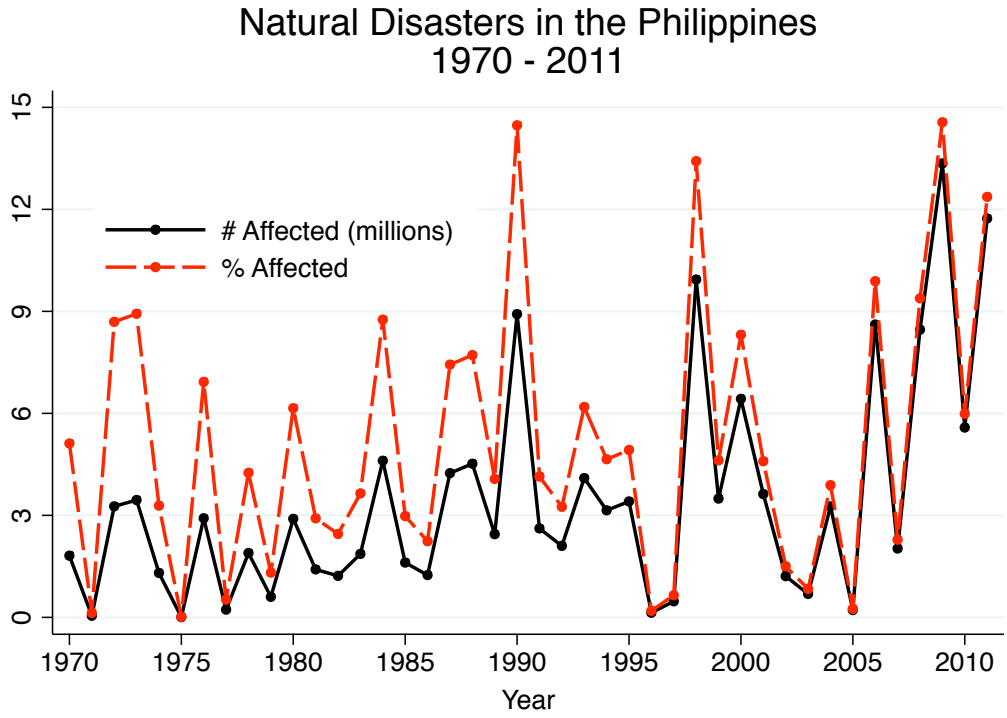
NATURAL DISASTERS IN THE PHILIPPINES

Observers describe a "belt of pain and suffering stretching from just below Hong Kong and the industrialized Canton area of China to just north of Malaysia and Singapore" when they refer to

this region's experience with and vulnerability to natural disasters (Murphy, 1992, also quoted in Bankoff 1999). The Philippines lies at the heart of this belt. The country regularly ranks among the three most disaster-affected countries in the world, often taking the top spot (EMDAT CRED). In 2010 alone, disasters displaced over one million people and affected over six million. These are substantial numbers, but less so when placed in recent context. Figure 5.1 illustrates this point graphically. [16] This figure displays the number of people that disasters have affected annually in the Philippines from 1970 – 2011, both in absolute numbers and as a percentage of the Philippines' population during this time period. This graph reveals two key points: First, natural disasters in the Philippines regularly impose staggering human costs. These events have affected an average of 5.5% of the Philippine population annually, or a total of over 145 million people since 1970. Second, these costs are growing. While the average annual percentage affected for the first half of this time period (1970-1989) totals 4.4%, the latter half has witnessed a rise to 5.9%. In the most recent 10 years, this figure again rises to 6.1%, and in the most recent five years, it rises again to 8.9%. This trend reveals that the escalation in natural disasters' human costs is not simply artifact of population growth alone. As I discuss in the following sections, this trend results from a combination of growing vulnerability and environmental exposure, shifting climatic conditions, escalating levels of environmental degradation, an patronage politics.

[16] Data for Figure 5.1 drawn from EMDAT - CRED.

FIGURE 5.1



The Philippine government describes a natural disaster as "a serious disruption of the functioning of a community or a society involving widespread…losses and impacts, which exceed the ability of the affected community to cope using its own resources" (RP Republic Act # 10121). Breaking this definition down into its three components—the "disruption," (environmental phenomena); the "losses and impacts" (the community's exposure to the phenomena); and the community's capacity to "cope using its own resources"—provides insight into why the Philippines experiences such high rates of calamity.

Nature's Input

Geological and meteorological forces coalesce to magnify the Philippines' susceptibility to naturally occurring phenomena. Subduction zones abut the country's coasts, and geologic

fractures and faults span its territory. These factors magnify earthquake vulnerability and render the earth that composes major Philippine landmasses especially prone to landslides. An infamous example occurred in February 2006 near St. Bernard, Southern Leyte when a massive landslide cascaded down an 800m tall escarpment and buried the village of Guinsaugon, killing over 1000 people. Scientists claim that the movement—an estimated 15 million cubic meters of earth—resulted from "progressive failures and tectonic weakening in a region made especially vulnerable by the inter-reaction of geological/tectonic, climatic and cultural factors" (Guthrie 2009). The slide was so large that it required permanent relocation of the entire village and significant manpower support from international actors, most notably the United States military, to assist the Armed Forces of the Philippines (AFP) with recovery efforts.

The Philippines also sits directly atop the "Pacific Ring of Fire," which is home to over 75% of the world's volcanoes, and 90% of the world's major earthquakes. The country averages five perceptible earthquakes per day and contains eighty-five active volcanoes (Daligdig and Besana, 1993; Zoleta-Nantes 2000). The 1991 eruption of Mt. Pinatubo on the island of Luzon, the second largest terrestrial eruption of the twentieth century, necessitated immediate assistance for over one million people, and resulted in the closing of two nearby United States military bases. The eruption's precursor, the 1990 Luzon earthquake, measured a 7.7 on the Richter scale. The quake sliced a 125 km gash in the earth, caused damage over a 20,000 km area, and killed over 1,500 people. Unfortunately, geologic disasters such as these are not uncommon. From 1900-2011, the Philippines experienced 22 major destructive earthquakes and 23 destructive volcanic eruptions. These events killed at least 13,000 people and affected over 4 million during this time period (EMDAT CRED).

In addition to geologic phenomena, the Philippines is also highly prone to hydro-meteorological disturbances. Without question the high frequency of tropical cyclonic activity presents the greatest human threat to the Filipino population. Each year, approximately 20 typhoons pass through the "Philippine Area of Responsibility."[17] Of those, an average of seven-eight strike land, affecting people living in coastal and low-lying areas, and those who rely on agricultural production as a primary livelihood. A variety of factors contribute to these phenomena. The Philippines is an archipelagic state located entirely within the tropics, and along a major typhoon belt. The northeast (October-March) and southwest (July-September) monsoon seasons deliver a substantial portion of the country's rainfall. Though the weather patterns that follow these seasons have historically been somewhat predictable, increases in the frequency of El Niño/La Niña Southern Oscillation (ENSO) episodes exacerbates weather variability. ENSO events, which occur primarily during the northeast monsoon season, fluctuate sea surface temperature and air pressure. El Niño, or oceanic warming, produces drier-than-average weather patterns, which can last a season or more. La Niña, El Niño's cooling counterpart, often generates higher-than-normal rainfall and increases cyclonic activity. Both of these events can wreak havoc on agricultural sectors. While El Niño can generate droughts, diminish water supplies, degrade topsoil, and increase forest fire risk, La Niña can inundate crops and generate powerful floods (Jose 2009).

Scientists speculate that ENSO's proliferation is due at least in part to rises in atmospheric temperatures associated with climate change (Latif and Keenlyside 2008). Changes in the earth's climate might also influence the incidence of disaster by increasing the rate of the water cycle—the processes of evaporation, condensation, and precipitation that propel water

[17] With sustained winds >= 118 kph, typhoons represent the strongest category of tropical cyclone in the Western Pacific.

through the hydrosphere. Recent research finds evidence that climate change intensifies the water cycle's speed at twice the rate scientists previously thought (Durack, Wijffels, and Matear 2012). If correct, this mechanism can have profound implications for the incidence of climatic events in sub-tropical and tropical regions like the Philippines. Dry places become dryer and wet places wetter. Droughts become longer, and storms—tornadoes, hurricanes, and typhoons—become stronger and more frequent.

Human Input: Deforestation

Human impact on environmentally protective resources magnifies the inclement effects of these naturally occurring events. The result is that what might otherwise pass as environmental phenomena often result in human catastrophe. In the Philippines, deforestation from logging and agricultural expansion is a key manifestation of this impact. Environmental NGOs identify the Philippines as having one of the top 10 highest deforestation rates in the world (McDermott 2009). In the 50 years following WWII, the Philippines lost an average of 2.4 acres of hardwood forest per minute (Lee 1997). In 2010, forestland covered only 22% of the total landmass, down from 35% in 1990 and 49% in 1950 ("Forest area (% of land area) in Philippines"). Only 2.8% of the Philippines is currently forested with primary growth ("Philippines Forest Information…" 2011). Deforestation and soil erosion on Cebu, one of the country's most populated islands, has been hugely problematic since at least 1935 (Pendleton 1935). In 1954, soil erosion affected an estimated 92% of Cebu's landmass, with the original surface entirely removed from 63% of the island (Barrera 1954). In 1990, Cebu was labeled an "ecological disaster" (Collins 1990). Today, almost no forest cover remains on the island.

Deforestation is problematic because it directly increases the risk of flooding, drought, and landslides, and indirectly strengthens other disaster types such as typhoons and storm surges. Logging and agricultural expansion, two major drivers of deforestation, generate topsoil degradation and erosion, which can cause larger and more frequent landslides and increase the silt content of storm runoff. Silt-laden streams choke waterways and destroy coastal mangroves and reefs necessary to protect against typhoons and storm surges. Erosion also prevents water from absorbing into the soil, which increases the speed of storm runoff, and heightens the risk that downstream communities will experience flooding, particularly during rainy seasons. Deforestation has other effects as well. It heightens drought risk because trees and topsoil channel rainfall to underground aquifers that distribute water to rivers during dry spells. Deforestation also contributes to climate change, and thus indirectly increases the risk of disaster, because forests act as carbon sinks, and because the act of deforestation releases large amounts of greenhouse gasses into the atmosphere.

Human Vulnerability

Recall that a population's level of vulnerability—the combination of environmental exposure and coping capacity—influences the extent to which natural phenomena become disasters. The Philippines' experience with population vulnerability is similar to predicaments faced across the developing world. A recent report found that although Japan and the Philippines contain approximately the same number of people exposed to tropical cyclones, a storm striking the Philippines would kill 17 times more people than one of equal magnitude striking Japan (Ginnetti et al. 2013). The primary causes tend to build upon and reinforce one another, and

include rapid population growth, poverty, landlessness, and habitation in environmentally hazardous locations.

In the past 50 years, a combination of declining mortality and high fertility rates have ballooned the Filipino population from 26 million in 1960 to around 100 million in 2012. Despite recent downward trends in the average birth rate, the population is still growing because the absolute number of women having children continues to rise. This growth has increased population density to unsustainable levels, particularly in urban areas, and has dramatically heightened disaster risk for large segments of the population. Urban growth has persisted at an average rate of around 4% since 1970. Philippine cities now hold 65% of the total population—up from 32% in 1972. By some accounts, Manila, with 41,014 persons/km^2, is now the most densely populated city in the world (Malone 2006). Cities are treacherous because high population density increases the risk that a disaster will occur and strengthens the magnitude of those that do. Poverty exacerbates the problem because a lack of assets and purchasing power encourages settlement in marginalized and environmentally exposed slums and squatter areas, which are disproportionately prone to flooding, fires and landslides. Squatter dwellings are dangerous because they are often constructed from flimsy materials vulnerable to storm winds and even the most minor earthquakes. Recent survey research suggests that up to 95% of the urban poor in Metro Manila have experienced floodwater inundation in their homes. 85% of the respondents reported that floods had either carried off or totally destroyed their houses (Zoleta-Nantes 2000). In part for these reasons the Climate Change Vulnerability Index in 2012 ranked Manila as the most vulnerable "high growth city" in the world to climate change, and the Philippines as the tenth most vulnerable country. In one horrific example of the type of tragedy this vulnerability can produce, on July 10th, 2000 a landslide of trash waste buried a community

of informal settlers in Payatas, a barangay (village/neighborhood) in Quezon City, adjacent to the largest dumpsite in the Philippines. The trash-slide, which resulted from a combination of high rains and a 70-degree trash pile slope angle, killed approximately 200 people and displaced an entire community.

Rural dwellers face difficulties similar to their urban counterparts. Heavy reliance on agricultural sectors coupled with exceedingly unequal land ownership patterns strengthens the effects of environmental calamities and diminishes people's capacity to recover from them. Approximately 12 million Filipinos rely directly on agriculture for their livelihoods and subsistence. Of these, 36.7% live below the poverty line, in contrast to the national rate of 22.9% (Philippine Bureau of Agricultural Statistics). In addition, the distribution of farm ownership remains highly unequal. While the number of farms in the Philippines has increased from 2.35 million in 1971 to 4.61 million in 1991, the average size of each farm has dropped from 3.6 hectares to 1.19 hectares during the same period (Leones and Moreno, 2011). Farms smaller than three hectares constitute 79% of the total number of farms, but only cover 38% of total farm area. In contrast, farms larger than 10 hectares account for only 3% of the number of farms, but cover almost 24% of farm area (Leones and Moreno, 2011). Furthermore, 40% of the agriculturally dependent do not own land; they rent, tenant farm, or farm surreptitiously. This landlessness and inequality can force farmers to accept pay below subsistence rates, settle in environmentally marginalized areas, and supplement income through illegal and environmentally degrading means such as illegal logging or small-scale mining. Settlement and cultivation in marginalized areas—flood plains and denuded hill slopes, for example—reinforces unsustainable farming practices and agricultural overuse that further weakens soil structures, results in poor crop yields, and increases the risk of drought. The combination of these processes reinforces

cycles of impoverishment, exacerbates food insecurity, and heightens environmental degradation, all of which increase vulnerability to disaster. Ironically, one mechanism that rural dwellers employ to cope with these issues is to migrate to urban areas. Unfortunately, this strategy only exacerbates problems in the cities.

DISASTER RELIEF AND POLITICAL EXCLUSION IN THE PHILIPPINES

If we can gauge a household's vulnerability to disaster as a function of its recovery capacity, then the state's ability to provide relief and reconstruction assistance can partially determine vulnerability. The Philippines possesses a clearly defined institutional framework to deliver support to disaster-affected areas. However, the patronage and corruption that pervade Philippine politics, particularly at the city/municipal and provincial levels, enable tremendous resource misappropriation towards the politically well connected, and at the expense of the marginalized and vulnerable. Bankoff's (2003) research supports this contention. He argues that there exists "…a correlation between natural hazards and the manner in which power is articulated in society that partially explains the widening disparities of wealth…within the Philippines" (Bankoff 2003, p. 84). This correlation obtains because in the Philippines:

> ….The political elite and those with family or social ties to them, are able to consolidate and even enhance their financial and political position in society directly through the misappropriation of public money designated for relief and rehabilitation programmes, and more circuitously through the patronage that control over such funds confers upon them. [The] corruption…is symptomatic of a 'culture' that permeates all levels of the public service down to relief workers at the disaster site and the voluntary labours of NGOs, though the scale in these latter cases is often petty (Bankoff 2003, p. 100).

I take this argument a step further to suggest that natural disasters and the political corruption, marginalization, vulnerability, and inequality they provoke provide key opportunities for groups

such as the CPP-NPA mobilize new members and supporters and wage violence against government forces, which in turn increases their capacity to challenge the state. The following section describes the institutional architecture for disaster response and outlines the ways in which local political leaders subvert this framework to reward political supporters.

Institutional Framework

In June 1978, Presidential Decree 1566 established the institutional foundation for disaster management in the Philippines. This measure created the Natural Disaster Coordinating Council (NDCC), which until 2010 served as the key institution charged with disaster management in the country. In 2010, Republic Act 10121 modified the NDCC's management structure and renamed it the Natural Disaster Risk Reduction and Management Council; however, the basic functions remain the same. The NDRRMC operates within the Office of Civil Defense (OCD), an agency created in 1972 with a mandate to protect the public during disasters and emergencies. The OCD Administrator serves as the NDRRMC executive officer in charge of policy implementation and disaster management, and functions as the chief advisor to the NDRRMC Chairman, the Secretary of National Defense. The heads of the four government agencies whose missions most closely align with disaster and disaster relief serve as vice chairmen. A host of other agency secretaries and bureaucratic and military agents, as well as civil society and private sector representatives constitute the remainder of the council, bringing total NDRRMC membership to 44 individuals. Table 5.1 provides the full council membership.

TABLE 5.1: NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL OFFICE HOLDERS AND MEMBER AGENCIES

NDRRMC OFFICEHOLDERS

1. Chairperson - Secretary of Department of National Defense
2. Vice Chairperson for Disaster Preparedness - Secretary of Interior and Local Government
3. Vice Chairperson for Disaster Response - Secretary of Department of Social Welfare and Development
4. Vice Chairperson for Disaster Prevention and Mitigation - Secretary of the Department of Science and Technology
5. Vice Chairperson for Disaster Rehabilitation and Recovery - Director-General of the National Economic Development Authority

MEMBERS

6. Secretary of the Department of Health
7. Secretary of the Department of Environment and Natural Resources
8. Secretary of the Department of Agriculture
9. Secretary of the Department of Education
10. Secretary of the Department of Energy
11. Secretary of the Department of Finance
12. Secretary of the Department of Trade and Industry
13. Secretary of the Department of Transportation and Communication
14. Secretary of the Department of Budget and Management
15. Secretary of the Department of Public Works and Highways
16. Secretary of the Department of Foreign Affairs
17. Secretary of the Department of Justice
18. Secretary of the Department of Labor and Employment
19. Secretary of the Department of Tourism
20. The Executive Secretary;
21. Secretary of the Office of the Presidential Adviser on the Peace Process
22. Chairman, Commission on Higher Education
23. Chief of Staff, Armed Forces of the Philippines
24. Chief, Philippine National Police
25. The Press Secretary
26. Secretary-General of the Philippine Red Cross
27. Commissioner of the National Anti-Poverty Commission - Victims of Disasters and Calamities Sector
28. Chairperson, National Commission on the Role of Filipino Women
29. Chairman, Housing and Urban Development Coordinating Council
30. Executive-Director of the Climate Change Office of the Climate Change Commission
31. President, Government Service Insurance System
32. President, Social Security System
33. President, Philippine Health Insurance Corporation;
34. President of the Union of Local Authorities of the Philippines
35. President of the League of Provinces in the Philippines
36. President of the League of Municipalities in the Philippines
37. President of the League of Cities in the Philippines
38. President of the Liga ng Mga Barangay
39. Four representatives from the CSOs
40. One (1) representative from the Private Sector
41. Administrator of the OCD

The NDRRMC does not possess its own independent operating budget; its operational funds flow from the various agencies that comprise it, as well as lower-tier Regional (RDRRMC) and Local Disaster Risk Reduction and Management Councils (LDRRMC). Although councils at all jurisdictional levels emphasize self-sufficiency in both disaster mitigation and management, in effect these offices serve primarily to distribute disaster relief supplies. In the case of very large catastrophes, such as the eruption of Mt. Pinatubo, it is common for the government to intervene and establish a separate management operations (Bankoff 2003).

RDRRMCs and LDRRMCs are fashioned after the national-level NDRRMC and operate at lower-level political jurisdictions. RDRRMCs serve the largest jurisdiction, the Philippine Region, but have no administrative power or executive officeholders. The NDRRMCC chairman assigns RDRRMC chairmen, which at the time of this writing are Regional Directors of the Philippine National Police. The Regional OCD chief serves as executive administrator of the RDRRMC. In Autonomous Regions, chief executives serve this role, and in Metro-Manila, the Chairman of the Metro Manila Development Authority. Like the NDRRMC, RDRRMCs possess no operating budget independent of the member agencies. These councils are charged with establishing a Regional Operations Center (ROC), implementing policy guidelines, advising LDRRMCs, and submitting recommendations to the NDRRMC. Local DRRMCs (LDRRMCs) operate at each subsequently lower jurisdiction or "local government unit" (LGU): the province, city/municipality, and barangay (village/neighborhood) level, respectively. The chief executive of each of these divisions (governor, mayor, barangay captain) serves as the chairmen of their respective LDRRMCs. The geographic scope of a disaster's effects determines administrative responsibility for disaster response. City/municipal LDRRMCs manage disasters that affect more than one barangay, the smallest Philippine administrative unit. Similarly, Provincial LDRRMCs

manage disasters affecting more than one city/municipality.

Funding for disaster relief and reconstruction activities, as well as disaster mitigation and preparedness, originates from National and Local Disaster Risk Reduction and Management Funds, commonly known as "Calamity Funds." The Congress of the Philippines appropriates national Calamity Funds under the General Appropriations Act (GAA), subject to presidential approval. The NDRRMC then recommends to the president specific allocation amounts for each of its member agencies. Each agency must allocate no less than 30% of the calamity funds for "quick response" to manage crisis emergency periods. At the local levels, LGUs reserve their Calamity Funds in a similar fashion to their national counterparts. Act 10121, which created the NDRRMC and LDRRMCs requires that LGUs set aside at least 5% of their annual revenue as Calamity Funds. Of this 5%, 30% is for "quick response."

In FY 2013, the national Calamity Funds totaled 7.5 billion pesos ($172 million USD). However, these allocations do not necessarily reflect the amount that NDRRMC member agencies actually spend on disasters. Agencies can draw resources from elsewhere in their budgets, or can petition for additional allocations. For example, in FY 2013 the GAA allocated the Department of Social Welfare and Development, the secretary of which acts as the NDRRMC VC for Disaster Response, P652.5 million for quick response. However, as of July 2013, the agency had already requested an additional P500 million to cover shortfalls following a series of highly destructive typhoons.

Mechanisms for Political Discrimination

The most important links in the DRRM framework are the local LDRRMCs. Their proximity to the population requires that they "take the lead in preparing for, responding to, and recovering

from the effects of any disaster…" (RP Republic Act # 10121, p. 21).[18] This requirement demands that agencies within a local government unit's LDRRMC handle the greatest share of emergency management, including damage assessment, resource requirement identification, and resource delivery. The result is that the lion's share of relief resources (both monetary and non-monetary) is channeled directly through LGU chief executives, who are then responsible for distribution to the public. That local officials, via local legislative boards, also possess the capacity to declare states of calamity further enhances this power. The power to declare that a given location is under a state of calamity can be highly political because it enables local officials to release (and request more) money from their calamity funds, and provides institutional cover for politicized fund distribution because only areas under calamity are eligible to receive funds.

These powers are problematic because they provide local officials with tremendous leeway in determining where and to whom to allocate resources, including both relief resources and reconstruction contracts, and where to declare states of calamity, all of which can be used selectively to reward supporters or punish defectors. In one interview, a barangay captain (village chief) in Barangay Cabagawan in St. Bernard municipality, Southern Leyte, recounted that following a natural disaster his predecessor routinely refused to ask the mayor for access to calamity funds because the fact that he and the mayor belonged to different political parties or "colors" implied that his request would be denied out of hand, regardless of the level of destruction incurred in his barangay.[19] The result is that residents of Cabagawan were often left with no form of government compensation, relief aid, or access to public goods and services.

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[18] This point was also reiterated in an interview with Edgardo Ollet, Chief of the NDRRMC Operations Center (OpCen), October 25, 2011.

[19] Author's interview with Danilo A. Galera, November 15, 2011.

Additional interviewees reported similar experiences in other disaster-prone areas.[20]

Far from damaging their chances at reelection, this selective application of calamity declaration and selective funding of disaster relief and reconstruction work can further consolidate local officials' power because these abilities facilitate personal enrichment and increase future electoral success through political patronage. Disaster victims who suffer from this political discrimination can petition officials directly in hopes to receive some assistance. However, interviews suggest that these requests usually necessitate promises of future electoral support, which subverts the democratic process and enhances dependency. For citizens that have the capacity to travel to the municipal center to make these entreaties, this strategy can also carry longer term costs because it can place citizens at political odds with their respective barangay captains, which can motivate future retaliation. The result for the marginalized and disaster-affected can be tremendous scarcity of basic subsistence resources with little capacity to improve or even challenge the situation. For example, in one rural barangay within Calbayog City municipality in Western Samar, the barangay captain recounted in a conversation that under the current mayor, residents had recently gone for weeks with only minimal access to food and clean drinking water following especially severe flooding. The floods destroyed crops, wrecked harvests, and contaminated the local well with sewage overflow. The only option for consumable goods access required travel to the city proper; however this option was infeasible for most residents because of extremely high transportation costs and high prices of clean water in town. The local office of the Department of Social Welfare and Development (DWSD) offered a "one

[20] In conversations with LDRRMC staff members in various LDRRMC offices in Western Samar, Eastern Samar, Northern Samar, Southern Leyte, and Albay provinces, individuals commonly reported that their local mayors often politicized disaster relief for the expectation of future electoral support. Although city councils technically have approval power for fund disbursal, they are seldom offer more than rubber stamp endorsement.

day survival" package of one kilogram of rice and a box of sardines as a token gesture, but these offerings were made selectively and distributed only in the city center.

The type of corruption and political patronage described here has long been documented in the Philippines and has helped given rise to the country's economic nom de guerre, "the sick man of Asia."[21] In explaining the persistence of these phenomena at the local level, Sidel (1999) states that local officials or "small town 'bosses' have thrived in large part because of the enduring institutional features of the Philippine state, most notably the discretionary powers of elected municipal executives over its local policing and taxing apparatuses" (Sidel 1999 p. 26). These powers include

> …broad discretion over local finances through [local officials'] influence over the appointment of municipal treasurers and assessors, authority to legislate municipal tax ordinances and to set public utility fees, and control of the disbursement of government funds through public works projects and public salaries (Sidel 1999 p. 26).

Executive control over local law enforcement, including the ability to determine police salaries and appoint or remove municipal policemen, enhances these powers by providing legal cover (Sidel 1999). This duel control over both fiscal and coercive resources enables local officials to enrich themselves through the establishment of patron-client relationships that politicize fund and contract allocation, which most certainly includes disaster relief and reconstruction resources.[22] The result is that for marginalized Filipinos

> …government is an abstraction, an alienated entity, whose only palpable dimension is the

[21] For example, according to the 2011 World Bank's World Governance Indicators Dataset, the Philippines ranks in the bottom 25% of all countries in "control of corruption," and in the bottom 35% in "rule of law." See: Kaufmann D., A. Kraay, and M. Mastruzzi 2010; For "sick man" reference, see for example: Ellis 2011; and Hirschberg et al. 2013.

[22] For additional resources on these types of arrangements, see: Nowak and Snyder 1974; and Baterina 1985.

> episodic patronage dispensed by bosses and politicians, which merely reinforces the poor's real condition of dependence. This same alienated condition causes the electorate in many places to repeatedly elect convicted criminals, underworld characters, and known grafters, simply because such behavior is irrelevant to the more advantageous local clientelist functions those persons discharge… (de Dios and Hutchcroft 2002/03).[23]

A second source of government funds for disaster relief and rehabilitation projects arises from the "Priority Development Assistance Funds," or "pork barrel funds" allocated to national legislators (congressmen and senators). In 2012, the total pork barrel allocation was P70 million ($1.62 million) for each congressman, P40 million for "hard" projects (infrastructure) and the remainder for "soft projects." Senators received P200 million ($4.63 million), P100 million each for "hard" and "soft" projects (Philippines Department of Management and Budget 2013). Legislators can use these funds for a variety of development-related schemes within their districts, including disaster relief, reconstruction, prevention, and mitigation. Although allocations are technically subject to oversight, monitoring is lax and pork barrel distribution highly politicized. Notably, the Department of Management and Budget memoranda that allocates pork barrel fails to define "soft project," though it does identify a series of very loose parameters. In effect, legislators use these funds to boost popularity in home districts and generate future votes, as evidenced by the ubiquitous posters of legislators displayed adjacent to completed projects such as roads, bridges, and parks, or on display in various governmentally sponsored training workshops. Because their use is discretionary, these funds can support the same type of patronage-based political relationships that local calamity funds support. Journalistic accounts corroborate these claims, reporting that officials often directly pocket these funds, embezzle them through fraudulent contract allocation, or use them to buy votes directly on

[23] Also quoted in: Hutchcroft and Joel Rocamora 2003

election day.[24]

The outcome of this combination of natural disasters and the discriminatory and corrupt politics they fuel is entrenched poverty, diminished social mobility, greater inequality, and isolation from the state, all of which reinforce human insecurity, heighten vulnerability, and generate anti-state grievances. Occasionally, public outcry reaches a breaking point and protests emerge. In the months following Typhoon Bopha (locally named Pablo), which killed over 1,000 Filipinos in December 2012, a series of public protests erupted at local Department of Social Welfare and Development offices and traffic thoroughfares (Dalumpines 2013; Escalante 2013). In one instance, thousands of protesters reportedly charged the gates of a DSWD storage facility to access the relief goods stored there; in another, a similarly sized group blocked automobile traffic for over twelve hours (Manlupig 2013). The stated goal of the protests was to call officials to account for politicization and selective allocation of relief goods, and the government's mismanagement of over $450 million of international aid and calamity funds. Although it is highly possible that political opponents of local officials and agency heads organized these protests to serve their own political ends, this example nevertheless indicates the power that disasters have to act as focal points to mobilize action. Indeed, if these processes can facilitate large-scale protests, it is not infeasible that they might also encourage some to take up arms against the state.

Non-governmental, and faith-based charitable organizations provide a modest alternative to government support, although resources and organizational capacity are limited. However, for the state, relying on these institutions to provide relief can be somewhat problematic because those that conduct this work tend to be affiliated with in some capacity, or at least friendly with,

[24] See for example: "Allegations of aid politicization…"

leftist social movements such as the CPP-NPA insurgents. The Catholic Church, for example, has established a network of "Social Action Centers" (SAC) within its parishes across the country following the Second Vatican Council's call for greater church involvement in social issues. Notably, owing to their proximity to and work with impoverished and marginalized Filipinos, SACs have historically been hotbeds for revolutionary discourse, producing a number of CPP-NPA cadres, and assisting with NPA recruitment throughout the movement's history (Caouette 2004; Jones, 1989). Another source of assistance arises from non-faith based civil society organizations, or "people's organizations," such as the Citizens' Disaster Response Centers (CDRC), a network of affiliated disaster support organizations located across the country. These centers provide "community based disaster management," which includes not only emergency response, but also disaster preparedness and mitigation training, rehabilitation, and public advocacy. Similar to the Church, the CDRCs tend to be highly sympathetic to the left, and have provided disaster relief both to and alongside NPA guerillas.[25] Indeed, the CDRC's mission statement cites its work with "…social movements that address poverty, social inequalities, and extractive, environmentally-destructive practices, policies and systems," as a key organizational goal. Carlos Padolina, the CDRC assistant director in Manila, suggests that the only problems that arise when providing support in CPP-NPA occupied areas occur when the Armed Forces of the Philippines request to accompany them on relief missions as an escort—ostensibly for intelligence-gathering purposes. When the AFP makes these requests, the types of work these institutions can conduct can be limited.[26]

Thus, while non-governmental organizations can provide a limited alternative to the government, their affinity for the left in many cases facilitates, or at least does not hinder, the

[25] Author's interview with Carlos Padolina, November 10, 2011.
[26] Author's interview with Carlos Padolina, November 10, 2011.

opportunities that disasters and discriminatory politics create for CPP-NPA. In the following section, I build upon this point to outline how the CPP-NPA, the oldest insurgent group in the country still in operation, exploits the political opportunities that disasters provide to augment its political base and recruit new followers.

FROM DISASTER TO CONFLICT: THE CASE OF THE CPP-NPA

In 1968 in Central Luzon, Jose Maria Sison, a University of the Philippines professor and activist founded the Communist Party of the Philippines (CPP) following his expulsion from the party's communist pre-cursor, Partido Komunista ng Pilipinas (PKP). The movement had its origins in the Hukbalahap ("Huk") revolution fought during World War II. The CPP, the ideological arm of the revolution, espouses a "Marxist-Leninist-Maoist" doctrine to counter the "semi-colonial" nature of Philippine society and the exploitative capitalism and U.S imperialism that fuel it. In 1969, CPP founders created the New People's Army, the military wing of the party, in order to instigate a peasant uprising, a "protracted people's war," which called for building of a mass base among the rural peasantry. CPP cadres founded the movement's third wing, the National Democratic Front Philippines (NDF or NDFP), in 1973. The NDF acts as the united front organization, the political wing to supplement the ideological and military actions of the CPP and NPA. The NDF consists of a constellation of legal and semi-legal institutions including trade unions, faith-based groups, human rights organizations, political parties and lobby groups that engage in various types of advocacy work, service provision, political alliance building, and other activities designed to strengthen public opposition to the status quo.

The CPP-NPA initially struggled to gain traction following Marcos' declaration of martial law in 1972. The abolition of habeas corpus, arrest and detention of tens of thousands of

suspected communists and political opponents, and military assaults against NPA forces pushed many party cadres underground and into the rural hinterlands. However while curtailing the party's capacity to organize in urban areas, this influx of activists into the provinces, coupled with growing poverty, exploitation, and marginalization of the rural peasantry, provided a tremendous boost for recruitment throughout the latter half of the 1970s and into the 1980s (Sison and Werning, 1989; Caouette 2004). At its height in 1986 the CPP-NPA possessed approximately 25,000 fighters and 30,000 CPP members, and had an active presence in 69 out of 80 total provinces.

Throughout the end of the 1980s and 1990s, the movement experienced a number of setbacks. A failure to fully co-opt the political opportunity that Marcos' ouster in 1986 provided, internal disagreements over party ideology and political and military strategies, the splintering off of several breakaway factions, and a series of deadly internal purges within the Mindanao fronts all combined to instigate a precipitous decline in capacity and membership (Caouette 2004; Rocamora 1994). However, in the years following, the movement has regained some of its original momentum through a consolidation and "reaffirmation" of core principles and ideologies, coupled with a renewed attention to mobilizing the rural peasantry. Currently, the primary obstacle the movement faces in sustaining itself stems from difficulties recruiting educated new cadres to rejuvenate party leadership. A relaxation of recruitment standards has resulted in more instances of abuse than had existed prior in the movement as less ideologically inclined guerillas exploit their position to coerce and steal. In certain areas, this lack of discipline has caused the local population to eschew NPA involvement, which has damaged its credibility.[27]

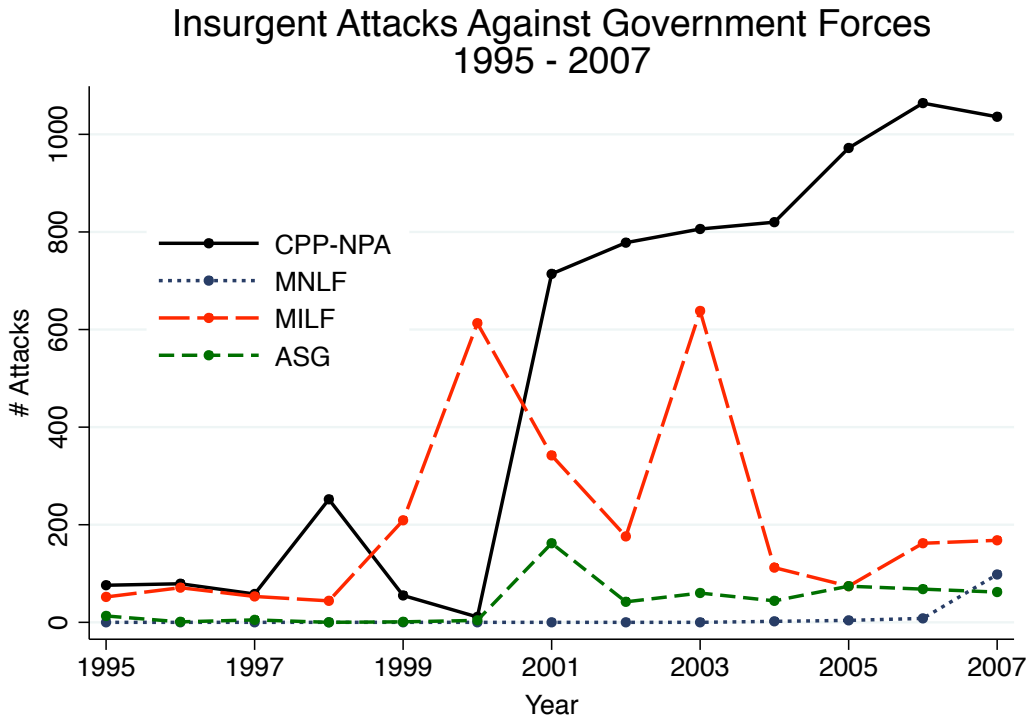
[27] Kwiatkowski (2008), for example, writes of these attitudinal shifts among Ifugao villagers.

Nevertheless, the movement soldiers on. Despite numerous rounds of failed peace talks and attempts by every Philippine government to militarily end the war, including most recently the Macapagal-Arroyo administration's full-throated assault, (Internal Security Operation code name) Oplan Bantay Laya, and its successor under the Aquino administration, Oplan Bayanihan, this group still possesses an estimated 5,000-7,000 active insurgents in 2013. What explains this groups' persistence? I suggest the CPP-NPA's resolve and capacity to maintain its campaign stem in part from environmental instability and disaster vulnerability in the Philippines, and their ability to successfully exploit these opportunities to mobilize public support. A participant in a recent focus group discussion held by the government's panel on peace negotiations notes regarding disaster prone areas along the east coast, "these areas, the corridor of poverty, are usually hit by storms and are among the poorest in the country. These are also where the insurgents breed" ("Environment advocates cite top conflict drivers…" 2011).

And the insurgents continue to breed. Though the Armed Forces of the Philippines (AFP) has claimed for years that the movement is waning, evidence regarding the groups capacity to wage attacks against military forces suggests otherwise. Figure 5.2 displays the number of insurgent attacks on government forces that have occurred in the Philippines from 1995-2007, the most recent year that comprehensive data are available. This figure reveals the attack history of the four largest insurgent groups operating in the country: the CPP-NPA, the Moro National Liberation Front, the Moro Islamic Liberation Front, and the Abu Sayyaf Group. Since 2000, the CPP-NPA has waged the majority of attacks on government forces, and its capacity appears to be growing—from a low of 11 attacks in 2000 to over 1,000 attacks each in 2006 and 2007. Given that the AFP has reported few major military successes in the years since 2007, it is not far-fetched to assume that the NPA has been successful at sustaining or even increasing these

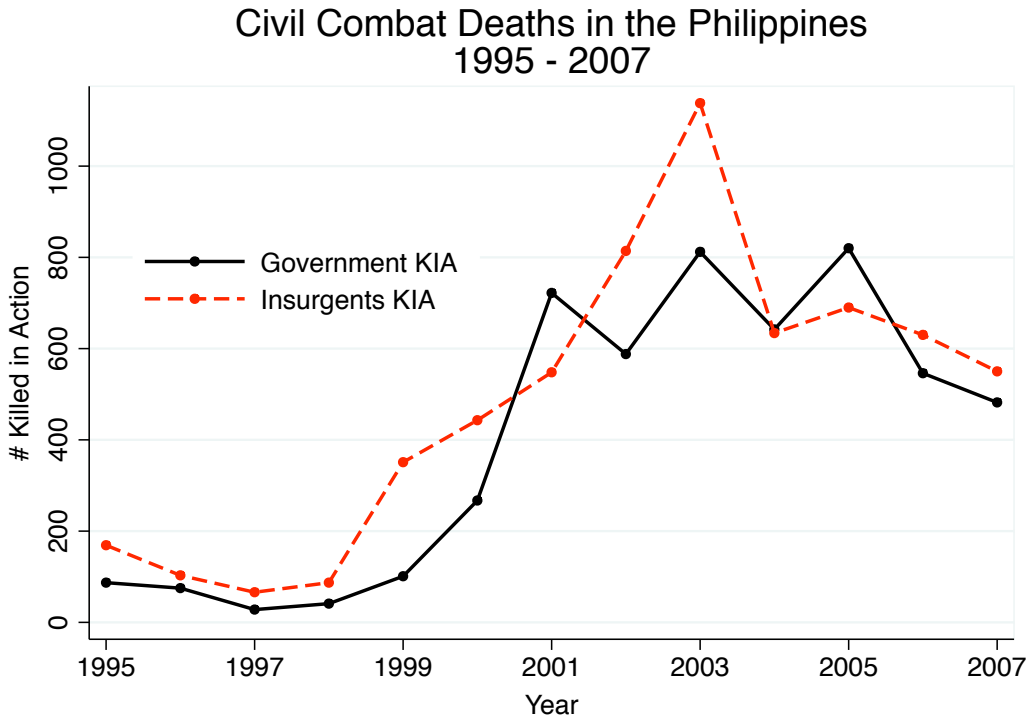
operations in the years since. Figure 5.3 reinforces this point; it displays the number of insurgents and government soldiers that have been killed in combat during this time period. This figure indicates that insurgents have maintained a consistent capacity to respond to the casualties the government imposes on insurgent forces. [28]

FIGURE 5.2



[28] Data for Figures 5.2 and 5.3 drawn from Berman et al. 2011.

FIGURE 5.3



In the following section, I detail this process of recruitment and how the movement has seized upon the environment and environmental disasters as key focal points for continued mobilization, which have partially fueled the movement's resurgence and enabled it to regain its footing.

CPP-NPA Recruitment

Although variations might occur based on the movement's previous community presence or particularities in local political-economy, the NPA traditionally employs a standard set of recruitment protocols throughout the organization (Caouette 2004, p. 229). Assuming no prior community presence, CPP cadres begin the process by establishing ties with a local contact

sympathetic to the cause.[29] A small number of cadres will then move into the village—often into the contact's own home—to facilitate introduction to other villagers and to gather information on community problems in order to tailor their political message. These cadres, to the extent that security constraints allow, might also perform or assist with community services such as education and literacy training, health care, or agricultural work (Kwiatkowski 2008, p. 241). In exchange, cadres ask residents to attend small community meetings at night to discuss local issues, the movement's message, and to enable the party cadres to assess the capabilities and willingness of villagers to support the cause. Eager participants are enlisted to recruit others who might also be inclined to engage. During the day, cadres ask receptive residents to participate in group activities designed to encourage cooperation and collective action. In describing this process, "Leonard", a former CPP member who spent several years recruiting, stated:[30]

> We [cadres] would begin by assigning them [villagers] to do small tasks like digging a new latrine or rebuilding an irrigation system. It was important to show them what they could achieve, to get them to understand how to work together. It helped them build trust with each other and with us. After a project was finished, everyone would meet and talk about it. We [cadres] would ask them what went well and what went wrong. We would ask them what they could have done better. This self-criticism and self-evaluation were very important…Many had never done this before. It taught them awareness, to reflect on their actions and to be critical.[31]

As the rapport builds, the initial meetings develop into longer political seminars and indoctrination sessions that further elaborate on the movement's message and relate how the ideological adherence to the NPA can empower villagers. Strong efforts are made to frame these

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[29] These individuals are often affiliated with the Catholic Church, which has the group helped tremendously in expanding operations into frontier communities. Today many of its top leaders were once affiliated with the church. For example, Luis Jalandoni, the current chair of the NDF peace negotiation panel, and Santiago (Ka Sanny) Salas, the current spokesman for NDF Eastern Visayas, were both priests prior to going underground.

[30] "Leonard" is a pseudonym.

[31] Author's interview with "Leonard," December 4, 2011.

messages in such a way that identifies and accentuates local injustices, names the agent or agents responsible, and formulates solutions to these injustices, all while conveying the movement's overarching political objectives in a way that resonates with villagers' cultural and normative experiences. The goal is total political indoctrination, and to leave in place a "Party Branch," a group of individuals fully integrated as activists and awaiting assignment to the various political or military positions within the movement (Rutten 1996). Once the recruiting cadres complete this process, they move on to other communities ultimately developing what Rutten (1996) describes as "…a state-like political organization, loosely centralized, that reache[s] from the national level down to region, district, section, and village, with party committees staffed by local men and women" (115).

This strategy provides a gateway for the NPA to expand. Its purpose is to establish a presence, attract future CPP cadres or NPA fighters, and to develop a foundation for "revolutionary taxation" that enables the movement to continue to operate. Once this expansion is complete, members work to co-opt or coerce local officials and other non-aligned residents to cooperate with the NPA to provide food, shelter, information, money and other resources to NPA fighters, and to eschew involvement with the military. When cooperation is not forthcoming, the NPA employs coercive tactics to maintain discipline, exert control, and facilitate resource extraction.

In addition to direct recruitment, the National Democratic Front (NDF), the CPP-NPA's united front organization, and its affiliated institutions or "people's organizations" also work to mobilize a broader political base that includes middle class, business and industry leaders, and politicians. The NDF conducts advocacy campaigns, distributes propaganda, plans strikes and protest movements, works to build legal and political alliances, and performs human rights work

all to advance the cause of the revolution. It has had notable successes at these broad-based mobilizations particularly within the Catholic Church (Caouette 2004, 300). NDF member institutions with legal or semi-legal status often work hand in hand with party activists in providing support, education, and social services to the masses. While the NDF and its affiliates do not engage in the type of direct party recruitment described above, these institutions' do conduct workshops, perform services, and hold political education seminars that are likely very similar to activities CPP-NPA cadres perform during the standard recruitment processes.

Natural Disasters and the CPP-NPA

A substantial portion of the propaganda the NPA espouses in seminars and in the movement's public communiqués emphasizes natural disasters, environmental degradation, and the need for environmental protection as rationale for the movement.[32] A natural disaster's occurrence catalyzes these statements because it exemplifies the environmental consequences of political corruption and unchecked corporate expansion and places these concepts in a local context familiar to victims. In this capacity, a disaster can provide a focal point around which to build public support. Political corruption (real or perceived) surrounding the disaster's causes and consequences can further enhance the salience of this propaganda, which can increase the disconnect citizens feel toward state institutions and boost the attractiveness of status quo alternatives. This corruption can also dramatically increase the level of material deprivation in excluded communities, which can decrease the opportunity costs of NPA membership.

Providing assistance and reconstruction work in disaster-damaged and excluded areas

[32] For example, a simple search of the word "environment" on the CPP-NPA's website (www.philippinerevolution.net) generates 354 hits that each link to CPP-NPA public bulletins. The words "disaster" and "typhoon" generate 129 hits and 85 hits, respectively.

builds upon these processes in that these actions bolster the CPP-NPAs credentials as a movement for the people and provide opportunities for cadres to interact with locals in a helpful and constructive capacity. This interaction enables cadres and NPA soldiers to build trust among residents and supports the movement's efforts to consolidate political support. In areas the NPA has already secured, these actions can rebuild or reinforce community ties that might have frayed during violent military confrontations or while extracting resources from residents. In areas where the movement seeks to expand, providing assistance can justify NPA presence and can provide opportunity to hold more indoctrination seminars. In both types of community, these actions can act as tipping points that motivate villagers to join the movement, and can encourage future reciprocal behavior—providing food, shelter, resources, or support to NPA fighters—among those that do not join. "Carlos," a cadre who currently holds a high level position within the CPP explains:[33]

> In experiences with communities effectively led by or with strong presence of the CPP-NPA and other revolutionary organizations, the people are always very grateful for whatever help these organizations are able to render to them. The CPP-NPA and other revolutionary organizations rendering assistance…boost these communities' appreciation and support…not only in those times of disaster but further on. They become all the more faithful and solid supporters of the CPP led revolutionary movement. Disasters may have economically temporarily weakened the mass bases and expansion areas of the CPP-NPA…but these organizations' assistance in the relief efforts have politically strengthened them...Such activities as disaster relief are able to pave roads for more numerous new recruits, particularly in areas where consolidation is still being developed and in areas of expansion.[34]

Three factors determine when and where the NPA will provide relief and what kind of assistance they can offer: proximity, practical capability, and security. Proximity refers to the location of NPA units relative to the disaster-affected area. NPA units and revolutionary people's

[33] "Carlos" is a pseudonym.
[34] Author's interview with "Carlos," December 5, 2011.

organizations affiliated with the NDF, are more likely to perform relief operations in communities within or near the areas they inhabit because of their familiarity with political, socio-economic, and cultural conditions and physical geography, the latter of which lends them an advantage in defending themselves in the case of a military exchange. However, Carlos notes that:

> [A lack of] proximity does not prevent NPA units and other revolutionary organizations from undertaking or assisting in relief and rehabilitation operations in communities outside their area of operations. If there are no units and local revolutionary organizations in the latter but the situation is deemed favorable for immediate or more long-term revolutionary work in these areas, such areas may become part of the expansion.[35]

Practical capability refers the NPA's capacity to respond. Because the NPA is a resource poor group, it often provides services (rather than goods) such as evacuation assistance and repair and reconstruction of farms, fields, wells, houses, and community buildings. In consolidated areas, this assistance can involve mobilizing sympathetic individuals in neighboring communities to assist in these activities. More capable units, in conjunction with "above-ground" organizations affiliated through the NDF, might have the ability to provide medical and technical support, equipment, temporary shelter, food, clothing and seeds for replanting. Depending on the relationship between NPA units and government officials in a given area, relief assistance might even include working directly alongside government relief providers.

Security refers to the NPAs capacity to operate openly without risk of attack from the AFP, the Philippine National Police (PNP) or locally-sourced paramilitary units (CAFGUs). Security concerns in non-consolidated and militarily contested areas might necessitate that members who seek to provide assistance disguise themselves as NGO personnel or civilian

[35] Author's interview with "Carlos," December 5, 2011.

volunteers. Carlos states:

> Practically all NPA units proceeding to…distressed areas always make sure first that there are no big threats to their security. Still, there have been lapses in the security checks…NPA units and other revolutionary forces are sometimes obliged to provide aid in secret especially in areas outside of their area of responsibility, areas near camps and detachments and patrols of the AFP, antagonistic police, or paramilitary forces…In many such cases, NPA units…send their members in disguise, or work through local revolutionary organizations in coordination with secret NDF members and other allies in local governments…[36]

In the case of very large disasters, or those that strike in contested areas, it is common for the group to declare a ceasefire (either unilateral or reciprocal with the AFP) so that they might operate with greater impunity; however, is unclear to what extent these ceasefires are genuine or opportunistic.[37] In areas where security concerns dominate and no ceasefire is in place, the NPA might still provide assistance, but limit their actions to coordinating communications from a remote location.[38]

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[36] Author's interview with "Carlos," December 5, 2011.

[37] During these ceasefires, it is not uncommon for opportunistic behavior such as surreptitious attacks (NPA and AFP) or looting of relief (NPA) convoys to occur. Both the AFP and the NPA claim violations with virtually every major ceasefire declaration, and both deny the others' claims.

[38] Carlos recounts one such experience that occurred following an earthquake and small tsunami that struck northern portion of the province of Oriental Mindoro on November 15th, 1994 (Author's interview with "Carlos," December 5, 2011).

> At sunup, the town officials of Puerto Galera were calling the city officials of Calapan City for assistance because two of their barangays were devastated by the tsunami with human casualties reaching around twenty. It so happened that their signal or call could not be received by Calapan City because of some hindrances…in the foothills of San Teodoro town. A unit of the NPA at that time was encamped at the hills of San Teodoro and had a powerful Ringo Ranger VHF antenna. When its radioman was informed of the strong earthquake and tsunami, he began to monitor the [radio] frequencies. When he monitored the calls from Puerto Galera and Calapan City about the calamities and the assistance needed, he asked the permission…to interfere in the radio communications to help coordinate the two locations…Permission was granted on the condition that he must not be known as an NPA for security reasons. He introduced himself as one of the radio enthusiasts from a nearby island of Mabini, in Batangas. Through this effort, rescue

The following section provides an example that illustrates precisely how the CPP-NPA mobilizes its forces for relief distribution. This anecdote was recounted during an interview with "Carlos."[39] While I was unable to corroborate Carlos' story with testimonial from the villagers in these specific barrios, conversations with locals in other areas where the NPA has provided relief aid support the contentions made here. I supplement this anecdote with secondary information on the disaster itself and the violence surrounding it.

Calamities, Relief, and Mobilization: The NPA in Quezon Province

On Nov. 29th, 2004 Tropical Depression "Winnie," one of the strongest storms of the year struck the Philippine landmass. Its arrival, the third in a succession of four consecutive storms, caused widespread flooding and landslides, with damage concentrated in and around the municipalities of Real, Infanta, and General Nakar in the Northern portion of Quezon province. These events caused the death of more than 1,400 people and destroyed farms, horses, infrastructure, telephone lines, and other facilities in these municipalities. In some areas, the floodwaters were so strong that many victims were forced to spend many days on the roofs of nearby buildings (Gaillard et al. 2007, 261). Authorities calculate that Winnie, along with the two storms that preceded it and one that followed, caused damage equal to approximately .35% of the GDP (Virola 2004; Gaillard et al. 2007).

The night the disasters occurred, NPA forces were gathered near the town proper in Infanta. This proximity, coupled with the lack of state forces (military, police, and paramilitary units) nearby, enabled NPA fighters to assist victims nearby with evacuation to higher ground.

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operation from Calapan City arrived on time at the affected barrios of Puerto Galera, San Teodoro and Baco towns.

[39] Information regarding the CPP-NPA's actions in Quezon province was taken from the Author's interview with "Carlos" on December 5, 2011.

The following day, the NPA unit called a meeting to organize the people in these areas to assist with the rehabilitation of their damaged property. NPA forces divided themselves into teams and proceeded to work on providing security, repairs, production work and housework. One team helped in repairing the wrecked irrigation system; another helped in replanting rice, and others with the replanting of root crops and vegetables in washed out farms, and the rebuilding of destroyed houses.

Local roads—those linking the affected municipalities together, as well as those within them—remained impassable for a month after the storms. These conditions meant that other relief providers, including government agencies, NGOs and other private organizations could only deliver relief supplies as far as Real. To assist, the North Quezon NPA unit communicated with other local CPP branches, NPA forces, and revolutionary organizations from Real to General Nakar to coordinate the movement of relief goods and building materials and the repair of damaged roads. Once the goods were delivered, the NPA and its affiliates, alongside local residents, assisted with infrastructure repair and rehabilitation. In exchange for the assistance, the NPA used the evenings to hold meetings with the individuals involved in the relief aid distribution and reconstruction work in order to conduct "political education" seminars for them.

In January 2005, after immediate work was finished, the CPP leadership in North Quezon formed a comprehensive plan for a longer-term response to the disasters' effects. This plan involved establishing a people's organization, an above-ground legal entity, to cover the entire N. Quezon sub-province and its three municipalities. Once established, the organization assisted with the more widespread gathering and distribution of relief and rehabilitation support, service provision to distressed communities, and coordination of the individuals and organizations involved from nearby cities, municipalities, and rural barangays in the sub-province. Following

its establishment, affiliated individuals solicited food, clothes, household goods, tools, seeds, and other resources from local allies friends, and unaffected communities nearby, as well as provincial and Manila-based disaster organizations and other relief aid sources. Grassroots chapters were established at the barangay level in order to systematize the process. In addition to its relief efforts, this organization conducted education and training and gave financial allowances to the full time organizers, relief workers and organizational staff. During this process, NPA units led and participated in relief and reconstruction efforts alongside members of the organization. NPA organized bayanihan (collective voluntary work) mobilizations to assist in these activities. This campaign lasted for more than two years. [40]

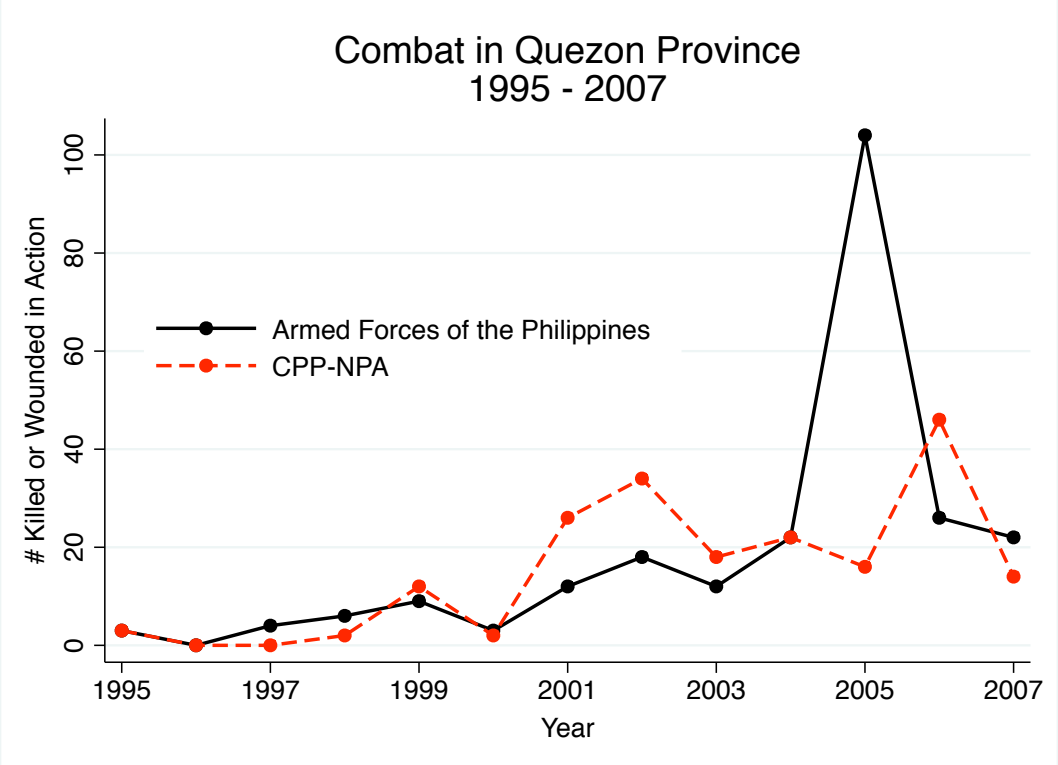
Secondary evidence on NPA military activities within Quezon province corroborates the notion that these activities boosted the CPP-NPA strength in the area, at least temporarily. Figure 5.4 displays the number of CPP-NPA and AFP killed/wounded in action in Quezon province from 1995-2007.[41] We can see that these groups' combat interactions hold a relatively steady trajectory until 2005, the year following the storms—all of which occurred in late November and early December 2004. In 2005, the number of AFP soldiers that NPA soldiers killed or wounded spiked, increasing from 22 in 2004 to 104 in 2005, while the number of CPP-NPA killed or wounded in Quezon decreased from 22 to 16. Although the precise level of support these actions generated is impossible to ascertain, this evidence suggests that these actions had the intended

[40] In seeking to build upon these efforts' political and practical successes, the CPP-NPA in 2006 re-launched the organization with the aim of improving local agricultural production. However, by this time the Armed Forces of the Philippines had gotten wind of the increases in CPP-NPA strength in the area, and moved to establish several military detachments and checkpoints throughout the sub-province. The security situation became more tenuous as military hostilities intensified, and the AFP began harassing and threatening the organization's officers and members. Because of this, the activists desisted in their activities and the disaster mitigation campaign ebbed to point from which it has not yet recovered.

[41] Data for Figure 5.4 drawn from Berman et al. 2011.

effects, as public support and assistance can be crucial for guerilla fighters to conduct offensive operations. The decline in AFP killed/wounded following 2005 is likely a result of the AFP's amplification of its counterinsurgency campaign in the province following the realization that insurgent support and presence had grown.

FIGURE 5.4



In the following sections, I attempt to ascertain whether the CPP-NPAs experiences in Quezon, and the movement's capacity to amplify operations and prolong conflict generalize across all civil conflicts in the Philippines. Specifically, I conduct statistical tests on the relationship between natural disasters and conflict violence at the province/year level. These techniques enable me to confirm empirical tests conducted earlier for Hypotheses 1 and 3 (H1 and H3), as well enable me to test whether the same opportunities that disasters create for insurgents also apply to government forces (H5).

QUANTITATIVE ANALYSIS

Data and Variables

In order to quantitatively test the relationship between natural disasters and civil conflict violence in the Philippines, I have compiled a panel dataset of 78 Philippine provinces spanning 1999-2007. I include data on all provinces for which comprehensive data were available.

The use of sub-state data in analyzing events such as natural disasters or conflict violence offers at least two advantages that make it preferable to cross-national data. First, data disaggregated from one country encourages greater confidence that the events in question are geographically proximate. Using a state as a unit of analysis increases the danger of spurious correlation because of the higher probability that the events under study occur in distant regions within the state. For example, in Russia one can easily imagine a destructive flood striking Eastern Siberia, while leaving a war in Chechnya untouched, yet the two would nonetheless register as coinciding. Though this danger also exists for sub-state data, the relatively small size of the unit of analysis in this examination—the average Philippine province is 4351 km^2—diminishes this risk. Second, sub-state data reduce the danger that unobserved country-specific heterogeneity such as that associated with changes in laws and governance structures, customs, and social norms will affect the outcome independently of the primary independent variable and thereby lead to inference errors. Finally, in most cases, the collection procedures for sub-state data are more homogenous than those for cross-national data, which lends greater confidence in its accuracy and precision.

Despite these benefits, the use of sub-state data also possesses one major drawback—the dynamics at work in a single state might not hold elsewhere. This is especially a danger for the

Philippines because the state possesses both disaster vulnerability and civil conflict in such high degrees. Because of this, critics might consider the Philippines to be an anomaly, unrepresentative of countries elsewhere in the world. However, I suggest that it is precisely the locations where these phenomena occur most frequently that people possess the greatest capacity to adapt to their effects. Furthermore, if scholars aim to understand the relationship between disasters and the risk of violence, then it is imperative to examine areas where these events actually transpire.

Dependent Variable

"Violence" is the key dependent variable in this analysis. Violence measures the per capita rate of attacks (# of attacks/provincial population) that each antagonist group involved in a Philippine civil conflict executes against its opponent. First, "Rebel Violence" accounts for the attacks that RP rebel groups, including Abu Sayyaf Group (ASG), the Moro National Liberation Front (MNLF), the Moro Islamic Liberation Front (MILF), and the CPP-NPA, wage against the Armed Forces of the Philippines (AFP) and allied forces. Although there are no data available to measure the size of insurgent forces directly, which might be a better measurement for these groups' capacity to recruit, the rate of violent attacks against the government can serve as approximation. If disasters enable insurgent groups to generate public support and expand operations, then these groups should have a greater capacity to wage violence against the government to meet their political objectives. Second, "Government Violence" accounts for the per capita rate of violence that the Armed Forces of the Philippines (AFP) and allied forces wage against insurgent groups. I estimate the relationship between natural disasters and government violence in order to test (H5), that the effects disasters can have on conflicts and violence can

apply equally to both government and rebel forces.[42] I obtain data for both of these variables from Berman et al. (2011). The authors report that these data were coded from:

> …unclassified details of over 22,245 individual internal security incidents reported by the Armed Forces of the Philippines from 1997 to 2006. These data were compiled from the original field reports of every operational incident reported during this period to the Armed Forces of the Philippines' Joint Operations Center by units conducting counterinsurgency and other internal security operations. Information coded from these reports include the date, location, and description of each incident, including the number of civilian casualties and who initiated the incident. (504).

This coding procedure and the data's specificity represent a significant improvement over the coarse measures employed in Chapters 3 and 4. This measure of violence gauges not only whether violence has occurred between warring parties, but also the level of violence and the party initiating the attack. Thus, these data enable me to analyze whether the opportunities and constraints that disasters provide to antagonists in conflict are dependent on the group's identity. In Chapter 2 I argue that disasters can act as double-edged swords in that they present opportunities for each side in conflict to amplify violence against the other (H5). This chapter enables an empirical assessment of that claim.

Independent Variables

Similar to prior chapters, the primary independent variable in this analysis captures the annual percentage of the population that disasters affect within a given political jurisdiction. In this chapter the unit of analysis is the Philippine province/year. I limit this analysis to disasters resulting from what the NDRRMC deems "destructive typhoons." This categorization includes

[42] I use the per capita rate of attacks as the primary dependent variable for both the government and rebels because this estimation accounts for scale. However, as a robustness check, I also estimate all models using a count variable that measures raw number of attacks per province/year.

all hazard events that result directly from typhoon or tropical storm inundation, and can include: landslides, storm surges, floods, and fires. I code only the effects of typhoons because the data for these phenomena are far more detailed than data for geologic events such as earthquakes and volcanic eruptions, and other climatological events such as droughts. Furthermore, as the most common environmental phenomena to strike the Philippines, as well as the one with (often) the largest geographic impact, typhoons can act as a sample of the dynamics that might result from other disasters.

I collected these data from archives in the NDRRMC headquarters in Manila and assembled it from individual government disaster reports. NDRRMC staff workers compile these reports from figures provided by local and regional NDRRMC offices in locations where disasters have occurred. This collection procedure is homogeneous across provinces and regions. Complete records extend back to 1999, however there is a larger amount of missing data in earlier years. Nevertheless, I find no reason to suspect that missing data is non-random.

5.5 – 5.7 display the spatial distribution of the primary independent variable and the raw count data that comprises the two dependent variables.[43] Two things stand out from these maps: First, there appears to be significant spatial overlap regarding insurgent and government violence and the population effects of disaster across many of the provinces in Southern and Eastern Luzon (The main island in the north), the Visayas (the islands in the maps' center), and Eastern Mindanao (the large island in the south). Second, this overlap does not appear to extend into Central and Western Mindanao, which is home to the two major Islamic separatist groups, the MILF and MNLF. Indeed, while many violent encounters have occurred in this region, historically these provinces have not been among the most vulnerable to disaster. Unfortunately,

[43] Data for Figures 5.5 – 5.7 drawn from NDRRMC statistical reports, and from Berman et al., 2011, respectively.

this trend appears to be changing as recent disasters such as 2011's Typhoon Sendong, which killed over 1,000 people in Illigan City and Cagayan de Oro, grow increasingly common.

FIGURE 5.5

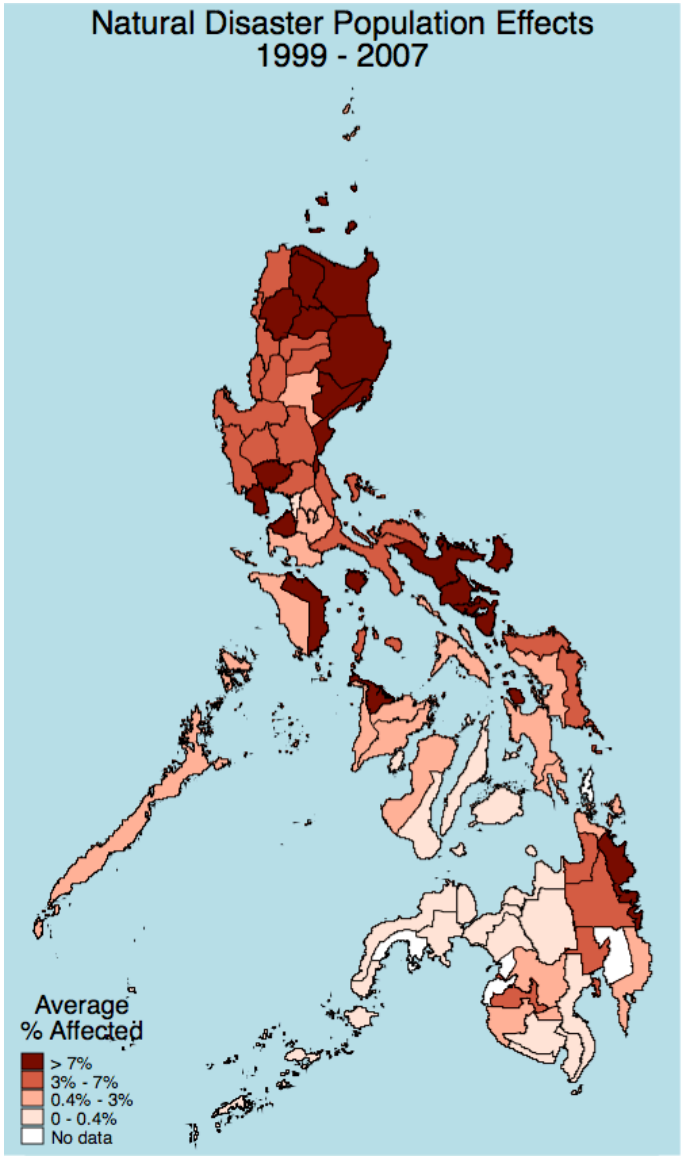


FIGURE 5.6

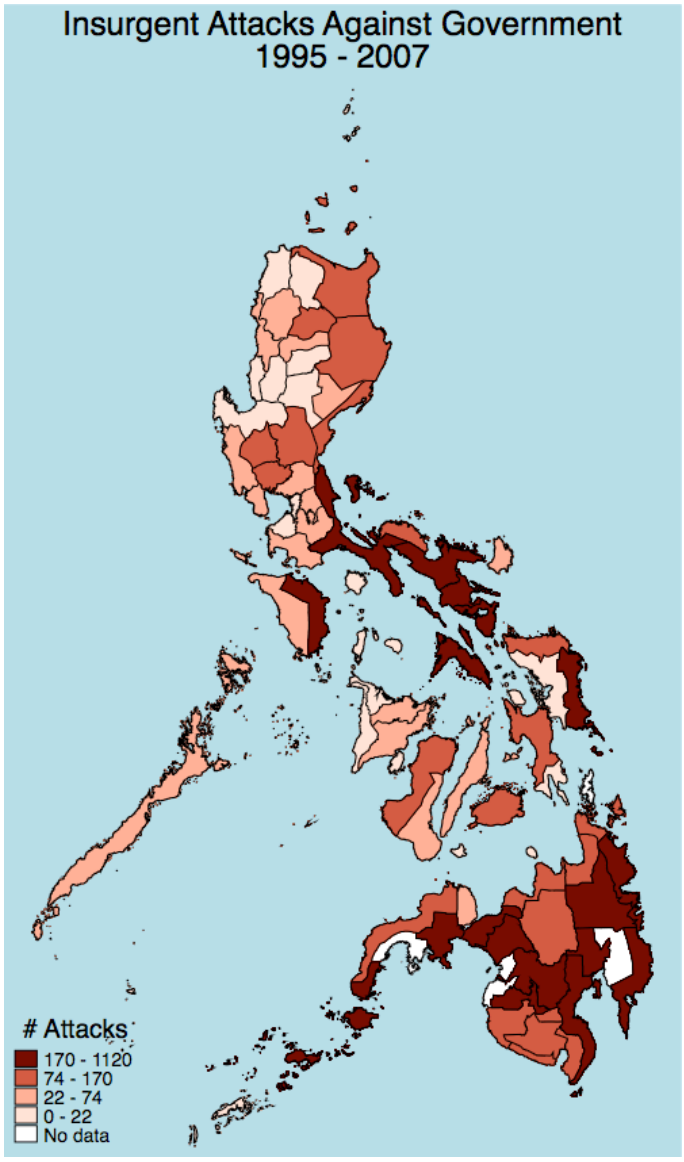
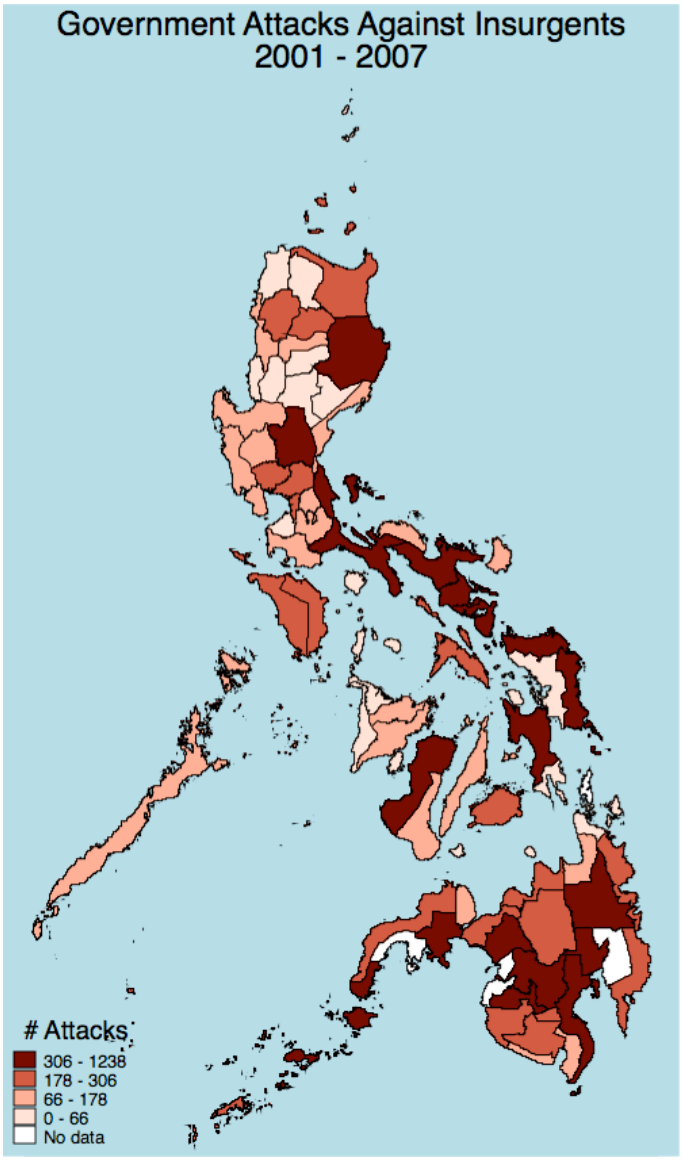

Insurgent Attacks Against Government
1995 - 2007
Attacks
170 - 1120
74 - 170
22 - 74
0 - 22
No data

FIGURE 5.7



Control Variables

I include controls for alternative explanations that might affect violence independently of the key independent variable. "Unemployment" measures the unemployment rate in a given province/year and should approximate the level of provincial economic activity as well as the availability of individuals to join insurgent groups. On the one hand, a lack of stable employment

implies lower opportunity costs for individuals to join insurgent groups. Furthermore, unemployment can generate anti-government grievances that can motivate individuals to take up arms (Brainard and Chollet 2007). In both of these cases, higher unemployment should generate higher levels of violence. On the other hand, however, unemployment might occur as a result of the constraints that increased security measures (checkpoints, roadblocks, curfews, spot inspections) impose on economic activity. In this case, we should expect an inverse relationship between unemployment and violence. Similarly, high levels of unemployment might decrease the costs of obtaining information that can preempt violence. Groups in conflict, particularly counterinsurgents, often use monetary rewards to purchase information from locals. The fewer alternative incomes sources there are, the lower the costs of obtaining this information, and the greater capacity a group should have to purchase it within a given budget. Berman et al. (2011) offer support for this negative relationship between unemployment and violence. Although the authors are unable to adjudicate precisely among these mechanisms, on balance the evidence suggests that the economic-activity suppressing impact of state security measures might be driving the results. I draw data for Unemployment from Berman et al. (2011) who obtained it from the Philippines Census Organization's quarterly Labor Force Survey (LFS) for 1997–2003 and 2006. I omit this variable in some of the models, as its inclusion results in a significant loss of observations.

I incorporate a control for demographic factors in all models that do not employ a fixed-effects assumption. "Ethnicity" gauges the percentage of a province's population that is Muslim. I include this factor to account for the fact that a significant portion of civil conflict violence occurs as a result of the multiple Muslim separatist insurgencies in Muslim provinces on the southern island of Mindanao. I draw data on Ethnicity from Berman et al. (2011).

Table 5.2a displays the correlation matrix of these variables, and indicates no significant danger of auto-correlation. Table 5.2b reports the summary statistics for each of the variables in these equations. In various sensitivity tests, I include controls for a province's population density, as greater violence might also be a result of closer proximity. However, because this variable did not achieve statistical significance in any of the models estimated, I excluded it from the models presented in this chapter.

TABLE 5.2A: CORRELATION MATRIX OF KEY VARIABLES

	Rebel violence (rate)	Gov. violence (rate)	Disaster	Ethnicity	Population	Unemp.
Rebel violence (rate)	1					
Government violence (rate)	0.69	1				
Disaster	0.11	0.07	1			
Ethnicity	0.40	0.36	-0.09	1		
Population	-0.12	-0.10	-0.07	-0.07	1	
Unemployment	-0.12	-0.13	0.05	-0.19	0.44	1

TABLE 5.2B: SUMMARY STATISTICS

	N	**Mean**	**Std. Dev.**	**Min**	**Median**	**Max**
Rebel violence (rate)	702	0.018	0.03	0	0.006	0.213
Government violence (rate)	702	0.04	0.07	0	0.01	0.72
Disaster	702	0.061	0.154	0	0	1
Ethnicity	702	0.072	0.214	0	0.001	0.933
Population	702	1,049,635	1,329,870	15,974	665,613	11,553,427
Unemployment	468	0.089	0.035	0	0.085	0.189

MODELS AND ANALYSIS

Rebel Violence

I apply ordinary least squares (OLS) regression to estimate the effects that disasters can have on the rate of violent attacks that each group (insurgents and the state) wages against the other.[44] Table 5.3 reports results from models estimating natural disasters' effects on rebel-initiated attacks on government forces for the entire sample of Philippine provinces. I include year-fixed effects in all regression equations to mitigate the danger that certain years are driving the results. Model 3 includes province-fixed effects to control for other time-invariant factors that might confound expectations. I also ran all models with the independent variables lagged one year to mitigate endogeneity concerns. However, because this technique did not significantly affect the results, and because imposing a lag diminishes sample sizes, I report only the models with no lags.

Within Table 5.3, the estimated coefficients for Disaster display a positive and statistically significant effect on the incidence of violence across model specifications. The coefficients are significant at the 99% confidence level in Models 1 and 2 and at the 95% level in Model 3. In all cases, larger natural disasters predict greater levels of violence. These results hold even after controlling for a number of alternative explanations, as well as imposing both province- and year-fixed effects.

[44] To increase robustness, I also model these relationships using a negative binomial regression that estimates the relationship between disasters and the raw count of violent attacks in a given province/year. I adopt this technique as an alternative to a Poisson distribution because much of the data is over-dispersed; its variance exceeds the mean, which makes Poisson models inappropriate (Cameron and Trivedi 1998).

TABLE 5.3: DISASTERS' EFFECTS ON REBEL-INITIATED VIOLENCE

	Ordinary Least Squares		
	Model 1	2	3
Disaster	0.03*** (-0.01)	0.03*** (-0.01)	0.02** (-0.01)
Ethnicity	0.06*** (-0.02)	0.07*** (-0.02)	
Unemployment		-0.15*** (-0.04)	-0.144** (-0.059)
w/Fixed Effects			X
N (clusters)	702 (78)	468 (78)	468 (78)
AIC	-3341.4	-2265.9	-2562.7
***p > .01, **p > .05, *p > .1			

Notes, Models 1-3: Ordinary least squares estimations with rebel-initiated violent incident rates as the dependent variable. Models 1-3 are population-weighted. All regressions include year fixed effects. Coefficients for year fixed effects and constant terms are suppressed. Model 3 includes province fixed effects for 78 Philippine provinces. Province-clustered robust standard errors in parentheses.

Table 5.4 reports results obtained from running regressions on a sample-subset of provinces with greater than 5% Muslim population. Running regressions on this sub-set enables us to discern whether or not there exist regional variation in Disaster's effects on the risk of violence within the Philippines. Because much of the insurgent activity in the Philippines is concentrated in provinces with Muslim populations at or above this threshold, re-running models on these provinces enables us to ascertain whether or not any one conflict in particular drives the results obtained in Table 5.3. This robustness check is particularly important in light of the case study I present because it lends confidence to the claim that the overall statistical results are not artifacts of the behavior of the CPP-NPA, as CPP-NPA activity in provinces with a greater then 5% Muslim population is not as pronounced. As in Table 5.3, Models 4 – 6 display coefficients and standard errors generated from OLS estimations, and Model 9 employs a provincial fixed effects assumption. The results in Table 5.4 track with those in Table 5.3; the Disaster coefficients are positive and statistically significant at the 99% level across models.

TABLE 5.4: DISASTERS' EFFECTS ON REBEL-INITIATED VIOLENCE IN MUSLIM PROVINCES

	Ordinary Least Squares		
	Model 4	5	6
Disaster	0.22*** (-0.07)	0.38*** (-0.1)	0.14*** (-0.04)
Ethnicity	0.04* (-0.02)	0.05* (-0.02)	
Unemployment		-0.29 (-0.22)	-0.23* (-0.13)
w/Fixed Effects			X
N (clusters)	108 (12)	72 (12)	72 (12)
AIC	-385.25	-245.15	-292.08
***p > .01, **p > .05, *p > .1			

Notes, Models 4-6: Ordinary least squares estimations with rebel-initiated violent incident rates as the dependent variable. Models 4-6 are population-weighted. All regressions include year fixed effects. Coefficients for year fixed effects and constant terms are suppressed. Model 9 includes province fixed effects for the 12 Philippine provinces with a Muslim population > 5%. Province-clustered robust standard errors in parentheses.

Government Violence

While Tables 5.4 and 5.5 report coefficients from regressions run on rebel-initiated attacks against government forces and its allies, Table 5.6 reports those obtained from regressions on government-initiated attacks against insurgents.

Recall from Chapter 2 the argument that the political and military opportunities that disasters create for insurgents should also be available to counterinsurgents. Politically, just as guerilla insurgents require the cooperation, or at least passive acquiescence, of local populations to wage insurgency, counterinsurgents must also rely on civilians to provide information that can enhance capacity to neutralize insurgent fighters. Furthermore, activities designed to win the hearts and minds of the population can undercut civilian support for insurgents and increase their willingness provide intelligence. Natural disasters create opportunities for the military to provide

direct rescue, evacuation, and relief assistance during the emergency phase of the crisis, and provide escort services for non-military and non-governmental relief providers in contested areas during the recovery phase. If executed properly, these actions embody the types of hearts and minds activities that can enhance civilians' perceptions of the military, which should increase civilian willingness to cooperate and undercut insurgent support. For example, while traveling with an AFP escort during an EcoWEB (a local environmental NGO) relief mission in contested territory in Lanao Del Sur province, near Illigan City, following typhoon Sendong, conversations with local aid recipients suggested that these individuals conflated the actions of the military as an escort with those of the NGO as the relief provider, and viewed both in a positive light. One individual stated that he chose to join the local chapter of the Citizens Armed Forces Geographic Unit (CAFGU), a paramilitary citizens' brigade and irregular auxiliary force of the AFP, because of the appreciation he felt for the military for distributing relief supplies. Another individual stated that prior to Sendong, the men in his barangay (himself included) would often withdraw into the forest when military convoys approached for fear of coercive questioning. However, following the military's decision to provide assistance with EcoWEB, the men felt more comfortable engaging with the troops. While this evidence is only anecdotal, it supports Webster's (2010) statement: "…disaster relief is counterinsurgency, only no one is shooting at you (yet)" (Webster 2010, 1).

Beyond indirect advantages gained through increased popular support, the military's role in crisis management can foster direct combat advantages when it enables military forces to occupy population-cleared areas. For example, following the eruption of Mt. Mayon in 2006, the military declared an area at the foot of the volcano as a "no man's land," and stationed a brigade there to restrict resident access. Though these actions were ostensibly for safety purposes,

conversations with local environmental activists suggest that the primary reason was to clear the area of inhabitants so the AFP could amplify its campaign against the NPA insurgents who had long populated the area (Perdigon 2011). These actions were taken in part as a response to the NPA's violent attacks on military forces that occurred as the volcano was erupting ("Cowardly, Criminal" 2006).

In both of these scenarios, we should expect a natural disaster's occurrence to increase the state's capacity to counter rebel threats. Table 5.5 displays the results. This table illustrates that not only do natural disasters predict insurgent attacks, but they also predict government attacks on rebel forces. This effect holds in all three models at the 95% confidence level. The effects of Disaster are robust to both year and province fixed effects.

TABLE 5.5: DISASTERS' EFFECTS ON GOVERNMENT-INITITIATED VIOLENCE

	Ordinary Least Squares		
	Model 7	8	9
Disaster	0.034** (-0.014)	0.036** (-0.014)	0.037** (-0.016)
Ethnicity	0.101*** (-0.03)	0.103*** (-0.03)	
Unemployment		-0.277*** (-0.051)	-0.198 (-0.156)
w/Fixed Effects			X
N (clusters)	702 (78)	468 (78)	468 (78)
AIC	-2435.1	-1682.9	-1848.1
***p > .01, **p > .05, *p > .1			

Notes, Models 7-9: Ordinary least squares estimations with government-initiated violent incident rates as the dependent variable. Models 7-9 are population-weighted. All regressions include year fixed effects. Coefficients for year fixed effects and constant terms are suppressed. Model 15 includes province fixed effects for 78 Philippine provinces. Province-clustered robust standard errors in parentheses.

Turning attention to the other variables included in the models, both Ethnicity and Unemployment yield consistent results across estimations. As expected, Ethnicity, a dichotomous variable that accounts for provinces with a greater than 5% Muslim population, is positive and significant in all models. This finding likely captures the actions of the two Muslim separatist movements (MILF and MNLF) as well as the Muslim terrorist group (ASG) in waging attacks against government forces on the southern island of Mindanao. Unemployment is negative and significant in some of the models presented, and retains the same directionality of sign in those that do not achieve statistical significance. This finding yields modest support for the conclusions in Berman et al. 2011, though the strength of the findings in this paper are slightly diminished when a provinces experience with natural disasters are taken into account.

CONCLUSION

To summarize, in qualitatively testing the effects of natural disasters on an insurgent group's capacity to recruit new members, and quantitatively testing the impact of these events on conflict violence in the Philippines, this chapter yields additional support for all five of the primary hypotheses in this dissertation. Not only can disasters prolong conflict, as they have in the case of the CPP-NPA, but they also can partially predict the level of violence within it. Furthermore, the effect of political discrimination and marginalization enhance insurgents' capacity to wage combat when it provides opportunities for insurgent groups to coerce or co-opt new members. Building on prior chapters, the effects of this discrimination persist beyond ethno-political discrimination to encompass discrimination that arises from political patronage and institutional corruption. Finally, not only do disasters create opportunities for insurgents to amplify conflict against the state, but these events can also enable government forces to intensify military efforts

against insurgent groups. In the following chapter, I revisit these points to elaborate on some areas for future research.

CHAPTER 6: CONCLUSION

Chapter 6 concludes with a review and reassessment of the major findings in light of their theoretical and practical implications, and a brief discussion on possible avenues for future research.

The Project and its Findings

This dissertation assesses the impact that destructive natural disasters have on the trajectory of civil conflict. In doing so, it examines natural disasters' effects on the duration of civil conflict, the incidence of violence within it, and the causal mechanisms that connect these independent and dependent variables. While a handful of prior works have addressed the impact that natural disasters might have for the onset of new conflicts to the best of my knowledge, none have assessed the relevance these events might have in explaining why conflicts persist. Given that many of the states that are perpetually mired in civil war are also among the most vulnerable to disaster, greater understanding of the causal relationship between these two phenomena is warranted.

Chapter 2 reviews the literature regarding the impact that environmental phenomena in general and natural disasters in particular can have on the risk of civil conflict. We can place this work into three categories, each of which generates distinct theoretical expectations. First, a small but growing body of research finds that rather than increasing the risk of violence, natural disasters might actually act as an impetus to peace. This strand originates from early sociological studies that find that crisis events can generate pro-social behavior among victims. In the aftermath of a crisis—the original studies analyzed the aftermath of Allied bombing campaigns

in WWII Germany and Japan—these scholars found: "…antisocial behavior, such as aggression towards others and scapegoating are rare or nonexistent. Instead, most disasters produce a great increase in social solidarity…and this newly created solidarity tends to reduce the incidence of most forms of personal and social pathology" (Fritz 1996, 10). Political scientists have applied this logic to the study of both international and civil conflict, with mixed empirical results (Kelman 2012; Slettebak 2012; Kreutz 2013). In this project, I find little support for the idea that natural disasters can increase the likelihood of peace. While short term cooperation can emerge among antagonists—the AFP and NPA declaring mutual ceasefires to facilitate aid delivery, for example—this diplomatic interaction does not persist beyond the immediate crisis period. I argue that a major reason why this is so is that disasters are inherently political events, events that can engender significant resource re-distribution, and in so doing, provide opportunities for exploitation among self-interested actors. Studies assessing the opportunities for international diplomacy, "disaster diplomacy," to arise in a disaster's wake, tend to be much less sanguine regarding the expectation that cooperation might emerge, I suspect, because they take the politics of disaster seriously.

The second school of thought that informs this dissertation, "environmental security," places the effects of resource scarcity at the center of the analysis. Work in this tradition explores the mechanisms through which scarcity might motivate violence as groups form or mobilize to compete over resources dwindling in the face of rising populations, environmental degradation, and resource overconsumption. Natural disasters can generate extreme episodes of resource scarcity. If scarcity begets conflict, then we should expect disasters to be primary causal agent. I find partial support for this argument in this dissertation. Disasters generate scarcity, which heightens vulnerability and diminishes human security. The outcome alters the incentive

structures that individuals in conflict-contested areas face when choosing whether or not to join an armed group. Abstaining from participation becomes more costly as exposure to violence rises. Similarly, participating in conflict becomes more feasible as the opportunity costs of participation decline relative to the potential incentives one might gain as a member of an armed group.

Finally, work in political ecology looks not to the role of scarcity in driving conflict, but to the ways in which the politics of resource distribution reinforces hierarchical and inherently unequal social relations. Thus, political ecologists view the scarcity that certain groups experience not as a driver of conflict, but as an indicator of the same underlying inequalities that do increase conflict risk. In this context, natural disasters are epiphenomenal. While these events might trigger violence, this outcome is a result of erupting latent tensions much more so than the disaster itself. In other words, a disaster is just as much of a manifestation of distributional conflict as it is a cause of it. In this dissertation, I find strong support for this line of thought. Political exclusion both causes and is caused by disaster exposure, and magnifies the impact that disasters can have on conflict risk above and beyond what might otherwise occur among groups of equal social, political, and economic standing. One issue that has dominated prior criticisms of political ecology studies is that difficulty in quantifying and measuring the concepts deemed theoretically important. I have attempted to address this concern in this project by empirically testing how groups that lack access to centers of political power respond to the effects of natural disasters, and how armed groups exploit these events to activate pre-existing antagonisms to build membership and public support.

Building upon these three schools of thought, I incorporate insights from human security and livelihood analyses, studies on the psychology of social justice and decision making, and

social movement studies to develop a theoretical framework amenable to empirical testing. My primary argument is that natural disasters can serve as exogenous shocks that provide opportunities for external actors to engage in political mobilization for violence. These opportunities arise from the human security costs disasters impose, the perceptions of social injustice that can arise over post-disaster re-distributions of wealth, and the underlying tensions that disasters expose among the politically marginalized. Weak, corrupt and discriminatory political institutions enhance these mobilization opportunities, which further augment the ability of violent groups to coerce, co-opt, and induce public cooperation. The outcome can both perpetuate civil conflict and increase the level of violence within it. However, as a corrective to scholars that ignore or downplay the effects that effects that disasters can have on the state's capacity to suppress insurgent activity, I argue that the same mobilization opportunities that disasters create for insurgents are also available to states waging counterinsurgency. Because the military often handles disaster response, particularly in areas that insurgents populate, and because the methods employed during these actions mirror counterinsurgency tactics, military forces can use disasters' effects to build public support and enhance cooperation. In this capacity, natural disasters act as double-edged swords on the risk of conflict; they can heighten insurgents' capacity to challenge the state, but also counter it because they create opportunities for both the state and insurgent groups to mobilize civilian cooperation and support.

Chapter 3 tests the hypotheses that natural disasters increase the level of violence in civil conflict (H1), and that discriminatory political institutions aggravate this outcome (H3). This chapter conducts a panel analysis on 154 countries from 1946-2005, all country/years for which there were comprehensive data available. The results in Chapter 3 yield strong support for both H1 and H3, indicating that disasters can have positive and statistically significant effects on the

incidence of violence, and that this effect is greater in states that discriminate against certain segments of their population. However, Chapter 3 also reveals that the type of disaster that strikes matters in terms of its effects on the outcome. Rapid onset disasters—floods, fires, storms, eruptions, mass movements and earthquakes—produce a much greater effect on the risk of conflict violence. In contrast, slow onset disasters—droughts and extreme bouts of temperature—produce a much more limited impact. I suspect that the difference arises from the destructive nature of rapid onset disasters, which heightens vulnerability, and the suddenness with which they occur, which can create more precise focal points for political mobilization.

Chapter 4 takes a similar tack. This chapter builds upon the insights developed in Chapter 3 to test whether a state's vulnerability to natural disasters—approximated through the average percentage of a state's population that disasters affect—can also prolong civil conflict (H2), and whether these events have a greater impact on conflict duration in states with discriminatory political institutions (H4). To test these hypotheses, I conduct an event history analysis on 321 civil conflicts occurring between 1946-2005. As in Chapter 3, the results in Chapter 4 yield strong support for both hypotheses, indicating that conflicts occurring in states with greater disaster vulnerability and with discriminatory political institutions tend to be longer, all things equal. Additionally, the findings in Chapter 4 reaffirm that rapid onset disasters pose the greatest threat, as these events exhibit the most robust relationship with the conflict duration than slow onset disasters.

Chapter 5 builds upon prior chapters to assess the effects that natural disasters have had on the trajectory of civil conflict in the Philippines, a crucial case country. This chapter employs both quantitative and qualitative techniques to assess these relationships. The case study evaluates the extent that disaster events generate mobilization opportunities for anti-state

challengers. Specifically, this analysis evaluates the impact that the combination of high disaster vulnerability and weak and corrupt disaster relief institutions have had on the Communist Party of the Philippines-New People's Army's (CPP-NPA) ability to recruit new members and generate public support for its revolutionary campaign. In the quantitative section of this chapter, I employ a panel dataset of 78 Philippine provinces from 1999-2007 to test the impact that natural disasters have had on the per capita rates of attacks that insurgent groups and Armed Forces of the Philippines' (AFP) wage against one another. Surprisingly, I find that not only do natural disasters increase insurgents' capacity to attack government forces, they also increase the AFP's ability to pursue violence against insurgents. I suspect that this relationship holds because in addition to enabling insurgent groups to coerce, co-opt, and induce public cooperation and boost membership, disasters also creates opportunities for military forces to win the hearts and minds of local populations, which can enhance counterinsurgency efforts.

Project Motivations and Contributions.

The impetus for this work arose from three primary considerations: First, the theoretical expectations and research findings that prior scholarship has produced remain starkly divided. Scholars have found natural disasters to be a cause of both peace and war, to increase the risk of conflict and to reduce it. This dissertation pushes this research forward by both questioning the extent natural disasters facilitate conflict, and by revealing the contextual conditions that mediate between disasters, human vulnerability, and war. Indeed, I argue that the contradictions in prior work are themselves revelatory because they illustrate the bifurcated effects that natural disasters can have on conflict risk. The findings produced in this dissertation support this contention. They indicate that while natural disasters enable insurgent groups to exploit population vulnerability to

increase civilian cooperation and control, particularly among politically-excluded, these events also provide opportunities for the state to boost legitimacy and enhance counterinsurgency efforts. This acknowledgement suggests that careful attention to the strategies counterinsurgents employ vis-à-vis civilians in a disasters wake can assuage disasters' most pernicious effects on the risk of conflict. Additionally, recognizing that political institutions can alleviate or exacerbate the extent that disasters influence conflict risk implies that institutional reform and oversight can go a long way towards mitigating their impact.

A second key consideration motivating this work concerns the likelihood that changes in global climatic conditions will increase the magnitude and frequency of natural disasters. Rapid population growth in vulnerable states coupled with settlement expansion in environmentally vulnerable areas and rising human impacts on environmentally protected resources—coastal reefs and wetlands, for example—should compound these climatic effects. Because the most adverse impacts will fall disproportionately on already impoverished states ill-equipped to handle them, and within these states, on the population groups least capable of adaptation and livelihood diversification, it is crucial to identify the conditions under which institutions of governance can mediate between disasters and violence. This dissertation addresses this point directly. In a departure from prior work that treats institutions as secondary, I find that institutional quality matters, that political institutions that marginalize and discriminate against certain segments of the population can both magnify disasters' impact and provide greater traction for violent groups to exploit these events to exacerbate and prolong conflict. Although others, most notably Kahl (2006) have made this point with respect to ethnic cleavages and exclusion, I expand this concept in Chapter 5 to include the discrimination and marginalization that can emerge from weak and corrupt institutional arrangements that facilitate political

patronage and clientelism. Furthermore, I not only suggest that political institutions matter in this context, I empirically parse out in Chapters 3 and 4 the level of impact that discriminatory institutions can have in encouraging violence and prolonging war. In Chapter 5 I address how these mechanisms have shaped the trajectory of conflict in a crucial case country mired in conflict, and at the forefront of the climate change debate. I find the impact that corrupt and clientelistic political arrangements have had on post-disaster redistributions of wealth has enabled anti-state challengers such as the CPP-NPA to gain political traction and perpetuate their violent revolutionary campaign. Thus, in order to encourage conflict stabilization and facilitate disarmament, demobilization, and reintegration, it is crucial for the Philippine state to not only bolster its defenses against natural disasters, but to also diminish the capacity of local political actors to use disaster events to enhance their political power and economic standing.

Finally, a key motivation for this dissertation emerges from the recognition that prior work has devoted excess attention to questions that concern whether or not resource scarcity influences the risk that new civil conflicts will emerge. While important, this attention has come at the expense of investigations into the ways in which episodes of extreme scarcity can activate dynamic processes within conflicts that enable both the state and anti-state challengers to pursue their agenda. In other words, just as important as understanding whether natural disasters cause conflict, is understanding how these factors can shape the trajectory of conflicts already underway. This dissertation confronts this task through an in-depth analysis of the mechanisms that connect natural disasters to conflict duration and conflict violence.

Directions for Future Research

A number of avenues for future research emerge from this project, two of which I detail in this section. First, although I attempt to assess the ways in which political marginalization and exclusion shape a disaster's impact on conflict risk, future work should pursue in greater detail what types of political configurations are more salient then others and why. For example, are ethno-political cleavages, as examined in Chapters 3 and 4, more likely to fuel conflict than exclusion that results from political patronage and clientelism, as examined in Chapter 5? Furthermore, does the type of political system—democracy, autocracy, anocracy—matter for the outcome? I suspect that disasters should generate the greatest impact on conflict risk in anocracies, because these states lack the transparency and institutional accountability of consolidated democracies, but also lack the repressive capacity and centralized control of totalitarian regimes. However, more research is required to determine the extent that this assumption is correct, and if so, why.

Second, future research should look in greater detail at the ways in which the state can diminish the adverse effects that disasters can have on conflict risk. In this work, I examine one avenue directly—that which arises when military relief providers engage in humanitarian assistance as a means for population-centric counterinsurgency. However, I do not explore in any detail the possibility that states can use natural disasters and well-executed disaster relief and reconstruction as a mechanism to build legitimacy and trust in the state. Although, one implication of the finding that discriminatory political institutions can magnify conflict risk post-disaster is that transparent institutions might reduce it, the extent to which this is true is unclear. Furthermore, while strong institutional accountability and oversight are undoubtedly important, the finding that disasters can increase violence and prolong conflict regardless of institutional

quality suggests that there might be other factors at play. For states in conflict, discerning precisely what mechanisms can build legitimacy and strengthen citizen trust in the state post-disaster might be crucially important for undermining the support that armed groups can marshal among disaffected and excluded victims. Additionally, although it is virtually impossible to completely diminish the risk of disaster, the finding that disasters themselves create opportunities for violence, indicates that states in conflict might consider investing in resources that can reduce disaster vulnerability as conflict defense mechanisms.

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