Disaster Strikes: The Influence of Climate Disasters on Conflict Intensity

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Abstract

Climate disasters have significant implications for development and human security, especially in contexts that are already fragile and vulnerable such as conflict-affected areas. However, their influence on conflict intensity in ongoing armed civil conflicts has thus far been chronically understudied. In this thesis, I examine the potential causal mechanisms linking the occurrence of sudden-onset climate disasters and fluctuations in conflict intensity using Somalia as a single case study and theory-testing process tracing. This builds on existing research by considering the emotional and psychological impact of sudden-onset disasters in contexts of conflict and its subsequent effect on aggression and violence. The case-study analysis establishes, to a certain extent, a causal link between the occurrence of sudden-onset disasters and increases in conflict intensity. However, certain contextual factors, such as the strength of state infrastructure, are identified as key determinants for such a causal link to be established.

Introduction

Since 2020, the number of fatalities in armed civil conflicts has seen a sharp increase (Davies et al., 2023). This number reached an all-time high since 1989 at over 200,000 battle-related deaths in 2022 (Davies et al., 2023). Increases in conflict intensity, measured here by the frequency of clashes between parties in a conflict, entail more death, destruction, and are often linked to a prolonging of conflicts themselves with long-term consequences for socio-economic development (Lujala, 2009). Conflict intensity has, however, been chronically understudied. Little is known about specific causal mechanisms resulting in changes in conflict intensity (Basedau et al., 2022; Ide, 2023).

One factor that may influence conflict intensity, which I will examine in this thesis, is the occurrence of climate-related disasters. Such disasters are defined as complex crises resulting from a natural hazard such as droughts, floods and extreme winds which afflict socio-economically vulnerable regions (Ide et al., 2020). A review of the literature on the link between climate disasters and conflict reveals a lack of studies specifically addressing the influence of climate disasters on conflict intensity. This is surprising as both climate-related disasters and conflict intensity, and their potential for interaction and mutual exacerbation, greatly impact human security in some of the most fragile and vulnerable contexts in the world (Buhaug et al., 2008). The potential causal link between them therefore merits further study as it could provide information on how to better stabilise a situation after an extreme climate event and mitigate increases in violence.

Most existing studies have examined potential linkages between climate change and conflict onset. In these studies, different measures of weather variability, primarily changes in temperature (e.g., Burke et al., 2009; Omelicheva, 2011; Bergholt and Lujala, 2012) or precipitation levels (e.g., Salehyan and Hendrix, 2014; Eastin, 2018) are utilised as proxies for climate change. Others have addressed the impact of disasters on conflict, either its onset (e.g., Nel and Righarts, 2008; Maystadt and Ecker, 2014) or its duration (Ghimire and Ferreira, 2016). However, the results of studies examining the effect of climate change on conflict are not directly applicable to questions regarding the impact of climate disasters. The former is a more gradual and incremental process, whereas the effects of climate disasters are felt more immediately (Bergholt and Lujala, 2012). As such, climate disasters are less predictable and present greater challenges for preparedness and resilience (Von Uexkull et al., 2020). The lack of predictability and abruptness of climate disasters are arguably more likely to cause damage and physical harm which, in the context of ongoing conflict, places a significant strain on

already limited resources (Buhaug et al., 2008). Furthermore, a context of protracted conflict has different implications for members of warring parties' socialisation to and tolerance of violence (Koubi et al., 2018). This will likely impact levels of aggression following an exogenous shock such as a climate disaster. Therefore, the specific causal link between climate disasters and the intensity of existing conflict merits further examination.

One of the few studies that has examined the causal mechanisms linking climate disasters to conflict intensity was conducted by Ide (2023); I aim to build on his findings with this current research. Ide (2023) argues that climate disasters trigger short-term changes in power relations between governments and rebel groups which cause changes in conflict intensity. While I utilise his idea of a shift in the 'power differential mechanism' between warring parties to construct my own theory, I argue that Ide affords insufficient attention to situation-specific grievances that arise following the onset of a climate disaster during ongoing conflict. These situation-specific grievances are linked to the shift in power relations but also to the emotional and psychological toll of experiencing a sudden, random and violent event such as a climate disaster in a context of widespread violence. I argue that the emotional and psychological impact of such disasters will have ensuing effects on levels of individual and collective aggression. I have also chosen to focus specifically on sudden-onset climate-related disasters, such as floods. These have been shown to have a greater effect on heightened grievances and changes in conflict perceptions than long-onset disasters, which allow for gradual adaptation (Koubi et al., 2018). Therefore, I seek to address the following question: to what extent do sudden-onset climate-related disasters influence conflict intensity?

I argue that, theoretically, the occurrence of sudden-onset climate-related disaster acts as a violent exogenous shock due to the rapidity in which it occurs, as well as its destructive nature and the physical and material damage it inflicts. The physical and material damage and destruction caused by the disaster is likely to place a strain on resources for the warring parties. Moreover, a disaster's impact on resource availability may be seen as altering a group's opportunities in conflict – the pool of materials, personnel, and finance that a group relies on to enact its military strategies – relative to its enemy. As such, I argue that this shock will cause a shift in power relations between the parties (Ide et al., 2020; Ide, 2023) because the physical and material damage incurred by each group will be uneven (Hultman and Peksen, 2017). Therefore, the party least harmed by a disaster's destructive repercussions will find itself at a relative military advantage, which it will arguably seek to capitalise on by increasing its

offensive against the enemy (Mitchell and Pizzi, 2021). In turn, the party that finds itself at a relative disadvantage will experience situation-specific grievances due to its new position within the balance of power in the conflict. In a context of ongoing conflict, where violence is entrenched and force is utilised as an emotional outlet as well as a practical instrument (Zeitzoff, 2014), these grievances will arguably be aired through increased aggression and violence. Overall, the exogenous shock caused by sudden-onset climate disaster will result in situation-specific opportunities and grievances will result in an increase in conflict intensity. I will test this theory empirically using a single 'most likely' case-study, namely Somalia, and theory-testing process tracing.

The remainder of this thesis will proceed as follows: In section 2, I address existing literature examining factors that may contribute to changes in conflict intensity. Section three then details the proposed hypothesis based on an outline of the theoretical foundations of this study. Section four outlines my methodological approach, including information on the choice of case studies for this research. The results are presented in section five, and their analysis is followed by a conclusion in which I discuss the wider implications of this research and potential areas for further study.

Literature review

Conflict intensity has thus far remained relatively understudied compared to conflict onset, both in relation to climate disasters and more broadly (Ide, 2023). However, it is arguably influenced by many of the same factors that impact conflict onset (Lujala, 2009). The most prominent debate within conflict onset and intensity literature revolves around arguments that emphasise either opportunity – mostly related to the availability of resources to enable fighting - (e.g., Salehyan and Hendrix, 2014; Landis, 2014; Ide, et al., 2020) or grievances – mostly regarding economic inequality or relative deprivation linked to resource scarcity – (e.g., Hendrix and Salehyan, 2012; Von Uexkull, 2014; Koubi, 2019) as the key underlying mechanism explaining conflict intensity.

While the debate surrounding the grievance and opportunity models of conflict is ongoing, most scholars now agree that they reinforce or complement each other to at least a certain extent (e.g., Taydas et al., 2011; Dyrstad and Hillesund, 2020; Lucas et al., 2022). Some prominent examples of factors identified in recent literature as measures of both opportunity and grievance

mechanisms in parallel include: warring parties' coercive or mobilisation capacity (Hultman and Peksen, 2017), competition over natural resources and the accumulation of resource wealth (Ross, 2004; Eastin, 2018), ideology (Basedau et al., 2022), ethno-national divisions and hostilities (Cederman et al., 2010), and having a history of conflict (Buhaug et al., 2008; Wischnath and Buhaug, 2014; Von Uexkull et al., 2016). As the debate regarding the grievance and opportunity models has progressed and been refined, one of the main interpretations that has emerged is that the mechanisms influencing violence in a particular conflict are dependent on the specific context – geographic, historical, socio-political, and cultural – in which they occur (Esteban and Ray, 2008). This context will determine both the opportunity and grievance mechanisms that constitute the basis for armed conflict, as well as how these mechanisms and the interaction between them evolve as the conflict progresses. Any changes in the warring parties' opportunities and grievances may in turn alter the dynamics of the conflict including its intensity (Ide, 2023).

I now turn to the literature addressing the potential impact of climate change and its related processes, including disasters, on armed conflict. Some scholars (e.g., Salehyan and Hendrix, 2014; Eastin, 2018) have found that precipitation shocks, or significant deviations in precipitation (Hendrix and Salehyan, 2012; Crost et al., 2018), increase the likelihood of conflict-related violence. Others (Von Uexkull, 2014) argue that rainfall shortages, through their impact on agriculture, may make civil conflict more likely. Certain studies (Burke et al., 2009) focusing on temperature change have found that temperature increases influence the probability of conflict onset. In direct contrast, others (Landis, 2014) find no relationship between temperature shocks, or indeed any other climate-related events (Omelicheva, 2011; Bergholt and Lujala, 2012); and violent conflict. In terms of disasters such as floods and droughts, discrepancies exist in the literature between those who argue that they increase the likelihood of violent conflict (e.g., Nel and Righarts, 2008; Ide et al., 2020), particularly in the case of droughts (Maystadt and Ecker, 2014; Von Uexkull, 2014; Von Uexkull et al., 2016), and those who suggest that they only facilitate conflict-related violence in contexts with existing vulnerabilities (Ide, 2023). Others (Ghimire and Ferreira, 2016) suggest that disasters do not affect conflict onset, but they can increase the duration of civil conflict. Existing research has therefore produced inconsistent and inconclusive results, partly due to the use of varying units and scales of analysis. It has therefore failed to decisively determine the causal effect of climate disasters on conflict. However, while a consensus has yet to be established regarding a causal link between climate variability or disasters and conflict, scholars seem to agree that

existing vulnerabilities in any particular context will make this causal link more likely (Buhaug et al., 2008; Koubi et al., 2018; Ide et al., 2020)

Overall, a review of published literature in this area reveals a gap in scholarship addressing specific causal mechanisms linking climate disasters, arguably the most violent manifestation of climate change, and conflict intensity. While opportunity and grievance mechanisms have been recognised as complementary to each other when determining conflict dynamics, recent studies (e.g., Taydas et al., 2011; Dyrstad and Hillesund, 2020; Lucas et al., 2022) have tended to focus on the former, acknowledging the latter in passing. Furthermore, in most cases (e.g., Von Uexkull, 2014; Koubi, 2019) grievances have been conceived as a rational product of experienced inequality or relative deprivation. Inequality and relative deprivation may constitute the material basis of grievances, but the effect of grievances in conflict stems from the largely emotional reaction that these individual and collective struggles trigger(Cederman et al., 2011). I seek to provide a more comprehensive account of the effect of sudden-onset climate disaster on both opportunities and grievances – or the physical and emotional dynamics of a conflict –particularly by incorporating considerations of the psychology of violence and aggression in contexts of protracted conflict.

Theory

In this section, I will elucidate my theoretical argument addressing the causal link between the occurrence of sudden-onset climate disasters and an increase in conflict intensity. I will begin with a discussion of situation-specific opportunities, followed by situation-specific grievances and a disruption to the norm of negative reciprocity. I will then argue that the interaction between these situation-specific mechanisms, produced by the sudden-onset disaster, will result in an increase in violence and aggression and therefore in conflict intensity.

The context of an ongoing conflict implies acute vulnerabilities due to damaging effects of the conflict itself, as well as structural factors such as poverty, low human development and weak governance practices that are common in conflict-affected areas (Buhaug et al., 2008). With a background of widespread heightened vulnerabilities and lowered resilience in such a context, the occurrence of a sudden-onset climate-related disaster such as a flood acts as an exogenous shock (Ide et al., 2020; Ide, 2013). This shock will have an effect on physical infrastructure through inflicted material damage and destruction, as well as on an emotional and

psychological level for warring parties as individuals and collectives (Cools et al., 2020). The latter will be partly linked to the physical and material damage itself and how this impacts the military capacities of both parties. It will also tie into the wider psychological implications of prolonged exposure to violence in a conflict setting. Because of the disaster's immediate and violent impact, in conjunction with the affected area's limited resilience due to the ongoing conflict, the opportunity and grievance mechanisms at the core of the ongoing conflict will shift, thereby altering conflict dynamics. This is particularly salient for sudden-onset climate-related disasters such as floods since their effect is more acute than long-onset disasters such as droughts (Bergholt and Lujala, 2012). A swift and largely unpredictable change to external circumstances due to a sudden-onset disaster will alter not only the relative physical capabilities of the warring parties and the balance of power within the conflict (situation-specific opportunities), but also how the parties perceive and react to this balance of power (situation-specific grievances).

For rebel groups and the state that are already involved in conflict, the sudden onset of a climate-related disaster acts as an exogenous shock which results in a shift in power relations between the warring parties (Ide et al., 2020; Ide, 2023). This shift in the balance of power, which Ide et al. (2020) and Ide (2023) term a 'power differential mechanism', can arguably be viewed most simply as a shift in opportunity mechanisms available to each party in the conflict. In other words, the level of damage and harm incurred by each party as a result of a climate-related disaster – such as physical and material damage to military bases, the destruction of natural resources and sources of income, or loss of personnel – will determine the military capabilities of each party post-disaster (Hendrix and Salehyan, 2012). Sudden-onset climate disasters will not impact the warring parties equally since each party's resource base – its available personnel, weapons, functioning military bases, and finances - will be affected differently (Mach et al., 2019). The level of harm incurred will depend on the strength of both the party's physical and institutional infrastructure. It will also be random to a certain extent, as it will depend on the worst affected geographic areas and how these relate to the warring parties' held territories (Ide et al., 2020). Therefore, this exogenous shock will alter the balance of power in favour of the warring party that is the least harmed because of the disaster (Ide, 2023).

In this sense, the occurrence of a climate-related disaster will change the military opportunities available to warring parties in a conflict in favour of one of the parties. This relative advantage

does not materialise because this party benefits from or even avoids harm to its military infrastructure as a result of the disaster, but rather because the other party incurs more harm and a relatively greater hit to its military capabilities (Mach et al., 2019). In turn, I argue that the former party will seek to capitalise on its relative military advantage by increasing its offensive against the enemy party to further weaken it towards defeat (Mitchell and Pizzi, 2021). This will involve increasing attacks against the enemy party as well as capturing enemy-held territory (Mitchell and Pizzi, 2021), thereby increasing conflict intensity. Protracted conflict is harmful to both rebel groups and the state as warring parties, irrespective of their military strength, and therefore both ultimately seek to end the conflict (Huber and Mayoral, 2019).

The shift in the balance of power within the conflict caused by the sudden-onset climate disaster, in addition to creating situation-specific opportunities for the relatively advantaged party, will also result in situation-specific grievances. A change in the power differential mechanism brought on by the exogenous shock of a sudden-onset disaster will create a new 'in' and 'out' group (Lickel, 2012), depending on which warring party is favoured by this change. In other words, the shift in the equilibrium of power will change the parties' expectation about their group's success in the conflict; positively in the case of the relatively advantaged party and negatively for the other (Zeitzoff, 2014). Since this change in the balance of power is the product of a random event, and conflicts are ultimately waged in the name of what parties consider to be 'just' (Lickel, 2012), I argue that it will be viewed as 'unjust' by the relatively disadvantaged party. This shift in the power differential mechanism will therefore result in situation-specific grievances as it pertains to one party's perception of its position relative to the other.

As well as creating situation-specific grievances, I also suggest that the shift in the balance of power will disrupt the norm of negative reciprocity within the conflict. This norm pertains to the idea that warring parties within a conflict will respond to perceived provocation with violence (Zeitzoff, 2014). In other words, once a conflict has started, spikes in violence – or conflict intensity – will occur if one party feels provoked by its enemy. Aggression and violence become the main tools for the warring parties to express their grievances towards each other (Dyrstad and Hillesund, 2020). In the case of protracted conflict, the norm of negative reciprocity is stretched to the extreme since continuous exposure to violence distorts the expectations of individuals and the parties (Zeitzoff, 2014). Perceived provocations are

responded to with increased force, which becomes both an instrumental and emotional response by the offended party (Bar-Tal, 2001). Therefore, in the context of ongoing conflict, the occurrence of an exogenous shock such as a sudden-onset climate disaster will arguably further disrupt the norm of negative reciprocity. This is because the ensuing shift in the balance of power will be random, rather than the outcome of the continuous tit-for-tat between the parties.

As a result, the parties' expectations regarding the conflict itself will become completely subverted. This subversion of expectations will arguably produce feelings of fear among the 'out-group', or relatively disadvantaged party, since they will find themselves with diminished military capabilities as well as increased uncertainty about the conflict and their chances of success (Zeitzoff, 2014). Conflict psychology theorists argue that group fear and anger are inextricably intertwined (Lickel, 2012; Zeistzoff, 2014). Therefore, the increase in feelings of uncertainty and insecurity among the out-group is likely to cause an increase in group aggression towards the enemy. This is particularly likely in the case of ongoing civil conflict, where constant exposure to violence results in collective socialisation to aggressive behaviour which perpetuates further acceptance of and reliance on violence to express grievances (Koubi et al., 2018). Consequently, I argue that situation-specific grievances (group anger and frustration) in combination with the disruption of the norm of negative reciprocity (group fear) will result in an increase in aggression and attacks by the relatively disadvantaged party against the enemy. While this may not result in an increase in the number of battle-related deaths due this party's relatively constrained resources, it will result in an increase in conflict intensity measured by the frequency of clashes between the warring parties.

My theory therefore builds on Ide's (2023) argument. The latter suggests that a change in conflict intensity (either an escalation or de-escalation) will occur if the balance of power shifts between the warring parties. However, he only accredits this change to the available opportunity mechanisms following the disaster. He omits situation-specific grievances from his argument, particularly for the relatively disadvantaged party. In addition, grievances themselves are inaccurately portrayed as purely rational in nature and largely tied to physical and material wants. By failing to consider grievances as an emotional reaction to external circumstances, Ide (2023) also fails to consider the anger, fear, and humiliation that come with a loss of power relative to the enemy and the ensuing effects on collective aggression.

Expectation: The occurrence of a sudden-onset climate-related disaster in the context of an ongoing civil conflict will cause an increase in conflict intensity.

Method

I propose to address this thesis' research question – namely the potential influence of sudden-onset climate-related disasters on the intensity of ongoing civil conflict - using theory-testing process tracing. This will minimise the risk of equifinality, where the same outcome may arise resulting from different factors but may mistakenly be assigned a common cause (George and Bennett, 2004:19). The use of theory-testing process tracing to examine the selected case study will therefore further increase the accuracy in determining potential causal pathways linking the occurrence of sudden-onset climate disasters and subsequent changes in conflict intensity (Ide, 2023).

In order for the causal mechanisms presented in the previous section to be tested using process tracing, each one must be validated using observables. The theorised shift in power relations, which will occur to the advantage of the least harmed party following the sudden-onset climate-related disaster, is difficult to quantify. However, as I have argued that this shift in the balance of power will mainly stem from a change in military capabilities owing to the physical and material damage and destruction sustained by each party, the latter will act as an indicator for this shift. Physical and material damage and destruction incurred by the warring parties specifically will include reported damage to military bases, damage to natural resources as sources of income, loss of personnel, as well as financial losses such as blows to either extortable or taxable civilian income bases due to widespread loss of income. These indicators represent changes in the external circumstances, or opportunity mechanisms, relevant to the conflict resulting from the sudden-onset disaster. As discussed in the previous section, this shift in opportunity mechanisms mainly embodies the change in available resources to the rebels and the state in the context of the conflict due to the uneven harm incurred by each party from the disaster. It therefore also represents the shift in power relations between the warring parties. Importantly, this observable pertains to the balance of power, or power differential mechanism between warring parties, and therefore the level of harm incurred by each party *relative* to the other is required for analysis as opposed to the *absolute* level of harm. Therefore, the full extent of the physical and material damage experienced by the rebels and the state separate from each other is not necessary for the purposes of this thesis.

The least harmed, or relatively advantaged, conflict party will seek to substantively capitalise on their relative military advantage following altered opportunity mechanisms by further weakening the enemy. This can be observed through a concerted effort to ensure in-group cohesion and unity against the enemy, evidenced by both internal and public communications on the issue. This may also be accompanied by renewed public decrying of the enemy party and its actions, and a conveyance of their confidence in their own likelihood of success. Moreover, to further increase its likelihood of success in ending the conflict, the relatively advantaged party may seek to bolster its military capabilities more decisively relative to the enemy. It may do so by seeking new recruits, as well as soliciting additional external support in the form of finance or weapons provision. The party's aims to increase its offensive against the enemy party post-disaster will also be directly reflected in its military strategy. This will involve coordinating troops to increase the number of attacks on enemy troops as well as to capture enemy-held territory. The increase in attacks will result in an overall increase in fighting in the conflict as the enemy troops will attempt to defend themselves, therefore resulting in a total increase in conflict intensity.

Similarly to the shift in power relations, an increase in group anger and fear in the relatively disadvantaged party - caused by situation-specific grievances and a disruption of the norm of negative reciprocity – poses measurement challenges. However, proxies may be used to indicate the presence of these collective emotions following a sudden-onset climate disaster. For example, a spike in group anger may be indicated by party communications post-disaster that include explicit anti-enemy rhetoric or propaganda and aggressive language – this would suggest widespread aggression towards the enemy on a collective level. Linked to this, the relatively disadvantaged party may solicit greater public support and attempt to shift public opinion in their favour through their external relations and communications. This would arguably indicate an elevated level of group insecurity and fear since public support in the abstract usually entails an increased support base in material terms, for example through new recruits (Ide, 2023). The relatively disadvantaged party may therefore seek this as a way of reinforcing its diminished military capabilities.

I have argued that situation-specific grievances and the collective anger they produce within the relatively disadvantaged party result in increased aggression and violence. This will manifest most clearly in an increase in the number and frequency of attacks against the enemy

party, despite the relative military disadvantage post-disaster. Since this would constitute a risky military tactic, it suggests that this party's violence and aggression following the shift in power relations is not only a product of rational strategising but is also driven by emotion. As advanced in the previous section, the heightened levels of aggression stemming from situation-specific grievances are heavily influenced by the protracted nature of conflict and the subsequent normalisation of violence as a means of expressing grievances (Dyrstad and Hillesund, 2020). This socialisation to aggression and violence cannot be ascertained regarding members of warring parties directly but may be alluded to by any civilian accounts following a sudden-onset disaster that indicate violence fatigue or desensitisation.

Case selection

I have opted to use a single-case study, selected as a 'most likely' case, for the observation of the proposed causal mechanisms. Based on the data in Table 1, the most likely case to exhibit the proposed causal mechanisms, by controlling for other factors that increase a state's vulnerability to the effects of climate-related disasters, is Somalia. In April 2020, Somalia experienced extensive floods, a sudden-onset climate disaster, that affected over 1 million people and were followed by an increase in conflict intensity. Moreover, Somalia is categorised as a low-income country, with a poverty incidence of 68% (African Development Bank, 2022), a national unemployment rate of 40% (African Development Bank, 2022), the lowest ranked healthcare system in the world (Global Health Security Index), and GDP that is 65%-dependent on agriculture (PMSRUN, no date). Somalia therefore exhibits all the main contextual factors identified in existing literature (e.g., Buhaug et al., 2008; Koubi et al., 2018; Ide et al., 2020) as increasing a state's vulnerability to the adverse effects of climate-related disasters.

Table 1. Most Likely case selection – increased vulnerability factors

Country	Disaster	Conflict intensity	IMF Classification	GDP per capita, PPP (in year of disaster)	HDI (in year of disaster)	Agricultural land (% of land area in year of disaster)	Natural Capital Index score (in 2022)	Vulnerability score (in year of disaster)
Somalia	Flood in April 2020, 1 million people affected	Increased	Low income	1190.6 *Figure 1*	N/A *Figure 7*	70.3% *Figure 13*	24.5 *Figure 19*	0.68 *Figure 25*
Sudan	Flood in July 2007, 565,000 people affected	Increased	Low income	3985.4 *Figure 2*	0.47 *Figure 8*	57.5% *Figure 14*	38.2 *Figure 20*	0.6 *Figure 26*
South Sudan	Flood in August 2013, 425,000 people affected	Increased	Low income	1957.3 *Figure 3*	0.411 *Figure 9*	45% *Figure 15*	39.9 *Figure 21*	N/A *Figure 27*
DRC	Flood in November 2015, 180,000 people affected	Increased	Low income	877.7 *Figure 4*	0.463 *Figure 10*	14.3% *Figure 16*	53.7 *Figure 22*	0.53 *Figure 28*
Afghanistan	Flood in April 2014, 140,000 people affected	Increased	Low income	14956.2 *Figure 5*	0.479 *Figure 11*	58.1% *Figure 17*	42.6 *Figure 23*	0.59 *Figure 29*
Myanmar	Flood in July 2015, 1.6 million people affected	Increased	Lower middle income	4200.9 *Figure 6*	0.553 *Figure 12*	19.5% *Figure 18*	51 *Figure 24*	0.51 *Figure 30*

The starting point for this thesis' case selection is the International Monetary Fund (IMF) Classification of Fragile and Conflict-Affected Situations (IMF, 2023). This classification identifies states that are vulnerable to the effects of climate-related challenges including disasters according to either the presence of conflict or institutional and social fragility and their income level between 2006 and 2024 (IMF, 2023). The IMF classification is cross-referenced with the International Disaster Database (version 2023.09, EM-DAT) - specifically with disasters classified as climatological (droughts and wildfires), hydrological (floods), and meteorological (extreme temperature and storms) – in order to identify the occurrence of climate-related disasters in these states. Finally, the UCPD Georeferenced Event Dataset (version 23.1, Davies et al., 2023), which tracks individual clashes between parties in a conflict, is used to identify changes in conflict intensity.

The vulnerability of potential cases (Figures 25-30), measured by their exposure, sensitivity, and adaptive capacity to the effects of climate change is examined using the Notre Dame Global Adaptation Initiative Country Index (version 2023, ND-GAIN). Secondly, World Bank data is utilised to consider GDP per capita, PPP (Purchasing Power Parity) (version 2021, The World Bank) to control for poverty (Figures 1-6), and the prevalence of agricultural land (version 2021, The World Bank) (Figures 13-18) which has been widely identified as increasing susceptibility to adverse effects from climate-related disasters (Von Uexkull et al., 2016). Thirdly, the UNDP Human Development Index (HDI) is used to compare levels of human development (version 2021/22, UNDP) (Figures 7-12), which has also been advanced as an

intermediary factor in causal linkages between climate-related processes and conflict (Ide et al., 2020). Finally, SolAbility's Natural Capital Index (SolAbility, 2022), which ranks states according to the presence of natural resources such as water and mineral resources (Figures 19-24), is utilised to control for the availability of natural resources. The availability of natural resources and the looting mechanism have been identified as contributing to the intensification of conflict in some contexts (Ross, 2004; Eastin, 2018), as referenced in literature review, and therefore controlling for variation in this respect between the cases will also control for this alternative hypothesis.

Analysis

I will now analyse the selected case study, namely the April 2020 floods in Somalia, using the detailed observables to test the theorised causal mechanisms. I will examine the events following this sudden-onset disaster chronologically, focusing first on the proposed shift in the balance of power within the conflict (situation-specific opportunities) before moving on to the emotional and psychological impacts of the disaster (situation-specific grievances and disruption of the norm of negative reciprocity).

Damage and destruction caused by 2020 sudden-onset floods

Due to its position in the Horn of Africa, Somalia is subject to seasonal rains twice a year (OCHA, 2020a). However, due to the worsening effects of climate change, these rains have become increasing forceful and long-lasting, in some cases triggering sudden-onset climate-related disasters such as floods (UNHCR, 2020). The Gu rains that began in April 2020 were particularly harmful in this regard as they triggered flash flooding in multiple states in southern Somalia. The effects of these rains were compounded by riverine flooding triggered by the previous rainy season which had not yet abated (OCHA, 2020a). The worst affected areas by the floods were identified as rural communities in the Juba and Shabelle river basins (ECHO, 2020). Instability and fractionalisation within the Somali government has created a reliance on external military support to prop up the state army and the government has thus far been unable to establish control outside of large urban settlements (UK Home Office, 2020). Most of southern Somalia exists in a governance vacuum (France24, 2019), where Al-Shabaab controls certain areas of the Lower and Middle Juba and Lower Shabelle regions and operates freely in others (OSAC, 2020). As such, the April 2020 floods most severely impacted Al-Shabaab-held areas, which should influence the shift in power relations – this will be examined presently.

Both the state and Al-Shabaab rely on civilian support, either directly through the provision of food and shelter or financial resources through extortion in the case of Al-Shabaab or as a tax base in the case of the state (EAPCCO, 2022). In the affected communities, the floods were estimated to have damaged 149,000 hectares of farmland across 100 villages, with severe and lasting repercussions for the livelihood of numerous vulnerable families (OCHA, 2020b). Since the destruction to farmland and subsequent loss of income occurred in territory de facto controlled by Al-Shabaab (ECHO, 2020), this suggests that the 2020 floods had a significant impact on the resources available to the group and its military campaign. However, the sharp reduction in household incomes and remittances in 2020, amounting to a 11% contraction of GDP, also had a substantive negative effect on the Somali state and its military capabilities (UNDP, 2020). The Somali armed forces, as the national military, are funded mainly through civilian taxes (UNDP, 2020). As such, a sharp decline in income resulting from the floods reduced this tax base and added to strains placed on the state's resources by the need to respond to the Covid-19 pandemic (EAPCCO, 2022).

Shift in power differential mechanism and situation-specific opportunities

Both the state and Al-Shabaab were therefore negatively affected by the sudden-onset flooding in April 2020, specifically through hits to both of their revenue sources. However, while the state experienced financial losses as a result of the floods, it is clear that its military capabilities were less severely impacted than those of Al-Shabaab. This is mostly because of the groups' geographic location. The fact that territory de facto controlled by Al-Shabaab sustained substantial physical and material damage (ECHO, 2020) caused a reduction in the pool of extortable capital to fund Al-Shabaab's military campaign. In addition, the Somali government has received continuous external support in its counterinsurgency efforts from organisations such as the United States Africa Command and the African Union Mission to Somalia (AMISOM) (ACLED, 2020). These organisations, as they are not based in Somalia, were not affected by the 2020 floods and were therefore able to continue to bolster the state's military capacity (EAPCCO, 2022). Furthermore, following the sudden-onset floods in 2020, the Somali government pledged USD $500,000 in aid to its civilian population (UNHCR, 2020). This suggests that the government was unharmed enough by the onset of the floods that it had resources to spare that could be diverted away from the ongoing conflict towards recovery efforts.

Overall, evidence intimates that while both warring parties in the Somali civil conflict incurred harm due to the 2020 floods, the level of physical and material damage incurred by each was random and uneven, as theorised. The Somali state was less harmed in physical and material terms and therefore sustained less of a hit to its military capabilities. As such, it can be described as the relatively advantaged party compared to the worse affected Al-Shabaab in the new balance of power within the conflict. This apparent shift in power relations can be said to have created situation-specific opportunities in the sense that the Somali state was well positioned to strike against a weakened Al-Shabaab due to its relatively stronger military capabilities following the 2020 floods. However, the shift in power relations did not have the exact predicted effect on conflict dynamics.

Specifically, the relatively advantaged party, in this case the Somali government, refrained from, or rather failed to, capitalise on its relative advantage. There is no evidence to suggest that the state increased its offensive against Al-Shabaab following the 2020 floods, either through an increase in the number of attacks or attempts to capture territory controlled by the group, or by seeking to reaffirm group unity against the enemy. Therefore, the theorised causal mechanism that the relatively advantaged party would seek to capitalise on this advantage to further weaken the enemy party was not observed in this case. The Somali case-study reveals that the relatively advantaged party must act upon the associated situation-specific opportunities in order to produce any changes in conflict intensity. The reality therefore goes beyond the theorised shift in power relations owing only to post-disaster military capabilities. In this sense, the creation of situation-specific opportunities as a result of a sudden-onset disaster - such as new enemy weaknesses that could be exploited - in themselves will not necessarily have a substantive effect on conflict dynamics. Any substantive effect in this regard will arguably depend on the ability of the relatively advantaged party, influenced by its institutional infrastructure, to act upon these opportunities by adjusting their military strategy. I suggest that the proposed causal mechanism in this regard did not unfold as theorised in the case of Somalia mainly due to the characteristics of the state, namely the lack of state unity and internal cohesion (ACLED, 2020).

While Somalia is a federal republic, it has experienced continuous obstructions regarding state-building processes since the fall of Siad Barre's regime in 1991 (OWP, 2021). A significant contributor to this chronic lack of consensus is the existence of distinct, influential factions within the state with strong ties to different clans. This internal fractionalisation contributes to

a lack of unity at the federal level (ACLED, 2021). This absence of cohesion within the federal government has arguably been made more evident since the emergence of Al-Shabaab in 2007, which has consistently demonstrated a high level of internal coherence and sound organisational logic built on a unifying Salafi-jihadist ideology (ICG, 2022). As such, I argue that, while the state was materially and militarily stronger following the April 2020 floods, its deeply fractured internal structure prevented it from organising itself as a party efficiently enough to capitalise on its relative advantage.

Moreover, the discrepancy between the theorised causal mechanism and the case-study evidence following the shift in power relations caused by the sudden-onset disaster implies one of two conclusions regarding the power differential mechanism. On one hand, it may suggest that the shift in power relations and situation-specific opportunities caused by a sudden-onset disaster do not, as theorised, have any causal effect on conflict intensity. On the other hand, this may indicate that a shift in power relations resulting from an exogenous shock such as a sudden-onset disaster has a causal effect on conflict dynamics, but that the power differential mechanism should be defined differently. In other words, the power differential mechanism may encompass not only physical and material assets and resulting military capacity but also how these assets are utilised, or not, given the external context and a party's own characteristics. The latter conclusion seems more likely since it emphasises the importance of specific context, which has been identified in existing literature (e.g., Esteban and Ray, 2008; Koubi et al., 2018; Ide et al., 2020) as crucial in determining the causal effects of climate disasters. It is also corroborated by the Somalia case, as has been discussed. Moreover, identifying party infrastructure as a key determining factor in the causal link between sudden-onset climate disaster and potential changes to conflict intensity builds on Ide's (2023) research.

Situation-specific grievances

Absent an intensification of the state's offensive, Al-Shabaab, characterised by strong internal cohesion, was able to adapt their own military strategy. This involved a total increase in the group's attacks with an emphasis on tactics of asymmetric warfare (ICG, 2022). The group's post-disaster military strategy therefore accounted for the change in external circumstances and their own constrained resources. It also served to further highlight and exploit the state's security weaknesses. While this military strategy is linked to situation-specific grievances, as will be addressed presently, collective anger and fear did not arise in the case of Al-Shabaab exactly as theorised.

The sudden-onset floods in April 2020 were followed by a series of daily attacks by Al-Shabaab against state and AMISOM troops in Lower and Middle Shabelle and Lower Juba, the worst-affected territories by the disaster (ACLED, 2020). These attacks, as well as targeting the state directly, were also viewed as a means for the group to rouse anti-government sentiment since they impeded the delivery of humanitarian aid to flood-affected communities (ACLED, 2020). Al-Shabaab's attempts to sow distrust in the state were accompanied by an increase in the group's outspoken condemnation of the government, particularly regarding the planned federal elections due to take place in 2020 (Hared, 2020). In addition, the group's pivot to targeting high level government and military officials and increasing the frequency of suicide attacks in urban areas (ICG, 2020) arguably imply an effort to highlight the state's security limitations. This seems to substantiate the theorised anti-enemy rhetoric propagated by the relatively disadvantaged party in the new balance of power caused by a sudden-onset disaster.

Furthermore, the second half of 2020 saw a 49% increase in Al-Shabaab perpetrated attacks compared to the same period in 2019, as well as a 28% increase in the number of battled involving Al-Shabaab (ACLED, 2020; Davies et al., 2023). The period from November 2020 to July 2021 saw a further increase in the frequency of clashes between the parties (UNSC, 2021; Davies et al., 2023). This 'worrying upsurge' in Al-Shabaab violence arguably indicates a spike in group anger and aggression towards the state, particularly as much of the violence was concentrated in government-controlled Mogadishu (UNSC, 2020b). Overall, the Somalia case lends credence to the argument that, following an exogenous shock such as a sudden-onset climate disaster, the relatively weaker party will exhibit an increase in group anger and aggression which manifests as an increase in violence. However, in this case, it is not clear that this anger and aggression arise as a result of situation-specific grievances linked specifically to the disaster and the resulting shift in power relations.

The spike in aggression and violence following the 2020 floods may have been mostly fuelled by Al-Shabaab's long-standing grievances – wanting to depose the government from power – that were simply being acted upon in a different way given the change in external circumstances following the sudden-onset flooding. This is likely since the relatively advantaged party, namely the state, failed to capitalise on its advantage by increasing its offensive on Al-Shabaab. As such, the shift in power relations, theorised to be the main source of situation-specific grievances after the occurrence of a sudden-onset climate disaster, had little to no substantive

impact on Al-Shabaab itself. Therefore, the case of Somalia offers no definitive evidence of an increase in violence perpetrated by the relatively disadvantaged party as being provoked only by situation-specific grievances. Nevertheless, the relatively greater hit to the group's resources sustained suddenly and randomly is likely to have added to the group's existing grievances.

While situation-specific grievances may have not had the predicted causal effect on conflict dynamics in the Somalia case, the widespread normalisation of violence due to ongoing conflict clearly contributed to the increase in aggression and violence post-disaster, as theorised. Civilian accounts from this period indicate pervasive fatigue and despair with the protracted conflict and widespread violence (CSIS, 2021), the latter of which had spilled into day-to-day life and created tensions within the civilian population (ICG, 2022). Many Somalis at this time acknowledged the violent and disruptive conflict between the state and Al-Shabaab as the main obstacle to individuals attaining a better life (CSIS, 2021). This suggests a normalisation of violence in the sense that violence was so omnipresent that it became accepted, albeit reluctantly, as a common occurrence. The preceding civilian accounts imply the rejection of violence because of its negative impact on individuals' and Somalia's potential for success and prosperity. In other words, they do not necessarily suggest a rejection of violence as an act in itself but rather a rejection of the consequences of this act. As such, these accounts are emblematic of societal desensitisation to violence. Violence becomes viewed as a transactional tool and a means to an end, for example to express grievances, rather than an inherently moral act.

Disruption of the norm of negative reciprocity

Theory suggests that in-group anger and fear are unequivocally linked in conflict settings (Zeitzoff, 2014). However, the Somalia case shows no evidence that the heightened group anger and aggression resulting in Al-Shabaab's spike in violent attacks was accompanied by heightened group fear and insecurity. For example, the group made no attempts to gain public favour or increased public support. In fact, while Al-Shabaab engaged in some service delivery after the 2020 floods, this was accompanied by the threat of force and the continued use of criminal tactics (CSIS, 2021). I argue that group fear and insecurity was not relevant in the case of Al-Shabaab following the 2020 floods for two reasons. First, as discussed, unstable state party infrastructure prevented the state from capitalising on its relative military advantage after the floods in the ways theorised. Al-Shabaab was therefore not as disadvantaged by incurred physical and material harm as predicted. Al-Shabaab's ability to evolve and adapt its military

strategy to the shift in external circumstances (UNSC, 2020a) proved to be an asset following the sudden-onset disaster. Their adaptability, facilitated by strong in-group cohesion, provided the group with a degree of stability and forced the state on the defensive. The group's adaptability allowed it to account for its own limited resources and the state's security weaknesses, thereby eliminating the fear that may arise when an exogenous shock disrupts a party's expectations within a conflict. Second, the significantly protracted nature of the Somali civil conflict, and the fact that Al-Shabaab has mostly favoured asymmetric tactics over direct confrontations with state troops throughout (ICG, 2022), suggests that the norm of negative reciprocity was never particularly relevant. In other words, the dynamics of the conflict were never based on a tit-for-tat strategy between the parties and therefore the sudden-onset floods had no substantive effect in this regard.

Conclusion

The aim of this thesis has been to examine the influence of sudden-onset climate-related disasters on the intensity of ongoing civil conflicts, using Somalia as a single 'most likely' case study. I suggested that the occurrence of a sudden-onset climate-related disaster in a conflict-affected context would result in an intensification of said-conflict. In theory, this increase in conflict intensity, measured primarily through the frequency of clashes between warring parties, would stem from both situation-specific opportunities and grievances resulting from a sudden-onset disaster. The former would arise from a shift in power relations within the conflict caused by the physical and material damage incurred by each party, with the relatively less harmed party experiencing a relative advantage. The latter would be experienced by the relatively disadvantaged party and would encompass the former, in conjunction with a disruption of the norm of negative reciprocity, resulting in increased group aggression and violence. The results of the case-study analysis offer limited evidence for the causal relevance of situation-specific grievances. However, the centrality of the psychological impact of sudden-onset disasters on warring parties in this analysis builds on and adds nuance to existing literature, such as Ide's (2023) argument. By considering collective emotions such as group anger and fear, I have sought to highlight that reactions to exogenous shocks such as sudden-onset disasters will always have an emotional component as opposed to being purely rational.

Somalia was selected as a most likely case because of its structural characteristics, such as low GDP and human development, that make it more susceptible to adverse effects from sudden-

onset climate-related disaster, including a potential increase in conflict intensity. The results of this thesis corroborate existing research (e.g., Esteban and Ray, 2008; Koubi et al., 2018; Ide et al., 2020) that identifies climate disasters as vulnerability amplifiers in contexts with high baseline levels of vulnerability linked to structural factors including low GDP and low human development. Moreover, the analysis reveals that, in answer to the question 'to what extent do sudden-onset climate-related disasters influence conflict intensity?', the answer is that sudden-onset climate-related disasters act as an exogenous shock that will likely contribute to an increase in conflict intensity. However, the proposed causal mechanisms were not all observed.

There was little evidence that the relatively advantaged party acted on its advantage, or of the significance of the disruption to the norm of negative reciprocity. While the theorised situation-specific opportunities resulting from a shift in power relations were not acted on by the state as predicted, this arguably created opportunities for Al-Shabaab to increase their own offensive. Therefore, the analysis lends credence to the importance of any shift in power relations, and ensuing situation-specific opportunities, following a sudden-onset climate disaster as potentially influencing conflict intensity. The case-study analysis also supports the idea that heightened group anger and aggression, at least partly fuelled by situation-specific grievances caused by a sudden-onset disaster, will also influence any spikes in violence. Furthermore, the analysis highlighted the organisational capacity, cohesion, and unity of the warring parties as much more significant than theorised. In the case of Somalia, fractionalisation and instability within the government was a major factor that allowed Al-Shabaab to intensify its military operations after the April 2020 floods (ACLED, 2021), although the latter's notable internal cohesion also facilitated this. Overall, the analysis of the sudden-onset 2020 floods in Somalia suggests that sudden-onset climate disasters act as an exogenous shock that will result in situations-specific opportunities and grievances. However, the impact of these situation-specific mechanisms on conflict intensity will depend on the specific context in which they occur, as well as how they relate to each other. Therefore, the existence of a direct causal link between sudden-onset climate disasters and an increase in conflict intensity has not been definitively proven in this thesis.

More generally, it is important to acknowledge that in states where vulnerability to climate-related disasters is pronounced due to severe structural weaknesses and vulnerabilities, resilience to these disasters will be chronically inhibited. As such, the repercussions of a single, isolated disaster are almost imperceptible. The consequences of such an event will be

influenced by the lingering consequences of previous disasters as well as other exogenous shocks, such as the Covid-19 pandemic. In other words, I argue that the occurrence of exogenous shocks such as sudden-onset climate-related disasters concurrently or in quick succession have a cumulative, adverse effect on infrastructure and resources. Therefore, in states facing such challenges, the occurrence of sudden-onset climate-related disasters may significantly contribute to increases in conflict intensity as they often have substantial destructive effects. However, they will rarely, if ever, be the sole cause for an increase in violence.

Other than the difficulties inherent in trying to make distinct determinations of causality pertaining to a single event in a context plagued by external challenges, this thesis suffers from two other major limitations. First, the use of a single-case study severely limits the generalisability and external validity of this research. While qualitative analysis allows for nuanced consideration of issues such as the impact of climate-related disasters, future research should explore the use of large-N studies to strengthen the arguments made in this thesis with more results. Second, the data utilised in the analysis was almost exclusively obtained from international organisations such as the UN and think tanks due to a lack of other available data. As such, almost all the information analysed centred the perspective and experience of the Somali state throughout the examined period. Furthermore, since Al-Shabaab is widely considered a terrorist group by the international community, all Western reporting on the Somali civil conflict will be inherently biased against the group and its activities, which poses difficulties for conducting objective analysis.

Finally, this research adds to the academic literature by identifying warring parties' internal structural stability and adaptability as highly influential in determining the impact of sudden-onset climate-related disasters on conflict intensity. This consideration also has clear policy implications since it allows for the identification of high-risk contexts, for example where rebel groups are highly organised, adaptable, and resilient and the state is weak. It highlights the urgent need for political reform in such states and for external support to be directed towards state-building and security matters as interconnected issues.

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