

**In the Eye of the Storm: Investigating the Relationship Between the Climate-Conflict
Nexus and Child Soldier Recruitment**

by

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Abstract

Despite the growing concern around climate change as a conflict threat multiplier, limited research has been done on how climate factors will change specific conflict patterns. At the same time, international institutions are urgently trying to bring an end to the global child soldier crisis. This paper examines how climate change-induced drought may impact patterns of child soldier use with the primary objective of encouraging further research and understanding of which driving factors are most likely to be influenced. Using drought as a climate proxy, a regression analysis is conducted on 198 internal armed conflicts involving government-rebel conflict dyads to determine whether there is a significant correlation between child soldier use and drought scores. Although the correlation in this model was found to be insignificant (P value = 0.95), the literature review and discussion draw important connections between vulnerabilities caused by climate change and common driving factors of child soldier use. Resource scarcity and the displacement of peoples are two notable areas where climate may proliferate child soldier use in certain case studies.

Key Words: Child soldiers, climate-conflict, regression analysis, child recruitment, armed conflict dyads, drought, threat multiplier

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1.0 Introduction

1.1 Background

1.11 The Climate-Conflict Nexus

Climate change is widely accepted among the scientific community as one of the greatest challenges facing the world today. The Anthropocene will disproportionately be impacted by the present adverse effects and future consequences of a changing climate. Climate change is a non-traditional security threat and will certainly exacerbate existing conflicts and increase the chance of their occurrence (Causevic, 2017; Nordås & Gleditsch, 2007; Akresh, 2016). Climate change related catastrophes such as changes in rainfall, extreme temperatures, harsh weather events, and sea-level rise will place additional stress on fragile states and vulnerable groups (Bretthauer, 2016). The concept of climate change as a causative factor for conflict is highly debated among academics. Most scholars argue that to attribute climate as the cause of a conflict is to oversimplify the underlying drivers and neglect the intersectional nature of participating groups (Verhoeven, 2011; Sunga, 2014). With that in mind it is generally agreed that climate change is a conflict threat multiplier and has strong influence on both contributing to new conflicts and leading to the recurrence of others. Two notable mechanisms wherein climate change is likely to affect conflict are through resource scarcity and increased displacement of peoples. The United Nations and the International Panel on Climate Change (IPCC) have endorsed the idea that climate change is in part responsible for resource scarcity, and therefore, is tied to conflict (Sunga, 2014). In addition, both rapid and slow onset climate processes will render many regions uninhabitable, resulting in the mass migration of internally displaced peoples (IDPs) and climate refugees (Bettini, 2017; Brown & Crawford, 2009). Refugee flows have been correlated to the

spread of conflict across borders and displaced peoples are often most vulnerable to political manipulation (Bohnet et al., 2018).

1.12 The Present Child Soldier Dilemma

At the same time as climate change threatens to increase rates of conflict, the global community struggles to prevent and remediate the use of child soldiers in war zones. As defined by the Paris Principles and Guidelines on Children Associated with Armed Forces or Armed Groups a child soldier is:

any person below 18 years of age who is or who has been recruited or used by an armed force or armed group in any capacity, including but not limited to children, boys and girls, used as fighters, cooks, porters, messengers, spies, or for sexual purposes; it does not only refer to a child who is taking or has taken a direct part in the hostilities (UNICEF, 2007).

Operating under this definition, the United Nations Child Soldiers Index estimates that more than 46 states recruit youth under 18 for the armed forces and that since 2016, there have been 18 known conflicts involving children (Zayed et al., 2012; United Nations, 2021a). These conflicts have taken place in regions including Myanmar, Sudan, South Sudan, Iraq, Syria, Somalia, The Democratic Republic of Congo, Mali and Nigeria (The Romeo Dallaire Initiative, 2021). Approximately 250 000 children are currently combatants in armed forces (Zayed et al., 2012). The Dallaire Institute argues the child soldiering is one of the most dire and extensive conflict-related threats facing the world today (Whitman & Holland, 2015).

Existing literature on child soldiers generally falls into one of three categories: the determinants, the factors that drive recruitment, and the consequences (Haer & Bohmelt, 2017). Within this body of research, one of the more highly contested and misunderstood topics is the

leading factors that influence child soldier recruitment. The one thing that the researchers agree on is that these factors driving the recruitment of child soldiers are complex, interconnected, and region-specific (Barstad, 2008; Khort et al., 2016; Achvarina & Reich, 2006). Common cited mechanisms associated with the voluntary and involuntary recruitment of child soldiers include poverty, access of belligerent groups to refugee/IDP camps, lack of employment, community instability, and the availability of small arms. It is under researched but plausible that several of these factors, particularly poverty, community instability, and access to refugee/IDP camps will be influenced by the concurrent climate crisis.

1.13 Gaps in Existing Research

The body of literature on climate-conflict and child soldiering separately is fairly comprehensive. However, there is little to no literature connecting these two security threats. That being said, a potential correlation between climate change events and child soldiering is evident in numerous case studies and literature, providing grounds for further study (Achvarina & Reich, 2006; Haer, 2019).

Nordas & Gleditsch recommended that the nuances of violence caused by climate change must be examined more carefully with focus on existing conflict models and variations by region (2007). In agreement with this, the specific pathways and mechanisms in which climate change is likely to influence conflict patterns is identified as a top research priority (Hsiang et al., 2013). Just as the impact of climate on conflict is misunderstood, the knowledge on the “state of the art” of child soldiering is lacking; identifying trends in recruitment will be critical in order to prevent its continued occurrence (Haer, 2019). Achvarina & Reich also identified the need to discuss how areas with large quantities of refugees also have higher volumes of child soldiers (2006).

Research demonstrates that climate change will cause resource scarcity and greater conflict as well as mass migration. These realities imply that the impacts of climate change, which cause resource poverty and displacement of peoples, may also carry influence on the recruitment and use of child soldiers in war torn states. Presently, the literature fails to address this likely connection between climate change and child soldier recruitment, necessitating further study and understanding of best practices for prevention in a twenty-first century context.

1.2 Problem Statement

At the crossroads of the climate change and child soldier crises, it is necessary to take an interdisciplinary approach to consider how climate impacts will influence conflict patterns and vulnerabilities that are associated with the recruitment of child soldiers.

1.3 Research Questions

1. What types of regions and conflicts are most vulnerable to the climate-conflict relationship?
 - a. How will the impacts of climate change affect the recruitment of child soldiers?
 - i. What mechanisms for recruitment are likely to be influenced by climate-related risks?

1.4 Purpose and Significance

The purpose of this study is to begin to draw connections between climate risks and the socio-economic risks that create ample environments for child recruitment in conflicts. Given the complexity of both the climate crisis and the experience of child soldiering, this study does not intend to draw conclusions or oversimplify the processes that cause this issue. On the contrary, it aims to begin a discussion on the relation between environment and conflict as it pertains to child

vulnerability and to encourage further qualitative and quantitative research into how these two fields may interact.

This research is significant to academics and the international community alike as it will aid in informing prevention policies, such as the Vancouver Principles on Peacekeeping and the Prevention of the Recruitment and Use of Child Soldiers (Government of Canada, 2019). In 2018, the Global Conflict Risk Index identified both internally displaced peoples and climate change as new variables to be considered in the context of violent conflict. It is argued that including climate change, with the suggested variable of drought, is very important to improving the validity and accuracy of conflict models (Halkia et al., 2018). On the 2030 Agenda for the Sustainable Development Goals, target number 8.7 is as follows: “take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms” (United Nations, 2021b). To achieve this feat in the next four years, massive changes would be necessary across the international community and within all states. Climate change cannot be left out of this discussion. This will be a novel study as it is the first to attempt to draw connections between the climate-conflict and child soldiering crises.

1.5 Research Design and Theoretical Framework

This study will employ a regression analysis technique to assess the statistical significance of climate change indicators when referenced with child soldier rates across all conflicts where sufficient data is available. Regression analyses are useful to determine how variables compound and relate to one another. The variables for this analysis will be determined by a comprehensive literature and case study review to ensure the most important determinants

of child-soldiering are included. The variables to be used are as follows: child soldier use (dependent variable), drought (independent variable), poverty, child population, education, duration and intensity (controls).

Several international relations and conflict theories will be utilized to frame this study. Most notably, the theory of willingness and opportunity to assess the likelihood of conflict (Haer & Böhmelt, 2016). This theory hinges on the assumption that engagement is primarily driven by willingness and opportunity. Willingness refers to the processes and activities that lead the choice of a certain behaviour or action over other alternatives (Starr, 1991). Opportunity is conceptualized as the situational possibilities and factors that are available to an individual or group in a given environment (Starr, 1991). It is relevant to the study of child soldiers as it forces the research to examine both the willingness and opportunity factors that drive belligerent groups to seek out children and that may trigger children to join armed forces. In tandem with this theory, the research will consider the feasibility thesis and the relative deprivation theory. The feasibility thesis operates under the assumption that movements and conflict actions occur primarily when they are feasible (Dudenhoefer, 2016). Relative deprivation theory links this to the climate crisis by looking back to Malthusian ideals and arguing that resource scarcity causes inequalities that inevitably lead to human conflict (Bretthauer, 2016).

1.6 Limitations and Assumptions

Populations experiencing conflict are highly unique, making it difficult to draw meaningful conclusions about conflict patterns across different regions and belligerent groups. Cross-sectional studies on conflict such as this are inherently unable to account for all important differences and rather, rely on controlling a set of economic and political indicators to draw comparisons (Carleton et al., 2016).

A second limitation is the lack of reliable and substantial data on the historical and present child soldier dilemma. It has proved abundantly challenging to access sufficient data to ensure that the sample size of conflicts is large enough that calculations have any significance. Many datasets and annual reports were reviewed so that the data was as robust as possible, however, this study remains a guide for further research rather than a conclusive quantitative analysis given the scarce reliable data inputs.

2.0 Literature Review

2.1 Chapter Introduction

To understand how climate change may influence the recruitment of child soldiers, it is important to form a comprehensive understanding of the existing literature. This chapter will frame the current research on climate change as a threat multiplier and on child soldier recruitment, exploring both commonalities and disparities amongst publications. It will also look at the methods commonly employed to analyze these complex and multi-variable questions.

2.2 Climate Change as a Conflict Threat Multiplier

Climate change has been attributed to significantly increasing the likelihood of conflict by aggravating issues like instability, insufficient water resources, and migration (Causevic, 2017). Hsiang et al. compared climate deviations and rates of violent conflict. They found that each change of 1 standard deviation in either warmer temperature or more drastic rainfall caused an increase of conflict between groups by a startling 14% (Hsiang, Burke, & Miguel, 2013). Hsiang et al. note that these effects will be highly context specific but that many regions are estimated to warm by 2 to 4 significant digits, based on regional intertemporal changes, before 2050, creating an urgent risk of heightened human conflict (2013). Brown and Crawford went into more detail to the security risks posed by climate change including competition for water

resources, food insecurity, land disputes, drops in economic growth, increased militarization, and resentment towards disproportionately unsustainable states (2009). Many of the authors shared the view that climactic variation is not the sole cause of conflict, but rather modifies social and economic conditions that change conflict potentials (Carleton, Hsiang, & Burke, 2016). As such, it is problematic to assume that climate will negatively influence conflict in all situations and necessary to explore situations in which regions may remain peaceful despite climate impacts or where the net-impact may not be harmful. Climate change impacts on conflict is critical to consider as children are uniquely vulnerable to conflict and forced recruitment (Akresh, 2016). Akresh stresses that the anticipated future increase in conflict will be detrimental to children's wellbeing if not sufficiently addressed (2016).

2.21 Resource Scarcity

Much of the argument that a reduction in access to resources will lead to violence is based upon Neo-Malthusian theory. This theory operates under the assumption that there are physical limits on resource consumption and as the population grows and exceeds these limits, conflict and catastrophe will arise (Perelman, 1979). It is similarly based upon Hardin's concept of the "tragedy of the commons" where actors that are given access to a natural resource are bound to act in self-interest and ultimately deplete the resource if no monitoring or coordination is put in place (1968). When resource scarcity occurs, Gurr's relative deprivation theory becomes relevant. This theory focuses on perceived entitlement to resources compared to actual access and suggests that when there is a gap between the needs and resources of an individual, or between the comparative resources between individuals, conflict may occur (Gurr, 1970). This relative deprivation has been associated with a frustration amongst individuals or groups that ultimately triggers aggression and violence (Džuverovic, 2013).

These theories have been both critiqued and built upon in the literature. Verhoeven warns against oversimplifying the tying of climate to conflict (2011). He argues that this conclusion fails to explain absence of violent conflict in environmental crises and points more towards the “green wars concept” (Verhoeven, 2011). In this framework, Homer-Dixon posits that climate and conflict are both topics too vast to be reasonably associated; however, he recognizes that developing countries are likely to experience greater social ills and loss of capacities due to environmental events and become more susceptible to conflict (1999). He also notes the exceptional potential of water scarcity to induce conflict given its engrained role in most aspects of society, especially agriculture (Homer-Dixon, 1999).

When climate is perceived not as a cause, but rather as an influencer of conflict, several trends can be observed. It is accepted that environmental and resource-centered disagreements may motivate rebellion and conflict (Rustad & Binningsbo, 2012). Reduced water availability and the impacts of drought are repeatedly linked to violent crises with precipitation rates and higher temperatures identified as critical drivers (Carleton, Hsiang, & Burke, 2016; Nordas & Gleditsch, 2007) (Kelley et al., 2015). For example, the 2007-2010 drought in Syria was in part responsible for the political unrest that followed due to the crop failure and migration of people that ensued as a result (Kelley et al., 2015).

When predicting which societies are most susceptible to climate-related conflict, Bretthauer found that least developed countries, neo patrimonial countries, and oil-rich countries were most vulnerable (2017). Neo patrimonial countries are nations with power centered around certain resources that often involve authoritarian rule and corruption in resource distribution (Bretthauer, 2017). On the other hand, non-agrarian countries that are interconnected with the global economy and have elevated levels of resource equality among domestic groups were least

susceptible to resorting to violence when faced with resource scarcity and climate change (Bretthauer, 2017). These identifiable patterns in resource reliance suggest that agricultural decline due to insufficient resources may be a key predecessor to conflict.

2.22 Criticisms of the Climate-Conflict Nexus

One of the main critiques of climate-conflict literature is the bias within the research that it is based on (Hendrix, 2018; Adams et al., 2018). Adams et al. suggest that the dependent variable sampling strategy used for research inhibits a genuine understanding of the socioeconomic and political factors caused by climate that lead to conflict (2018). The authors point out that climate-conflict research only comes from a few regions, such as those in Sub-Saharan Africa. This creates a risk of making the climate-conflict nexus seem disproportionately strong and creating stigma around certain states as being more violent in nature than others (Adams et al., 2018). Hendrix adds that studying climate and conflict in a small number of contexts restricts researchers from reaching conclusions or approaches that could be applied in other areas or on an international scale (Hendrix, 2018). Hendrix and Adams raise an important point about the role of bias in climate-conflict literature.

Another common criticism of climate-conflict nexus research is that it is conducted with a biased lens for the negative impacts of climate change. Hsiang et al. argue that the discussion around the climate-conflict nexus should be formed in a neutral way and pay more attention to positive effects of climate change on conflict and regions that remain peaceful despite environmental failure (Hsiang, Burke, & Miguel, 2013). For example, when investigating how natural disasters may affect conflict, research must not focus just on the economic and social crises that this creates, but how a natural disaster may also disable rebel forces and their ability to continue to engage in conflict (Walch, 2018). Research on this issue in the Philippines found that

any benefits derived from a weakness to armed groups brought on by natural disasters was outweighed by the negative outcomes of conflict from loss of state stability and increased competition (Walch, 2018).

2.3 Climate Change as a Driver of Migration

Climate change not only causes resource scarcity but renders many regions uninhabitable resulting in the mass migration of internally displaced peoples (IDPs) and climate refugees (Bettini, 2017; Brown & Crawford, 2009). The IPCC has identified that its effects will disproportionately impact the most vulnerable and marginalized groups (2014). Likewise, poverty and insecurity are correlated with migration (Detraz & Windsor, 2014). McLeman identified six climate thresholds: adaptation becomes necessary, adaptation becomes ineffective, substantive changes in livelihoods becomes necessary, migration ensues, migration rates become non-linear, and migration rates cease to be non-linear (2018). If some of these thresholds are exceeded, people will have no choice but to migrate which can be a very disruptive and challenging process (McLeman, 2018). Brown found populations migrating for reasons associated with climate change as early as the 1980s, especially from negative agricultural productivity and storm frequency and severity (2008). Climate change processes causing migration can either be slow onset or rapid onset, meaning that communities may not have time to adapt (Detraz & Windsor, 2014). UN figures show that international migrants in the last decade have already exceeded estimates of 150 million by 64 million more migrants (United Nations, 2012). The International Organization for Migration (IOM) noted the impossibility of predicting the number of current and future climate refugees given uncertainty about the magnitude of climate impacts and the interconnected factors that cause people to migrate (Detraz & Windsor, 2014). The lack of knowledge and planning for accommodating and aiding climate

refugees is disconcerting. Presently, environmental-related factors are not legal justification to claim refugee status nor have states offered to take responsibility by intaking a substantial number of climate refugees (Ahmed, 2018).

2.4 Factors Influencing Child Soldier Recruitment

The processes and mechanisms that cause the recruitment of child soldiers seem to be very region and case specific, with most authors emphasizing different primary factors for causation.

Generally, the recruiters belong to rebel groups that have been marginalized in their society and may be army leaders, non-state actors, or other enlisted children (Zayed et al., 2012). Reasons for rebel groups enlisting children are usually conceived through a supply and demand framework. Supply refers to factors that make children accessible and feasible to use as combatants and demand refers to the costs and benefits of doing so (Haer et al., 2020). In the African continent, more than 50% of the population is younger than 18 years of age and there is a prolific number of small arms that enable children to be effective fighters (Dudenhoefer, 2016). The vast number of youth and weapons available alongside the widening of inequalities and generation of economic crises through globalization are often cited as main reasons for rebel groups to exploit children (Haer, 2018). Compared to adults, children tend to be more psychologically vulnerable and lack an adequate sense of fear, making them more likely to take risks and less likely to desert (Haer et al., 2020; Dudenhoefer, 2016). Another article that conducted a global analysis on child soldiers from 1987-2007 found that casualty-intensive and long-duration conflicts were more likely to involve child soldiers (Tynes & Early, 2014). At the armed group level, children are often dehumanized and viewed as a military tool with different costs and benefits of use (Tynes & Early, 2014).

The recruitment may be voluntary, in which the child seemingly chooses to join a rebel group, or involuntary, in which they are abducted or enticed to join through violent force (Dudenhoefer, 2016). Again, the literature is split on whether child soldiering is mostly voluntary or involuntary. Based on a series of roundtable discussions with former child combatants, Zayed et al. found that the majority of children were involuntarily abducted or recruited by armed groups (2012). On the contrary, Khort et al. conducted a survey of 258 child soldiers in Nepal and found that 80% of child soldiers joined voluntarily (2016). This survey also identified discrepancies in reasons for joining. 51% of females and 22% of males stated personal connection as their reason for joining. Additionally, 22% of males and 10% of girls listed economic conditions as the driving factor. Other reasons listed in the survey included an intriguing philosophy and a need to escape their current difficult life situation (Khort et al., 2016). Regardless of the initial reason or process of recruitment, it is critical to recognize that once the children are involved in the conflict, they are told that their participation and actions are positive and bringing justice for their group which can have long lasting psychological and behavioural repercussions (Zayed et al., 2012).

Barstad attributes children in armed groups primarily to poverty. He posits that youth find themselves in a desperate situation where the only way to survive economically and meet their basic needs, such as sufficient food, is to become a soldier (2008). In addition, he identifies the secondary factors of security, access to education, family and friends, a sense of belonging to a group identity and ideology, and revenge (Barstad, 2008).

Achvarina & Reich bring a different perspective to the traditional belief that poverty is the leading vulnerability for child soldiering by stating that the main factor is rebel access to refugee camps (2006). They found that there is a significant correlation between access to

internally displaced peoples (IDPs) and refugee camps and the amount of child soldiers in an armed group. Poverty is still an important factor to consider but fails to explain why many children in poverty do not become soldiers (Achvarina & Reich, 2006). It has also been found that refugees and IDPs are more susceptible to political manipulation and engaging in existing conflicts because of the resentment and lack of certainty they face (Bhonet et al., 2018). Despite their evidence, there is scarce literature on the militarization of refugees or refugee camps as an access point for armed groups to cease child soldiers (Achvarina & Reich, 2006). Lischer outlined this more clearly by identifying three main patterns of recruitment from IDP camps (2010). The first is the militarization path in which militants are omnipresent among the refugee population and recruit from within the camps. Second, the insecurity path refers to under-protected camps that are attacked and the children are either abducted by attackers or mobilized for defense. Finally, the article explains the insecurity path over time as protracted displacement in insecure camps leading to youth desperation and “voluntary” recruitment (Lischer, 2010).

Lischer also conducted interviews with former child soldiers who gave complex and variant reasons for engaging in combat including: limited access to basic necessities, pressure from adults, trauma from previous atrocities, desire to alleviate suffering, and perception that there is no superior alternative (2010). In an article on understanding recruitment in Africa, Dudenhoefer echoed Lischer’s findings about children not having a better alternative. The economic, social, and individual conditions of recruits must be considered to assess whether children feel like they have any other option but to join rebel groups for their perceived survival (Dudenhoefer, 2016). A 2021 article investigated the socio-economic factors influencing children in the midst of violence and found that children adhered to coercive recruitment because

there was no perceived alternative livelihood or alternate source of basic needs (Regilme & Spoldi, 2021).

Recruitment of Child Soldiers in the Willingness and Opportunity Framework	
Armed Group Willingness <ul style="list-style-type: none"> - Casualty-intensive conflict - Economic crisis - Duration of conflict - Opposition also using child soldiers 	Armed Group Opportunity <ul style="list-style-type: none"> - Children in high supply - Youth desperation - Unprotected refugee/IDP camps - Illicit funding - Psychological vulnerability of children
Child Soldier Willingness <ul style="list-style-type: none"> - No perceived alternative - Resource scarcity - Poverty - Individual experience and trauma - Long-term displacement - Lack of education or life outside of conflict 	Child Soldier Opportunity <ul style="list-style-type: none"> - Small arms abundance - Desire to alleviate suffering - Pecuniary rewards (e.g., wages, drugs, alcohol) - Non-pecuniary rewards (e.g., achievement of rank, forming a group identity)

Table 1. Factors influencing child soldiering structured using the willingness and opportunity conflict studies theory with similarities to the climate-conflict risks indicated in bold.

The factors influencing child soldier recruitment both at the armed group and individual youth level can be framed using the willingness and opportunity theory as seen in Table I. This table is not comprehensive but rather provides an overview of the many complex factors that lead to child soldiering and identifies in bold where some of these factors may be connected to risks associated with the climate-conflict nexus.

2.5 Commonly Used Methods in this Field of Study

To examine the benefits and limitations of different approaches to research on both climate-conflict and child soldiers, a review of methods in the literature was conducted.

For climate-conflict studies, there are two primary approaches that are used. The first is cross-sectional studies that use statistical regressions to look at how certain variables trend across numerous locations and case studies by controlling for as many economic and social indicators

as possible (Carleton et al., 2016). The main limitation is that conflicts are too complex to control for all important differences across regions; ideally, studies could be carried out on multiple populations differently affected by climate but without any other dissimilarities (Carleton et al., 2016). To minimize this limitation, the second approach involves looking at variation in climate over a period time for one population, assuming that the socio-economic and political variables for the population have stayed relatively the same. However, this method is only useful for short-term climate impacts as long-term climate change would defeat the validity of using the same population (Carleton et al., 2016). To measure climate impacts, changes in temperature and rate of precipitation/drought are the most commonly used indicators and have been endorsed by the GCRI as of 2018 (Halkia et al., 2018).

The methods used in the literature on child soldier recruitment are more varied between qualitative and quantitative. Process-tracing case studies to realize the unique driving factors for particular regions and individuals is a common approach. For example, Kakhuta-Banda process-traced recruitment in Angola and Mozambique with a focus on poverty levels, orphan rates, the availability of small arms, access to IDP/refugee camps, supply and demand, voluntary recruitment, and how the child soldiers were being used (Kakhuta-Banda, 2014). Cross-sectional quantitative methods have also been implemented. One study focused on the long-term calculations that belligerent groups use when deciding if they will use child soldiers. It examined how child soldier use varied when one independent variable was changed while all other variables were held constant (Lasley & Thyne, 2015). Achvarina & Reich also took a quantitative approach by conducting a multiple regression test on 12 cases where sufficient information was identified to determine the impact of access to IDP camps on recruitment (2006).

2.6 Chapter Summary

This review of the literature demonstrates the complexity and differences surrounding these topics. Although, both climate-conflict and child soldiering have been researched quite abundantly, there is a demand for more specific and cross-sectional studies to be done that draw connections between current findings. This chapter demonstrates areas where climate increases risk for conflict and where conflict and thus climate, may affect recruitment of child soldiers. The existing research seems to provide a sufficient basis for research into how climate change may affect child soldiering, however, no scholarly research was identified on this topic to date.

3.0 Methods

3.1 Research Design

To identify potential patterns in the relationship between climate change and the recruitment of child soldiers, this study uses a multivariate regression analysis method. This method is useful for identifying how an independent variable and a series of control variables will impact a dependent variable. Given that both climate change and conflict are wicked problems, a regression analysis will allow for the input of multiple factors to account for different explanations. Drought will be used as a proxy to represent climate change factors. This analysis will aid in proving or disproving if there is a significant relationship between drought and the use of child soldiers in global conflicts between 1987 and 2007.

3.2 Sample Selection

The sample will be based on the dataset created by Tynes and Early on the use of child soldiers in armed conflicts in all reported countries from 1987 to 2007 (2015). After emailing scholars and organizations, such as the Dallaire Institute, Amnesty International, UNICEF and the Coalition to Stop the Use of Child Soldiers and inquiring as to the most recent and

representative data on conflicts using child soldiers, most sources referred to either the 2015 dataset from Tynes and Early or the 2006 dataset from Achvarina and Reich (Johnson, personal communication, October 8, 2021; Thyne, personal communication, November 29, 2021). The dataset from Tynes and Early was chosen because it represents the largest dataset pertaining to child soldier use to date and covers the broadest time period which is useful when comparing to climate factors. Although Achvarina and Reich presented more detailed data on the number of child soldiers used in each conflict relative to the total combatants, there was only sufficient data for 12 conflicts with child soldiers in their study. The Tynes and Early dataset contains 198 internal armed conflicts (2015). All of these case studies also presented sufficient data for the independent and control variables.

3.3 Multiple Regression Model and Variables

To first test whether there is any correlation, without consideration of externalities, between drought and child soldier use, a preliminary simple regression analysis between these two factors will be conducted. This regression analysis will take the same form as the one below but will only be conducted between child soldier use (CS) and drought as a climate proxy to determine if there are statistically significant results. If it seems that there is some correlation, then the multivariate regression analysis will take the following form:

$$\text{CS} = \beta_0 + \beta_1 \text{Drought} + \beta_2 \text{Duration} + \beta_3 \text{Intensity} + \beta_4 \text{GDP P/C} + \beta_5 \text{Child Population} + \beta_6 \text{Education}$$

Where;

CS represents the dependent variable of child soldier use, coded as a 0 if no armed groups used child soldiers, 1 if either the government or a rebel group used child soldiers, and 2 if both government and rebel group(s) used child soldiers.

Drought acts as a proxy for climate and represents the primary independent variable. It is measured on a drought score scale from 0-21 which considers severity, intensity, area, and the drought peak (maximum intensity). Data was retrieved from the Global Drought Observatory Database (Spinoni et al., 2019).

Duration is a control variable informed by the Tynes and Early database that accounts for the total length of the conflict based on reports from UCDP/PRIO's Armed Conflict Database (Gleditsch et al., 2002).

Intensity is a control variable also informed by the Tynes and Early database that is coded as 0 for conflicts that had 25-999 fatalities per year and 1 for conflicts that had greater than 1000 fatalities per year.

GDP P/C acts as a control variable representing economic development with data being from the year prior to the start of conflict (Tynes & Early, 2015).

Child Population is a control variable representing the available pool of recruits and is denoted as percentage of children from age 0-14 within a country's population (Tynes & Early, 2015).

Education is the final control variable denoted by expected years of schooling in each country under the assumption that fewer years of schooling makes youth more susceptible to engaging with an armed group (Tynes & Early, 2015).

This equation is modelled after the equation used by Achvarina and Reich on their analysis of child soldiers in relation to internally displaced peoples and was modified to suit the variables of this study (2006). Variables were included or excluded based on previous research conducted by Tynes and Early and the availability of reliable data that matched the 198 observations in the UCDP/PRIO's Armed Conflict database (2015).

3.4 Data Sourcing and Selection Process

The selection of variables was informed by existing literature and findings from other research projects. This section aims to summarize the reasoning for each variable and outline the data sources and coding processes for each.

3.41 Independent Variable

The independent variable is designed to reflect climate-related risks to conflict. In accordance with the most recent recommendations from the Global Conflict Risk Index (GCRI), this will be a measure of the standardized precipitation evapotranspiration index (SPEI) for each region during the conflict years (Halkia et al., 2018). The SPEI can be equated to the impact of drought which, given its long-term damaging effect, has been identified as a threat multiplier for conflict. The data will be retrieved from the Global Drought Observatory Database (Spinoni et al., 2019). In this database drought events were detected using SPEI at a 12-month scale and drought events commenced when the indicator falls below a negative standard deviation for a minimum of two consecutive months (Spinoni et al., 2019). The drought scoring system is based on severity, intensity, area, and the drought peak (considers both maximum intensity and largest area). After being scored, droughts were categorized as either moderate, severe or exceptional (Spinoni et al., 2019). To be included in the dataset for this study, drought events had to either start or peak within a year of the start of the conflict. This was decided to keep this variable consistent with the data collected for other variables which all pertained to a year prior to the conflict. In the cases where multiple droughts were recorded within a year of the given start dates, the most significant drought event was included.

3.42 Dependent Variable

The dependent variable is child soldier use at any point throughout the conflict. For this information, the 2015 dataset by Tynes and Early will be used. Their data was generated by conducting case research using news sources, academic studies, interviews and reports to determine whether child soldiers were used in the 198 conflicts from the UCDP/PRIO Armed Conflict Database. The conflicts examined were all government-rebel conflict dyads from internal armed disputes. The definition of child soldiers used in this study is “any child 15 years old or younger that is party to a regular or irregular armed force in combat or supporting roles. The use of child soldiers in support roles, including jobs such as: cooks, porters, messengers, spies, and camp followers recruited for sexual purposes” (United Nations, 1989). 15 years of age was used rather than the new definition of 18 as this is how it was defined during the time of these conflicts and keeps results consistent with reporting.

3.43 Controls

The control variables of conflict duration, intensity, GDP per capita, child population, and education will be replicated from the existing Early and Tynes dataset (2015). These are all variables with existing research on how they are tied to child soldiering rates. GDP per capita is not directly attributed as a cause of child soldiering, as many conflicts in poor areas do not involve youth, but it is seen as an influential factor that can lead people to greater desperation and conflict. Conflict duration and intensity are also noted to influence the desperation of both armed groups and individuals in a conflict, making them more likely to resort to the recruitment of children (Tynes & Early, 2015). Child population is included based on research on how the accessibility of children influences their use, especially when a prolific amount of small arms are available. Essentially, the more children in a population, the more likely rebel and government

groups are to use them in conflict (Dudenhoefer, 2016; Haer et al., 2020). Finally, education is based on the expected number of years of schooling a child will receive. Education has been tied to both a push and pull factor given that children with lower education will be less likely to explore alternatives to recruitment and more likely to hold frustrations toward their government or different groups (Barstad, 2008).

3.5 Data Analysis Plan

This model is structured to better understand how the independent variable, drought, may or may not relate to the dependent variable, use of child soldiers. If the results prove to be statistically significant, this relationship can be analyzed through a lens of correlation. This result would be key in guiding future research in the field as well as policy development. Should the relationship prove not to be statistically significant, it can be noted that no quantitative relationship exists between these two indicators using this dataset. However, this remains useful for analyzing the literature and other studies as to why there was no correlation and what other climate mechanisms should perhaps be included. Additionally, should the results not be statistically significant, the analysis could include what further data may be required to improve the accuracy of the study, what variables may need to be omitted or added, and if a different approach may need to be taken altogether. For example, more specific data on the amount of child soldiers used might have completely altered the results or inclusion of an agricultural dependence variable might be important to understand impacts of droughts; these are the kind of things that can be explored.

3.6 Conclusion

Overall, this regression methodology and data analysis process aims to identify a preliminary correlation between a commonly used climate-conflict indicator and child soldier

use. Regardless of whether the relationship proves to be statistically significant, this approach is important as a foundation to exploring this complex relationship and informing further study on the subject.

4.0 Results and Data Analysis

The multivariate regression model was employed to assist in answering the research questions regarding how the impacts of climate change may impact the recruitment of child soldiers. Statistically significant results would imply a correlation between instance of child soldiers use in internal armed conflict dyads and severity of drought. Table I presents the mean, standard deviation, minimum, and maximum for the variables used in this study that included 198 different observations from the Early and Tynes dataset (2014). It is notable that the mean drought score was 6.60, indicating that most of the 198 dyads involved at least a moderate drought event that ran in the year prior or the first recorded year of the conflict. Of the 198 conflicts, 69 had no significant drought (35%), 43 had moderate drought events (22%), 42 had severe drought events (21%), and 44 exceptional drought events (22%). Additionally, the average use of child soldiers was 1.39, indicating that in most of the conflicts at least one actor used children. Only 29 (15%) out of the 198 observations were coded as 0 with no child soldiers recorded.

Table 2. Summary statistics for the control, dependent, and independent variables used in the regression analysis.

Variables	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Child Soldier Use	198	1.39	0.73	0	2
Drought Score	198	6.60	6.32	0	21
Conflict Duration	198	3.39	1.62	0	6
Conflict Intensity	198	0.47	0.50	0	1
GDP per Capita	198	6.29	1.07	4	10
Education	198	40.58	7.26	18	50
Child Population	198	6.60	6.32	0	21

Despite the high prevalence of both drought events and child soldier use within the conflict dataset, the regression analysis results in Table II demonstrate that the correlation is not statistically significant, and that the data is not useful in predicting whether drought events influence the occurrence of child soldier recruitment.

Table 3. The regression statistics and significance for each of the variables involved in the multivariate regression analysis.

Variable	Coefficients	Standard Error	<i>t</i> Stat	<i>P</i> -value
Intercept	1.948572	0.632831	3.079136	0.002382
Drought Score	-0.00048	0.007383	-0.06543	0.947897
Conflict Duration	0.135881	0.032626	4.164807	4.71E-05
Conflict Intensity	0.303123	0.104931	2.888781	0.004314
GDP per Capita	-0.08365	0.061843	-1.35264	0.177771
Education	-0.03399	0.021702	-1.56597	0.119011
Child Population	-0.00959	0.008991	-1.06695	0.287341

Regression Statistics	
Multiple R	0.489182
R Square	0.239299
Adjusted R Square	0.215403
Standard Error	0.646844
Observations	198

Beginning with the overall regression statistics, the strength of the entire regression analysis's linear relationship can be interpreted using the adjusted R-squared value of 0.215403 which serves as a metric for how useful the model is at predicting the use of child soldiers. This means that 21.5% of variation in child soldier use can be explained by using this model. The standard error indicates the mean distance that data points are from the line of best fit. In this study, data points are within 0.647 dependent variable units from the regression line. Given that 1 unit represents the difference between an armed group using or not using child soldiers, 0.647 is quite a high margin of error.

It is also useful to examine the P-values of each variable in Table II. The P-value is helpful in determining whether each variable has a correlation with the dependent variable of child soldier use. As expected, based on the previous findings by Tynes and Early, *Conflict Duration* and *Conflict Intensity* both had P-values of less than 0.05 and are statistically significant (2014). *GDP per Capita*, *Education*, and *Child Population* all had P-values of less than 0.30 but greater than 0.05 which is not statistically significant but still notable enough that these correlations may not be entirely due to chance. Finally, the independent variable of *Drought Score* that was introduced in this study had a large P-value of 0.95. This large P-value suggests that there is no correlation between drought score and child soldier use beyond due to random chance.

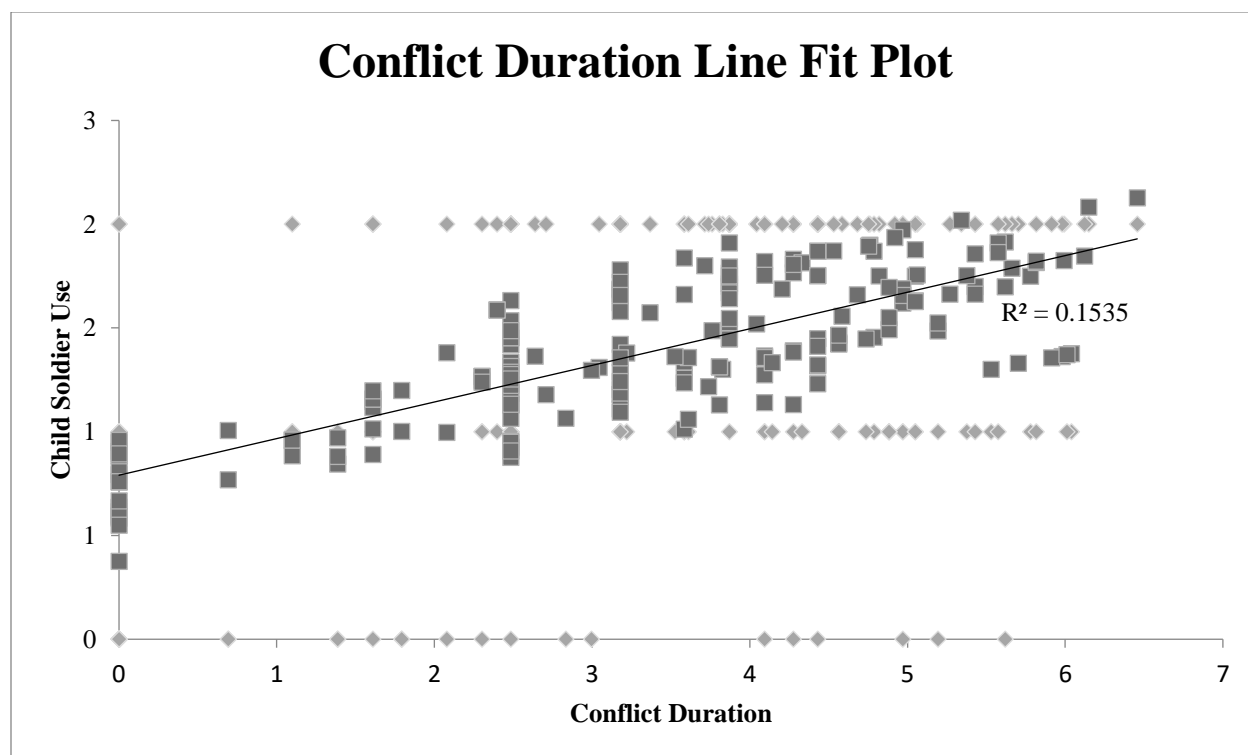


Figure I. Graph of the regression between conflict duration and child soldier use. The dark grey squares represent predicted values, and the light grey diamonds represent data points.

In Figure I, it is clear that the data points and their predicted values trend upwards towards the right and that as the duration of the conflict increases on a 7-point scale, so does the instance of child soldier use. Most of the points fall in the general direction of the line of best fit with a regression coefficient of 0.1535.

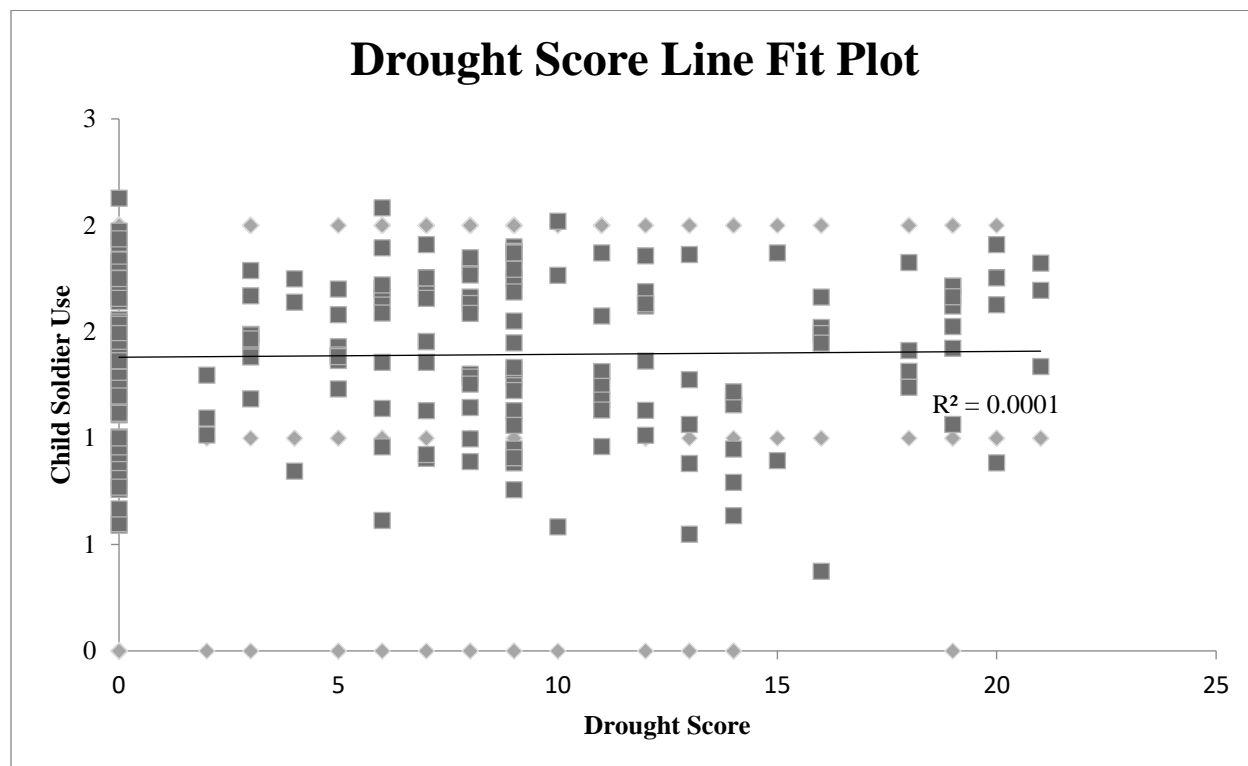


Figure II. Graph of the regression between drought score and child soldier use. The dark grey squares represent predicted values, and the light grey diamonds represent data points.

Unlike in Figure I, where the relationship between variables is visually clear and could be effectively used as a predictor, Figure II shows the lack of correlation between drought score and child soldier use. The data predictions do not fall on any sort of trend line and are scattered randomly around the line of best fit which has a regression coefficient of 0.0001. It becomes further evident in this graph that within the multivariate regression, drought score and instance of child soldier use do not correlate and cannot be used to predict trends.

Overall, the control variables of *Conflict Duration* and *Conflict Intensity* proved statistically significant as expected but the regression analysis of the added independent variable of *Drought Score* did not provide any grounds for correlation.

5.0 Discussion

In answering the overall research question regarding what types of regions and conflicts are vulnerable to the climate-conflict relationship, the analysis of this dataset proved quite useful. The sheer prevalence of moderate, severe, or extreme drought events amongst the 198 conflicts indicates that this natural phenomenon must have a notable influence on modern armed conflict dyads. 65% of the conflict observations involved at least a moderate drought event within a year prior to a year after the conflict instigated. As mentioned, climate change and drought do not singularly cause conflict, but they alter other factors that increase the likelihood of it occurring (Carleton, Hsiang, & Burke, 2016). Bretthauer's categorization of which states are most likely to resort to violence when faced with climate change-induced resource scarcity may aid in understanding this statistic (2017). He found that in order for climate change to lead to insecurity, it must affect the resources that people rely on to sustain livelihoods, which is apparent predominantly in neopatrimonial, oil-rich, and agrarian dependent regions (Bretthauer, 2017). This proposition would mean that states with the financial capacity and stability to offset the negative effects of drought would be less likely to resort to conflict. Likewise, droughts that are widespread and cross-border rather than localized may be more likely to lead to aggression if entire supply chains are impacted. Although this particular study focused on child soldier use, an interesting area of study to further explore would be to use the same dataset with different variables such as comparing conflict intensity to fluctuations in food prices and drought score or examining political stability in relation to drought. The potential of this dataset to continue to

explore different conflict mechanisms in relation to drought score is one of the most important outcomes of this study.

When answering the sub-research questions regarding the impact of climate change on recruitment of child soldiers, the results were significantly more inconclusive and are consistent with the null hypothesis. It seems that while there may be identifiable patterns between climate and conflict, bridging this connection to child soldier use or non-use is more difficult. It is likely that drought and resource scarcity play a role in conflict occurrence which inherently increases the risk for child soldiering. However, once the conflict is occurring, drought score is not useful as a predictor for whether actors will recruit children for this dataset. These results are contrary to the predictions made based upon a review of the existing literature and the willingness and opportunity theoretical approach. It was anticipated that given the links between climate change, resource scarcity and violent conflict, drought would be an indicator of child soldier use. Gurr's relative deprivation theory emphasizes that in times of resource scarcity causing a disparity between human need and access to resources, frustration and aggression is likely to occur (Gurr, 1970; Dzuverovic, 2013). The impacts of climate on child soldier recruitment were framed using the willingness and opportunity approach under the assumption that drought would exacerbate risk factors such as economic crisis, youth desperation, prevalence of unprotected refugee/IDP camps, lack of perceived alternatives, resource scarcity, poverty, long-term displacement, and a desire to alleviate suffering even if that means enrolling in armed forces. However, the P-value of 0.95 and the lack of pattern existent in Figure II indicate that using the dataset, there is no relationship between drought and child soldier use. It is accepted that climate change and conflict are highly complex problems, and the dataset may benefit from quantifying more control variables and nuanced drivers of willingness and opportunity alongside drought as a general

concept. This lack of relationship is an important finding as it allows for revisions to the dataset and methodology in order to further identify where climate change may be more specifically tied to recruitment drivers and encourages a more nuanced understanding of these links. There is a possibility that drought does not affect the supply and demand of child soldiers as strongly as anticipated, and other factors, such as conflict duration and intensity outweigh climate's influence. However, based on the reviewed literature, it still remains plausible that drought could be a contributing factor to the recruitment of child soldiers; this study proves that the relationship is not simple and that it is likely not drought that causes recruitment, but it is the societal constraints that drought creates that perpetuate this crisis. Figure III illustrates a potential relationship for drought's influence on recruitment that could be used for further quantitative and qualitative research.

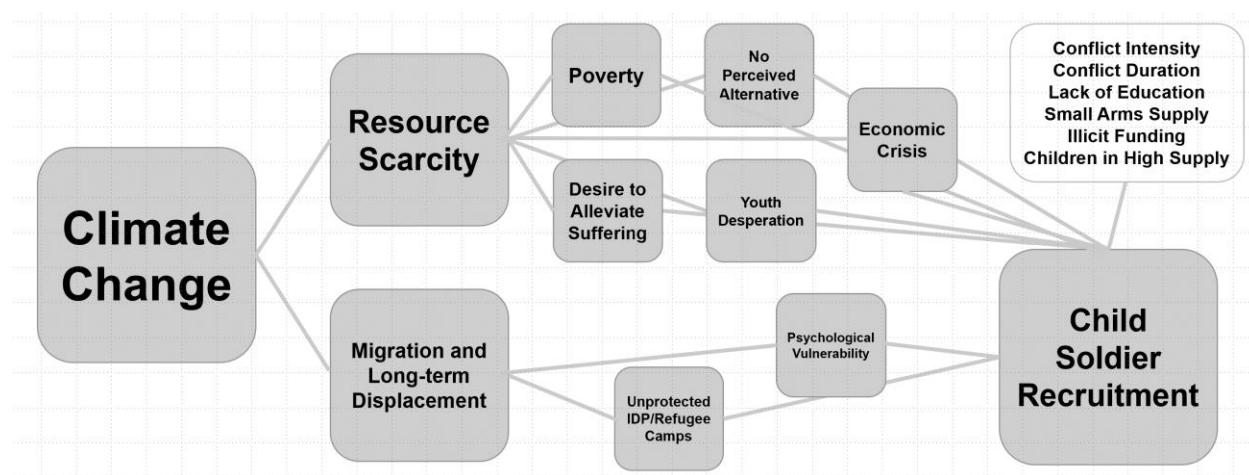


Figure III. A summary of some of the complex factors that are exacerbated by climate change and may also lead to child soldier recruitment.

5.1 Dataset Limitations

As anticipated, one major limitation of this study is in the accuracy of the dataset on the use of child soldiers. The Early & Tynes dataset provides a wide number of 198 observations, but each observation only confirms whether or not a child soldier was recorded as being used in

conflict by either the government or the armed group or both. A dataset which further details the number of children involved in each group or at what point in the conflict they were recruited would be more accurate in determining correlations. The current dataset codes the same number of units (one for each group in which children were confirmed) regardless of how many children may have been used. For example, if 1 child was used by a rebel group or if 1000 were used by the government, the value is the same. When comparing to drought using the willingness and opportunity framework, the underlying prediction is that as climate abnormalities cause constraints, more children will be recruited; this dataset does not sufficiently allow this to be evaluated.

The dataset was likewise limited by choosing to include only droughts that onset a year prior or within the first year of conflict in order to remain consistent with the other control variables used in the dataset. The results may have been different if all droughts that occurred at any point during the conflict were included or if the child soldier recruitment variable could be understood in a time scale of the conflict and the drought variable could be matched to point of recruitment rather than conflict instigation.

5.2 Confounding Variables

There are also two notable variables that would contribute to the accuracy of this study and may help in illustrating connections to drought. Due to the time constraint and lack of available data, these variables were not included in the large 198-observation dataset.

The first variable is agricultural dependence. During periods of resource scarcity, non-agrarian countries have been found to remain more peaceful as they have greater adaptive capacities (Bretthauer, 2017). The opposite is also true where drought is a critical driver, mostly in regions where the economy is closely tied to agriculture of unrest (Carleton, Hsiang, & Burke,

2016). Without controlling for agricultural dependence, the regions that experienced high drought scores but did not involve the use of child soldiers as the drought didn't increase desperation may skew the data. For example, the 1983-2002 conflict in Sudan (PRIO ID = 18) had a child soldier use of 2, meaning that both the government and the armed group in the dyad used children. It also had a drought score of 20 due to an extreme drought event occurring from July 1982 until July 1988, a total of 73 months long. According to the World Bank agricultural land index, which gives agricultural land as a percentage of total land. 36% of Sudan's land is used for agricultural purposes and would be adversely affected by drought (World Bank, 2021). 34% of Sudan's GDP is accounted for by the agriculture, forestry, and fishing industries (World Bank, 2020). Another example is the 2002 conflict in Turkey (PRIO ID = 159) which had no recorded child soldier use, but an extreme drought score event of 18 occurring prior to the conflict from July 2000 until December 2001. 49.1% of Turkey is deemed as agricultural land but it only accounts for 6.7% of their total GDP (World Bank, 2021; World Bank, 2020). Case studies like these would be important to delve further into to understand whether Turkey's smaller reliance on agriculture relative to Sudan influenced the use or non-use of child soldiers in these regions during extreme drought events. As with any cross-sectional approach, adding this variable would also have to account for the many other geographic, social, economic, and political differences between states like Sudan and Turkey as much as possible.

The second variable that should be added to the dataset is internally displaced peoples, especially as driven by climate change. Again, this particular study was too vast to find enough comprehensive data but perhaps a smaller study size with more thorough data and indicators on internally displaced peoples would be helpful. IDPs and refugees should be included as it is a variable both driven by drought and contributing to the supply of child soldiers. It is known that

climate change causes changes in human settlement and mobility and due to both long-term and short-term impacts will create many uninhabitable regions (Bettini, 2017). Likewise, IDPs were identified by Achvarina and Reich as a leading factor in the use of child soldiers given the ability of belligerent actors to access camps and either involuntarily or voluntarily recruit children (2006).

By accounting for agricultural dependence and prevalence of refugees/IDPs, researchers may be able to identify more subtle links between drought and child soldier recruitment.

5.3 Suggestions for Further Study

A common theme seems to be the dearth of reliable data on important indicators to understand climate-conflict relationships. As such, a primary need is for more comprehensive datasets on the use of child soldiers in conflicts, how and why they were recruited, and how many are being employed in different regions. It is very difficult to accurately find correlations when simply coding for use or non-use, albeit an important start.

To acknowledge the complexity and unique circumstances of these crises, perhaps a more qualitative and process-tracing approach is needed to initially identify how willingness and opportunity are affected by climate change. By examining select case studies more thoroughly, a mixed methods approach could then be taken with variables that are based on observed scenarios rather than broader theories or predictions. Therefore, it is recommended that case-specific research on how climate-indicators, like drought, have and continue to influence conflicts involving children is the next step, especially as long as data remains insufficient for conclusive quantitative research.

6.0 Conclusion

This study set out to aid in understanding how climate change as a conflict threat multiplier may impact the recruitment of child soldiers. The existing literature on both the climate-conflict nexus and factors influencing child soldier recruitment provides grounds for concern about how climate change may exacerbate the voluntary and involuntary risk factors for the unethical use of children. Gurr's relative deprivation theory as well as the willingness and opportunity framework were used to identify potential pathways of concern, such as resource scarcity and the displacement of peoples.

Specifically, this study employed a regression analysis method to examine 198 conflict dyads between government and rebel groups using drought score as a climate proxy. It built upon the variables previously used and analyzed by Tynes and Early to also account for an environmental factor under the hypothesis that there would be some correlation between child soldier use and drought severity. The results of this regression proved insignificant. The complexity of these issues is perhaps too vast to be controlled for in this dataset and the correlation between climate change and child soldier use is more indirect than anticipated. It is important to note, however, that drought seems to have a strong correlation to these conflicts given that 65% of conflict occurrences studied involved at least a moderate drought event. The research on this drought-conflict relationship is fairly robust, but the research on how drought influences specific mechanisms of conflict, such as child soldiers, is scarce. The application of child soldiers seems to be very situationally specific whereas the impact of drought on tensions is more straightforward. In the future, other quantitative and qualitative research on this issue must take into consideration the social, economic, and political nuances of each location regarding their recruitment or non-recruitment of children.

This study provides a narrative connecting key fields of research and identifies a new and urgent field of study. It is recommended that this issue be revisited with adjustments that account for the dataset limitations, the confounding variables, and the disadvantages of taking a broader quantitative approach. As the international community faces these dire challenges, actors must begin to understand how crises that are being tackled separately may overlap and multiply the negative impacts of other concurring crises. If the Responsibility to Protect children is to be fulfilled, an improved understanding of why these children are recruited and how climate change will alter these risks is imperative.

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Appendices

Appendix A: Raw Dataset

conflict_co	country	CSuse_B	Conflict D	Conflict Int	GDP p/C	Education	Child Pop.	Drought S	0=None; 1=0=None; 1
1	Iran	1	5	1	7	8	45	8	3
2	Philippines	1	6	1	6	9	42	18	3
2	Philippines	1	2	1	6	10	41	0	1
4	Paraguay	1	2	0	7	8	41	8	3
5	Myanmar	1	6	1	5	6	39	0	3
5	Myanmar	1	2	0	5	8	30	18	3
8	Myanmar	1	4	0	5	6	37	3	3
8	Myanmar	1	4	0	5	6	37	16	3
9	India	1	5	0	6	9	38	0	2
9	India	1	5	0	6	9	38	5	2
9	India	1	3	0	6	10	33	0	2
10	Myanmar	1	6	1	5	6	39	6	3
11	Israel	1	6	0	7	11	47	12	3
11	Israel	1	6	0	7	11	47	6	3
11	Israel	1	6	0	7	11	47	0	2
11	Israel	1	6	0	7	11	47	0	2
11	Israel	1	6	0	7	11	47	0	3
11	Israel	1	4	0	7	11	47	12	3
11	Israel	1	4	0	7	11	46	12	2
11	Israel	1	2	0	7	11	46	0	3
13	India	1	4	0	6	9	38	5	2
13	India	1	4	0	6	10	33	0	3
14	Myanmar	1	4	0	5	6	37	16	3
15	Iraq	1	5	1	7	9	46	4	1
15	Iraq	1	3	0	6	9	42	0	2
15	Iraq	1	4	0	6	9	42	0	2
15	Iraq	1	3	0	6	9	42	0	2
15	Iraq	1	3	0	7	9	42	0	2
15	Iraq	1	2	0	8	9	42	0	2
18	Myanmar	1	4	1	5	6	39	0	3
18	Myanmar	1	5	0	5	8	34	0	3
19	Ethiopia	1	5	1	5	3	45	0	3
19	Ethiopia	1	2	1	5	3	45	8	1
19	Ethiopia	1	4	1	5	3	45	8	3
20	Nepal	1	5	1	5	9	42	0	3
21	Iraq	1	6	1	7	9	46	4	1
21	Iraq	1	5	1	7	9	46	5	3
22	Ethiopia	1	5	1	5	3	45	10	3
23	Democrati	1	3	1	5	6	48	19	2
23	Democrati	1	4	1	5	6	48	19	3
23	Democrati	1	4	1	5	6	48	19	3
23	Democrati	1	3	1	5	4	48	19	3
24	Burundi	1	2	0	5	5	45	0	3
24	Burundi	1	4	1	5	4	47	10	3
24	Burundi	1	2	0	5	4	47	9	3
24	Burundi	1	5	1	5	4	47	9	3
24	Burundi	1	5	1	5	4	46	11	3
25	Chad	1	2	0	5	3	46	13	3
25	Chad	1	0	0	6	6	46	14	3
25	Chad	1	2	1	6	6	46	0	3
26	Columbia	1	6	1	7	8	38	8	3
26	Columbia	1	4	0	7	8	38	0	3
26	Columbia	1	6	1	7	8	38	3	3
26	Columbia	1	4	1	7	8	38	0	3
27	Peru	1	5	1	7	10	40	16	3
27	Peru	1	4	1	7	10	38	3	3
116	South Afrik	0	6	1	8	9	41	0	0
28	Cambodia	1	6	1	5	7	45	0	3
28	Cambodia	1	5	1	5	11	43	9	3
44	Afghanista	1	3	1	6	3	46	7	3
28	Cambodia	1	5	1	5	11	43	0	3
30	Philippines	0	5	1	6	9	42	12	0
30	Philippines	1	5	1	7	11	40	12	2
30	Philippines	1	5	1	7	11	40	12	2
31	Sudan	1	6	1	6	4	45	20	3
31	Sudan	1	2	1	6	4	43	0	1
31	Sudan	1	4	1	6	4	43	0	1
31	Sudan	1	2	1	7	5	41	7	1
31	Sudan	1	2	1	7	5	41	7	3
31	Sudan	1	2	0	7	5	41	7	3
31	Sudan	1	4	1	6	4	42	6	3
31	Sudan	1	4	1	6	4	42	6	3
33	Uganda	1	3	1	6	5	48	5	1
33	Uganda	1	2	1	6	5	48	3	3
33	Uganda	1	4	1	6	5	48	3	3
33	Uganda	1	5	1	5	5	49	9	3
33	Uganda	1	4	0	6	5	49	0	3
33	Uganda	1	2	0	6	5	49	0	3
33	Uganda	1	2	0	6	5	49	3	3
34	United Kin	1	6	0	9	13	19	8	2
34	United Kin	1	0	0	10	16	19	16	2
35	El Salvadc	1	5	1	7	8	44	7	3
37	Pakistan	1	4	0	6	6	39	21	2
37	Pakistan	1	3	0	6	6	39	8	2
39	Angola	1	6	1	7	7	47	0	3
41	Indonesia	1	6	1	6	9	38	21	1
42	Morocco	0	5	0	7	6	42	3	0
43	Mozambiq	1	5	1	5	4	47	15	3
43	Mozambiq	1	4	1	6	4	45	8	3
44	Afghanista	1	4	1	5	3	46	9	3
44	Afghanista	1	4	1	5	3	46	9	3
44	Afghanista	1	4	1	5	3	46	9	3
44	Afghanista	1	4	1	6	3	46	0	3
44	Afghanista	1	3	1	5	4	47	0	3
44	Afghanista	1	4	1	5	4	47	0	3
44	Afghanista	1	3	1	6	3	46	9	3
44	Afghanista	1	4	1	5	4	47	20	2
45	India	1	5	0	6	8	39	0	2
45	India	1	4	0	6	9	38	5	3
45	India	1	4	0	6	9	37	0	3
46	Nicaragua	1	5	1	7	7	47	0	3
47	Somalia	1	4	1	4	2	45	7	3

47	Somalia	1	4	1	5	2	45	0	3	2
47	Somalia	1	3	1	5	2	45	0	3	2
47	Somalia	1	3	0	6	2	44	0	3	2
47	Somalia	1	3	1	6	2	45	6	3	2
48	Iran	1	5	1	7	8	45	20	1	1
49	Liberia	1	4	1	6	4	45	7	3	2
49	Liberia	1	4	1	6	4	45	7	3	2
49	Liberia	1	4	1	5	9	44	0	3	2
49	Liberia	1	2	1	5	9	44	3	3	2
50	Spain	1	4	0	9	12	23	6	2	1
119	South Afric	0	4	0	8	9	41	5	0	0
51	India	1	5	0	6	8	39	19	2	1
51	India	1	5	0	6	9	37	19	2	1
51	India	1	2	0	6	9	37	0	2	1
52	Sri Lanka	1	6	1	6	9	34	13	2	1
53	Turkey/Ott	1	5	1	7	7	39	0	2	1
53	Turkey/Ott	0	2	0	8	8	31	19	0	0
53	Turkey/Ott	0	4	0	8	8	31	0	0	0
54	Togo	0	0	0	6	7	46	9	0	0
55	Comoros	0	0	0	6	6	46	0	0	0
57	India	1	5	1	6	8	38	12	2	1
58	India	0	4	0	6	9	38	5	0	0
59	Indonesia	1	5	1	6	10	36	21	2	1
60	Panama	0	0	0	8	10	35	6	0	0
62	Papua New	1	4	0	7	5	42	18	3	2
63	Romania	0	0	0	8	14	24	10	0	0
65	Mali	0	2	0	6	3	45	14	0	0
65	Mali	0	1	0	6	3	46	0	0	0
65	Mali	0	1	0	6	6	45	0	0	0
66	Niger	0	2	0	6	2	49	0	0	0
66	Niger	0	2	0	6	3	49	8	0	0
66	Niger	0	0	0	5	3	49	14	0	0
67	Rwanda	1	4	0	6	6	49	0	3	2
67	Rwanda	1	4	1	5	6	49	0	3	2
68	Senegal	1	5	0	6	4	47	16	2	1
71	Trinidad and	0	0	0	8	10	34	0	0	0
72	Djibouti	1	4	0	7	3	44	0	2	1
72	Djibouti	1	2	0	7	3	41	0	2	1
74	Haiti	0	0	0	6	5	43	7	0	0
74	Haiti	0	0	0	6	5	43	9	0	0
74	Haiti	1	2	0	6	5	38	0	1	1
74	Haiti	1	2	0	6	5	38	0	3	2
75	Sierra Leone	1	5	1	5	4	42	6	3	2
75	Sierra Leone	1	4	1	6	4	42	0	3	2
75	Sierra Leone	1	3	1	6	4	42	0	3	2
75	Sierra Leone	1	2	1	5	4	42	6	2	1
75	Sierra Leone	1	0	0	5	4	42	6	2	1
76	Turkey/Ott	0	3	0	8	8	36	13	0	0
76	Turkey/Ott	1	1	0	8	9	29	4	2	1
77	Yugoslavia	0	0	0	8	11	23	14	0	0
78	Yugoslavia	1	2	1	8	11	23	14	3	2
78	Yugoslavia	1	2	1	8	11	23	14	1	1
79	Algeria	1	2	0	7	9	43	0	2	1
79	Algeria	1	5	1	8	9	43	9	2	1
79	Algeria	1	2	1	8	9	43	9	2	1
79	Algeria	1	4	1	8	9	40	9	2	1
79	Algeria	1	5	1	7	11	43	3	2	1
79	Algeria	1	2	0	8	12	30	7	2	1
80	Angola	1	4	0	7	6	48	14	3	2
80	Angola	1	4	0	7	6	48	9	3	2
82	Bosnia and	1	4	0	7	9	24	11	3	2
82	Bosnia and	1	4	0	7	9	24	11	3	2
83	Croatia	1	2	0	9	13	21	9	3	2
83	Croatia	1	4	0	9	13	21	9	3	2
87	Moldova	0	2	0	7	12	28	6	0	0
88	Tajikistan	1	3	1	6	11	43	0	2	1
88	Tajikistan	1	3	0	5	12	44	2	2	1
89	Azerbaijan	0	0	0	7	14	34	0	0	0
89	Azerbaijan	0	0	0	6	11	34	0	0	0
91	Bosnia and	1	3	1	7	9	24	11	3	2
93	Mexico	1	0	0	8	10	36	13	3	2
94	Russia (Sc	1	3	1	8	14	21	0	3	2
95	Yemen (Ar	1	2	1	7	7	50	0	3	2
97	Pakistan	1	4	0	6	4	43	0	2	1
97	Pakistan	1	2	0	7	6	39	2	2	1
101	Comoros	1	1	0	6	7	44	0	2	1
102	Congo	1	2	0	7	11	44	9	3	2
102	Congo	1	4	0	7	11	44	9	3	2
102	Congo	1	3	1	7	10	43	7	3	2
104	Guinea-Biss	1	2	1	5	4	41	8	3	2
106	Lesotho	0	1	0	6	9	44	0	0	0
106	Yugoslavia	1	3	1	8	11	22	0	3	2
107	Ethiopia	1	5	1	5	4	45	0	3	2
108	Russia (Sc	1	0	0	8	14	18	0	2	1
109	Uzbekistan	0	1	0	7	10	37	13	0	0
109	Uzbekistan	0	2	0	6	11	33	0	0	0
110	Central Afr	1	2	0	6	5	42	8	3	2
110	Central Afr	1	0	0	6	5	42	15	2	1
111	Macedonia	1	1	0	7	11	22	20	2	1
112	United Sta	1	4	1	10	12	22	9	2	1
113	Cote d'Iv	1	3	0	6	6	42	11	3	2
113	Cote d'Iv	1	1	0	6	6	42	11	3	2
113	Cote d'Iv	1	3	0	6	6	42	11	3	2
113	Cote d'Iv	1	2	0	7	6	41	11	3	2
114	Democrat	1	2	0	5	4	48	18	1	1
115	Niger	0	3	0	6	4	49	2	0	0