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# Catalysts and Accelerants: Untangling the Linkages between Climate Change and Mass Atrocities

John Riley and Will Atkins

**Abstract:** This paper examines whether the latest round of climate change is creating the structural conditions that support the occurrence of mass atrocities. The argument here is that climate change interacts with the level of a state's fragility and increases the likelihood of a mass atrocity—however, it is not doing so in the way that is commonly expected. Mass atrocities are more likely to be caused by climate change in relatively stable states than in fragile states. Fragile states are already likely to endure mass atrocities, and the effects of climate change have little additional impact. On the other hand, when relatively stable countries are exposed to climate change and lack the adaptive capacity to respond, their decision-makers or military leadership may conclude that committing a mass atrocity to solve a political or national security problem to be a valid strategic option.

**Keywords:** Mass Atrocities; Genocide; Climate Change; State Fragility; Adaptive Capacity

## Introduction

A hotter planet does not necessarily mean a more violent one. In fact, as at least one finding suggests, climate change may ultimately lead to greater levels of peace via industrialization and democratization.<sup>1</sup> What is certain, however, is that climate change can lead to destabilizing political outcomes. From the “exceptional climate stability” characterizing the centuries during the Roman Empire's rise<sup>2</sup> to the unprecedented desertification that may have helped upend the Akkadian Empire,<sup>3</sup> the world's climate has been continuously changing and thereby challenging those poorly prepared, while favoring those with the right political, economic, and social mix.

Research, however, suggests that we are witnessing something new and catastrophic. Human activities have caused an imbalance to the climate system, causing global temperatures to rise 2.1 degrees since 1980.<sup>4</sup> For both developing as well as fully developed states, the national security concerns are as alarming as they are varied.<sup>5</sup> From rising oceans to more virulent and frequent natural disasters, the territorial integrity of many countries will be challenged, and the ability of most governments to provide for the safety and security of their citizens will be tested.<sup>6</sup> One potential extreme outcome would be a proliferation of mass atrocities.

This paper examines whether this latest round of climate change is creating the structural conditions that support the occurrence of mass atrocities; the “large-scale, systematic (extensive, organized, widespread, sustained) violence against civilian populations and other noncombatants”<sup>7</sup> resulting in a thousand or more civilian deaths in a calendar year. The argument here is that climate change interacts with the level of a state's fragility and increases the likelihood of a mass atrocity. However, this effect is not

occurring in the way that is commonly expected, as mass atrocities are more likely to be caused by climate change in relatively stable states than in fragile states. This may seem counter-intuitive at first glance, but as we will show, fragile states are already likely to endure mass atrocities, and the effects of climate change have little additional impact. On the other hand, when relatively stable countries are exposed to climate change and lack the adaptive capacity to respond, their decision-makers or military leadership may conclude that committing a mass atrocity to solve a political or national security problem to be a valid strategic option.

This paper unfolds according to the following. The next section reviews the causes of mass atrocities, and it examines how climate change may produce accelerant, catalytic, or resource scarcity effects leading to more frequent or more intense mass atrocities. In doing so, it attempts to offer a degree of causal clarity allowing for hypotheses to be specified and tested. We then describe the methods used to test these hypotheses, as well as the findings, concluding with a discussion of the implications these findings suggest.

## Review of the Literature

Why do regimes commit mass atrocities? Despite extensive quantitative and case study analysis, there is no agreed upon model.<sup>8</sup> However, some general patterns have emerged.<sup>9</sup> Most notably, the conditions of war,<sup>10</sup> or civil war,<sup>11</sup> enable the creation of mass atrocities. Not surprisingly, since the Holocaust, the role of ideology<sup>12</sup> and modernity<sup>13</sup> have both been central to many analyses, and regime types,<sup>14</sup> economic and political discrimination,<sup>15</sup> new state status,<sup>16</sup> and the threat posed by rebels against the state,<sup>17</sup> have all played critical roles in creating the conditions for mass atrocities to occur.

Despite lacking a unifying theory on mass atrocities, virtually all modern analyses reject the idea that the atrocities are spontaneous, irrational, or an inevitable byproduct of war. Rather, as Benjamin Valentino put it, there is a strategic logic to mass killing, and they “occur when powerful groups come to believe it is the best available means to accomplish certain radical goals, counter specific types of threats, or solve difficult military problems.”<sup>18</sup> That is, a mass atrocity can be understood as a product of a means-ends analysis, or a strategy that advances the interests of certain decision-makers. As such, the decision to commit a mass atrocity may become as much a resource and logistical question as much as it may be a political one. That is, “The same logistical constraints that apply to warfare extend to violence against civilians...[and] As logistical challenges mount, a combatant loses the capacity to repress, kill, and destroy on a massive level.”<sup>19</sup> Consequently, like any other government function, how successful a mass atrocity will be is in part a function of the effectiveness of the actor.<sup>20</sup> Finally, mass atrocities often are committed at critical points when the government’s legitimacy is threatened or perceived to be under siege. For example, “militaries might decide to launch genocidal campaigns during periods of rapid political change when they perceive a serious threat of their political and economic interests or the institution’s longstanding status as the ‘guardian of the nation’”<sup>21</sup> As such,

mass atrocities might be the final product of a reactionary effort<sup>22</sup> to preserve a regime's perceived legitimate right to rule.

In sum, the literature suggests that neither war nor the degree or state fragility (countries governed by varying degrees of illegitimate and ineffective regimes) cause mass atrocities; however, these conditions do create the situational factors that may lead policy-makers to view a mass atrocity as a viable policy option. From this perspective, how could climate change facilitate the political conditions that would lead decision-makers to conduct a mass atrocity to solve a military or political challenge?

The study of the possible relationship between climate change and mass atrocities is still under development,<sup>23</sup> and it is situated in the much larger, albeit inconclusive, research on climate change and conflict.<sup>24</sup> Mass atrocities include some genocides (“an intent to destroy, in whole or in part, a national, ethnical, racial or religious group”<sup>25</sup>) as well as other types of systematic violence against civilians (such as democide or ethnocide).<sup>26</sup>

Thus far, two schools of thought have theorized how climate change might lead to mass atrocities. First, the Stimson Center theorizes that climate change may produce mass atrocities by acting as an “accelerant.” From this perspective, climate change exacerbates existing “ethnic, religious, and other tensions” that can create a vortex of political instability leading to a mass atrocity.<sup>27</sup> There is a certain appeal to the analogy of an accelerant igniting existing tensions,<sup>28</sup> and it may be what UN Secretary General Ban Ki-moon meant when he drew a thread from man-made greenhouse emissions to the drought in Darfur to the conflict engulfing the region.<sup>29</sup> However, as many critics have suggested, the apparent timing of droughts in Sudan and Syria are not enough to conclude that the effects of climate change played a causal role in creating those mass atrocities.<sup>30</sup> At a minimum, the term ought to be used with greater precision.

Greater clarity is gained by sorting out climate change's potential role as either a catalyst or an accelerant in causing or exacerbating mass atrocities. As a catalyst, climate change may be initiating, or interacting with other factors to initiate, a mass atrocity. If climate change requires an interaction with other factors, such a line of reasoning would suggest that climate change is a necessary but not a sufficient cause of mass atrocities. As an accelerant, the claim is that climate change could make mass atrocities more intense, resulting in increased death counts. If correct, then climate change is not necessarily a critical factor in initiating mass atrocities, but its effects make the atrocities more horrific. Once untangled, these more precise concepts can then be tested in a series of hypotheses.

Hypotheses 1a: As exposure to climate change increases, the likelihood of a mass atrocity occurring increases.

Hypotheses 1b: As exposure to climate change increases, the intensity (number of deaths) of a mass atrocity increases.

However, the impact of the exposure to climate change may be mitigated by the state's adaptive capacity: "the latent ability of a system to respond proactively and positively to stressors or opportunities."<sup>31</sup> That is, the expectation is that some states are better prepared than others to manage their exposure to climate change.

Hypotheses 2a: As a state's adaptive capacity decreases, the likelihood of a mass atrocity occurring increases.

Hypotheses 2b: As a state's adaptive capacity decreases, the intensity of a mass atrocity increases.

Returning to the mass atrocity literature reviewed above, climate change effects may interact with the factors associated with producing the atrocities. Of particular interest is a state's effectiveness and legitimacy and thereby its overall level of fragility.

As droughts and violent weather patterns increase and sea levels rise, traditional living patterns often change. A government's effectiveness (the ability to provide core government services) comes under pressure. This lack of effectiveness could cause a mass atrocity in a number of ways, especially if the areas most impacted by climate change had a history of conflict or follow ethnic, racial, or religious patterns of divisions. The government may come to view a mass atrocity as a strategic opportunity. For example, this may have been what happened in 2008 in Burma when the ruling military junta initially refused to accept aid or allow relief workers into the Irrawaddy Delta region after Cyclone Nargis devastated the region. At least 84,500 died and an additional 53,800 went missing,<sup>32</sup> and the cyclone provided a useful opportunity to deny vital aid to the "non-Burmese people,"<sup>33</sup> press forward with a national referendum, and undercut support for the Karen National Union.

Legitimacy, the citizens' perception of who has the right to rule, may play a critical role as well. If a government is unable to provide core services to their citizens, increasingly parts of the populous will no longer see the government as legitimate. Citizens will turn to alternative governance solutions (such as non-sanctioned political institutions, police, and military) to provide for their needs. For example, escaping the violent and unpredictable weather patterns in eastern Nigeria, cattle herders have migrated into Nigeria's Western belt.<sup>34</sup> This has led to violent conflict between the Hausa-Fulani and the local farmers, and local governments standing up paramilitary "police forces."<sup>35</sup> Indeed, such migration has long been considered a significant factor as both a result of climate change, and as a catalyst of state fragility.<sup>36</sup>

Taken together, effectiveness and legitimacy comprise the fragility of the state (or in positive terms, the stability of a state). The expectation is that as states become more fragile the likelihood and the intensity of a mass atrocity increases.

Hypothesis 3a: As a state's fragility increases, the likelihood of a mass atrocity increases.

Hypothesis 3b: As a state's fragility increases, the intensity of a mass atrocity will increase.

A second approach theorizes that climate change may lead to resource scarcity, and the subsequent competition for diminishing resources would result in mass atrocities. At the interstate level, concern over food supplies could lead to panic, and cause the more powerful states to see a “human group as the source of the ecological problem.”<sup>37</sup> As Zimmerer argues, even the perceived threat of resource scarcity might lead governments to see people perceived as superfluous who “would have to disappear, leave the region, or be killed.”<sup>38</sup> Along the same lines of reasoning, a competition of nonrenewable resources, such as “extreme energy competition” might lead to an ecocide.<sup>39</sup> Hendrix also argues that demographic-environmental stress is more likely to produce a mass atrocity in societies with a high degree of groupness operating in a political system that places little restraint on its government.<sup>40</sup>

Additionally, the intensity of these conflicts may increase for at least two reasons. On the one hand, resource scarcity can increase the motivation “to acquire or defend resources by the use of violence, individually or collectively”<sup>41</sup> because both the aggressor and defender inherently view violence as an acceptable means. On the other hand, countries facing these pressures may fragment, and become more vulnerable to future violence.<sup>42</sup> This school of thought therefore provides the final set of hypotheses:

Hypothesis 4a: As food and water scarcity increases the likelihood of a mass atrocity increases.

Hypothesis 4b: As food and water scarcity increases the intensity of a mass atrocity increases.

## Data and Methods

To test these hypotheses, a novel dataset was constructed by merging several existing datasets together. To determine the catalysts of mass atrocity, the Political Instability Task Force (PITF) datasets for ethnic wars, revolutionary wars, and genocide/politicide were utilized, coding those that exceeded 1,000 deaths per year with a dummy variable indicating the occurrence of a mass atrocity.<sup>43</sup> The remaining states were coded as lacking such an atrocity. These datasets were specifically chosen, as PITF describes the deliberate killing of non-combatant civilians in the context of wider political conflicts.

To analyze the accelerants of mass atrocity, the same PITF dataset was utilized, which also provides a best estimate for the number of deaths caused by each instance of a mass atrocity. To these data, climate change information from the University of Notre Dame’s Global Adaptation Index (GAIN) was appended.<sup>44</sup> These GAIN data provide measures of a country’s exposure to climate change, as well as levels of food and water scarcity. Measures of state fragility were also included, provided by the Center for Systemic Peace’s State Fragility Index.<sup>45</sup>

All variables were scaled and transformed such that increases in any particular variable illustrated a more negative outcome (i.e., up is bad). The resulting dataset contained 3,780 case-years covering all nations from 1995 to 2018, with periodic gaps in coverage.

To test the (a) versions of each hypothesis—that of independent variables as catalysts—a binary logistic regression was conducted across all countries and years available, using the presence of an atrocity as the dependent variable. That is, each of the independent variables were analyzed according to their ability to increase the likelihood of an atrocity occurring. Independent variables that were included are: exposure to climate change (Hypothesis 1a), adaptive capacity (Hypothesis 2a), state fragility (Hypothesis 3a), and food and water scarcity (Hypothesis 4a).

To test the (b) versions of each hypothesis—that of independent variables as accelerants—an ordered logit regression was conducted across the same countries and years available, using the categorized magnitude of fatalities as the dependent variable. The same independent variables were analyzed to determine their ability to increase the severity of a mass atrocity, once one has begun. The same independent variables were included: exposure to climate change (Hypothesis 1b), adaptive capacity (Hypothesis 2b), state fragility (Hypothesis 3b), and food and water scarcity (Hypothesis 4b).

## Results

The calculation of catalytic effects was conducted using a logistic regression, with the occurrence of a mass atrocity as the binary dependent variable.

**Table 1. Models 1 and Model 2 (Non-Interactive Effects)**

IVs	Model 1 (Catalysts) Binary Logit DV: Occurrence of Atrocity			Model 2 (Accelerants) Ordered Logit DV: Number of Deaths		
	Odds Ratio	% Change in Odds		Odds Ratio	% Change in Odds	
Exposure to Climate Change	1.094	+9.4%	**	0.976	-2.4%	
Adaptive Incapacity	1.084	+8.4%	**	1.015	+1.5%	
Food Scarcity	0.950	-5.0%	**	0.970	-3.0%	
Water Scarcity	1.041	+4.1%	**	1.029	+2.9%	**
State Fragility	1.557	+55.7%	**	1.122	+12.2%	**
Constant	0.000		**			
<b>Number of Cases</b>		<b>3,780</b>			<b>268</b>	
<b><math>\chi^2</math></b>		<b>666.41</b>			<b>16.02</b>	
<b>Probability &lt;</b>		<b>0.0001</b>			<b>0.0001</b>	
<b>Pseudo R<sup>2</sup></b>		<b>0.3444</b>			<b>0.0290</b>	

**Notes:** Cell entries are odds ratios, based on unstandardized binary logistic (Model 1) and ordered logistic (Model 2) regression coefficients and standard errors. These odds ratios have been transformed into the percentage change in odds of an atrocity occurring (Model 1), or that a higher threshold of deaths will be reached. Constant indicates baseline odds (Model 1). Ordered logits do not contain baseline odds.

\*p < 0.10; \*\* < 0.05 (two-tailed)

In analyzing the catalytic hypotheses, Model 1 unsurprisingly finds that many of the theorized causes of mass atrocities do, in fact, lead to a higher likelihood of an atrocity occurring—consistent with theoretical expectations. The one exception to these expectations is that of food scarcity, which shows a decrease in the likelihood of an atrocity occurring. We theorize that this results from the fact that many countries with no observable food shortages (e.g., Israel, Turkey, and Colombia) are just as likely to commit an atrocity as those with shortages (e.g., DR Congo, Somalia, and Chad). What this also means, however, is that the prevailing theory of drought-caused food shortages in Syria being the source of atrocities<sup>46</sup> may be called into question or may simply be an outlier compared to the global dataset. In fact, GAIN data show that Syria had experienced higher levels of food scarcity throughout the 10 years prior to the droughts in 2008-2010, without resorting to a mass atrocity. This is not to say that food shortages have no effect on the likelihood of a mass atrocity occurring, but that in and of itself, food scarcity alone cannot cause an atrocity. Food scarcity would need to be paired with some sort of state fragility, or in the case of the Arab Spring, rising expectations that the government should address widespread hunger, which may be met with brutal force, should the government believe its legitimacy is in question.

Having identified those variables that are expected to act as catalysts for mass atrocity, we now turn to determining which of these variables might act as an accelerant—making death tolls higher—once an atrocity has begun.

Analysis of the accelerant hypotheses is challenging due to the much lower number of case-years where an atrocity has occurred. As a result, evaluating each variable's effect on the number of deaths caused (once an atrocity has begun) yields sparse results. Although water scarcity and state fragility appear to have some effect on the likelihood of increased deaths, the overall model performs rather poorly (Pseudo-R<sup>2</sup> of 0.029).

Interpreting the results of Models 1 and 2 might lead one to believe that although state fragility is the largest catalyst of atrocities, exposure to climate change is a larger catalyst than a state's adaptive capacity, or scarcity of food and water. From Model 1, one might also conclude that climate change increases the likelihood of a mass atrocity for all nations by 9.4 percent. Similarly, one might also conclude that none of these variables have much of an effect on the magnitude of killing that occurs during these atrocities (Model 2). However, these interpretations would be incomplete, as these models hide the nonlinear effects of climate change on fragile nations.

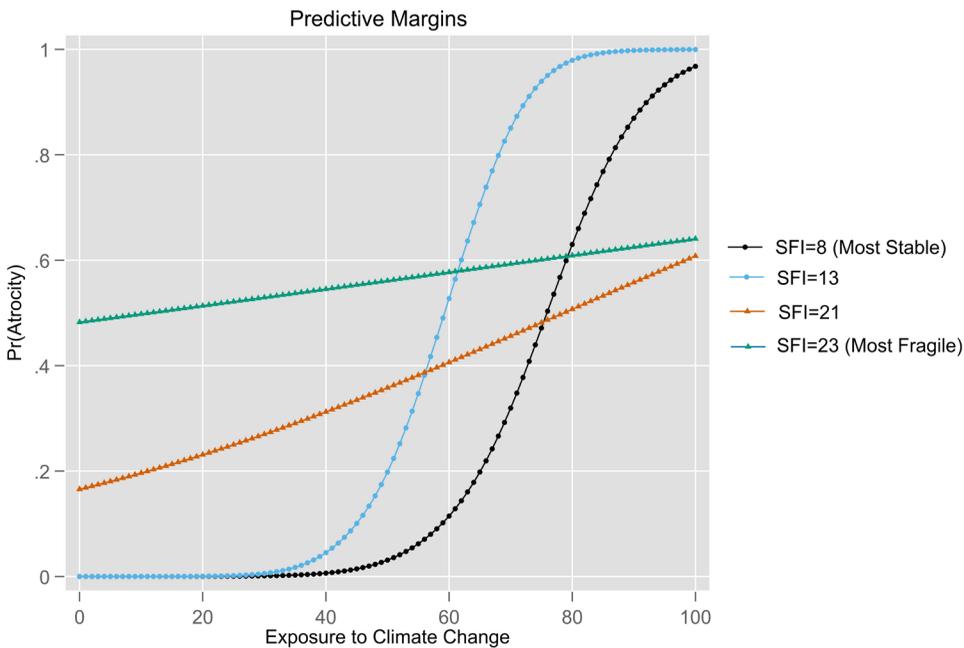
Returning to the mass atrocity literature, the Stimson Institute and Center for Naval Analysis have theorized that climate change effects may act as “force multipliers” with the factors associated with producing the atrocities. Of particular interest is a state's effectiveness and legitimacy and thereby its overall level of fragility. In truth, these very interactive effects between exposure to climate change and a state's level of fragility are what provide profound insights into the effects of climate change on mass atrocities.

Model 3 includes the interaction of exposure to climate change and the level of state fragility, as theorized above. Here, state fragility becomes a much larger catalyst of mass atrocities around the world. Additionally, Model 3 also reveals that climate change in and of itself does not increase the likelihood of a mass atrocity occurring in a given nation (Hypothesis 2a). Instead, what we see is that climate change primarily acts as a catalyst for atrocities in those nations that we would normally categorize as stable. This can be more clearly observed in Figure 1, which plots the effects of climate change across four different levels of state fragility. For those nations that are the most fragile, climate change provides a positive, but marginal, effect on the probability of mass atrocity occurrence, as those fragile nations are already quite prone to atrocities regardless of the presence of climate change. As a result, exposure to climate change in nations such as Afghanistan, DR Congo, or Sudan has little effect on the likelihood of an atrocity occurring.

On the other hand, climate change has a substantial effect for more stable nations, causing an exponential increase in the probability for atrocity in these traditionally immune nations. Here, it becomes clearer that even the most stable nations are not immune to committing atrocities as the effects of climate change increase. Such examples would include Russia, Thailand, and Indonesia, each with relatively stable governments prior to committing an atrocity,<sup>47</sup> experiencing high levels of exposure to climate change, and ultimately initiating an atrocity in a particular year. Therefore, while climate change has little effect on the probability of atrocity for fragile states, it can certainly act as a catalyst for more stable nations.

The remainder of the explanatory variables in Model 3 remain statistically significant with similar magnitudes as from Model 1.

**Figure 1. Effect of Climate Change and Fragility on Probability of Atrocity**



Turning once again to the accelerants of mass atrocities, despite the low number of observations, several additional conclusions can be drawn from Model 4. First, a nation's fragility, adaptive capacity, and water scarcity are the only variables that exhibit both catalytic and accelerant properties. Additionally, state fragility remains the largest accelerant of civilian deaths, albeit with a lower level of statistical significance. More importantly, exposure to climate change provides no effect as an accelerant on the likelihood of increased number of deaths—either by itself, or when interacted with the level of fragility present in the particular nation.

**Table 2. Models 3 and 4 (Interactive Effects)**

IVs	Model 3 (Catalysts) Binary Logit DV: Occurrence of Atrocity		Model 4 (Accelerants) Ordered Logit DV: Number of Deaths	
	Odds Ratio	% Change in Odds	Odds Ratio	% Change in Odds
Exposure to Climate Change	1.043	+4.3%	1.057	+5.7%
Adaptive Incapacity	1.109	+10.9% **	1.102	+10.2% **
Food Scarcity	0.960	-4.0% **	1.006	+0.6%
Water Scarcity	1.045	+4.5% **	1.036	+3.6% **
State Fragility	2.519	+151.9% **	1.887	+88.7% *
<b>State Fragility * Exposure to Climate</b>				
0 ( <i>Least Fragile</i> )	1	(empty)		(empty)
1	1	(empty)		(empty)
2	1	(empty)		(empty)
3	1.190	+19.0% **		(omitted)
4	1.226	+22.6% **	1.079	+7.9%
5	1.228	+22.8% **	1.092	+9.2%
6	1	(empty)		(empty)
7	1.121	+12.1% *	0.892	-10.8%
8	1.110	+11.0% *	0.924	-7.6%
9	1.159	+15.9% **	0.920	-8.0%
10	1.116	+11.6% **	0.947	-5.3%
11	1.103	+10.3% **	0.932	-6.8%
12	1.105	+10.5% **	0.944	-5.6%
13	1.086	+8.6% **	0.904	-9.6%
14	1.076	+7.6% **	0.911	-8.9%
15	1.044	+4.4%	0.927	-7.3%
16	1.045	+4.5% *	0.898	-10.2%
17	1.018	+1.8%	0.890	-11.0%
18	1.023	+2.3%	0.888	-11.2%
19	0.986	-1.4%	0.853	-14.7%
20	0.999	-0.1%	0.890	-11.0%
21	1.004	+0.4%	0.897	-10.3%
22	1.004	+0.4%	0.880	-12.0%
23	0.997	-0.3%	0.855	-14.5%
24	1	(omitted)	0.867	-13.3%
25 ( <i>Most Fragile</i> )	1	(empty)	0.849	-15.1%
<b>Constant</b>	0.000	**		
<b>Number of Cases</b>	<b>2,738</b>		<b>268</b>	
<b><math>\chi^2</math></b>	<b>605.93</b>		<b>93.28</b>	
<b>Probability &lt;</b>	<b>0.0001</b>		<b>0.0001</b>	
<b>Pseudo R<sup>2</sup></b>	<b>0.3480</b>		<b>0.1690</b>	

**Notes:** Cell entries are odds ratios, based on unstandardized binary logistic (Model 3) and ordered logistic (Model 4) regression coefficients and standard errors. These odds ratios have been transformed into the percentage change in odds of an atrocity occurring. Constant indicates baseline odds (Model 3). Ordered logits do not contain baseline odds.

\* $p < 0.10$ ; \*\*  $< 0.05$  (two-tailed)

## Conclusion

This study supports several main findings. First, exposure to climate change per se is neither a catalyst nor accelerant for mass atrocities. This is hardly surprising as no serious person is arguing that simply because the seas and the temperature are rising that people are going to kill thousands of innocent people. The commission of mass atrocities is a political act—albeit a horrific one—that is committed because key decision-makers see it to be advancing their larger strategic interests. If climate change is going to lead to mass atrocities, it has to be part of that larger political puzzle.

Second, findings presented here offer weak support at best for the claim that droughts and food shortages cause mass atrocities. Food and water are vital resources and countries do go to war over them, and, after conquering a territory, a state may seek to eliminate the residents (e.g., Nazi Germany after its invasion of Poland); however, the findings here do not support the hypothesis that systematic incidents of that sort have taken place since 1995.

Third, findings here refute the claim that exposure to climate change acts as an accelerant after a mass atrocity has already begun. There is nothing uniquely horrific (as measured by deaths) about mass atrocities that also have exposure to climate change.

Having noted these negative findings, this study does suggest that climate change may have acute causal impacts on mass atrocities. A state's fragility, adaptive capacity, and water scarcity exhibit both catalytic and accelerant properties. Additionally, and most importantly, exposure to climate change acts as a catalyst for relatively stable states, but climate change has little additional effect on the likelihood of fragile states committing mass atrocities. This insight may prove exceptionally important in future research and prevention efforts. For instance, we might learn more from case study analyses investigating the differing effects of climate change on Russia (relatively stable) and the Sudan (very fragile). Moreover, this finding would suggest that mass atrocities are going to take place in fragile states regardless of climate mitigation effects: other intervention efforts are required.

Moving forward, more granular research is needed. For instance, the findings presented in this study were based on data that consolidated scores for entire countries, and this, of course, can be very misleading. That is, the mean area in which an atrocity took place was between 10-25 percent of the size of the state, whereas many of the explanatory variables being used were state-wide averages (e.g., state-wide levels of resource scarcity or government legitimacy). Uganda is an excellent illustration. It is a medium-size country, and it typically produces a strong legitimacy score. However, northern portions of the country contain pockets of people who are highly dissatisfied with President Museveni's government. Moreover, the violence has been largely contained to the north. State-wide scores of legitimacy would tend to obscure this important variation.

One intent of this paper was to start the process of untangling the possible relationships between climate change and the occurrence mass atrocities. This paper's findings suggest

that climate change may be playing a virulent role in producing mass atrocities in otherwise stable states. However, climate change's role is likely more complicated—and possibly more consequential—than these findings support. Additional large-n statistical studies buttressed by in-depth case study analysis are needed.

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## Endnotes

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**REFERENCES:** JPWS uses *The Chicago Manual of Style's* notes and bibliography system with endnotes. For further information on references, please consult *The Chicago Manual of Style*, 17th edition.

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