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## **Climate Change as a Dangerous Accelerant of Mass Atrocity**

**Jesse Jenkins**

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*Investigating potential connections between mass atrocity and climate change reveals that the vulnerability of food systems may be a valuable predictive factor in understanding which states will respond to climate change with violence.*

"Food is the basis of the empire. Yellow gold and ten thousand strings of cash cannot cure hunger. What avails a thousand boxes of pearls to him who is starving of cold?" [1] - King Senka

### **Introduction**

An ongoing study by Dr. John Riley and Lt Col William Atkins shows that strong states tend to be able to cope well with the effects of climate change and not turn to violence.[2] They also argue that the weakest states are already broken and on the path to committing a mass atrocity regardless of the effects of climate change.[3] This leaves a middle section of states who are not too weak and not too strong. When some of these middle states experience the impacts of climate change, they turn to mass atrocity.[4] These climate change-induced mass atrocities may occur due to the state's inability to provide for a displaced and needy population or the unwillingness of their leaders to deal with the situation. Whatever the reason may be, the response seen in the middle section is inconsistent; two states may appear similar by certain broad metrics, but only one of them commits a mass atrocity. The next question at hand is why we see this inconsistent response in this "Goldilocks zone." [5]

### **Literature Review**

This study will rely heavily on qualitative analysis that I will complete in two sections. The first section is a historical case study from the following three books: H.H. Lamb's *Climate, History, and the Modern World*, David Keys' *Catastrophe: An Investigation into the Origins of the Modern World*, and Michael Coe & Stephen Houston's *The Maya*. Relevant excerpts from these works provide us with a basic understanding of what other factors have historically been present in times of climate change-induced devastation. From this, I will build a working theory that attempts to explain the factors that must be present for climate change's effects to be magnified. Second, I will conduct a case study of Nigeria, South Sudan, and Syria.

These three states have experienced violence in the wake of climate change. I will work to identify whether or not the factors from my historical review are present in these case studies. These two qualitative endeavors will form a more substantiated theory, which will finally be tested through a quantitative analysis.

### **Climate Change and the Modern World**

Lamb outlines a comprehensive history of climate change and the effects it has had on humanity. From his work, we observe numerous examples of climate change affecting food sources. Regardless of whether the food shortage is caused by drought or overpopulation, we see how food insecurity exacerbates whatever conditions are present at that point in time. Closely related to food security is the population. Fast-growing populations in the past have found themselves especially vulnerable to climate change-induced famine when the food source fails to grow at similar rates.[6]

Lamb's first example of climate change affecting food supply comes with the Black Death. The drought that preceded the epidemic served to spark famine that left the British population especially vulnerable to the deadly disease. "Before the arrival of the Black Death, there were large numbers of villages with uncultivated land in every part of England, mostly said due to shrinkage of the population since the famine years." [7] While not a climatic catastrophe, the Black Death was indeed a catastrophe, and here we see the preexisting conditions of famine as magnifying the carnage that the epidemic caused. The effect of famine on the Black Death is far from an isolated incident. "The summers of 1555 and 1556 and the harvests they produced certainly came as a severe shock after the easier times that preceded them... Whether the outcome should be described as famine is debatable, but presumably, malnutrition aggravated the influenza epidemic of 1557-8 in which whole families died... deaths exceeded the number of births for several years." [8] While it appears that drought and famine only serve to aggravate existing conditions, the inverse may also be true. Bountiful agricultural periods have served as a buffer from tough times. An example of a bountiful period acting as a buffer can be observed in late-17th century Ireland. "The potato, discovered in South America and grown in Ireland..., may have been largely responsible for sparing the Irish the famine which afflicted Scotland so directly in the 1690s." [9]

Another theme found in Lamb's work that is tangential to the above is that populations can easily be lulled into complacency in good times and therefore become overly dependent on a single crop, making themselves vulnerable to catastrophe. This is seen with the very case referred to above, Ireland. "They provided ideal conditions for the potato blight fungus... In Ireland, where the potato was the staple crop on the multitudes of small farms, 80 percent of them under 6 hectares and many only a fifth of that size, the effect was devastating.

Despite relief measures, particularly large imports of maize from the United States, enormous numbers of the people died.”[10] This is seen again following WWII. “The increase of population and modern political and organizational developments since 1950 have made these safeguards largely impossible. Governments prefer to organize cash cropping, taking in larger areas which were formerly used for grazing, and concentrating on few varieties if not only a single crop.”[11] What is different between the post-WWII world and Ireland is that another factor has mitigated the potential negative effects of food insecurity. This factor is a lowered sensitivity to climate change. Therefore, by the 20th century, states have prioritized cash cropping and profit, but they have also grown strong enough to be able to do so.

In sum, what are the key takeaways from Lamb’s work in regards to climate change and food security? Primarily, we see the importance of a society’s food security. A civilization that has been adversely affected by famine will almost certainly feel the effects of climate change more than they would have otherwise. Second, we see that overpopulation tends to be a contributing factor to agriculture failures. “The Irish potato famine...was surely the most horrifying example in Europe of a well-documented climatic disaster...Its consequences were greatly aggravated by the fast-growing overpopulation.”[12] Additionally, we observe that technological advancements in agriculture have prioritized profits over food security; however, states have grown and developed to become more resistant to the effects of climate change. This growth was not the same for all states, so sensitivity to climate change must also be considered as a potential causal factor.

### *Catastrophe*

Similar to Lamb, Keys conducts a comprehensive historical review of man’s connection with climate change. What makes his piece unique is that Keys is specifically interested in a mysterious climatic crisis that took place during 535-536 C.E., described as, “the sun gave forth its light without brightness like the moon during this whole year...people were terrified that the sun would never shine properly again. In some parts of the empire, there were agricultural failures and famines.”[13] Keys is curious to find the origins of this event as it is recorded in history by several individuals, only on the effects, not the causes. Another recording of these events describes it as such, “The sun became dark and its darkness lasted for 18 months. Each day, it shone for about four hours, and still, this light was only a feeble shadow. Everyone declared that the sun would never recover its full light again.”[14] This climatic event did not incite the same response from populations across the board. We see that certain areas were able to cope while others were either ill prepared or crumbled under the stress.

Keys provides valuable insight into how climate change affects food security. He finds that disease combined with preconditions such as drought leads to food

insecurity. “He saw fields abundant in grain which was becoming white and stood erect yet had no one to reap or gather it in.”[15] Keys also observes how famine can interact with overpopulation. “Typically, famines force their desperately hungry victims to move around, often traveling substantial distances, in search of food—and then to congregate at those few places where food or water is still available.”[16]

Similar to Lamb, Keys’ focus is on food security. He highlights the devastating effects of famine and how it contributes to violence. “A similar multiregional famine also struck in 1789-1792 and seems to have contributed to the French Revolution. In those years, crops failed in France, the northern United States, northeast Brazil, and most appallingly in India, where the resultant mass starvation-known as the “Skull Famine” caused so many deaths that it was impossible to keep count of the bodies.”[17]

From Lamb, we gather that not all states are equally resistant to climate change, famine sometimes exerts an interactive effect on overpopulation (which often leads to violence), and therefore, we must focus heavily on food security.

### *The Maya*

Michael Coe’s *The Maya* is another historical work focused on the ancient Mayan civilizations. While the piece is not directly related to climate change, he offers one piece of valuable insight while discussing the downfall of the ancient empire.

We know from the downfall of past civilizations, such as the Roman and Khmer empires, that it is fruitless to look for single causes. But most Maya archaeologists now agree that three factors were paramount in the downfall: endemic internecine warfare, overpopulation (and accompanying environmental collapse), and drought.”[18]

First, “it is fruitless to look for single causes.” When addressing the issue of climate change and food security, I am not under the impression that there will be a clear-cut connection between the dependent and a single independent variable. Next, drought acting as a factor in the Mayans’ downfall indicates that the society was not resistant to climate change. It is unclear whether or not overpopulation interacts with this drought, but it nevertheless contributes to its downfall. Finally, violence in the presence of these two factors supports my general theory.

### *Lessons Learned*

We say we study history to not repeat our mistakes. When we talk about the Holocaust, we say never again. This is precisely why I base this study so strongly on historical context. The lessons learned from our past will inform this research *vis-à-vis* the following takeaways. 1) While overpopulation does not directly cause

famine, it serves to strain the present food supply and exacerbate any preexisting conditions. 2) Many countries may feel the effects of climate change, i.e., drought; however, some are more sensitive than others to these effects.[19] 3) Food insecurity can be a brutal and self-perpetuating cycle that magnifies any existing unfavorable conditions. 4) These factors are all strongly interconnected but can aid in identifying which states will feel greater pains from climate change and therefore be more likely to experience violence from these effects.

### **Theory**

“Because conflicts are rarely, if ever, attributable to single causes, conflict analysis and concomitant efforts at reducing the risks of conflict must consider a multitude of complex relationships and contributing factors.”[20] Recall, the purpose of this research is to understand when a state will experience violence in the wake of climate change. I am seeking to understand what factors contribute to a state feeling extreme strain in the presence of climate change. This theory views climate change as an accelerant to mass atrocity. Referencing the study from The Stimson Center, climate change theoretically serves to exacerbate any preexisting conditions.[21] Each of my potential causal factors is viewed from this perspective.

Overpopulation, sensitivity to climate change, and food security are three factors that have often been observed in the presence of climate change induced devastation. Additionally, I base my theory on Sayne’s framework. Sayne looks at “(1) the country’s likely climatic shifts, (2) how these shifts could contribute to resource shortages, (3) the possible secondary impacts of shortage, and (4) how shortages and their secondary effects could fuel violence.”[22] I theorize that food insecurity, overpopulation, and climate change sensitivity serves to aggravate any political tensions and increase the likelihood that a government will respond to its citizenry with violence.

Overpopulation and food insecurity are commonly understood terms; however, it is important to explain how sensitivity to climate change differs from these factors. Vulnerability and adaptation compose the variable of sensitivity to climate change. “Vulnerability is the potential to be adversely affected by an event or a change and the ability to cope with or recover from its impacts.”[23] Adaptation is the adjustment in natural or human systems in responses to actual or expected climatic change or their effects.”[24] While some states may be very vulnerable to climate change, they may possess the ability to adapt to these effects very well. Some states may not be relatively vulnerable to climate change but lack the capacity to adapt. A qualitative assessment of both factors will serve as a measure of a state’s general sensitivity to climate change.

## **Methods**

My independent variables of interest are overpopulation, food security, and sensitivity to climate change. Overpopulation will be viewed as a recent increase in an area's population to exceed what the region is used to and able to support. There is no quantifiable metric to determine when overpopulation has been reached, as certain areas can handle more increase in population than others, but indications of overpopulation can be seen as government statements, increased conflict over scarce resources, and statements of resentment from local population leaders. Food security will be seen as a region's ability to produce food for the existing population. Poor levels of food production and distribution will largely contribute to poor food security. Considerations will be made if a region has low food security. Low food security is similar to climate change sensitivity in many ways but can be seen in a region that is largely dependent on one crop or if their crops are highly sensitive to drought. Finally, sensitivity to climate change is a qualitative evaluation of a region's vulnerability and ability to cope with climate change.

As previously noted, these independent variables are highly interactive with one another. Overpopulation may be triggered by food insecurity of a neighboring region; it may be triggered by a state's poor response to climatic events. Food insecurity may be magnified by overpopulation or poor agriculture adaptation to climate change. Finally, a state will be more sensitive to climate change as food insecurity and overpopulation serves to make it more vulnerable. That said, I have kept these three independent variables separated, as they are distinct from one another in many ways. Overpopulation may in fact be caused by a multitude of other reasons such as ethnic/political conflict or a promise of economic opportunity. Food insecurity may be caused by crop-killing disease and fungi. An area may also be vulnerable to climate change due to ineffective authoritarian regimes. Due to this, these three variables cannot be lumped together, but we must simultaneously be aware of the interactive effect at hand.

The primary dependent variable I am interested in is mass atrocity. In this study, I am considering mass atrocity to be any "large-scale, systematic (extensive, organized, widespread, sustained) violence against civilian populations and other noncombatants"[25] that results in 1,000 or more civilian deaths.[26] With these variables and theory in mind, my hypothesis is the following: A state that experiences relative overpopulation, food insecurity, and climate change sensitivity will be more likely to experience a mass atrocity in the presence of climate change compared to a state not experiencing these independent variables.

## **Case Studies**

Utilizing this working theory and hypothesis, I will conduct case studies of Nigeria, South Sudan, and Syria while paying close attention to overpopulation,

climate change sensitivity, and food security.

### *Nigeria*

Nigeria has been identified as a climate change hot spot by the Intergovernmental Panel on Climate Change.[27] When identifying particular regions, Northern Nigeria is feeling the effects of climate change the worst. Rains have decreased by 25 percent in the past 30 years, and temperatures are reaching 105 degrees Fahrenheit and beyond.[28]

Nigeria is a state that experiences overpopulation as “[a] nation of 150 million people shoehorned into an area twice the size of California.”[29] The worsening climatic conditions of the north have triggered large migrations in the region, contributing to overpopulation in the southern Delta region.[30] Specifically, the thirty-year drought in the Sahel has been partially responsible for feed and water shortages. These shortages have displaced nomadic pastoralists into the south.[31] Nigeria’s sensitivity to climate change stems from poor responses to climatic shifts; the state’s inability to react, in turn, leads to shortages of critical supplies that could otherwise be avoided.[32] The UN Food and Agricultural Organization rates Nigeria’s water use and conservation practices as poor; these preexisting factors only serve to magnify climate change-induced drought.[33] In terms of food security, Nigeria could be worse off. While the food supply at present is adequate, eighty-five percent of its crops are rain-fed and highly sensitive to shifts in precipitation and temperature.[34] Therefore, while food security is adequate, food actually serves to increase Nigeria’s sensitivity to climate change, as extant food sources are fragile.

Does Nigeria experience mass atrocity? The answer is uncertain at best; however, conflict over contested resources accounted for at least 10,000 deaths in the past decade.[35] Drought and increased temperatures forced farmers to cultivate more land each year, furthering scarcity and competition for grazing land among displaced nomads.[36]

### *South Sudan*

When considering specific regions in South Sudan, “[f]lood Plains, namely Western and Eastern, located in most of former Jonglei, Upper Nile, Unity, Warrap and Lakes States, get hard hit by frequent floods and droughts. It is therefore unsurprising that the Eastern Flood Plain experiences more conflicts in response to climate shocks.”[37] South Sudan has experienced decreased rainfalls, increased temperatures, and increased prevalence of drought and floods as a result of climate change.[38] This has caused resource scarcity that may not have resulted directly in overpopulation but has led to migration, which sparks violence in the competition for scarce natural resources.[39] “Examples of a migration to a new area as a result of climate-induced displacements include migration of Jonglei Agro-pastoralists to



Equatoria region, which has caused conflicts with farmers in the region since the 1990s. Scarcity of resources in rural areas as a result of drought and floods has forced people to migrate to towns, in turn increasing socio-economic stresses that sometimes fan political upheavals.”[40]

Food security interacts very closely with overpopulation in the case of South Sudan. In South Sudan, we see a case where there is not a population issue, but a consistent food shortage caused by climatic events and poor response from the government. In South Sudan, conflict tends to occur following a flood or drought, indicating the exacerbating effect that these events have on preexisting conditions.[41]

“Neo-Malthusians use resource scarcity theory as the main tool to explain the connection between climate change and conflict. They argue that environmental changes, due to their ability to cause scarcity through degradation or destruction of resources, pose great danger to human security through conflicts.”[42]

### *Syria*

In 2012, Syria’s population peaked at 22 million, more than seven times its size compared to 1950.[43] This increase in addition to decreased water flow from the Ataturk dam earned existing water sources a scarce designation.[44] Increased population also decreased the state’s adaptability to the effects of climate change and was accompanied by significant drought, described as the “worst long-term drought and most severe set of crop failures since agriculture civilizations began in Fertile Crescent many millennia ago.”[45]

Syria’s food security is very weak in that it is highly vulnerable to climatic shifts. “In the Mediterranean environment of northern Syria, crops are largely dependent on the use of growing season rainfall (very little water is stored from season to season).”[46] In addition to this fragile food source, Syrian agriculture also relies on highly inefficient irrigation methods. “Most of Syrian irrigated agriculture is in need of modernization, still relying on highly inefficient flood irrigation.”[47]

To make matters worse, Syria possesses a very weak infrastructure that is often targeted by terrorist organizations. “Water-related conflicts occur in many forms, including disputes over access to water and the control of water systems, the targeting of water infrastructure and systems during conventional conflicts and terrorist actions, and the use of water as a weapon.”[48] This fragile infrastructure proves the government very unadaptable, making the state sensitive to climate change. “[T]he regime’s failure to put in place economic measures to alleviate the effects of drought was a critical driver in propelling such massive mobilizations of dissent.”[49]

In the case of Syria, we see the factors of food insecurity leading to high levels of migration and overpopulation in certain areas. “The combination of very severe

drought, persistent multi-year crop failures, and the related economic deterioration led to very significant dislocation and migration of rural communities to the cities. These factors further contributed to urban unemployment and economic dislocations and social unrest.”[50]

Table 1: Climate Change Relates Risk Factors on Mass Atrocity

	Nigeria	South Sudan	Syria
Over Population	Yes (South)	No	Regional
Climate Change Sensitivity	High (North)	High	High
Food Security	Adequate	Low	Low (Fragile)
Mass Atrocity	No	Yes	

### Results

The results from the triple case study are condensed in table 1. They are not entirely conclusive but do go so far as to show that the independent variables in question are present in the three states above, which all experience climate change and all experience violence/mass atrocity. The qualitative assessment of these states attempts to assert that this is more than a mere correlation. There is an element of causation that must be recognized, as each of these risk factors appears to worsen the effects of climatic events, which then increase the chance of mass atrocity.

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